Grant Thornton

An instinct for growth™

Ex-Ante Cost Review of Galloper Offshore Wind Farm Transmission Assets

Report of Grant Thornton UK LLP

dated 13 February 2018

CONTENTS

APPENDICES

1 EXECUTIVE SUMMARY

1.1 This report relates to the Galloper Wind Farm (the Wind Farm) which is owned by a consortium of investors including Innogy Renewables UK Limited (Innogy), Siemens Financial Services, Green Investment Group and Sumitomo. The full ownership structure is set out at paragraph 2.21. The project is developed by Galloper Wind Farm Limited (GWFL/ the Developer) and project construction and operations are managed by Innogy through a Management Services Deed (MSD).

1.2 Our review and this report is based upon the cost template submitted to Ofgem dated 17 May 2017 and incorporates information and explanations provided regarding the costs in this version of the cost template, both from our site visit and in correspondence with the Developer, up to 19 October 2017.

1.3 The Wind Farm is situated offshore to the east of the operational Greater Gabbard wind farm approximately 27km from the shore of Suffolk.

1.4 The Wind Farm is composed of 56 Siemens SWT-6.0-154 Wind Turbine Generators (WTGs) providing a total name plate capacity of 336MW. In August 2017, a powerboost was implemented increasing this capacity to 352.8MW. Each WTG is linked to the offshore electricity platforms by buried subsea array cables. Two export cable circuits connect the Offshore Substation Platform (OSP) to the onshore substation (adjacent to the existing 132kV Greater Gabbard substation located at Leiston). Finally, two underground cables of approximately 0.28km link the onshore substation to the National Grid Electricity Transmission (NGET) substation at Leiston allowing connection to the national grid transmission system.

1.5 The Wind Farm Transmission Assets are currently under construction, with the expectation of being fully operational and commissioned by Summer 2018.

1.6 Grant Thornton UK LLP (Grant Thornton/we) has been instructed by The Office of Gas and Electricity Markets (Ofgem) to review the ex-ante cost assessments prepared by the Developer for the Transmission Assets of the Wind Farm (Ex-Ante Review).

1.7 The Ex-Ante Review has considered the accuracy, completeness and allocation of costs against the cost template prepared by the Developer for the Wind Farm Transmission Assets, based on supporting information and methodology provided by the Developer. Further detail on our work is set out in Sections 4 to 12 of this report. The purpose of a review at this stage is to:

1.7.1 determine if a developer cost estimate requires updating for the next stage of the transfer process, Invitation to Tender (ITT);

1.7.2 assist in the identification of technical issues by noting areas where the cost information suggests that further technical review may be required to consider efficiency as part of determining the Indicative Transfer Value (ITV) for the ITT stage of the process; and

1.7.3 assist determination of the ITV for ITT by reviewing accuracy, allocation and completeness of cost information.

1.8 The Developer's estimate of the cost of the Wind Farm Transmission Assets, included in the cost assessment template dated 17 May 2017 (the CAT), amounts to £323.4 million. This represents a £5.6 million decrease on the initial cost assessment by the Developer at 28 June 2016 as set out in version 1 of the cost template that projected the original cost to be £329.1 million. The CAT presents the Developer's estimated costs of the Transmission Assets as follows:

Transmission Assets cost summary

	CAT Reference	Ref	Direct costs £	Contingency £	Total £	%
Project common costs	CR8	6.1	[redacted]	[redacted]	[redacted]	[redacted]
Offshore substation	CR2	7.1	[redacted]	[redacted]	[redacted]	[redacted]
Submarine cable supply and installation	CR3	8.1	[redacted]	[redacted]	[redacted]	[redacted]
Land cable supply and installation	CR4	9.1	[redacted]	-	[redacted]	[redacted]
Onshore substation connection	CR5	10.1	[redacted]	[redacted]	[redacted]	[redacted]
Reactive substation	CR6	11.1	[redacted]	-	[redacted]	[redacted]
Connection costs	CR7	12.1	[redacted]	-	[redacted]	[redacted]
Total capital costs			[redacted]	[redacted]	[redacted]	[redacted]
Interest during construction			[redacted]		[redacted]	[redacted]
			[redacted]	[redacted]	**323,399,473**	100.0%

SUMMARY OF FINDINGS

1.9 The Developer has provided us with supporting documentation and/or explanations for the majority of items included within the cost template. Our review found that all major items of capital expenditure for Transmission Assets have either been procured under contracts specific to the transmission business, or have been procured under contracts specific to the Wind Farm as a whole and have been allocated between the Transmission and Generation Assets using a mix of allocation methodologies that will be considered further in this report.

1.10 As part of our line-by-line review of the CAT, we have agreed the costs of the transmission business above £100,000 to supporting documentation. This included confirming costs in the CAT to contracts between the Developer and subcontractors, contract variations orders and to working schedules prepared by the Developer that set how estimated costs within the CAT have been calculated. It also included gaining an understanding from the Developer about the determination of costs in the CAT, such as the approach to procurement of main items of expenditure, the allocation of shared costs between the transmission and generation businesses, and the treatment of costs incurred in foreign currencies.

1.11 In most cases, we were able to confirm that the costs included in the CAT were appropriately stated. However, we identified that some costs were incorrectly stated, and as such, we propose adjustments for these costs at paragraph 1.41 below.

1.12 Furthermore, there were some costs where we were unable to gain sufficient comfort of their treatment in the CAT, and where this is the case, we recommend that Ofgem should discuss these areas with the Developer. Such costs are detailed in paragraphs 1.28 to 1.40 below.

Cost allocation

1.13 The CAT includes a number of common costs to the Wind Farm as a whole. Where costs are not directly attributable to either the transmission or generation business (shared costs), the Developer has allocated costs to the Transmission (OFTO[1]) Assets using three different, so-called, Cost Allocation Keys (CAK):

1.13.1 CAK1 - Cost-based CAK. Direct Transmission Assets costs as a percentage of total capital expenditure (CAPEX). This rate is similar to allocation rates we have seen used in previous projects where the cost of Transmission Assets capital expenditure is taken as a percentage of total Wind Farm capital expenditure, where the rate derived is 23.00%[2]. The Developer has explained that this rate is applied to non-specific CAPEX where the other allocation methods are not considered appropriate, such as insurance costs and offshore services contract;

1.13.2 CAK2 - Time-based CAK. Innogy internal project team time that is directly related to the Transmission Assets as a percentage of the total project team time that can be allocated either to the Transmission or to the Generation Assets. The rate of 39.64%[3], derived from OFTO allocation percentages applied to each of the roles in the resource planner (see paragraph 1.21 below), is applied to costs where it is reasonable to allocate indirect costs based on how much direct project team time is spent on different assets. For example, general project management costs and admin personnel costs; and

1.13.3 CAK3 - Area-based CAK. For costs such as offshore site investigation and UXO clearance, where there are clear geographical areas in relation to the costs incurred, the allocation has been made based on the proportion of offshore lease area related to the Transmission Assets as a percentage of total offshore lease area. The Developer has determined that the Transmission Assets share of the geographical area of the Wind Farm is 32.81%[4].

[1] Offshore Transmission Owner

[2] £[redacted] (OFTO main works) / £[redacted] (Total CAPEX for main works) 22.58%. For calculation purpose the Developer has rounded this up to 23.0%

[3] During our review this was updated to 40.81% as set out in paragraph 5.48

[4] 11.25km^2 (OFTO area) / 34.29km^2 (total area) = 32.81%

Electrical Systems contract

1.14 The Electrical Systems contract covers four CR categories in the CAT (see **Appendix 3**). Each line in the package forecast is allocated to either non-OFTO, one of the four CR categories directly or for costs which relate partially to each of the CR categories (the Electrical Package shared costs) the costs are 'shared'. The Electrical Package shared costs include spares and project management costs, and such 'shared' costs are allocated across the four CR categories using the following allocation rates:

Allocation rates for Electrical System 'shared' costs

	CAT Reference	'Shared' cost allocation % (a x b)
Offshore substation	CR2	63.47%
Land cable supply and installation	CR4	4.76%
Onshore substation connection	CR5	12.33%
Reactive substation	CR6	18.16%
		98.73%

1.15 In principle, we consider that the allocation methodologies used by the Developer appear reasonable and in line with cost allocation methodologies we have seen in previous projects. However, the allocation methodology between Transmission and Generation Assets is subject to the agreement of Ofgem and we have simply verified that the calculations match the methodology rather than verified that the methodology applied is correct.

Cost allocation rates

1.16 The table below summarises the allocated costs included within the CAT, and the effective allocation rate[5] for such costs:

Project common costs

	Total £	Allocation £	Effective Rate
Common costs	[redacted]	[redacted]	[redacted]%
Resourcing costs[6]	[redacted]	[redacted]	[redacted][7]
DEVEX	[redacted]	[redacted]	[redacted]%
Total	**162,506,169**	[redacted]	[redacted]%

[5] Ie excluding costs with an 'allocation rate' of 100%

[6] See paragraph 5.3

[7] The effective allocation rate for resourcing costs becomes 40.85% when the updated allocation rates as per paragraph 5.48 are applied

1.17 The above table shows that the allocation methodologies used by the Developer has resulted in cost allocations to the Transmission Assets at an average rate of 29.25%, which is slightly higher than rates we have seen on previous projects of around 25%. This is due to the higher effective rate of 39.41% in relation to resourcing costs.

1.18 Whilst the effective rate for resourcing costs of 39.41% is higher than the CAPEX rate used for resources on previous projects, discussions on previous projects have highlighted that the amount of time spent by project teams on the Transmission Assets as a proportion of total time can be higher than the proportion of CAPEX. Furthermore, the Developer has stated that the resources costs for GWFL have been allocated based on actual time spent as recorded in timesheets which should result in a more representative allocation rate.

1.19 However, in light of the higher effective allocation rate for shared costs to the Transmission Assets, particularly in relation to resourcing costs, we recommend that Ofgem should discuss cost allocation further with the Developer.

Resources costs

1.20 The CAT includes approximately £[redacted] relating to the time costs of project management resource on the project, including time spent by both Innogy employees and contractors, on the Transmission Assets.

1.21 We have been provided with a resource planner, which details the time spent by the employees on the Transmission Assets. This lists all project roles, durations, actual rates (where role is filled), shift pattern derived estimated working days and inflation (as per the governing MSD to calculate a forecast total cost by month across the relevant personnel categories).

1.22 We understand that GWFL are required to sell the Transmission Assets to the offshore transmission owner (OFTO) at cost. As such, if the rates calculated by the Developer include any profit element, this would be inconsistent with this requirement. The Developer confirmed that no profit element is included within internal staff costs and contractor's rates are at cost plus 10% to cover administration costs such as IT, office space etc.

[8] See breakdown of resources in the table at paragraph 5.3

Contingencies

1.23 The CAT for the Transmission Assets includes a contingency provision amounting to £[redacted] (6.32%[9] of pre contingency capital costs excluding IDC). The Developer has calculated the contingency provision based upon its assessment of risks in relation to the Transmission Assets (and a share of common costs where appropriate), the likelihood of such risks being realised and an estimate of the costs involved in these circumstances.

1.24 Based upon our experience of similar projects, this appears to be a sensible approach, and the percentage of contingencies is not out of line with what we have seen on other projects. However, we consider that the assessment of the expected value of risks and of the likelihood of each event occurring fall within the scope of a technical assessment, rather than the Ex-Ante Review. On that basis, we cannot say whether these amounts which form the basis for the contingency provision are correct. As a result, in light of this limitation, we are unable to conclude whether the contingency provisions in the CAT are reasonable.

1.25 We note that by the time of the ex-post cost assessment (the Ex-Post Review), the value of the contingencies is expected to fall to zero, as at that stage all costs will be known.

Foreign exchange

1.26 The CAT includes costs which are payable in foreign currencies (EUR) totalling €[redacted] (£[redacted]). Due to the immaterial size of these payments (in the context of total cost), they are made from the Sterling bank account based on the applicable spot rate. The Developer has converted these costs to GBP within the CAT by applying hedged rates applicable on GWFL's non-OFTO currency contracts (which have significant exposure to foreign exchange rates and therefore have been hedged).

1.27 The Developer has advised that, at Final Transfer Value (FTV), GWFL intends to adjust these costs to be based on actual spot rates. It is noted that if the spot rate were applied to the costs payable in foreign currencies, at an assumed average of 1.17, then the cost to the Transmission Assets, would increase by an insignificant amount of approximately £50,000.

Areas requiring technical input

Resourcing costs

1.28 The CAT for the Transmission Assets includes the cost of time spent by Innogy's internal staff in managing the project and in the construction of the Transmission Assets.

[9] [redacted]

1.29 The Developer has provided us with detailed schedules, linked to the resource planner, that show forecast time spent, which is updated for actuals every three months, by each individual and activity during the construction of the Wind Farm. However, it is not our area of expertise to establish whether the time spent by the internal staff is reasonable, or whether the rates used in the CAT are reasonable.

1.30 On this basis, we recommend that Ofgem should review these schedules in order to determine whether these costs are being efficiently incurred.

Contingency

1.31 Another area requiring technical input, as we set out above, is the contingency provision for the Transmission Assets. This has been calculated based upon the Developer's assessment of the risks associated with the construction of the Transmission Assets, plus a general provision of 15% of the subtotal for any unidentified risks. It is not our area of expertise to establish whether the Developer's assessment of the expected value of risks and of the likelihood of each event occurring are correct.

1.32 On this basis, should Ofgem require a review of these risks, we recommend that it should review the risk schedule in order to determine whether the Developer's assessment is reasonable.

Plan B and C options

1.33 As further detailed in Section 7[10], the Developer has explained that Plan B and Plan C options are risk management measures, protecting against the risk of delay, to ensure GWFL maintains its programme. These mitigation measures were essential requirements of banks and stakeholders in GWFL to ensure it progressed through financial close and into construction.

1.34 Plan B costs included in the CAT of £[redacted] relate to an additional vessel reservation option to ensure the heavy lifting vessel was available when needed. The Developer notes the vessel is not required, however the sunk cost of £[redacted] has been kept in the CAT.

1.35 Plan C costs mitigate against further delays, by by-passing the OSP to transport power onshore via a cable alteration. The estimated costs of £[redacted] relate to works that have not been instructed to be undertaken. The Developer notes that this work is now unlikely to progress, as the OSP has already been installed. However, the costs remain in the CAT in case of an unexpected failure or delay during the final OSP works.

[10] From paragraph 7.11

1.36 We recommend Ofgem discuss these costs further with the Developer as it appears to be a prudent approach to include all of the costs for Plan B and C in the CAT considering it is very unlikely they will be incurred.

Spares

1.37 The CAT includes (CR2, CR4, CR5 and CR6) costs for spare parts in relation to the Electrical Services Agreement, which total £[redacted] in relation to commissioning and start-up spares and £[redacted] for operational spares, as detailed at **Appendix 5**. Further costs for spare parts are included in CR3 of the CAT in relation to the supply and installation of the export cable as set out in paragraphs 8.5 and 8.7. In line with previous projects, we recommend that Ofgem should take a view regarding the level of spare parts in the ITV.

Unsubstantiated costs

1.38 The CAT contains a number of estimates made by the Package Managers for expected contract variations and remaining budgets. The table below sets out the costs where we have been given explanations for the inclusion of the costs by the Developer but the level of information provided has been insufficient for us to substantiate the amount included in the CAT.

1.39 These unsubstantiated costs total £[redacted] ([redacted]% of capital costs) and are as follows:

Unsubstantiated costs

	CAT Reference	Ref	OFTO amount £
Transaction costs - external legal advice	CR8	5.14	[redacted]
Transaction costs - transactional fees and transaction enabling	CR8	5.18	[redacted]
DEVEX – Legacy (2012-2014) – CRO.06.01.06 – Development	CR8	6.9	[redacted]
DEVEX – Legacy (2012-2014) – CRO.06.01.09 – Overheads	CR8	6.9	[redacted]
			2,071,238

1.40 We understand that that in relation to the development costs (DEVEX) the Developer is unable to provide further information as these historic costs were originally accounted for by SSE (as they were incurred pre-2012 when RWE was in a joint venture with SSE, who undertook the lead in reporting these costs). We recommend that Ofgem should discuss the unsubstantiated costs further with the Developer and take a view on whether these costs should be included within the Transmission Assets.

[11] As detailed in paragraph 5.6 of Appendix 5, we have proposed adjustments to reflect the current estimate and reduce the cost of operational spares from £[redacted] to £[redacted]. We understand that this estimate may be subject to further amendment and hence we recommend that Ofgem should discuss this further with the Developer

Conclusion

1.41 Following the Ex-Ante Review and the supporting information provided, we consider that adjustments of £2,189,187 (0.74% of capital costs) are required to decrease the value of the costs included in the CAT, as summarised in the following table.

Impact of cost assessment

	CAT Reference	Ref	£
Cost of Transmission Assets per CAT (excluding IDC)		1.8	[redacted]
Revised estimates - updated for new information available since the CAT date			
Decrease in cross project engineering costs for current estimate	CR8	6.4	[redacted]
Decrease in operational spares no longer sourced under the Electrical Services contract[12]	CR2	7.8	[redacted]
Decrease in operational spares no longer sourced under the Electrical Services contract[13]	CR4	-	[redacted]
Decrease in operational spares no longer sourced under the Electrical Services contract[14]	CR5	10.6	[redacted]
Decrease in operational spares no longer sourced under the Electrical Services contract[15]	CR6	11.8	[redacted]
Decrease in expected future variations to the Electrical Services contract	CR2	7.9	[redacted]
Decrease in expected future variations to the Electrical Services contract	CR4	-	[redacted]
Decrease in expected future variations to the Electrical Services contract	CR5	10.7	[redacted]
Decrease in expected future variations to the Electrical Services contract	CR6	11.9	[redacted]
Decrease in PC resource budgeted costs no longer required	CR2	7.30	[redacted]
Decrease in guard vessel costs (now actual costs known)	CR3	8.9	[redacted]
Decrease of contract NRL4692 price due to scope element no longer needed	CR3	8.10	[redacted]
Decrease in contract variations (NRL3129) to reflect latest forecast	CR3	8.15	[redacted]
Decrease in Fisheries Compensation costs to reflect latest forecast	CR2	8.20	[redacted]
Decrease in Fisheries Compensation costs to reflect latest forecast	CR3	8.20	[redacted]
Decrease in costs relating to the supply of second stage harmonic filters (scope no longer in contract)	CR6	11.6	[redacted]
			[redacted]
Adjustments where the amounts verified differs to the CAT amount			
Increase in resource costs (CRO.02) upon updating CAK2 allocation rate	CR8	5.49	[redacted]
Increase in DEVEX costs upon updating CAK2 allocation rate	CR8	5.49	[redacted]
Decrease proposed by the Developer in relation to DEVEX costs	CR8	6.8	[redacted]
			[redacted]
Total adjustments			**(2,189,187)**
Revised cost of Transmission Assets			**292,008,746**

[12] As noted in footnote 11 above, the estimated cost of operational spares may be subject to further amendment and therefore the adjustment amount would change. We recommend that Ofgem should discuss this further with the Developer and confirm the amount of the adjustment

[13] ibid

[14] ibid

[15] ibid

Summary of cost movements and unsubstantiated costs

1.42 At **Appendix 1**, we set out a summary by CR category of the cost movements detailed in the table at paragraph 1.41 above, along with the unsubstantiated costs set out in the table in paragraph 1.39 above.

Grant Thornton UK LLP

Grant Thornton UK LLP

London

13 February 2018

2 INTRODUCTION AND BACKGROUND

INSTRUCTIONS

2.1 Grant Thornton UK LLP has been instructed by Ofgem to prepare an Ex-Ante Review of the cost information and cost templates prepared for Ofgem by the Developer in relation to the GWFL Transmission Assets.

2.2 The review is to understand whether the costs provided in the Developer's cost template can be matched to specific contracts or other supporting information, and whether appropriate metrics exist for cost allocation between transmission and generation. Our work involved tracing the amounts quoted in the cost assessment template to supporting contracts, schedules and other supporting information that indicates how costs have been derived. The review also involved a site visit to the Developer's premises in order to discuss the information provided, together with the basis for the cost allocation metrics used.

2.3 The purpose of a review at this stage is to:

2.3.1 determine if a developer cost estimate requires updating for the next stage of the transfer process, ITT;

2.3.2 assist technical evaluation by noting areas where the cost information suggests that further technical review may be required to consider efficiency as part of determining the ITV for the ITT stage of the process; and

2.3.3 assist determination of ITV for ITT by reviewing accuracy, allocation and completeness of cost information.

2.4 The Ex-Ante Review is based upon the Developer's current estimates of the costs to be incurred in developing and constructing the transmission assets. Following construction of the Wind Farm, we expect to carry out a forensic review of the actual expenditure incurred by the transmission business (the Ex-Post Review).

2.5 Grant Thornton's review of the ex-ante cost information prepared by the Developer is limited to the scope as set out above and does not include detailed cost verification or any review of technical or legal issues.

2.6 Our review and this report is based upon the cost template submitted to Ofgem dated 17 May 2017 and incorporates information and explanations provided regarding the costs in this version of the cost template, both during our meeting with and correspondence with the Developer up to 19 October 2017.

2.7 If further information is produced and brought to our attention after service of this report, we reserve the right to revise our opinions as appropriate.

2.8 This work does not constitute an audit performed in accordance with Auditing Standards.

2.9 Except to the extent set out in this report, we have relied upon the documents and information provided to us as being accurate and genuine. To the extent that any statements we have relied upon are not established as accurate, it may be necessary to review our conclusions.

2.10 The report has been prepared using Microsoft Word and Microsoft Excel. The report may contain minor rounding adjustments due to the use of computers for preparing certain calculations.

RESTRICTION ON CIRCULATION

2.11 Grant Thornton does not accept or assume responsibility, duty of care, liability or other obligation to any third party other than Ofgem who, as a result, either directly or indirectly, of disclosure of the whole or any part of this report by Ofgem, receives, reads or otherwise obtains access to this document. Any party relying on this report does so entirely at their own risk.

2.12 In the preparation of our report, Grant Thornton has been provided with material by Ofgem (and by third parties at Ofgem's request) relating to third parties. We have relied upon warranties and representations provided by Ofgem that it is fully entitled to disclose such information to us for inclusion within our report, free of any third party rights or obligations, and that Ofgem will only permit circulation of this report in accordance with any rights to confidentiality on the part of any third party. Any objections to the inclusion of material should be addressed to Ofgem. Accordingly, Grant Thornton acknowledges no duty or obligation to any party in connection to the inclusion in the report of any content referring to any third party material or the accuracy of such material.

DISCLOSURES OF INTEREST

2.13 To the best of our knowledge, we have no connections with any of the parties or advisors involved in this matter, beyond normal commercial relationships, which would influence our report in any way.

FORMS OF REPORT

2.14 For your convenience, this report may have been made available to recipients in electronic as well as hard copy format. Multiple copies and versions of this report may therefore exist in different media and in the case of any discrepancy, the final signed electronic copy should be regarded as definitive.

BACKGROUND TO THE WIND FARM

2.15 The Wind Farm is situated offshore in the Thames Estuary, to the east of the operational Greater Gabbard wind farm, and approximately 27km south of the shore of Suffolk. The onshore licensing body is NGET and the GWFL Transmission Assets will connect to the NGET substation at Leiston allowing connection to the national grid transmission system.

2.16 The Wind Farm is composed of 56 Siemens SWT-6.0-154 WTGs providing a total name plate capacity of 336MW. In August 2017, a powerboost was implemented increasing this capacity to 352.8MW. Each WTG is linked to the offshore electricity platforms by buried subsea array cables. Two export cable circuits, each consisting of a buried subsea 132kV export cable approximately 45km in length and an onshore cable approximately 0.85km in length, connect the Offshore Substation Platform (OSP) to the onshore substation (adjacent to the existing 132kV Greater Gabbard substation located at Leiston). Finally, two underground cables of approximately 0.28km link the onshore substation to the NGET substation.

2.17 The Wind Farm Transmission Assets are under construction at present, with the expectation of being fully operational and commissioned by Summer 2018.

2.18 The GWFL Transmission Assets are expected to deliver an availability of 98%[16], taking into account both planned and unplanned maintenance.

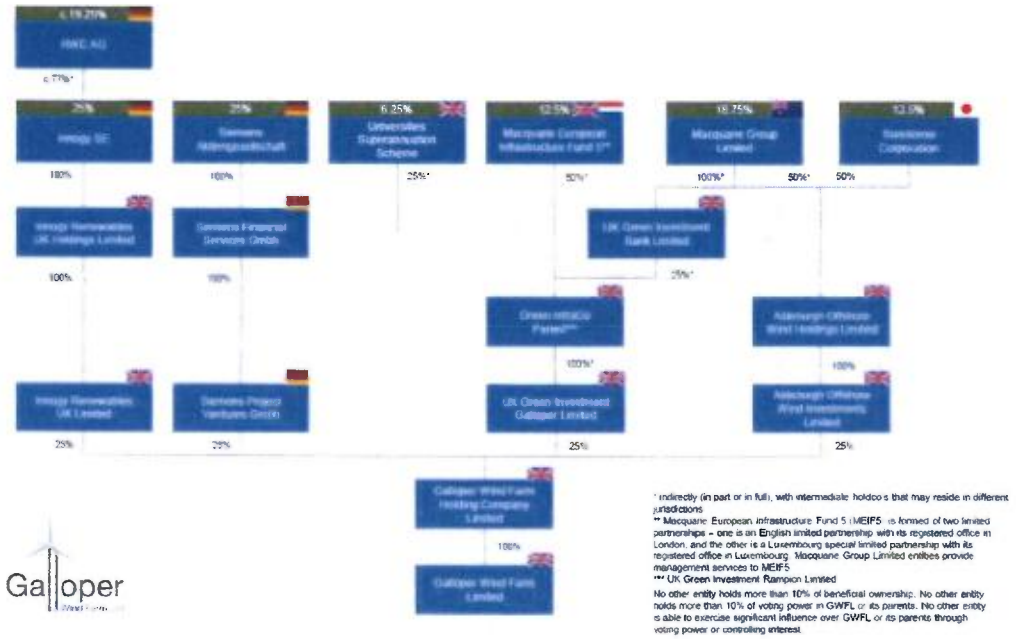
OWNERSHIP STRUCTURE

2.19 The Wind Farm is owned by a consortium of investors including Innogy Renewables UK Limited, Siemens Financial Services, Green Investment Group and Sumitomo.

2.20 In addition to equity funding from the owners, GWFL has also secured project financing from a group of commercial banks and the European Investment Bank.

[16] Information Memorandum dated March 2017, page 26, Table 5

2.21 The current ownership structure[17] of the Wind Farm is set out below:



[17] "2017-10-31 GWFL Corporate Structure Chart"

3 THE GWFL EX-ANTE REVIEW

3.1 The main purpose of the Ex-Ante Review of the Wind Farm's Transmission Assets is to determine:

3.1.1 whether the costs as set out in the Developer's cost template for the Transmission Assets are appropriately stated to use in Ofgem's cost assessment; and

3.1.2 whether costs not directly attributable to either the Generation or Transmission Assets have been allocated between the two on a reasonable basis.

3.2 The starting point in our review of the cost information provided was the CAT dated 17 May 2017, and was based upon the Developer's estimates of the costs of the Transmission Assets at 28 February 2017.

3.3 Our review has considered confirmation that costs included in the CAT relate to contracts that are either for the Transmission Assets or are for the Wind Farm in a broader sense but have a reasonable basis for allocation between Transmission Assets and other elements of the Wind Farm. The basis of allocation is different in some cases depending upon:

3.3.1 whether the costs can be directly attributed to either the transmission or generation businesses (as in the case of the main capital contracts); or

3.3.2 what is considered the main driver behind the relevant development or project management cost (this is usually capital cost or the degree of time/activity required in relation to different components of the Wind Farm development).

3.4 In each case where an allocation is involved we have considered if the proposed method and rate of allocation are appropriate for that particular cost. We have not at this stage sought to verify that any expenditure has actually been incurred by tracing to actual payments, as that will be done for selected contracts as part of the later forensic review.

3.5 The cost assessment for the Transmission Assets of the Wind Farm as per the CAT is summarised below:

Transmission Assets cost summary

	CAT Reference	Ref	Direct costs £	Contingency £	Total £	%
Project common costs	CR8	6.1	[redacted]			%
Offshore substation	CR2	7.1	[redacted]			%
Submarine cable supply and installation	CR3	8.1	[redacted]			%
Land cable supply and installation	CR4	9.1	[redacted]			%
Onshore substation connection	CR5	10.1	[redacted]			%
Reactive substation	CR6	11.1	[redacted]			%
Connection costs	CR7	12.1	[redacted]			%
Total capital costs			276,720,844	17,477,089	294,197,333	91.0%
Interest during construction			29,201,539	-	29,201,539	9.0%
			305,922,384	**17,477,089**	**323,399,473**	100.0%

3.6 Our findings in respect of the Ex-Ante Review are set out as follows:

3.6.1 the overview of the Developer's processes for accounting and procurement of the Wind Farm is set out in Section 4;

3.6.2 our work in relation to costs and procurement matters which are common to the CAT as a whole is set out in Section 5;

3.6.3 our work in relation to project common costs and development costs which have been allocated to the Transmission Assets, summarised on the CAT under CR8, is set out in Section 6;

3.6.4 our work in relation to costs specific to each component of the Transmission Assets, summarised on the CAT under CR2, CR3, CR4, CR5, CR6, and CR7 is set out in Sections 7 to 12; and

3.6.5 a summary of the issues identified as part of our review is set out in the executive summary (Section 1).

INFORMATION PROVIDED

3.7 Grant Thornton has relied upon the following information in reviewing the cost assessment for the Wind Farm:

3.7.1 Preliminary Information Memorandum dated September 2016 and Information Memorandum dated March 2017[18];

3.7.2 information contained in the Ofgem developer data room for the Wind Farm Project; and

3.7.3 information and explanations provided to us by the Developer. This includes a meeting with the Developer on 20 September 2017 to discuss the Transmission Assets and telephone calls and email correspondence with the Developer.

[18] Actual dates not specified

4 GWFL PROCESSES

INTRODUCTION

4.1 In this section, we set out the processes that have been used by the Developer in relation to the procurement of and the accounting for the Wind Farm, and in particular, the Transmission Assets.

4.2 From our discussions with the Developer and our review of the cost information prepared by them in respect of the Transmission Assets, it is evident that there are systems in place which will help to ensure that the cost of the Wind Farm Transmission Assets represents value for money including:

4.2.1 competitive tendering;

4.2.2 specific planning and budgeting tools, including building on experience obtained from similar projects; and

4.2.3 controls over variation orders and large expenditure items.

PROCUREMENT PROCESS

4.3 The overall procurement strategy for GWFL (the Procurement Strategy[19]) was finalised in March 2013. In determining the Procurement Strategy, consideration was given to lessons learnt from previous RWE Npower Renewables (RWE) offshore wind projects, the projects key drivers, the supply chain competition, the supply chain capability and track record and the supply chain appetite for accepting contractual offshore risks.

Multi-contract strategy

4.4 At the time the Procurement Strategy was being developed, the finance strategy for GWFL was for the Wind Farm to be financed on balance sheet by RWE and SSE Renewables who were equal shareholders. These two shareholders were jointly involved in the review and approval process of the Procurement Strategy. After considering various contracting options, a multi-contract strategy was recommended as the most suitable, cost effective and efficient procurement and construction approach.

[19] Ofgem developer data room 2.1.9.4 "Galloper Project Procurement Strategy Approved Clean 15032013"

4.5 Appendix 1 of the Procurement Strategy lists an optimum work package breakdown for the supply and construction elements, which details 12 main project contracts. In proposing the work package breakdown consideration was given to a number of items including minimisation of the number of project contracts and competitive tendering to be used for all main contracts wherever possible other than where it is simply not achievable or that there is an overwhelming case that there is a greater benefit to single source.

4.6 Appendix 1 of the Procurement Strategy identifies the following lots in relation to the Transmission Assets:

4.6.1 Lot 4A: Electrical System. This lot includes Electrical system works design, design and build of onshore substation, supply and installation of onshore cables as well as supply of the OSP, design manufacture and supply of OSP foundation;

4.6.2 Lot 4B: Transportation and Installation of OSP and OSP foundation. The scope of this lot is the supply of a crane vessel and installation works to install the OSP and OSP foundation supplied under Lot 4A;

4.6.3 Lot 5A: Subsea export cable supply and Subsea array cable supply. This lot involves the design, manufacture, supply and load out onto the vessel provided by the contractor under Lot 5B; and

4.6.4 Lot 5B: Installation of subsea array and export cables. The scope of this lot is the collection of the cables from the manufacturer's port of loading and the installation of the cables at the offshore site.

Change in strategy to EPCI

4.7 In November 2013, the shareholders instructed GWFL to prepare for a non-recourse debt finance solution to meet the project capital requirements. As a result of the move from equity finance to non-recourse project finance and the view that this required fewer contracts with less contractual interface risk being held by the project, the Procurement Strategy was reviewed to ensure suitability for the requirements of the new financing structure.

4.8 As a consequence of reducing the contractual risks, it was recognised that the change in strategy would reduce the risk of contractual claims, provide a more certain package outturn cost and improve warranties. Subsequently, an amendment[20] to the Procurement Strategy was issued, which brought together the offshore transportation and installation elements with the design and supply parts of the major contracts. This reduced the number of major project contracts from 12 to five Engineering Procurement Construction Installation (EPCI) contracts.

4.9 EPCI contracts offer advantages such as the transfer of risk to the contractor, increased certainty of outturn costs, improved warranties and a favourable position with respect to project finance. Details of the five major EPCI contracts for GWFL are set out in the table below:

Major Contracts

Contract Lot	Scope Amendment to Procurement Strategy
1. Wind Turbine Generators	EPCI – Unchanged (installation vessel lot 2 was placed within scope in July 2013)
2. WTG Foundations	EPCI – Lots 3a, 3b and 3c (Design, Supply and Install) to be amalgamated
3. Electrical System	EPCI – Lots 4a and 4b (Electrical System and Offshore Substation Transportation and Installation) to be amalgamated
4. Subsea Export Cables	EPCI – Lot 5a and Lot 5b (Supply and Install) to be amalgamated
5. Subsea Array Cables	EPCI – Lot 6a and Lot 6b (Supply and Install) to be amalgamated

4.10 The contracts relevant to the Transmission Assets are:

4.10.1 Lot 3 – Electrical System: this includes a pricing request for the offshore transport and installation (T&I) of the OSP and associated jacket foundation; and

4.10.2 Lot 4 – Export Cables: this contract involves two ITTs, one for the supply, and one for the installation works. By amalgamating these two work packages, the interface risks between the packages are reduced.

4.11 The high-level proposals of the Procurement Strategy are further developed in the 'Contract Strategy' documents, providing contract specific details in respect of the tender/bidding process, sourcing type and form of contract and any specific contract-related risks, key issues or special requirements.

[20] Ofgem developer data room 2.1.9.4 "001544967-01 Procurement Strategy for Galloper Offshore Wind Farm - Addendum 1 – Final"

Competitive Tendering

4.12 The majority of the Transmission Assets were built under two main EPCI contracts (Electrical Systems and Cables) and a third contract for the NGET Unlicensed Works. Details of the contract strategy for the two main contracts, including the use of a competitive tendering process with selection of preferred bidders being based on an evaluation model (adapted for each contract on a case-by-case basis), are set out in **Appendices 3 and 6**.

4.13 As part of our work we have reviewed the tender evaluation reports in relation to these contracts, including the reason behind the award for each contract and ensured the processes are line with those documented in the Procurement and relevant Contract Strategy. Our reviews in this regard are also detailed in these Appendices.

Contracting

4.14 All construction contracts for the GWFL project are entered into by Galloper Wind Farm Limited.

DECISION MAKING PROCESSES

4.15 All project decisions must be made in accordance with loan documents and shareholder agreements. The Project Director (PD) and/or Finance Director (FD) assess if decisions require Board and/or Lenders approval. The below table, provided by the Developer[21], summarises the delegation of authority levels that are effective on the Galloper construction project:

Approval Thresholds				Required Approvals			
Budget change	Contractual commitment (within budget)	Programme	Scope	Project Manager / Function Manager	Senior Project Manager / Deputy PD	Project Director / Finance Director	Board / Lenders
Transfer within package budget <£250k	<£250k	Change to package level programme with no effect on interface dates / project milestones	Changes that do not waive any material entitlement and do not change interface responsibility	X			
Transfer within package budget <£500k	<£500k	Change to project key milestone or change to interface date	Potential waiver of material entitlement or any change in interface responsibility		X		
Any budget transfer to/from project contingency or any transfer between packages or >£500k within package	>£500k	Extension of Time under main contracts	Waiver of material entitlement			X	Assessed by PD / FD

4.16 Further to the above, Project Managers may delegate applicable authority to Package Managers.

[21] Ofgem developer data room 3.1.2.4 "Galloper DoA"

ACCOUNTING AND BUDGETING PROCESS

4.17 Innogy, as project manager of the Wind Farm provides the accounting team that supports the Wind Farm project and undertakes the budgeting process. Innogy uses the SAP accounting system for the Wind Farm, with a multi-level Work Breakdown Structure (WBS) coding system to assign costs of the Wind Farm and allocate responsibilities to packages.

4.18 An excel based suite of workbooks is managed by the project control managers to report expenditure, accruals and forecasts, which are based upon monthly meetings with the package managers assisted by their contract managers, responsible for their respective contracts.

4.19 The SAP based accounting system manages the procurement and payment of vendors' purchase orders for the Wind Farm. Invoices from vendors are 'Goods receipted' (processed for payment) within the system, following a strict process as detailed in paragraph 4.21 below, and allocated to their appropriate WBS code. The finance team provides details of incurred expenditure monthly to the project controls for inclusion in the package reports.

Purchase order and invoice approval

4.20 The Developer operates a rigid invoice and purchase order approval process to ensure that payments are made in accordance with RWE's Verification Process and internal audit advice by allowing identification and storage of approvals in a suitable form and location.

4.21 The approval process is outlined below:

4.21.1 Invoices are received through the Galloper Invoicing Inbox. Once the source of the payment request has been identified (ie GWFL contracted Vendors[22] or RWE Innogy UK Ltd vendors[23]), the invoice is recorded on the GRN (Good Receipt Notice) register (which has a tab for each of the vendors) in blue text to denote it is in progress and not yet complete.

[22] Contractors with payment processes within their contracts will invoice once they are in receipt of a payment certificate whereas smaller directly contracted vendors are likely to have their invoices vetted by their projects contacts, and therefore in some cases the project contact may forward the invoice to the inbox after receiving it directly

[23] In the case of project resource, the vendors are not contracted directly to GWFL but via the MSD

4.21.2 A Payment Request Form (PRF) is required to be added to the invoice prior to passing to Project Controls. This facilitates the correct split between PO lines, either for different WBS allocation or, for Contractors, to identify day rate costs from expenses. Vendor and invoice details are added to the PRF by the commercial administrator and source information on the invoice is checked for accuracy.

4.21.3 Project Controls ensure the house bank information is correct (including if in foreign currency to check whether hedged, otherwise payment to come from the GBP account) and add to the PRF along with PO allocations and any splits required and the payment due date.

4.21.4 Invoices are reviewed by the Package Manager, supported by their Contract Manager, in order to check existence of a verifiable purchase order with sufficient remaining value. They also advise on or confirm any GRN split across multiple lines and verify scope/price, payment terms etc. If the review leads to a query, such as incorrect invoice value, the invoice should be directed back to the vendor as appropriate.

4.21.5 Approvals are logged within the mailbox folder structure and within the SAP attachment to the GRN. Once the PRF, signed for approval, is received, the net value is GRN'd against the purchase order, and the GRN register is subsequently updated and the blue text changed to black.

4.21.6 GRN details (GRN ref, PO, line and invoice details) are then sent by email to 'AP SAP Administrator' and once the GRN is successfully matched by AP, the payment is processed.

4.21.7 The Interim Manual Payment Process is then carried out between AP and Finance (Project Accountant) to ensure the correct payment date information and authorisation to make payment is in place. If a match does not take place, the invoice will appear on the list of parked invoices. The Project Controls team and Project Accountant review this list weekly.

Cost controlling

4.22 In terms of forecasting, the Project Controls Manager arranges monthly accrual meetings with each responsible Package Manager and their Contract Manager to review and update their package forecast. Expected progress against plan or contract milestones is reviewed, as well as valuations made and variations issued for updating the project capex summary spend workbook.

4.23 Once all updates are collated, the in-month and cumulative expenditure and forecast data against plan is presented to Project Directors. Once agreement has been reached in relation to the updated data, the forecast is approved and distributed to the shareholders.

Accrual Process

4.24 An accrual is defined in the project as the Value of Work Done (VOWD) less the GRNs (Actuals) to date. The VOWD can be based upon a physical measure, a contract milestone or estimated by the Technical Officer (TO) where no other quantitative assessment is suitable or available.

4.25 The accrual process for the calculation of monthly accruals by the Project Controls Manager is set out in a GWFL process note[24] and is summarised below:

4.25.1 Seven working days before the month end, package reports with updated actuals from an interim SAP download of GRN data are prepared.

4.25.2 Five working days before the month end, Project Controls monthly expenditure meetings are held with the TOs in order to understand, input and amend the value of the work done and to drive the accrual.

4.25.3 Four working days before the month end, GRNs are taken from SAP at the close period for the month.

4.25.4 Three working days before the end of the month, the accrual information is fed back to SAP via the Project Accountant who challenges the project accrual and the agreed position is input to SAP.

COST ACCOUNTING AND ALLOCATION METHODOLOGY

4.26 For each package that includes costs relating to the Transmission Assets (OFTO costs), the forecast spend profile is reflected in a back-up document to the CAT, titled 'OFTO Galloper revd'. In each respective package tab in this back- up document, the total forecast is shown, below which the OFTO forecast is detailed (with each line item assigned an OFTO percentage) and further down the sheet the non-OFTO allocation of costs is detailed.

[24] Ofgem developer data room 3.3.2 "GWFL Process Note Accrual Process"

4.27 Where project costs are not fully attributable to the Transmission Assets, ie they relate to the Wind Farm as a whole (shared costs), estimates have been made of the proportion of the costs that should be attributed to the Transmission Assets. The CAT identifies the proportions of costs allocated to the Transmission Assets and the Developer has provided supporting calculations and further details of these allocations.

4.28 Shared costs are typically indirect costs which are for the general benefit of the overall project and include:

4.28.1 general project management and administration;

4.28.2 project support functions eg procurement, cost control, health and safety;

4.28.3 general consultants eg surveys, legal, environmental and consent; and

4.28.4 equipment benefitting both the Transmission and Generation Assets.

4.29 Cost allocation of shared costs has been performed using so-called Cost Allocation Keys (CAKs). GWFL has developed three different allocation keys to allocated specific shared costs depending on their nature. Further detail on cost allocations, and the work we have undertaken in relation to the allocation methods, is set out in Section 5.

5 COSTS COMMON TO THE TRANSMISSION ASSETS AS A WHOLE

INTRODUCTION

5.1 Whilst the CAT has broken down the costs of the Transmission Assets into distinct areas, largely based upon the separate components that make up the Transmission Assets, there are certain costs and cost principles which are common to the Transmission Assets as a whole.

5.2 As such, we have summarised the work that we have undertaken in relation to these costs and cost principles in this section, and we cross refer to our findings in relation to such costs and cost principles in the later sections of this report.

RESOURCING COSTS

5.3 The CAT contains resourcing costs comprising the following amounts:

Resourcing

	CAT Reference	Ref	Resources £	Other £	Total £
Offshore substation	CR2	7.26	[redacted]	-	[redacted]
Submarine cable	CR3	8.16	[redacted]	-	[redacted]
Onshore substation	CR5	10.10	[redacted]	-	[redacted]
Common costs	CR8	6.1	[redacted][25]	4,206,366	[redacted]
			15,393,977	**4,206,366**	**19,600,343**

5.4 Below we consider resource costs and then the other costs, such as quality monitoring costs and travel and accommodation which are not derived from the resource planner.

Resources

5.5 As shown in the table above, the majority of the CRO.02 package cost of £[redacted] relate to resources costs (£[redacted]) which are derived from the resource planner, an excel spreadsheet which creates the forecasted costs based on the resource plan.

5.6 The resource planner lists all personnel and project roles, durations, actual rates, shift pattern, derived estimated working days and inflation (as per the MSD). From this information, a forecast total cost by month across the relevant personnel categories is calculated.

[25] Comprising £[redacted] transactional costs and £[redacted] non-category specific costs

[26] Included in the CAT as 'Resource (non-category specific) costs of £[redacted] and 'Transaction costs' of £[redacted], as set out in the table at paragraph 6.1 below

5.7 Each role in the resource planner is also assigned an estimated OFTO percentage allocation based upon their role[27]. The calculated forecast costs from the resource planner feed into the CRO.02 package report and forecasts, and are updated every three months with a 'true up' figure to align the historic forecast to an actual cost.

5.8 The estimated OFTO allocation percentages are assigned to each resource line to derive the OFTO resource cost. The allocation percentages (rates) used by the Developer (and our work in relation to these) are set out in paragraphs 5.38 to 5.49 below[28]. These percentages are subsequently firmed up with actual OFTO allocations based upon the data from the internal time reporting system, CSS, which allows employees to allocate their time to specific work streams.

5.9 The Developer confirmed[29] its understanding[30] that no profit element is included within Innogy's internal staff costs and contractor's rates are at cost plus 10% to cover administration costs such as IT, office space etc.

5.10 We have agreed the calculations of total resources costs and where applicable the daily rates used have been agreed to the MSD. However, the CRO.02 spreadsheets provided by the Developer are complex and therefore we have only performed a high level review of the detailed workings in order to confirm the process described by the Developer. Furthermore, although the rates used appear to be reasonable, we recommend Ofgem review the spreadsheets in order to assess whether the amount of time spent and rates are efficiently incurred and that the percentages allocated to the Transmission Assets are reasonable.

[27] Roles which cannot be assigned as entirely Transmission or Generation assets, such as general management, are assigned the "Management CAK", itself derived monthly from those with Transmission Asset/ Generation Asset assignable roles

[28] During our review of resource costs, as set out in paragraph 5.49, it was discovered that the resource cost allocation rate required updating. As a result, resourcing costs of £[redacted] (paragraph 5.3) have increased by £[redacted] to £[redacted]

[29] At site visit on 20 September 2017

[30] We note that whilst GWFL confirmed its understanding of the costing process adopted by Innogy, it cannot confirm on behalf of Innogy

Other costs

5.11 Non-resource planner costs of £[redacted] comprise the following:

Non-resource planner costs

	Ref	CAK	OFTO %	OFTO Total €	OFTO Total £
Quality Monitoring – externally serviced					
Electricals			[redacted]%	-	[redacted]
Cables			[redacted]%	-	[redacted]
Electricals			[redacted]%	[redacted]	[redacted]
Cables			[redacted]%	[redacted]	[redacted]
Quality Monitoring – internally provided					
Support		CAK1	[redacted]%	-	[redacted]
Electricals			[redacted]%	-	[redacted]
Quality Internal and External Adjusting Factor		CAK1	[redacted]%		[redacted]
	5.12				[redacted]
External Legal Fees (General)	5.13	CAK2	[redacted]%	-	[redacted]
External Legal Fees – Transactional	5.14		[redacted]%	-	[redacted]
HSE	-	CAK2	[redacted]%	-	[redacted]
Office costs	5.15	CAK2	[redacted]%	-	[redacted]
Travel and accommodation	5.16	CAK2	[redacted]%	-	[redacted]
Finance and advisory costs	5.17	CAK1	[redacted]%		[redacted]
Transaction fees and enabling	5.18		[redacted]%		[redacted]
					4,206,366

5.12 The Developer explained that quality monitoring costs are forecast costs derived from a resource plan which is updated with the Quality Manager to ensure accuracy of the accruals and forecast. Sources of services are split between external and internal based upon availability, experience and rate in the market. We have traced the forecast costs through to the package report provided by the Developer in support of these costs and note the following:

5.12.1 Externally provided services are outsourced from suppliers such as Bureau Veritas, Parsons Brinckerhoff and Cardno. We have reviewed the invoice register included in the package report and note that all invoices are individually below £100,000.

5.12.2 Internally provided quality costs are managed via the MSD with an affiliate of Innogy supplying the services, in this case, RWE Generation, consisting of expert Welding/Coatings, Inspectors etc.

5.12.3 Within the February 2017 reporting period (on which the CAT is based) the expected forecast outturn was £[redacted] however not all of the scope had been itemised in roles on the resource planner. The quality 'adjusting factor' relates to the remainder of forecast costs yet to be assigned to roles.

5.13 A breakdown of external legal fees was obtained from the invoice register included in the package report. The invoices with Eversheds LLP, Pinsent Masons LLP etc are all individually below £100,000.

5.14 The Developer has explained no supporting documentation or calculations are available in relation to the transactional external legal fees of £[redacted][31]. Rather, these costs are a high level estimate based on their understanding of historical precedence. The Developer now believes that the estimate of £[redacted] will be exceeded due to "*the process delay and anticipate external due diligence costs.*" As such, we recommend that Ofgem should discuss these costs further with the Developer before finalising the ITV.

5.15 Office costs are billed quarterly in relation to the fixed annual fee set out in the MSD (subject to inflation).

5.16 Travel and accommodation expenses of £[redacted] relate internal costs such as payroll expenses, credit cards etc as well as smaller externally provided costs, eg taxis. The forecast cost is based on a monthly cost (pre-allocation) of £[redacted].

5.17 A breakdown of finance and advisory costs of £[redacted] is included in the package report and we note all amounts are individually below £[redacted].

5.18 As with the transactional external legal fees, transactional fees of £[redacted] and transaction enabling costs of £[redacted][32] are high level estimates based on previous projects. As we have not been provided with further detail in relation to these estimates we recommend that Ofgem should discuss these costs further with the Developer before finalising the ITV.

CONTINGENCIES

Methodology

5.19 The Developer has conducted a detailed exercise in order to calculate the contingency provision for the projects, based on the Risk Register at March 2017.

5.20 The risk management process is set out in the Risk Management Plan dated 28 December 2016.

[31] Included in CR8 of the CAT as 'Transaction costs' totalling £[redacted], along with transactional fees and transaction enabling costs of £[redacted] (see paragraph 5.18 ource costs for OFTO transactional roles listed in the reso anner of £[redacted] (see table at paragraph 5.3)

[32] Included in CR8 of the CAT as 'Transaction costs' totalling £[redacted], along with external legal costs of £[redacted] (see paragraph 5.14) and resource costs for OFTO onal roles listed in the resource plan £[redacted] (see table at paragraph 5.3)

5.21 Each Package Manager is responsible for identifying all potential risks in connection with their specific packages, based upon issues that have arisen from previous projects, and then, with support from the Project Risk Manager, they estimate the probability of the risk materialising and the cost.

5.22 The Risk Register is maintained by the Senior Risk Manager and records all significant project risks. It is reviewed and revised on a monthly basis to enable an accurate and up to date estimate of the total contingency.

Calculation

5.23 The overall risk contingency level of the project is calculated using a quantitative risk analysis approach. However, when looking at individual risks, a weighted average contingency approach is adopted. Any assumptions behind the three point estimated values (good/medium/bad) that drive the contingency calculation are obtained from the relevant subject matter experts during reviews and captured within the risk register against each relevant risk.

5.24 For each risk, an OFTO percentage is allocated. The default value of this allocation percentage is based on the specific package in which the risk resides and agreed cost allocation key. The percentage allocation against each risk is reviewed prior to submission in order to identify and correct any anomalies. The weighted average contingency for each risk is then multiplied by the relative OFTO percentage in order to calculate an OFTO contingency value per risk.

5.25 On top of the sub-total of OFTO contingency values for all identified risks, there is an additional amount of unidentified contingency, calculated at 15% of the subtotal.

5.26 Where one can clearly identify the weighted risk cost against a specific asset, the risk item is assigned to one of the specific categories within the Cost Assessment Template, and the costs are reflected within that category's forecast outturn in the template. Where this is not possible, the contingency is shown as non-category specific within CR8 of the CAT.

5.27 The contingency provision included within the CAT, approximating 6.32% of pre-contingency costs, is set out in the table below:

Contingencies

	CAT Reference	Ref	Total £
Offshore substation	CR2	5.32	[redacted]
Submarine cable supply and installation	CR3	5.33	
Onshore substation	CR5	5.34	
Common costs (non-category specific contingency)	CR8	5.35	
			17,477,089

5.28 We note that this contingency provision is based upon the CAT, as prepared in March 2017, and therefore the current value of contingency is likely to have decreased as the construction of the Transmission Assets nears completion. By the time of the Ex-Post Review, the value of the contingencies will fall to zero, as all costs will be known at that stage.

Verification work

5.29 We have discussed the contingency provision with the Developer, and initially sought an overview of the key OFTO-related risks associated with the contingency and explanations for all large amounts (>£250,000) included within the provision.

5.30 The Developer has provided us with the Risk Management Plan that sets out the approach to quantifying risks and the key risks by area, alongside a schedule (an extract of the risk register) detailing all risks in relation to the Transmission Assets. This schedule describes the risk, its cause and assigns a probability of the risk occurring and the expected value. The share attributable to the OFTO is then recorded.

5.31 The key amounts are summarised below, and we have agreed these amounts to the schedule provided by the Developer.

Offshore substation

5.32 Contingencies of £[redacted] in relation to the offshore substation have been made to cover risks related to:

5.32.1 OSP piles may fail to achieve depth;

5.32.2 electrical contractor performance;

5.32.3 OSP installation vessel delay (installation phase); and

5.32.4 delays to the programme due to the inability to formally discharge DCO requirements.

Submarine cable supply and installation

5.33 Contingencies of £[redacted] in relation to the submarine cable have been made to cover the risks related to:

5.33.1 export cables requiring further works and/or are damaged or faulty after installation (pre-handover);

5.33.2 export cable pulling activity duration is longer than predicted;

5.33.3 export cables may not reach target burial depth;

5.33.4 interfacing package(s) causing delay to the offshore export cables package; and

5.33.5 storage and/or disposal of any surplus export cable.

Onshore substation

5.34 Contingencies of £[redacted] in relation to the onshore substation have been made to cover onshore substation landscape and demobilisation risks.

Project common costs

5.35 Contingencies of £[redacted] in relation to common costs have been made to cover risks such as:

5.35.1 the export cables being damaged or quality risk (design/manufacturing);

5.35.2 weather down time causing offshore export cable installation delay;

5.35.3 OSP hook-up and pre-commissioning taking longer than scheduled, or is delayed;

5.35.4 additional legal or advisory costs;

5.35.5 export cable installation duration is longer than predicted (due to contractor);

5.35.6 the export cables being damaged during installation;

5.35.7 project financing costs during construction differ from those originally planned;

5.35.8 extension and/or variation to the offshore services contract;

5.35.9 wilful damage to OSP; and

5.35.10 unidentified contingency of £[redacted][33], as per paragraph 5.25 above.

[33] Total risk based contingency of £[redacted] = £[redacted]

Technical review

5.36 We have reviewed the risk provisions included within the list of contingencies in relation to the Transmission Assets, which appear reasonable provisions concerning the Transmission Assets at the time of the CAT submission. However, we consider that the assessment of the expected value of risks and of the likelihood of each event occurring fall within the scope of a technical assessment, rather than the Ex-Ante Review. On that basis, we cannot confirm whether these amounts, which form the basis for the contingency provision, are correct.

INTEREST DURING CONSTRUCTION

5.37 The CAT includes the Developer's nominal pre-tax interest charge of 8.0% up to August 2017. Interest should be included up to the end of construction. After this time, the project is expected to be generating power and so beyond this time the Developer will cease to earn interest. The Developer's current interest cost for the Transmission Assets totals £[redacted]. For the avoidance of doubt, we have not verified the Developer's assessment of interest during construction, as this is outside the scope of our review.

COST PRINCIPLES

Cost allocation

5.38 Where costs are not directly attributable to either the transmission or generation business (shared/indirect costs), the Developer has allocated costs to the Transmission Assets using three different, so-called, Cost Allocation Keys (CAKs). Each key is used depending on the nature of the indirect costs:

5.38.1 CAK1 - Cost-based CAK. Direct Transmission Assets costs as a percentage of total capital expenditure (CAPEX). This rate is similar to allocation rates we have seen used in previous projects where the cost of Transmission Assets capital expenditure is taken as a percentage of total Wind Farm capital expenditure, where the rate derived is [redacted]%[34]. The Developer has explained that this rate is applied to non-specific CAPEX where the other allocation methods are not considered appropriate, such as insurance costs and offshore services contract;

[34] £[redacted] (OFTO main works) / £[redacted] (total CAPEX for main works) = [redacted]%. For cal pose the Developer has ro p to [redacted]%

5.38.2 CAK2 - Time-based CAK. Innogy internal project team time that is directly related to the Transmission Assets as a percentage of the total project team time that can be allocated either to the Transmission or to the Generation Assets. As described in paragraphs 5.5 to 5.8 above, each role in the resource planner is assigned an OFTO percentage based upon their role. These in turn derive specific resource based OFTO percentages[35] (which are recalculated each month). The overall OFTO derived rate of 39.64%[36] is applied to costs where it is reasonable to allocate indirect costs based on how much direct project team time is spent on different assets. For example, general project management costs and admin personnel costs; and

5.38.3 CAK3 - Area-based CAK. For costs such as offshore site investigation and UXO clearance, where there are clear geographical areas in relation to the costs incurred, the allocation has been made based on the proportion of offshore lease area related to the Transmission Assets as a percentage of total offshore lease area. The Developer has determined that the Transmission Assets share of the geographical area of the Wind Farm is 32.81%[37].

Electrical Systems contract allocation

5.39 As noted in paragraph 3.12 of **Appendix 3**, the Electrical Systems contract covers four CR categories in the CAT. Each line in the Electrical Systems (SUB01) package forecast is allocated to either non-OFTO, one of the four CR categories or for pricing schedule items which relate partially to each of the CR categories (the Electrical Package shared costs), the costs are 'shared'. Shared costs include the advance payment bond, spares and project management costs.

5.40 The allocation of 'shared' costs is calculated using a formula which takes into account all OFTO elements of the Electrical Systems package (SUB01) costs divided by the total SUB01 package cost, being 98.73%[38]. This is then multiplied by the allocation percentage for the applicable CR category, which is calculated as the OFTO costs applicable to that CR category (excluding variation orders and claims) divided by the total OFTO costs (excluding variation orders and claims).

[35] As set out in the table at paragraph 5.48 below

[36] See paragraph 5.48 for updated allocation rate

[37] 11.25km² (OFTO area) / 34.29km² (total area) = 32.81%

[38] Comprising [redacted]% onshore substation costs (CR5), [redacted]% reactive substation costs (CR6), [redacted]% offshore subs on costs (CR2) and [redacted]% land cable s (CR4). Therefore, non-OFTO co e [redacted]% of the total SUB01 package c

5.41 The allocation percentages (and the overall 'shared' cost percentage applied to the Electrical System costs included in the CAT which do not directly relate to one of the four CR categories) are:

Allocation rates for Electrical System 'shared' costs

	CAT Reference	Ref	OFTO allocation % (a)	CR allocation % (b)	'Shared' cost allocation % (a x b)
Offshore substation	CR2	7.6	98.73%	64.29%	63.47%
Land cable supply and installation	CR4	9.5	98.73%	4.82%	4.76%
Onshore substation connection	CR5	10.5	98.73%	12.49%	12.33%
Reactive substation	CR6	11.7	98.73%	18.40%	18.16%
				100%	98.73%

Cost allocation rates

5.42 The table below summarises the allocated costs included within the CAT, and the effective allocation rate[39] for such costs:

Project common costs

	Total £	Allocation £	Effective Rate
Common costs	[redacted]	[redacted]	[redacted] %
Resourcing costs[40]			[redacted] %[41]
DEVEX			[redacted] %
Total	**162,506,169**	**47,538,295**	**29.25%**

5.43 This table shows that the allocation methodologies used by the Developer has resulted in cost allocations to the Transmission Assets at an average rate of 29.25%, which is slightly higher than rates we have seen on previous projects of around 25%. This is due to the higher effective rate of 39.41% in relation to resourcing costs.

5.44 Whilst the effective rate for resourcing costs of 39.41% is higher than the CAPEX rate used for resources on previous projects, discussions on previous projects have highlighted that the amount of time spent by project teams on the Transmission Assets as a proportion of total time can be higher than the proportion of CAPEX. Furthermore, the Developer has stated that the resources costs for GWFL have been allocated based on actual time spent as recorded in timesheets which should result in a more representative allocation rate.

[39] Ie excluding costs with an 'allocation rate' of 100%

[40] Including resource costs allocated at an overall derived rate of 39.64% and non-resource planner costs as set out in paragraph 5.11 above

[41] The effective allocation rate for resourcing costs becomes 40.85% when the updated allocation rates as per paragraph 5.48 below are applied

5.45 However, in light of the higher effective allocation rate for shared costs to the Transmission Assets, particularly in relation to resourcing costs, we recommend that Ofgem should discuss cost allocation further with the Developer.

Verification of allocation rates

Cost-based CAK [CAK1]

5.46 We have verified the calculation of the allocation rate provided by the Developer for OFTO main contract expenditure as a proportion of total capital expenditure, and this appears to have been determined in line with the stated methodology.

Time-based CAK [CAK2]

5.47 During our review of the calculation of the allocation rate in relation to resource costs the Developer realised that the CAK2 allocation rate of 39.64% applied to the CAT had not been updated (through links between the underlying CRO.02 spreadsheets), to the correct percentage of 40.81%. As a result, the resource elements of CAPEX and DEVEX in the CAT that link to this allocation rate had also not been updated.

5.48 The updated OFTO allocation rates are set out in the table below:

Cost Allocation Key for resource costs

WBS	OFTO %
Internal – Construction	40.56%
Internal – Operations	0.00%
Contractor - Construction	45.23%
Contractor - Operations	0.00%
Contractor – Direct	25.06%
OFTO Transactional	99.85%
Construction Rep	26.84%
	40.81%

5.49 Applying the updated allocation rate of 40.81% increases resourcing costs by £[redacted][42] and DEVEX costs (CRO.06.02.09 – Staff and Overheads) that are allocated based on the CAK2 allocation percentage by £[redacted][43], ie a total increase of £[redacted]. We propose an adjustment to the CAT for these cost increases.

[42] To increase total resourcing costs from £[redacted], as set out in the table at paragraph 5.3, to £[redacted]

[43] To increase DEVEX costs in relation to staff and overheads of £[redacted], as set out in the table at paragraph 6.6, to £[redacted] (and total DEVEX costs to £[redacted]

Area-based CAK [CAK3]

5.50 We have verified the calculation of the allocation rate for the offshore lease area and this appears to have been determined in line with the stated methodology.

Resourcing costs

5.51 The CRO.02 package report included in the CAT back up document details the different CAK allocation rates applied to resourcing costs. Resource costs (project management) are allocated based on CAK2 whilst the allocation rates of non-resource planner costs are detailed in the table at paragraph 5.11 above.

5.52 We have verified that the allocation rates appear to be determined in line with the stated methodology. Likewise, the assessment of costs as all relating entirely to Generation Assets or Transmission Assets accords with our expectations.

Foreign exchange

Accounting for foreign exchange in the CAT

5.53 Whilst non-OFTO elements of GWFL have significant exposure to foreign exchanges rates, and as such these costs have been hedged, the Transmission Assets have no significant exposure to foreign exchange risks and therefore foreign currency payments are made based on applicable day rates (ie the spot rate) from the Sterling bank account.

5.54 Costs included in the CAT in relation to smaller contracts which have been made with providers who require payment in EUR are limited to the following transactions:

Costs denominated in foreign currencies

Package	Description	Vendor	Forecast cost €	£ Equivalent included in the CAT
CAB.01	Plan C joint, legal opinion and delay costs	VBMS/NKT	[redacted]	[redacted]
CRO.02	Externally provided Quality monitoring	Bureau Veritas	[redacted]	[redacted]
CRO.02	Market data	Poyry	[redacted]	[redacted]
CRO.01	OE Engineering	Primo Marine	[redacted]	[redacted]
CRO.03	Insurance – Broker fee	Aon	[redacted]	[redacted]
			438,195	**319,693**

5.55 Due to the immaterial size of these smaller contracts, the Developer has converted costs included in the CAT into Sterling using the hedged rates applicable on GWFL's non-OFTO foreign currency contracts.

Rates used

5.56 As explained in paragraph 5.55 above, for all project reporting, the GWFL hedged exchange rate of 1.3706735402947 is used to convert costs into Sterling.

5.57 The Developer has advised that, at FTV, GWFL intends to adjust these costs to be based on actual spot rates. However, it is noted that if the spot rate were applied to these transactions, at an assumed average of 1.17[44], then the costs included in the CAT would increase by an insignificant amount of approximately £50,000. As such, no further work has been performed in relation to foreign exchange.

Application of overriding global discounts

5.58 The Developer has confirmed that no global discounts have been obtained in the course of the project.

Related party transactions

5.59 The Developer has confirmed that there have been no related party transactions, other than project management and personnel.

Boundaries used for purposes of cost allocation

5.60 The Information Memorandum confirms the boundary points of the Transmission Assets proposed by the Developer, as follows:

5.60.1.1 offshore ownership boundaries – up to the 33kV cable connections on the OSP switchgear panels, ie at the 33kV switchgear cable terminal boxes; and

5.60.1.2 onshore ownership boundaries – located at the NGET substation at Leiston, where NGET's 132kV substation includes two 132kV OFTO owned circuit breakers, ie at the 132kV breaker's busbar disconnectors.

5.61 The details that we have seen reflect costs between these two boundary points.

[44] Consistent with the average exchange rate during the period from https://www.oanda.com/currency

6 PROJECT COMMON COSTS AND DEVELOPMENT COSTS

PROJECT COMMON COSTS

6.1 The project common costs included within the CAT are comprised as follows:

Project common costs

	Ref	£
Resource (non-category specific)		[redacted]
Transaction costs		
	5.3	[redacted]
Technical Support Services	6.3	
Development costs	6.5	
Insurance	6.13	
Contingency (non-category specific)	5.27	
		43,012,009

6.2 With the exception of resource costs and contingency, which we consider in Section 5, we detail the above costs further in this section. The rates for the allocation of costs to the Transmission Assets, including the rationale for the allocation methodology and the procedures we have undertaken to verify these rates, are set out in Section 5.

Technical Support Services

6.3 Forecast costs of £563,581 in relation to technical support services are summarised as follows:

Technical Support Services

Package	Description	Total costs £	Allocation rate	Total per CAT £
CRO.01.01.03	OSP Design Certification	[redacted]		
CRO.01.02.01	Cross Project Engineering			
CRO.01.02.04	Electricals			
CRO.01.02.05	Cables – Array & Export			
CRO.01.02.06	Ports and Offshore site			
				563,581

6.4 The Developer has provided the monthly contract report (with PO summary) from the August 2017 package report which details the vendors, the costs to date and forecasts. We have reviewed the report and the Developer has advised that the cross project engineering estimate of £[redacted] should be reduced by £[redacted] to £[redacted]. As such, we propose an adjustment to reduce the CAT by £[redacted][45].

[45] £500,000 allocated at 23.00%

General development costs

6.5 General development costs (DEVEX) are incurred in the GWFL project development activities and include all activities in the initial commencement of the project including site investigations and ensuring consents.

6.6 The general development costs, included in the CRO.06 package report, are summarised as follows:

DEVEX

	Total costs £	Allocation rate	OFTO Allocation £
Legacy (2012-2014)			
Site Investigations	[redacted]	23.00%	[redacted]
Electrical		23.00%	
Development		23.00%	
HSE&S		23.00%	
Overheads		23.00%	
Staff Costs		23.00%	
Phoenix (2015)			
Site Investigations	[redacted]	23.00%	[redacted]
Electrical		100.00%	
Consent and Leases		40.27%	
Staff and Overheads		40.83%	
	51,470,690		**13,526,543**

Verification of costs incurred

6.7 In order to gain comfort in relation to the general development costs incurred, we obtained a breakdown of DEVEX costs by PO/vendor and for non-resources expenditure we obtained and reviewed copies of invoices, where the costs allocated to the Transmission Assets are greater than £100,000. The results of our review are summarised in **Appendix 2**.

6.8 As noted in **Appendix 2**, the Developer has proposed an adjustment to decrease the CAT by £[redacted] in relation to £[redacted] of pre-allocated DEVEX costs in relation to site investigations (Legacy) which cannot be substantiated and the Developer now considers these costs to be within separately identified invoices.

6.9 Also set out in **Appendix 2** are unsubstantiated costs of £[redacted] and £[redacted] in relation to development and overheads respectively. The Developer has explained that pre 2012, RWE was in a joint venture with SSE, who led in reporting costs. As these DEVEX costs were not recorded in the RWE (now Innogy) SAP system, data retrieval is not possible. As we have not been provided with any supporting documentation, we have been unable to substantiate these DEVEX costs. As such, we recommend that Ofgem should discuss these costs with the Developer prior to finalising the ITV.

6.10 We have confirmed that there has been no double counting of resources costs between those included in general development costs and those included in common costs as summarised in paragraph 5.3.

Allocation rates

6.11 The allocation rates used for DEVEX, set out in the table at paragraph 6.6 above and in **Appendix 2**, have been calculated using the same methodology as that detailed from paragraph 5.38.

6.12 During our review, it became apparent that the CAK2 allocation rate had not been updated. As noted in paragraph 5.49 above, updating this allocation rate to the correct percentage of 40.81%, increases DEVEX costs (CRO.06.02.09) by £[redacted].

Insurance costs

6.13 The Wind Farm expects to incur insurance costs of £[redacted], of which 23.00% has been allocated to the Transmission Assets amounting to £[redacted], as set out in the table below:

Insurance costs

	Ref	Total costs £	Allocation rate	Total £
Contractors All Risks Insurance				
CAR		[redacted]		
CAR Terrorism				
	6.14			
Delayed Start Up				
DSU (Delayed Start up)		[redacted]		
DSU Terrorism				
	6.14			
		[redacted]		
Marine Warranty - Surveillance	6.15			
Project insurance				
Charterers Liability and D&O				
Broker fee (EUR)[46]				
	-			
		[redacted]		
Other - Third Party Liability	-			
Variations	-			
Total		**11,438,368**		**2,575,161**

6.14 We have agreed the CAR and the DSU costs to the policy with Allianz.

[46] Total costs of EUR[redacted] (EUR[redacted] at [redacted]%)

6.15 Surveillance costs of £[redacted] (total costs of £[redacted]) relate to the Mwaves contract. We have reviewed the forecast costs of £[redacted][47], which the Developer explained is based upon the Package Manager's expectation of in-month costs based upon expected attendances and office based time from the marine warranty surveyor. Further, we have agreed £[redacted] of the forecast costs to invoices.

[47] The Developer notes that the forecast has recently increased to £[redacted] due to additional vessels and port loud outs etc. However, the Developer will try and recoup this additional cost from Siemens. As the additional estimate is not certain, no adjustment is proposed

7 OFFSHORE SUBSTATION

7.1 The OSS costs are comprised as follows:

CR2 - OFFSHORE SUBSTATION COSTS

Contract Overview	Ref	£
Electrical Services Agreement		
General	-	[redacted]
Topside primary structure	-	
Topside secondary structure	-	
Topside corrosion protection	-	
Topside HV plant	-	
Topside LV electrical system and electrical installation	-	
Topside instrumentation and control	-	
Topside telecoms	-	
Topside facilities	-	
Topside architectural	-	
Topside inspection, testing and onshore comm	-	
Jacket primary structure	-	
Jacket secondary structure	-	
Jacket corrosion protection	-	
Jacket LV electrical system and electrical installation	-	
Jacket architectural	-	
Platform load-out	-	
Platform transport and install	-	
Hook-up and commissioning	-	
Other	-	
	7.4	[redacted]
Training	7.5	
Other	7.5	
Electrical Package Shared Costs	7.6	
Category Specific Options and Variations	7.10	
Other Category Specific Costs	7.26	
		106,378,333

ELECTRICAL SERVICES AGREEMENT (NRL2587)

7.2 Following a competitive tender, as described at **Appendix 3**, the Developer entered into an EPCI contract with Alstom Petrofac Consortium (APC). The contract covered the provision of electrical systems works, the manufacture, supply and construction of the onshore substation, the onshore cable works, the OSP and jacket foundation and the offshore transportation and installation of the OSP and foundation.

7.3 The contract costs relating to the offshore substation have been recorded in the CR2 of the CAT and our work in relation to these is set out below.

7.4 Costs totalling £[redacted], as set out in the table in paragraph 7.1 above, have been agreed to the underlying contract[48]. Further details of these costs, as recorded in the contract, are set out in **Appendix 4**.

7.5 We have also agreed training costs of £[redacted] and other costs of £[redacted], as detailed at **Appendix 4**, to the contract.

Electrical Package Shared Costs

7.6 As described at **Appendix 3** and paragraph 5.39 above, the Electrical Systems contract covers four CR categories in the CAT and various contract items have been 'shared' across the four CR categories using the allocation rates set out in the table in paragraph 5.41 above. The 'Electrical Package Shared Costs' are detailed in **Appendix 5** and the amounts allocated to the offshore substation are summarised in the table below:

Electrical Package Shared Costs

	Ref	Total costs £	Allocation rate	Total per CAT (CR2) £
Project Management	-	[redacted]		
Spares	7.7			
Contract Option (O3) : Advanced Payment Bond	-			
Prov Sum: OFTO Spares	7.8			
Contract Variations	7.9			
		8,301,428		5,269,319

7.7 The Electrical System contract contains £[redacted] in relation to commissioning and start-up spares. These costs have been allocated across the four CR categories with £[redacted] ([redacted]%) included in CR2 as relating to the offshore substation. In line with previous projects, we recommend that Ofgem should take a view regarding the level of spare parts in the ITV.

7.8 As detailed in paragraphs 5.5 and 5.6 of **Appendix 5**, the Developer has updated the estimated costs in relation to operational spares from £[redacted] to £[redacted]. As such, we propose an adjustment to decrease the costs allocated to CR2 in the CAT by £[redacted][49]. Additionally, as noted in the above paragraph in relation to the commissioning and start-up spares, in line with previous projects, we recommend that Ofgem should take a view regarding the level of spare parts in the ITV.

[48] Contract Schedule 1 - Contract Price (adjusted by Forex)

[49] £[redacted] - £[redacted] = £[redacted] £[redacted] multiplied by the CR2 allocation rate of [redacted]% = £[redacted]

7.9 As detailed in paragraph 5.8 of **Appendix 5**, the Developer's latest estimate of expected contract variations is £[redacted]. As such, we propose and adjustment to decrease the costs allocated to CR2 in the CAT by £[redacted][50].

Category Specific Options and Variations

7.10 Category specific options and variations totalling £[redacted] comprise the following:

Category Specific Options and Variations

	Ref	£
Plan B Option	7.13	[redacted]
Plan C Option	7.19	
Prov Sum: Jack-up barge & Supply Boat	7.22	
New equipment and Mods to existing equipment	7.17	
Offshore - Contract Option (OB a)	7.23	
APC Contract Amending Agreement	7.24	
		27,225,115

Plan B and Plan C Option

7.11 The Developer has provided a memo[51] to clarify the "Plan B" and "Plan C" costs and explain why the costs were "*necessary enablers for facilitating the construction and financing*" of GWFL including the related Transmission Assets. This memo states the purpose of Plan B and Plan C is to ensure that appropriate and efficient mitigation measures are in place so GWFL maintains its programme and to offer protection from the key risk of a delay, which would jeopardise the ability of GWFL to qualify for Renewable Obligation Certificates (ROCs)[52].

7.12 Income generated through ROCs is a fundamental part of the GWFL business plan, without which GWFL's revenues would not be sufficient to meets its financing obligations. Consequently, risk management measures, including Plan B and Plan C, were deemed essential requirements of banks and stakeholders in GWFL to ensure it progressed through financial close and into construction.

[50] £[redacted] - £[redacted] = £[redacted] (see **Appendix 5**). £[redacted] multiplied by the CR2 allocation rate of [redacted]

[51] Ofgem developer data room 3.1.2 "2017-09 GWFL-Plan B and C Memo" (the Plan B and C Memo)

[52] The Renewables Obligation (RO), managed by Ofgem, require electricity suppliers to source a portion of their supplied electricity from renewable sources. Those who generate qualifying renewable electricity are issued ROCs by Ofgem for 20 years. GWFL has a ROC application deadline of 31 March 2018 and one or more offshore wind turbines must be completed for that date

7.13 Plan B is the cost of an additional vessel reservation option to ensure the heavy lifting vessel was available during July/August 2017 (as a significant delay to OSP topside manufacture would likely cause GWFL to miss its contracted installation vessel slot due to non-availability of vessels). The cost was originally estimated at £[redacted]. However, due to the efficient progress through the fabrication process, the vessel option was terminated on 22 November 2016 and so the cost is now expected to be reduced to £[redacted], which we have agreed to variation instruction VI-008a.

7.14 The Developer has explained that Plan B in itself is not sufficient to entirely mitigate the risk of potential OSP delay and that a further mitigation scenario, Plan C, is in place. The Plan C proposal allows for the connection of a string of turbines directly to an export cable, by-passing the OSP.

7.15 To ensure Plan C was deliverable if required, the GWFL budget was updated to account for a number of additional activities[53], including further engineering/grid studies, variations to the design of the onshore substation/offshore substation jacket and ensuring the substation was constructed with mitigation measures incorporated. In particular, the Electrical Systems contract included the following options (with indicative pricing as set out below) that would allow Plan C to progress[54]:

Option	£
OC a) New Equipment	[redacted]
OC b) Mods to Existing Equipment	
OC c) Mods to Existing Equipment required to be ordered at Early Works	
	856,090

7.16 Certain variations to the contract were executed immediately to ensure that long-lead items were procured. We have agreed the following contract variations (totalling £[redacted]) to supporting documentation:

7.16.1 VI-001 issued on 23 July 2015 instructed option OC c) and was fully implemented at a cost of £[redacted].

7.16.2 VI-015 (3 March 2016) and VI-018 (15 March 2016) provided support for additional preparatory work, the design intent document and 'studies' as described in OC a. The costs of these variation instructions are based on time records, VI-015 has been agreed at £[redacted] whereas VI0018 is currently an estimate of £[redacted].

[53] These are set out in more detail on page 3 of the Plan B and C Memo

[54] Further detail in relation to the options is included on page 4 of the Plan B and C Memo

7.16.3 VI-033 dated 17 November 2016 instructed APC to immediately proceed with the following works covering elements of OC a) and OC b):

	£
Project management, design and procurement of equipment Ring Fenced Engineering Support Supply of 200m spare cable as per contract option O8	[redacted]
	657,362

7.17 The Developer has explained that estimated costs included in the CAT of £[redacted] in relation to 'New equipment and Mods to existing equipment' originally comprised:

7.17.1 OC a) and OC b) costs as set out in the table at paragraph 7.15 above, ie £[redacted] and £[redacted] respectively (total cost of £[redacted]); plus

7.17.2 the cost of VI-001 in relation to OC c) of £[redacted].

7.18 However, at February 2017, OC a) and OC c) had been instructed under the variations set out in paragraph 7.16 above, with costs totalling £[redacted]. As such, OC b), which had not been instructed, was 'removed' from the estimate (and added to the further budget of £[redacted] as detailed in the below paragraph) but the original budget of £[redacted] was not updated for the difference of £[redacted][5]. Similarly, we do not propose an adjustment in respect of this small difference.

7.19 Plan C costs included in the CAT of £[redacted] relate to amounts budgeted that had not been instructed. These are the £[redacted] in relation to OC b) (see table at paragraph 7.15 above) and a further budget of £[redacted] for Plan C related works which the Developer notes are now unlikely to be progressed with as the OSP has already been installed and offshore commissioning underway.

7.20 The Developer concludes the following in the Plan B and Plan C Memo:

7.20.1 without Plan B and Plan C, GWFL, including the Transmission Assets, could not have been delivered; and

7.20.2 due to the efficient progress made in relation to the installation of the OSP it appears likely that GWFL will benefit from a saving of approximately £[redacted] in relation to Plan B and the budget of £[redacted] for Plan C appears unlikely to be incurred as a result of Plan C not proceeding.

[5] £[redacted] - £[redacted] = £[redacted]

7.21 However, the Developer has decided to keep the Plan C option available (and hence the costs in the CAT) should an unexpected failure or delay during the final OSP works offshore be experienced. This appears to be a prudent approach and given that the OSP is now installed we recommend that Ofgem should consider whether including Plan B and/or Plan C costs in the CAT is reasonable.

Jack-up barge and supply boat

7.22 As detailed at **Appendix 4**, we have agreed costs of £[redacted], for the provision of Jack-up barge and supply boat, to the contract, included in the price schedule under "provisional sums".

Contract option OB a)

7.23 We have agreed costs of £[redacted] for contract option OB a) to variation instruction VI-008. This relates to the reservation fee for an additional installation window (November 2016 to April 2017) and the alternative case installation window (August 2017).

APC Electrical Systems Contract Amending Agreement

7.24 The Developer has provided a memo[56] to explain the amendment to the Electrical Systems contract and the changes to the design and cost of the offshore substation. The amendment relates to changes to one of the key deliverables under the Electrical Systems contract, being the design, engineering, fabrication and installation of the OSP jacket foundation, ie the steel trussed structure supporting the OSP topside held to the sea-bed by steel pile foundations.

7.25 We have agreed costs totalling £[redacted], for the extended time and costs to accommodate changes in the jacket design, to the APC Electrical Systems Contract Amending Agreement. The Developer's memo summarises the key updates to the jacket design and Annexure 2 to the agreement provides the following breakdown of the increase in contract price:

APC Electrical Systems Contract Amending Agreement

	£
Materials	[redacted]
Engineering and PMT	
Fabrication	
Transport and Installation	
Third Parties	
Others	
Settlement of EWNs-001, 002 and 003	
Settlement of EWNs-005, 006, 009, 011, 012 and 013	
	17,470,000

[56] Ofgem developer data room 3.1.5 "2017-04 GWFL-APC EoT Note"

Other category specific costs

7.26 Other costs in relation to the offshore substation comprise the following:

Other Category Specific Costs

	Ref	£
Project management	5.3	[redacted]
Contingency	5.27	
Offshore Construction Monitoring (CR2 - offshore substation allocation)	-	
Offshore Consent Conditions (CR2 - offshore sub allocation)	-	
Third Party - offshore (CR2 - offshore sub allocation)	-	
Port Facilities / Site Establishment etc (CR2 - offshore sub allocation)	7.27	
Offshore site (CR2 - offshore sub allocation)	7.31	
Personnel Transfer Vessels	7.37	
		8,635,169

Port facilities/Site establishment costs

7.27 We have been provided with the 'POR.01 – Offshore Services Contract' package report in support of the port facilities/site establishment costs included in CR2 of the CAT of £[redacted]. Total POR.01 costs are £[redacted] and have been allocated to the CAT using the CAK1 allocation rate as set out in the table below:

Site management and enabling

	Total costs £	Allocation rate	Total per CAT £
Crew transfer vessel	[redacted]	[redacted]	[redacted]
Emergency Response, Maintenance and Support Vessels			
Onshore Site Management Costs			
Site Buoyage			
Other			
Options and Variations			-
Offshore Enabling			[redacted]
	44,488,110		8,813,605

7.28 The costs allocated to the Transmission Assets of £[redacted] comprise £[redacted] for the Crew Transfer Vessel (CTV) costs described in paragraph 7.37 below and £[redacted] for the port facilities/site establishment costs. The port facilities/site establishment costs have been attributed between CR2 (offshore substation) and CR3 (submarine cable) based on the geographical data used to calculate the CAK3 (CAK SI) allocation rate, such that 20%[57] (£[redacted]) is included in CR2 (and 80% (£[redacted]) is included in CR3, see table in paragraph 8.16 below).

[57] Being 2.25km² OSP area (20%) compared to 9km² export cable corridor (80%)

7.29 Of the £[redacted] port facilities/site establishment costs relating to the Transmission Assets, £[redacted] (85%) relate to the James Fisher Marine Services (JFMS) contract. The POR.01 package report provided sets out actual costs to date and forecast costs in the contract price format from the JFMS contract and then reallocates the costs in line with the package allocation described in paragraph 7.28 above. We have traced the OFTO amounts through to monthly contract forecasts. These were then compared to monthly contract expenditure and a breakdown of all invoices totalling expenditure to date was obtained. We have reviewed JMFS invoices over £100,000 and agreed costs totalling £[redacted], of which 23.00% (£[redacted]) has been allocated to the Transmission Assets.

7.30 The Developer has advised that enabling costs in relation to 'PC Resource' totalling £[redacted][58] are no longer required[59]. We therefore propose an adjustment to decrease costs in the CAT by this amount.

Offshore site costs

7.31 We have been provided with the 'POR.04 – Offshore Site' package report in support of costs included in CR2 of the CAT of £[redacted]. Total POR.04 costs are £[redacted] and have been allocated to the CAT as set out in the table below:

Offshore site costs

	Ref	Total costs £	Allocation rate	Total per CAT £
Geophysics Surveys	7.35	[redacted]	[redacted]	[redacted]
UXO Surveys				
UXO Mitigation (Potential removal of UXO)	7.36			
Offshore Survey reps				
		15,514,284		4,978,412

7.32 As shown in the above table, costs have been allocated to the Transmission Assets using the area based CAK3 allocation rate of 32.81%. However, the total costs have been reviewed on a line-by-line basis and the Developer has zeroed[60] some of the forecast costs yet to be incurred on the basis that the likelihood of that actual expenditure is low.

7.33 On the same basis as described in paragraph 7.28 above, the OFTO costs of £[redacted] have been allocated 20% (£[redacted]) to CR2, (and 80% (£[redacted]) to CR3, see table in paragraph 8.16 below).

[58] £[redacted] at 23% = £[redacted]

[59] As PC Resource costs have been allocated to the CRO.02 package

[60] An allocation rate of 0%

7.34 We have reviewed the POR.04 package report costs and traced all OFTO amounts through to the monthly contract forecasts. These were then compared to monthly contract expenditure and a breakdown of all invoices totalling expenditure to date was obtained. We reviewed all invoices over £100,000.

7.35 GWFL entered into a contract with Gardline Geosurvey Limited (Gardline) for the provision of site investigation services. We have agreed costs totalling £[redacted] to Gardline invoices[61], of which £[redacted] has been allocated to the Transmission Assets at 32.81%.

7.36 GWFL also entered into a contract with N-Sea Offshore Limited (N-Sea) for the provision of UXO Risk Management Services. We have agreed costs totalling £[redacted] to N-Sea invoices[62], of which £[redacted] has been allocated to the Transmission Assets at 32.81%.

Personnel transfer vessels

7.37 As set out in the table at paragraph 7.27 above, the POR.01 package includes £[redacted] allocated at 23% (£[redacted]), in relation to CTVs. We have reviewed the underlying contract with JFMS for the provision of enabling services, including the charges and payment plan, along with a supporting calculation of the CTV and forecast fuel costs[63] as summarised in the table below:

Crew transfer vessels

	No. of days	Daily rate	Total costs £	Allocated @ 23.00% £
CTV 1	542	[redacted]	[redacted]	[redacted]
CTV 2	428			
CTV 3	397			
CTV 4	397			
CTV 5	308			
CTV 6	308			
Fuel, Lubes, Harbour Dues	3,455			
			9,914,317	2,280,293

[61] Over £100,000

[62] ibid

[63] As a rates based element of the POR.01 package, the forecast costs are reviewed monthly and updated with the package manager for actual costs (ie the February 2017 forecast costs included in the CAT include actuals up to January 2017)

8 SUBMARINE CABLE SUPPLY AND INSTALLATION

8.1 The submarine cable supply and installation costs are comprised as follows:

CR3 – SUBMARINE CABLE SUPPLY AND INSTALLATION COSTS

Contract Overview	Ref	£
Offshore Subsea Export Cable		
132kV Cable at 1000mm2 Aluminium conductor	8.3	[redacted]
Subsea Export cable ancillaries	8.4	
Offshore Cable Installation		[redacted]
Subsea Cable Installation	8.6	
Options and Variations		
Guard vessel	8.8	
Cable Storage	8.10	
Plan C Joint	8.12	
Legal	-	
OSP Consequential Payment	8.13	
Variations	8.15	
Other Category Specific Costs	8.16	
		98,760,672

EXPORT CABLES AGREEMENT (NRL3129)

8.2 Following a competitive tender, as described at **Appendix 6**, the Developer entered into a contract with VBMS (UK) Ltd/NKT cables GmbH & co. (VBMS) for supply and installation of the export cables.

132kV cable supply

8.3 We have agreed costs of [redacted] for supply of the export cable to the underlying VBMS contract[64], as summarised in the below table:

Cable supply

		Quantity	Unit price £	Total price £
132KV Cable at 1000mm2 Aluminium conductor (2 x 45km, 300m trial, 1 x4km, including fibre optic cables (spare foreseen to be supplied together with the submarine cables 2 x 47km)	Required	90,000m	[redacted]	[redacted]
	Spare	4,000m		
	Other	300m		
				[redacted]

[64] Contract Schedule 2 - Contract Price

8.4 Costs of £[redacted] for the subsea export cable ancillaries have been agreed to the price schedule of the underlying VBMS contract, as summarised in the below table:

Subsea export cable ancillaries

Description		Quantity	Unit price £	Price (required) £	Price (spare) £	Total price £
Transition Joint Kit (electrical) (3 phases)	Required	2	[redacted]	[redacted]	[redacted]	[redacted]
	Spare	2				
Transition Joint Kit (mechanical anchor clamp)	Required	2				
	Spare	2				
Submarine Repair Joint Kit	Spare	4				
OSP Hang off (temporary and permanent)	Required	2				
	Spare	1				
Termination Kit (3 phase system, male part only with ancillaries)	Required	2				
	Spare	1				
Abandonment end caps kit (1 per phase)	Required	6				
	Spare	3				
Temporary end caps kits (1 per phase)	Required	6				
	Spare	6				
Fibre Optic joint box (4 onshore, 4 offshore) (including glands)	Required	8				
	Spare	1				
Earthing cable for hang offs, terminations and joints (120mm")	Required	150m				
	Spare	30m				
Chinese end stockings	Required	4				
	Spare	4				
Chinese lace-up stockings	Required	8				
	Spare	4				
Export Cable Monitoring System (ECMS)						
Cable cleats (assuming 3phase cleats)	Box of	80				
Permanent anchoring, jointing, termination & testing export cables onshore Temporary & Permanent Hang-offs, Jointing, Terminations & Tesing Export Cables Offshore (OSP) Reservation Fee						
Temporary Security Management System for wet storage period						
				2,328,206	830,089	3,158,295

8.5 The above table includes spare costs totalling £[redacted]. We also note the £[redacted] of costs in relation to spare cable, as set out in the table at paragraph 8.3 above. In line with previous projects, we recommend that Ofgem should take a view regarding the level of spare parts in the ITV.

Offshore cable installation

8.6 We have agreed costs of £[redacted] for the subsea cable installation to the underlying VBMS contract[65], as summarised in the below table:

Cable installation
Pricing Option 4: Lump Sum Activities - Inclusive of All-Weather

	£
Project Management & Engineering	[redacted]
Cable Protection System Procurement (assume 3 off, including bellmouth and temporary seal)	
Cable Crossings and Protection - Fronded Concrete mattresses - assume 72 (3 crossings of 2 x cables each, assuming 2 x 3 below and 1 x 6 above cable per crossing)	
Beach Operations	
PLGR/ Multi Beam Survey	
4 of out of service cable clearances (Hermes, UK-Netherlands 3, 5 and 12)	
Installation Vessel(s) mobilisation	
Installation Vessel(s) de-mobilisation	
Export Cable 1 Collection & Delivery to Field	
Export Cable 1 Installation/ Burial & Remedial Burial	
Deburial Cable end #1 and Pull in cable #1 and #2	
Export Cable 2 Collection & Delivery to Field	
Export Cable 2 Installation/ Burial & Remedial Burial	
Supply and install of OSP Pulling Winch, Generator & Welfare Container (GWFL end ownership)	
Offload spare cable at storage facility port (to be determined)	
Pre-sweeping of the cable route	
Pre and postlay mattresses excl CPS (incl in 2nd line) - provisional sum for 50 mattresses in event of need for remedial where required	
Remedial works by Canyon, 20 days incl mob and de-mob	
Test HDDs in 2015, after installation by third party	
WoW for all above activities	
Discount	
Individual amounts below £100k	
Total	[redacted]

8.7 We note that the above table includes £[redacted] in relation to spare cable. In line with previous projects, we recommend that Ofgem should take a view regarding the level of spare parts in the ITV.

[65] Contract Schedule 2 - Contract Price

Options and Variations

Guard vessel

8.8 The CAT includes £[redacted] relating to forecast costs for guard vessel services under the JFMS contract (NRL3936). The forecast was based upon the original working time rate of £[redacted] per day for 282 days[66], rounded to £[redacted].

8.9 These costs have now been finalised, based on an adjusted rate of £[redacted] per day for 263 days and we have agreed costs of £[redacted] to variation order 4. We propose an adjustment to the CAT of £[redacted][67] for the decrease in guard vessel costs now the actual cost is known.

Cable storage

8.10 The Developer entered into an agreement with VBMS (UK) Limited (NRL4692) to provide storage facilities for spare export cable. We have agreed storage costs of £[redacted] for 400m² cable to the contract. These comprise a fixed lump sum of £[redacted] plus a yearly rate of £[redacted] (subject to annual increase of 3%) for two years totalling £[redacted][68]. Included in the total cable storage costs in the CAT of £[redacted] is a further £[redacted][69] of budgeted costs.

8.11 The Contract Manager has confirmed that the fixed lump sum of £[redacted] set out in the contract includes the scope of costs originally budgeted at £[redacted] and therefore this budget is no longer required[70]. As such, we propose an adjustment to decrease the costs in the CAT by £[redacted].

Plan C Joint

8.12 We have agreed costs of €[redacted] for the design and supply of a 132kV to 33kV subsea cable joint to NKT Cables contract documentation. We note that the costs included in the CAT are £[redacted] ie using an exchange rate of 1.33 rather than the GWFL hedged exchange rate of 1.37 as described in paragraph 5.56 above. We do not propose an adjustment for the small difference of £[redacted][71] had the hedged exchange rate been applied.

[66] £[redacted] x 282 days = £[redacted]

[67] £[redacted] - £[redacted] = £[redacted]

[68] £[redacted] + (£[redacted] x [redacted]%) = £[redacted]

[69] £[redacted] - £[redacted] = £[redacted]

[70] The Developer has advised that they are aware of a potential variation in relation to cable storage being required as additional spare cable may require storage, transfer or scrapping. As this is yet to be determined we do not propose any adjustment

[71] €[redacted] / [redacted] = £[redacted] - £[redacted] - £[redacted] = £[redacted]

OSP Consequential Payment

8.13 We have agreed costs of £[redacted] to Amendment Agreement Number 1 in relation to the VBMS export cables contract (NRL3129). The increase to the contract price is made up of £[redacted] and €[redacted] (converted using the hedged exchange rate of 1.37 to £[redacted][72].

8.14 Annexure 1 of the contract amendment provides the following breakdown of the contract price increase:

8.14.1 wet storing of export cable 2 at the OSP following laying and plough operations;

8.14.2 longer wet storage requirements of export cable 1 at the OSP;

8.14.3 additional vessel time due to being unable to simultaneously pull in cable 1 and then lay and pull-in cable 2;

8.14.4 'ndurance' then performs two export cable pull-ins when OSP is available; and

8.14.5 costs associated with Valcap monitoring system.

Variations

8.15 We have agreed variation orders in relation to the export cable contract (NRL3129), with a net total of £[redacted][73], to supporting documentation. The package manager confirmed that the latest forecast includes total variations of approximately £[redacted] and agreed with our proposal to decrease the costs included in the CAT of £[redacted] by £[redacted][74].

Other category specific costs

8.16 Other costs in relation to the export cable comprise the following:

Other Category Specific Costs

	Ref	£
Project management	5.3	[redacted]
Contingency	5.27	
Offshore Construction Monitoring (CR3 - submarine cable allocation)	8.17	
Offshore Consent Conditions (CR3 - submarine cable allocation)	-	
Third Party - offshore (CR3 - submarine cable allocation)	8.19	
Port Facilities / Site Establishment etc (CR3 - submarine cable allocation)	7.28	
Offshore site (CR3 - submarine cable allocation)	7.33	
Total		**13,933,643**

[72] £[redacted] + £[redacted] = £[redacted]

[73] Variation orders 5, 6, 7, 8 and 9

[74] £[redacted] - £[redacted] = £[redacted], rounded down to £[redacted]

Offshore Construction Monitoring

8.17 Offshore monitoring costs which relate to the Transmission Assets comprise:

Offshore Monitoring

	Total costs £	Allocation rate	Total per CAT £
Consultancy advice	[redacted]	23.00%[75]	[redacted]
Archaeology		32.81%[76]	
FLO		32.81%[77]	
Total	**407,000**		**127,949**

8.18 The OFTO costs of £[redacted] have been attributed between CR2 (offshore substation) and CR3 (submarine cable) based on the geographical data used to calculate the CAK3 (CAK SI) allocation rate, such that 80%[78] (£[redacted]) is included in CR3 and 20% (£[redacted]) is included in CR2 (paragraph 7.26).

Third Party – offshore

8.19 Third party costs of £[redacted][79] relate to Fisheries compensation payments. Forecast costs of £1.2 million have been allocated to the Transmission Assets at 32.81%[80] and then attributed between CR2 and CR3, as described in paragraph 8.18 above.

8.20 Costs invoiced to date total £[redacted], which we have agreed to invoices from Brown and May. The Developer has advised us that the latest forecast has been reduced by £[redacted] to £[redacted], comprising the £[redacted] expended and estimated costs of £[redacted] for two future payments[81] with potential increases in the number of fishermen claiming compensation included each. As such, we propose an adjustment to decrease the CAT by £[redacted][82].

[75] CAK1 – cost based allocation

[76] CAK3 – area based allocation

[77] ibid

[78] Being 9km² export cable corridor (80%) and 2.25km² OSP area (20%)

[79] £[redacted] x 32.81% = £[redacted] £[redacted] x 80% = £[redacted]

[80] CAK3 – area based allocation

[81] £[redacted] in relation to December 2017 and January and February 2018 and £[redacted] in relation to Ma May 2018

[82] £[redacted] x 32.81% = £[redacted] (of which £[redacted] (80%) relates to CR3 costs and £[redacted] (20%) relates to sts

9 LAND CABLE SUPPLY AND INSTALLATION

9.1 The land cable supply and installation costs are comprised as follows:

CR4 – LAND CABLE SUPPLY AND INSTALLATION

Contract Overview	Ref	£
Onshore Land Cable		
Overall System Testing		[redacted]
General		
Other		
	9.4	[redacted]
Onshore Cable Supply		
Cable Supply and Installation		
Works in NGET Substation		
Supply of 132kV cable and accessories		
	9.4	[redacted]
Onshore Cable Installation		
Horizontal Directional Drilling		[redacted]
	9.4	[redacted]
Onshore Cable Jointing		
Transition Joint Bays		[redacted]
	9.4	[redacted]
Electrical Package Shared Costs	9.5	
Other Category Specific Costs	9.6	
		7,050,221

ELECTRICAL SERVICES AGREEMENT (NRL2587)

9.2 Following a competitive tender, as described at **Appendix 3**, the Developer entered into an EPCI contract with APC. The contract covered the provision of electrical systems works, the manufacture, supply and construction of the onshore substation, the onshore cable works, the OSP and jacket foundation, and the offshore transportation and installation of the OSP and foundation.

9.3 The contract costs relating to the onshore cable have been recorded in the CR4 of the CAT and our work in relation to these is set out below.

9.4 With the exception of the Electrical Package Shared Costs and the other category specific costs, which are detailed below, the costs set out in the table in paragraph 9.1 above, have been agreed to the underlying contract[83]. Further details of these costs, as recorded in the contract, are set out in **Appendix 4**.

ELECTRICAL PACKAGE SHARED COSTS

9.5 As described at **Appendix 3** and paragraph 5.39 above, the Electrical Systems contract covers four CR categories in the CAT and various contract items have been 'shared' across the four CR categories using the allocation rates set out in the table in paragraph 5.41 above. The 'Electrical Package Shared Costs' are detailed at **Appendix 5** and the amounts allocated to the onshore cable are summarised in the table below:

Electrical Package Shared Costs

	Total costs £	Allocation rate	Total per CAT (CR4) £
Project Management	[redacted]	4.76%	[redacted]
Spares	[redacted]	4.76%	[redacted]
Contract Option (O3) : Advanced Payment Bond	[redacted]	4.76%	[redacted]
Prov Sum: OFTO Spares	[redacted]	4.76%	[redacted]
Contract Variations	[redacted]	4.76%	[redacted]
	8,301,428		394,903

OTHER CATEGORY SPECIFIC COSTS

9.6 Other costs in relation to the onshore cable comprise the following:

Other Category Specific Costs

	Ref	£
Land Transactions (CR4 - Onshore Cable related)	9.7	[redacted]
Onshore Consents Conditions (CR4 - onshore cable allocation)	-	[redacted]
Onshore Consents Monitoring (CR4 - onshore cable allocation)	-	[redacted]
Third Party - onshore (CR4 - onshore cable allocation)	-	[redacted]
Total		476,723

[83] Contract Schedule 1 Contract Price (adjusted by Forex)

9.7 Land transactions costs of £426,111 comprise the following:

Land Transactions

	Ref	£
Ogilvie lease	9.8	[redacted]
Ogilvie land agent fees	-	[redacted]
Ogilvie legal fees	-	[redacted]
Ogilvie lease - crop compensation	-	[redacted]
SCDC lease	-	[redacted]
SCDC lease legal fees	-	[redacted]
Land transactions support	-	[redacted]
UKPN solicitors undertaking	-	[redacted]
Total		**426,111**

9.8 We have agreed Ogilvie lease payments to the Deed of Easement and an email from the Land Agent, which sets out the following payments (along with supporting calculations[84]) totalling £[redacted]

Ogilvie lease

	£
Easement payment	[redacted]
Freehold payment	[redacted]
Licence payment	[redacted]
Provision to cover additional sums for unexpected issues	[redacted]
Total	**265,451**

[84] Using the formulas set out in Schedule 3 of the Ogilvie Option Agreement

10 ONSHORE SUBSTATION

10.1 The onshore substation costs are comprised as follows:

CR5 – ONSHORE SUBSTATION COSTS

Contract Overview	Ref	£
Civils/Land & Associated		
General	-	[redacted]
Earthworks	-	[redacted]
Infrastructure	-	[redacted]
Architectural	-	[redacted]
	10.4	[redacted]
Electrical Componentry		
LV electrical system & electrical installation	-	[redacted]
Balance of Plant (BoP)	-	[redacted]
Other costs	-	[redacted]
OFTO HV/ BoP SCADA	-	[redacted]
OFTO CCTV/ Telecoms	-	[redacted]
Metering & NGET System Monitoring	-	[redacted]
Overall System Design (System Studies)	-	[redacted]
	10.4	[redacted]
Electrical Package Shared Costs	10.5	[redacted]
Category Specific Options and Variations	10.8	[redacted]
Other Category Specific Costs	10.10	[redacted]
		16,622,296

ELECTRICAL SERVICES AGREEMENT (NRL2587)

10.2 Following a competitive tender, as described at **Appendix 3**, the Developer entered into an EPCI contract with APC. The contract covered the provision of electrical systems works, the manufacture, supply and construction of the onshore substation, the onshore cable works, the OSP and jacket foundation, and the offshore transportation and installation of the OSP and foundation.

10.3 The contract costs relating to the onshore substation have been recorded in the CR5 of the CAT and our work in relation to these is set out below.

10.4 Civils/Land and associated costs totalling £[redacted] and electrical componentry costs totalling £[redacted] have been agreed to the underlying contract[85]. Further details of these costs, as recorded in the contract, are set out in **Appendix 4**.

[85] Contract Schedule 1 - Contract Price (adjusted by Forex)

ELECTRICAL PACKAGE SHARED COSTS

10.5 As described at **Appendix 3** and paragraph 5.39 above, the Electrical Systems contract covers four CR categories in the CAT and various contract items have been 'shared' across the four CR categories using the allocation rates set out in the table in paragraph 5.41 above. The 'Electrical Package Shared Costs' are detailed in **Appendix 5** and the amounts allocated to the onshore substation are summarised in the table below:

Electrical Package Shared Costs

	Ref	Total costs £	Allocation rate	Total per CAT (CR5) £
Project Management	-	[redacted]	12.33%	[redacted]
Spares	-	[redacted]	12.33%	[redacted]
Contract Option (O3) : Advanced Payment Bond	-	[redacted]	12.33%	[redacted]
Prov Sum: OFTO Spares	10.6	[redacted]	12.33%	[redacted]
Contract Variations	10.7	[redacted]	12.33%	[redacted]
		8,301,428		1,023,805

10.6 As detailed in paragraphs 5.5 and 5.6 of **Appendix 5**, the Developer has updated the estimated costs in relation to operational spares from £[redacted] to £[redacted]. As such, we propose an adjustment to decrease the costs allocated to CR5 in the CAT by £[redacted][86]. Additionally, in line with previous projects, we recommend that Ofgem should take a view regarding the level of spare parts in the ITV.

10.7 As detailed in paragraph 5.8 of **Appendix 5**, the Developer's latest estimate of expected contract variations is £[redacted]. As such, we propose and adjustment to decrease the costs allocated to CR5 in the CAT by £[redacted][87].

CATEGORY SPECIFC OPTIONS AND VARIATIONS

10.8 Category specific options and variations totalling £[redacted] comprise the following:

Category Specific Options and Variations

	Ref	£
Prov Sum: Landscaping	10.9	[redacted]
Removal of Power Quality Meters	-	[redacted]
Irrigation Pipe Works at Leiston	-	[redacted]
		118,109

[86] £[redacted] - £[redacted] = £[redacted]. £[redacted] multiplied by the CR5 allocation rate of 12.33% = £[redacted]

[87] £[redacted] - £[redacted] = £[redacted] (see **Appendix 5**). £[redacted] multiplied by the CR5 allocation rate of 12.

10.9 The CAT includes budgeted costs of £[redacted] in relation to landscaping costs. The Contract Manager confirmed that this budget allowance was advised by the contractor (Breheny) during the initial enabling works period in 2014. We have been provided with the original quotation for these works which sets out a detailed breakdown of costs totalling £[redacted].

OTHER CATEGORY SPECIFIC COSTS

10.10 Other costs in relation to the onshore substation comprise the following:

Other Category Specific Costs

	Ref	£
Project management	5.3	[redacted]
Contingency	5.27	[redacted]
Land Transactions (CR5 - Onshore Substation related)	-	[redacted]
Onshore Consents Conditions (CR5 - onshore sub allocation)	-	[redacted]
Onshore Consents Monitoring (CR5 - onshore sub allocation)	-	[redacted]
Third Party - onshore (CR5 - onshore sub allocation)	-	[redacted]
Total		2,705,702

11 REACTIVE SUBSTATION

11.1 The reactive substation costs are comprised as follows:

CR6 – REACTIVE SUBSTATION COSTS

Contract Overview	Ref	£
Reactive Compensation Equipment		
Design and specification	11.4	[redacted]
Supply of Reactive Compensation system	11.4	[redacted]
Supply of Harmonic filters	11.5	[redacted]
		[redacted]
Switchgear/Protection		
Supply of 132kV switchgear and protection relay system		[redacted]
Re-validation of SVC Scope		[redacted]
	11.4	[redacted]
Transformer		
Supply of Reactive Compensation transformers		[redacted]
Supply of Earthing and auxiliary transformers		[redacted]
	11.4	[redacted]
Auxiliary equipment/accessories		
Supply of Interlocking systems		[redacted]
Installation of the above		[redacted]
Testing & commissioning of all the above		[redacted]
	11.4	[redacted]
Electrical Package Shared Costs	11.7	[redacted]
Other Category Specific Costs	11.10	[redacted]
		19,764,333

ELECTRICAL SERVICES AGREEMENT (NRL2587)

11.2 Following a competitive tender, as described at **Appendix 3**, the Developer entered into an EPCI contract with APC. The contract covered the provision of electrical systems works, the manufacture, supply and construction of the onshore substation, the onshore cable works, the OSP and jacket foundation, and the offshore transportation and installation of the OSP and foundation.

11.3 The contract costs relating to the reactive substation have been recorded in the CR6 of the CAT and our work in relation to these is set out below.

11.4 With the exception of the Electrical Package Shared Costs and the other category specific costs, which are detailed below, the costs set out in the table in paragraph 11.1 above, have been agreed to the underlying contract[88]. Further details of these costs, as recorded in the contract, are set out in **Appendix 4**.

11.5 As set out in **Appendix 4**, costs included in the contract for the supply of harmonic filters are £[redacted] for the first stage filter and £nil for the supply of the second stage filter. However, the CAT includes costs of £[redacted] in relation to the second stage harmonic filter, resulting in total costs in relation to the supply of harmonic filters of £[redacted].

11.6 The Developer has advised that the supply of the second stage harmonic filter was moved from a contract item to an option and has since been designed out and so is no longer required. As such, we propose an adjustment to decrease the costs in the CAT by £[redacted].

ELECTRICAL PACKAGE SHARED COSTS

11.7 As described at **Appendix 3** and paragraph 5.39 above, the Electrical Systems contract covers four CR categories in the CAT and various contract items have been 'shared' across the four CR categories using the allocation rates set out in the table in paragraph 5.41 above. The 'Electrical Package Shared Costs' are detailed in **Appendix 5** and the amounts allocated to the reactive substation are summarised in the table below:

Electrical Package Shared Costs

	Ref	Total costs £	Allocation rate	Total per CAT (CR6) £
Project Management	-	[redacted]	18.16%	[redacted]
Spares	-	[redacted]	18.16%	[redacted]
Contract Option (O3) : Advanced Payment Bond	-	[redacted]	18.16%	[redacted]
Prov Sum: OFTO Spares	11.8	[redacted]	18.16%	[redacted]
Contract Variations	11.9	[redacted]	18.16%	[redacted]
		8,301,428		1,507,858

11.8 As detailed in paragraphs 5.5 and 5.6 of **Appendix 5**, the Developer has updated the estimated costs in relation to operational spares from £[redacted] to £[redacted]. As such, we propose an adjustment to decrease the costs allocated to CR6 in the CAT by £[redacted][89]. Additionally, in line with previous projects, we recommend that Ofgem should take a view regarding the level of spare parts in the ITV.

[88] Contract Schedule 1 - Contract Price (adjusted by Forex)

[89] £[redacted] - £[redacted] = £[redacted] multiplied by the CR6 allocation rate of [redacted]% = £[redacted]

11.9 As detailed in paragraph 5.8 of **Appendix 5**, the Developer's latest estimate of expected contract variations is £[redacted]. As such, we propose and adjustment to decrease the costs allocated to CR5 in the CAT by £[redacted][90].

OTHER CATEGORY SPECIFIC COSTS

11.10 Other costs in relation to the onshore substation comprise the following:

Other Category Specific Costs

	£
Onshore Consents Conditions (CR6 - reactive sub allocation)	[redacted]
Onshore Consents Monitoring (CR6 - reactive sub allocation)	[redacted]
Third Party - onshore (CR6 - reactive sub allocation)	[redacted]
Total	193,074

[90] £[redacted] £[redacted] = [redacted] (see **Appendix 5**). £[redacted] multiplied by the CR6 allocation rate of 18.16% = £[redacted]

12 CONNECTION COSTS

12.1 Connection costs of £[redacted] relate to the contract with NGET (NRL2831) for the design, supply, installation, testing and commissioning of two number F35/2 switches into the existing National Grid Substation at Leiston.

12.2 We have agreed costs totalling £[redacted] to the underlying contract, which sets out a breakdown of the costs as summarised in the table below:

NGET connection costs

	£
SEESA and NG PM	[redacted]
Engineering, Design and Verification	[redacted]
SEESA and NG Commissioning 1 & 2	[redacted]
Plant and Materials	[redacted]
Electrical Installation	[redacted]
Civil Works	[redacted]
	2,576,320

12.3 The above costs of £2,576,320 include variation order 1 (pfisterer connections), variation order 2 (storage and additional packaging of the switchgear) and variation order 3 (detailed design works). Together with an invoice for £33,750 in relation to application fees, this totals the £2,610,070[91] included in the CAT.

[91] £[redacted] + £[redacted] = £[redacted]

1 SUMMARY OF COST MOVEMENTS AND UNSUBSTANTIATED COSTS

Summary of cost movements

Project cost category	Per CAT £	Adjusted value £	Total adjustment £	Breakdown £	Revised estimate/ Adjustment/ Reallocation	Rationale for adjustment	Unsubstantiated costs £
Project common costs	[redacted]	[redacted]	[redacted]	[redacted]	Adjustment	Increase in resource costs (CRO.02) upon updating CAK2 allocation rate	[redacted]
				[redacted]	Adjustment	Increase in DEVEX costs upon updatng CAK2 allocation rate	
				[redacted]	Adjustment	Decrease proposed by the Developer in relation to DEVEX costs	
				[redacted]	Revised estimate	Decrease in cross project engineering costs for current estimate	-
Offshore substation	[redacted]	[redacted]	[redacted]	[redacted]	Revised estimate	Decrease in operational spares no longer sourced under the Electrical Services contract	
				[redacted]	Revised estimate	Decrease in expected future variations to the Electrical Services contract	
				[redacted]	Revised estimate	Decrease in PC resource budgeted costs no longer required	
				[redacted]	Revised estimate	Decrease of Fisheries Compensation costs to reflect latest forecast	
Submarine cable supply and installation	[redacted]	[redacted]	[redacted]	[redacted]	Revised estimate	Decrease in guard vessel costs (now actual costs known)	-
				[redacted]	Revised estimate	Decrease of contract NRL4692 price due to scope element no longer needed	
				[redacted]	Revised estimate	Decrease in contract variations (NRL3129) to reflect latest forecast	
				[redacted]	Revised estimate	Decrease of Fisheries Compensation costs to reflect latest forecast	
Land cable supply and installation	[redacted]	[redacted]	[redacted]	[redacted]	Revised estimate	Decrease in operational spares no longer sourced under the Electrical Services contract	-
				[redacted]	Revised estimate	Decrease in expected future variations to the Electrical Services contract	

Summary of cost movements

Project cost category	Per CAT £	Adjusted value £	Total adjustment £	Breakdown £	Revised estimate/ Adjustment/ Reallocation	Rationale for adjustment	Unsubstantiated costs £
Onshore substation	[redacted]	[redacted]	[redacted]	[redacted]	Revised estimate	Decrease in operational spares no longer sourced under the Electrical Services contract	-
				[redacted]	Revised estimate	Decrease in expected future variations to the Electrical Services contract	
Reactive substation	[redacted]	[redacted]	(619,764)	[redacted]	Revised estimate	Decrease in operational spares no longer sourced under the Electrical Services contract	-
				[redacted]	Revised estimate	Decrease in expected future variations to the Electrical Services contract	
				[redacted]	Revised estimate	Decrease in costs relating to the supply of second stage harmonic filters (scope no longer in contract)	
Connection costs	[redacted]	[redacted]	-	-			-
Total capital costs (exc. IDC)	[redacted]	[redacted]	[redacted]				[redacted]
			[redacted]				[redacted]

2 GENERAL DEVELOPMENT COSTS

Ref	Contract description	Total costs £	Allocation rate	Total per CAT £	Notes	Unsubstantiated costs £	Allocation basis
	Legacy (2012-2014)						
CRO.06.01.02	Site Investigations	[redacted]	[redacted]%	[redacted]	Gardline Geosciences and Fugro costs of £1,608,716 (£6,994,416 pre-OFTO Allocation) agreed to supporting invoices The Developer has proposed to remove £342,484 (total cost £1,489,061) from the CAT as these costs cannot be substantiated and following a detailed review the Developer considers these costs to be within separately identified Fugro and Gardline invoices.	-	Set rate – CAK1
CRO.06.01.04	Electrical	[redacted]	[redacted]%	[redacted]	J Breheny Contractors Lrd and Alstom Grid UK Ltd costs of £390,857 (£1,699,377 pre-OFTO Allocation) agreed to supporting invoices	-	Set rate – CAK1
CRO.06.01.06	Development	[redacted]	[redacted]%	[redacted]	Pre RWE reporting – no details in the SAP system and therefore no further detail can be obtained	755,734 -	Set rate – CAK1
CRO.06.01.08	HSE&S	[redacted]	[redacted]%	[redacted]	No individual invoices over 100k	-	Set rate – CAK1
CRO.06.01.09	Overheads	[redacted]	[redacted]%	[redacted]	Pre RWE reporting – no details in the SAP system and therefore no further detail can be obtained	115,504	Set rate – CAK1
CRO.06.01.10	Staff Costs	[redacted]	[redacted]%	[redacted]	RWE Innogy costs of £2,326,544.45 (£10,115,410.66 pre-OFTO Allocation) reviewed and agreed	-	Set rate – CAK1
	Phoenix (2015)						
CRO.06.02.02	Site Investigations	[redacted]	[redacted]%	[redacted]	Gardline costs of £323,569.11 (£1,406,822.23 pre-OFTO Allocation) reviewed and agreed to supporting invoices	-	Set rate – CAK1
CRO.06.02.04	Electrical	[redacted]	[redacted]%	[redacted]	No individual amounts over £100k		100%
CRO.06.02.06	Consent and Leases	[redacted]	[redacted]%	[redacted]	No individual amounts over £100k		Package based OFTO allocation
CRO.06.02.09	Staff and Overheads	[redacted]	[redacted]%	[redacted]	Clifford Chance costs of £254,787.84 (£624,480 pre-OFTO allocation) reviewed and agreed to supporting invoices		Linked to CAK2
		[redacted]		[redacted]		[redacted]	

3 ELECTRICAL PACKAGE SPECIFIC STRATEGY AND TENDER PROCESS

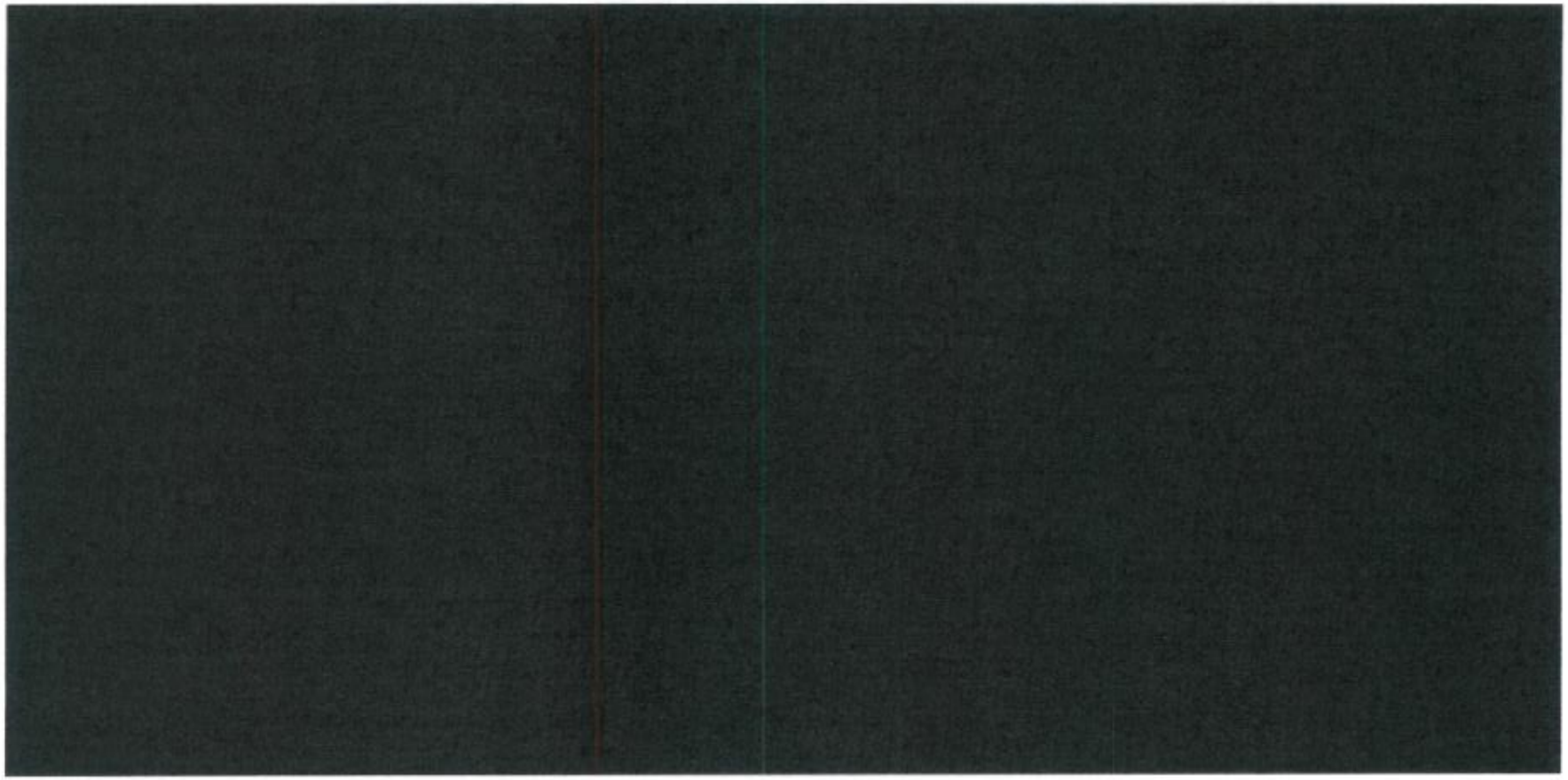
[redacted]

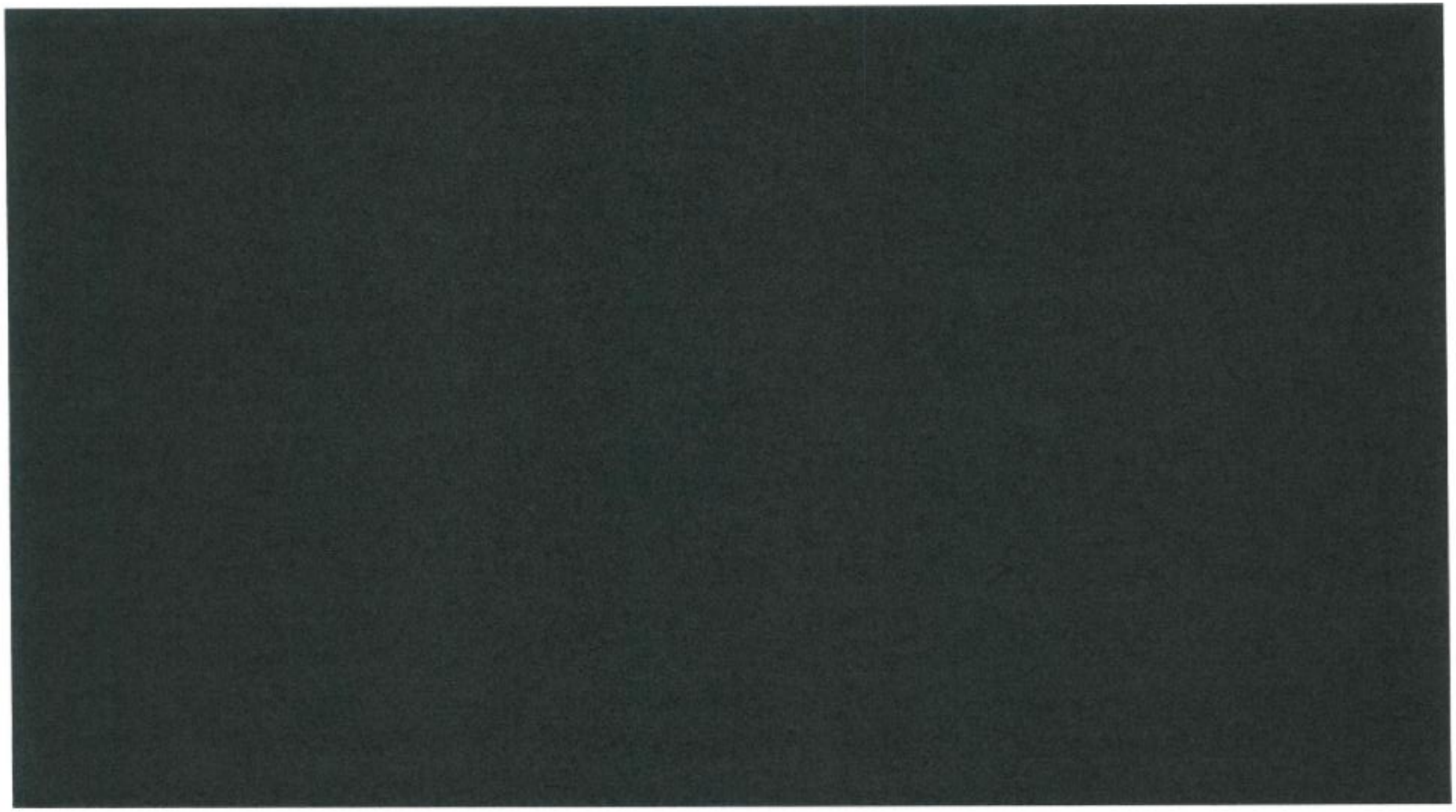
[redacted]

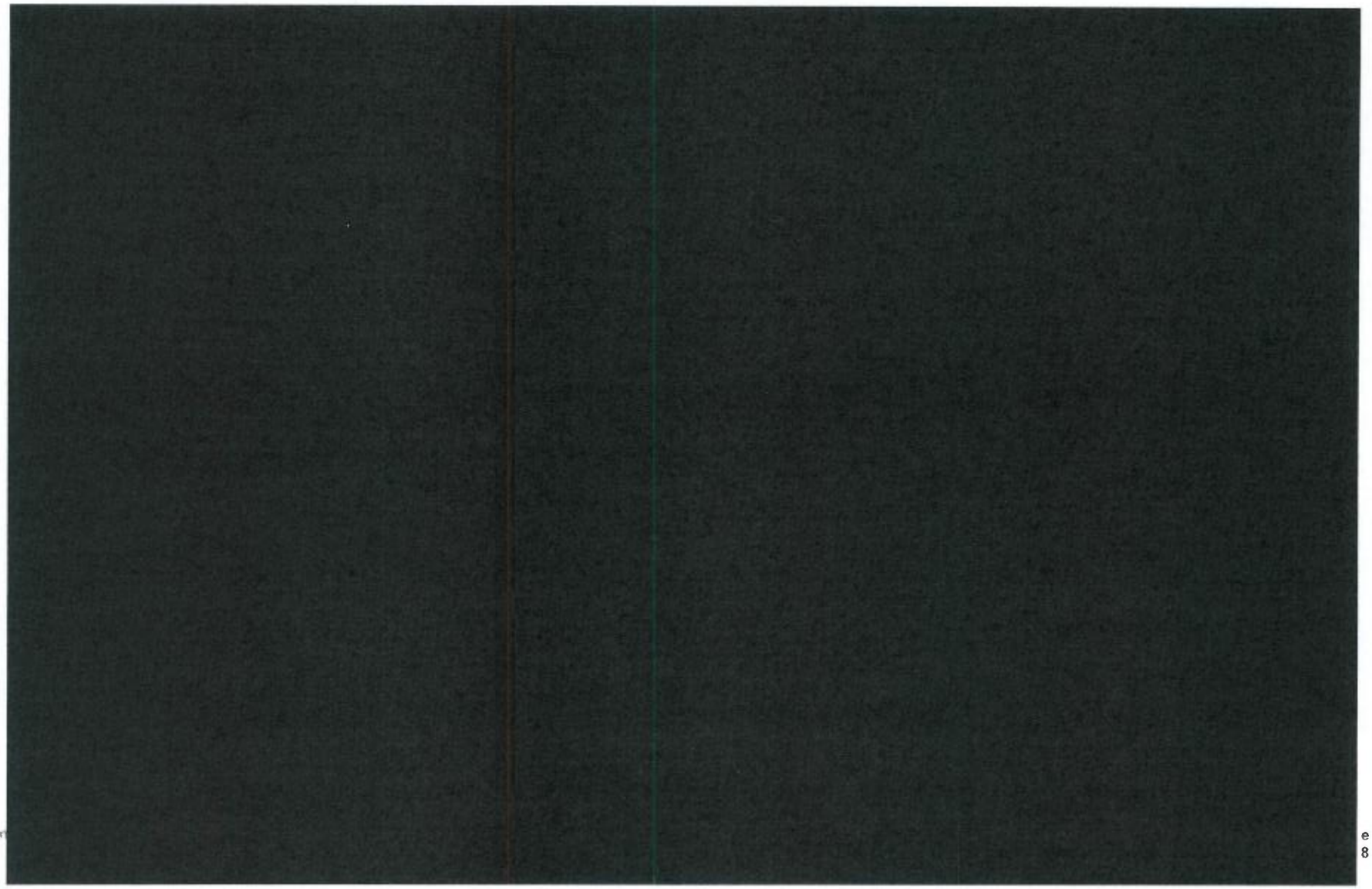
[93] CR2, CR4, CR5 and CR6

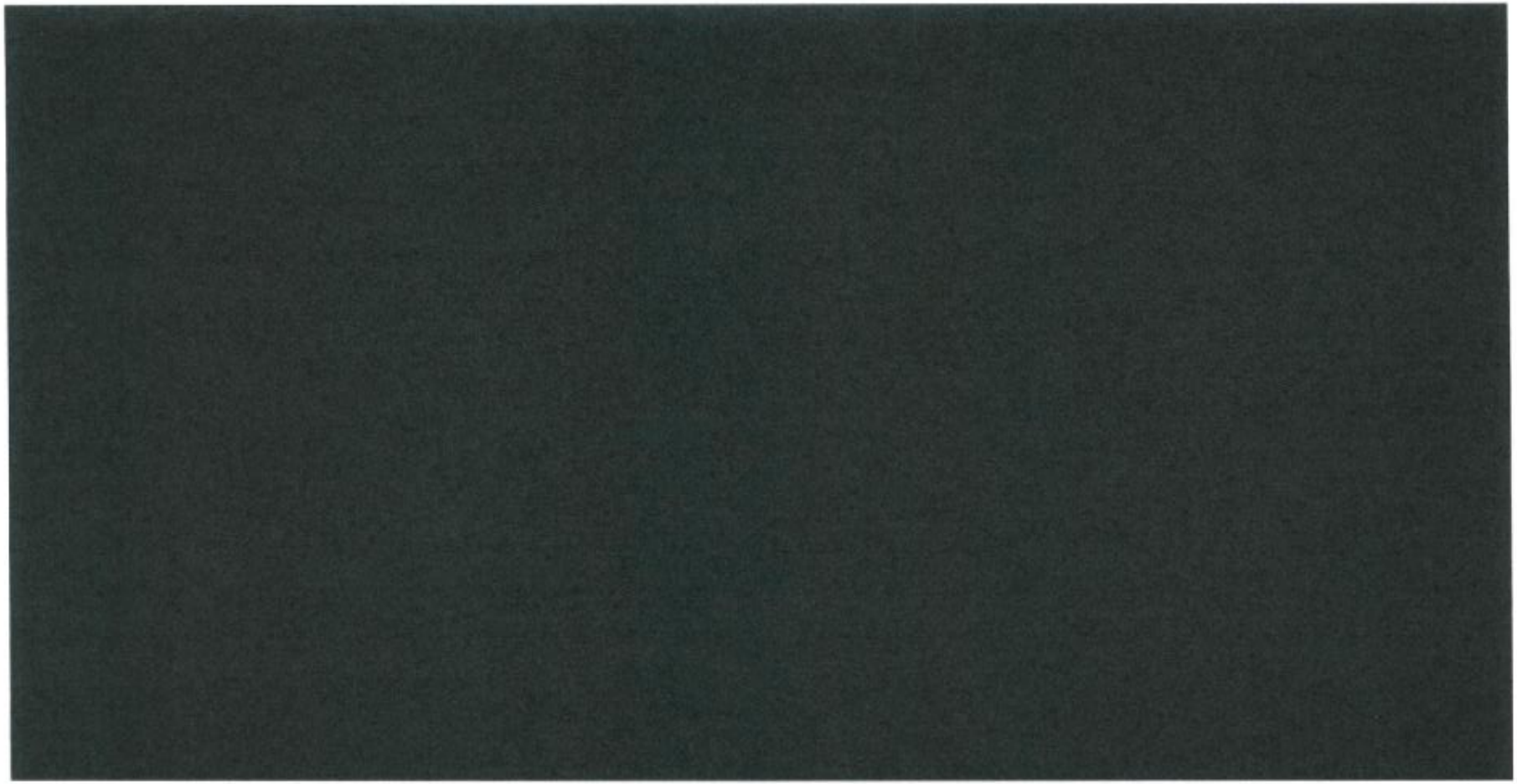
[redacted]

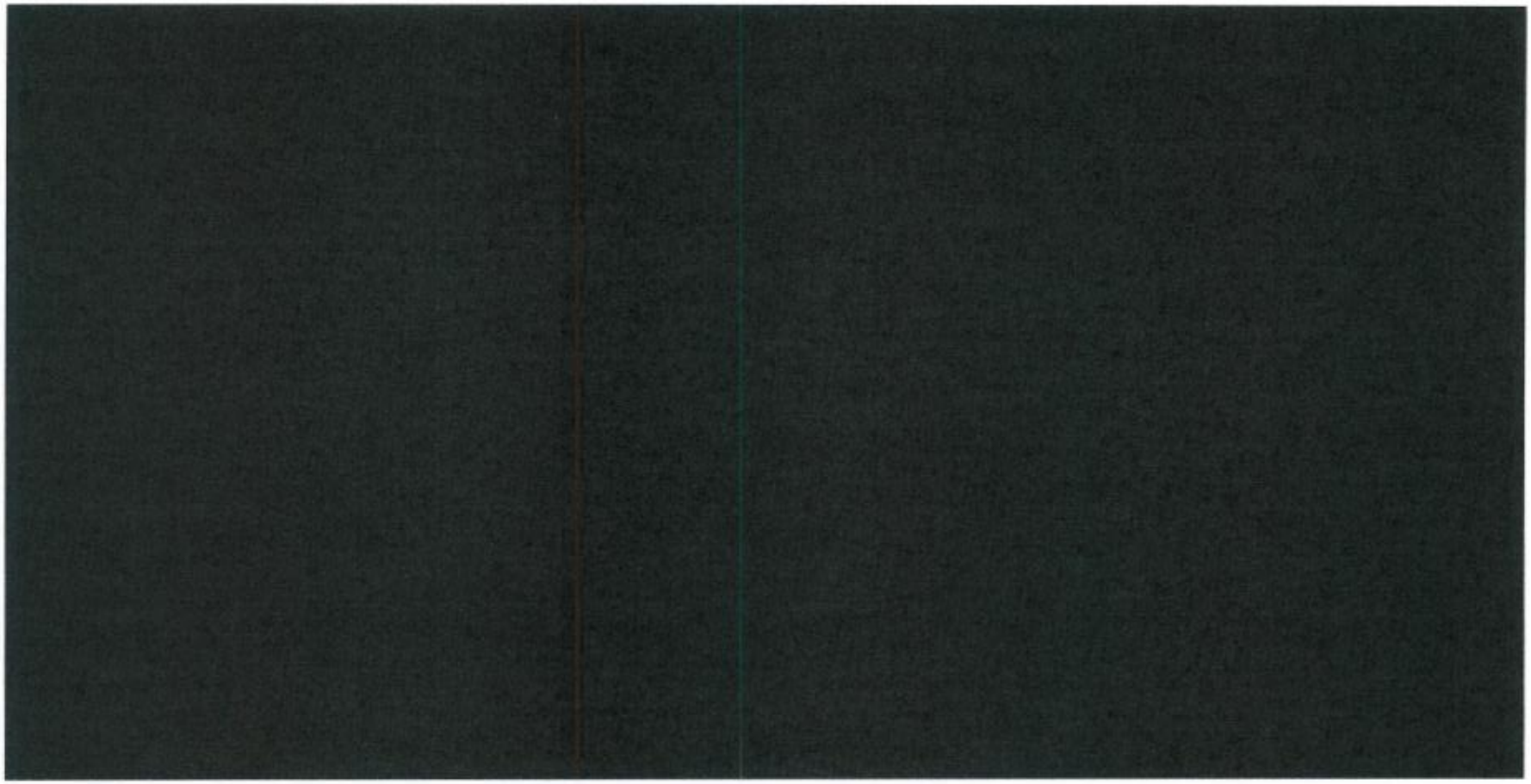
4 ELECTRICAL SYSTEMS AGREEMENT (NRL2587) – MAIN CONTRACT COSTS

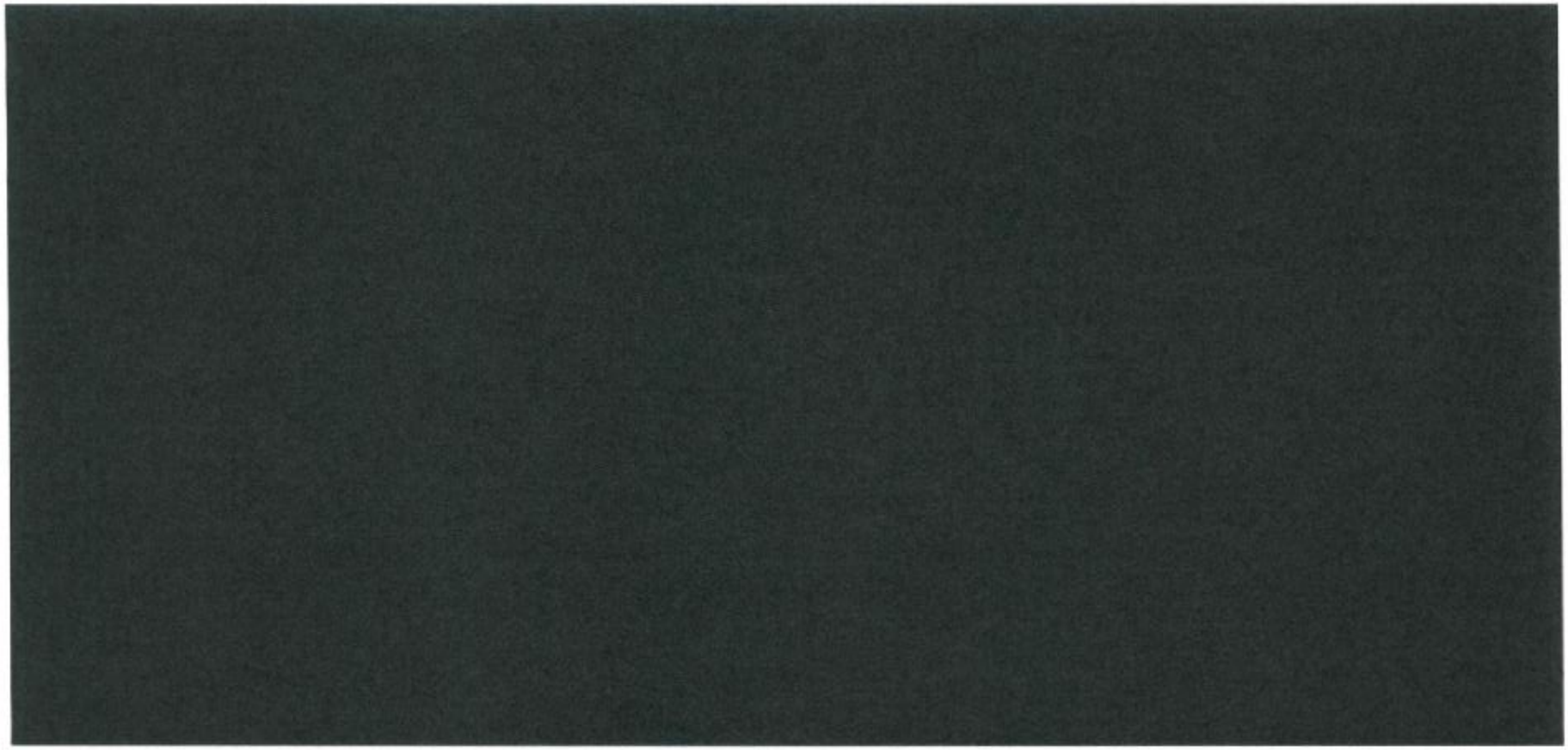


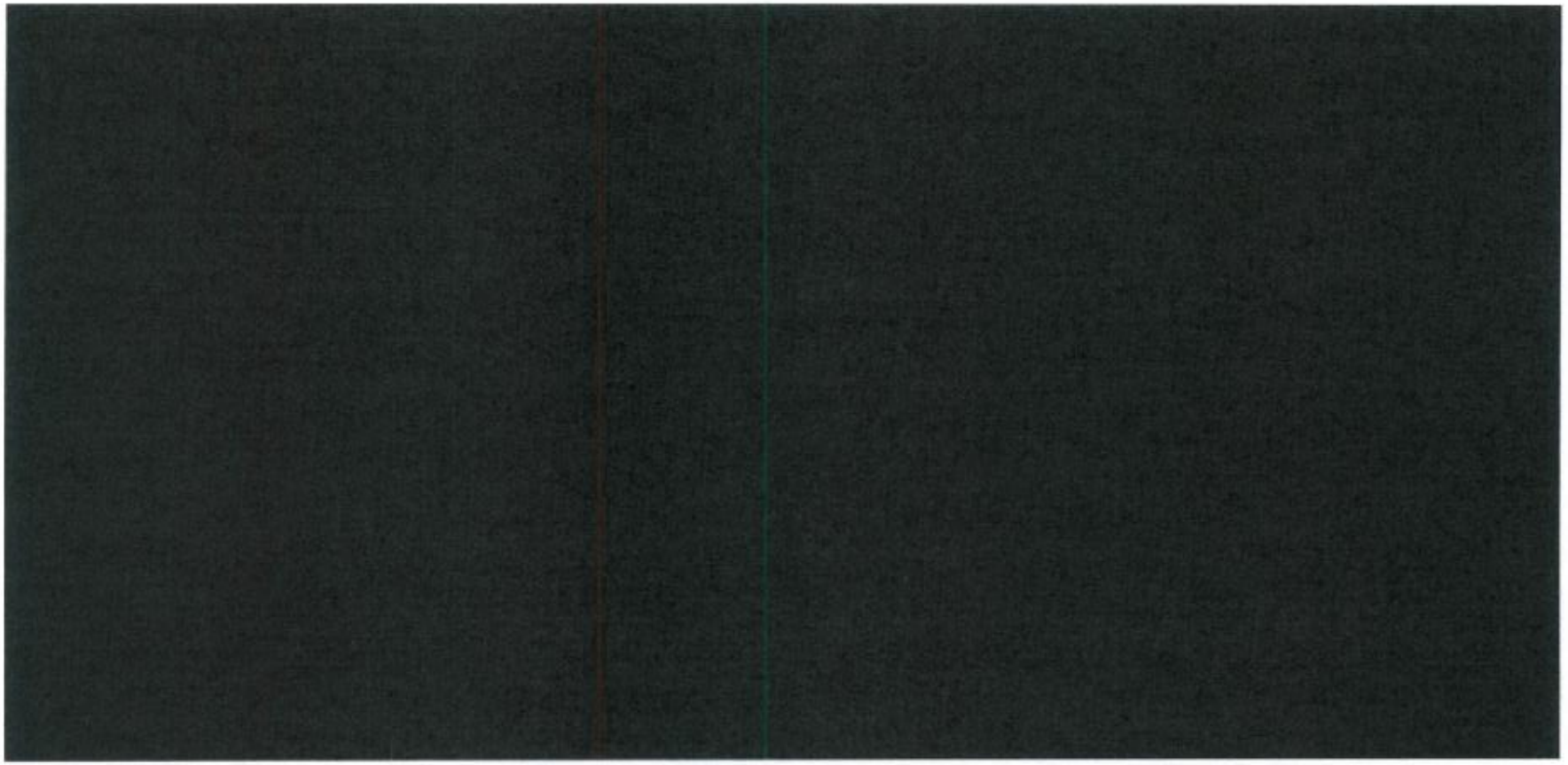


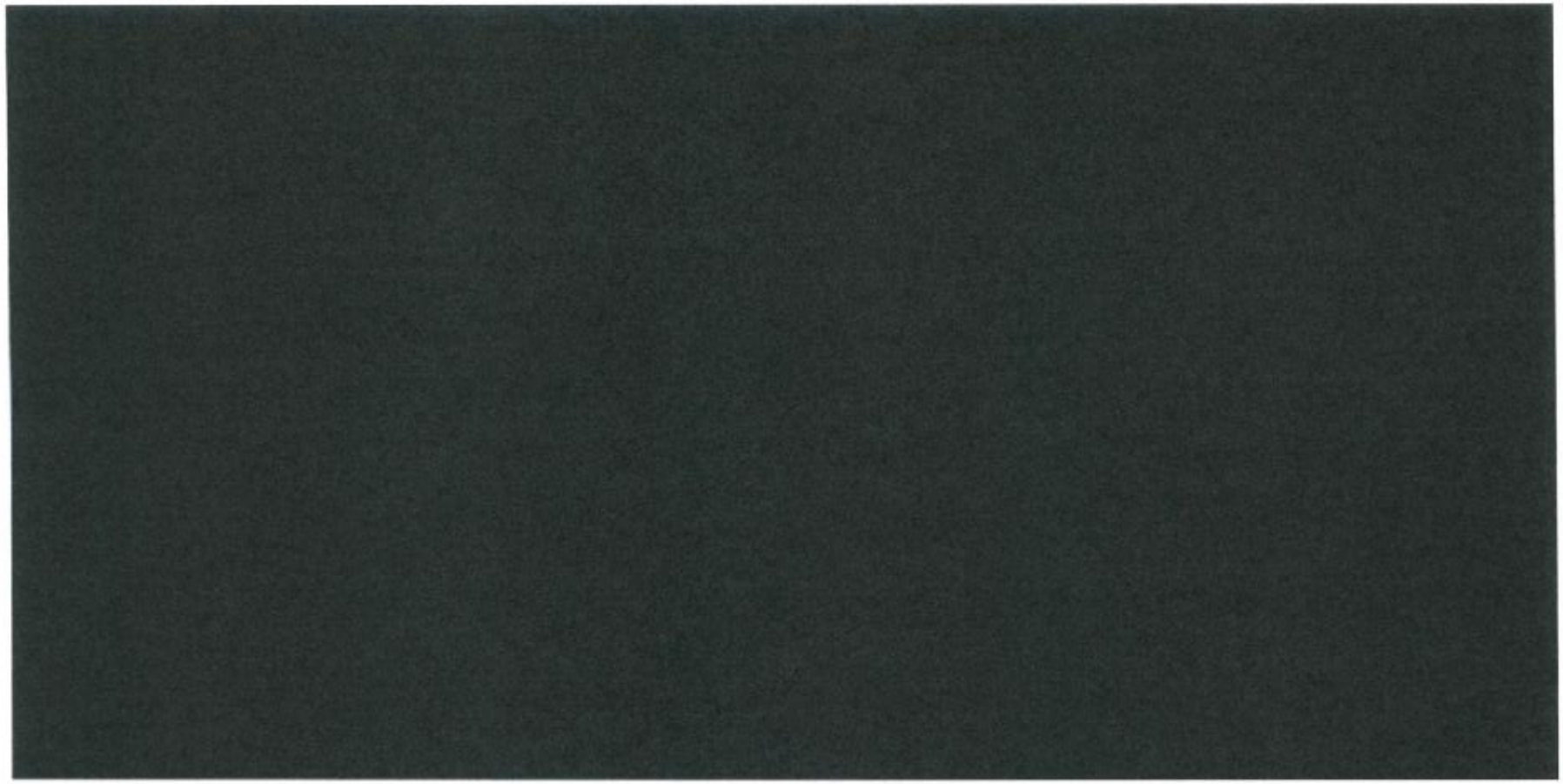


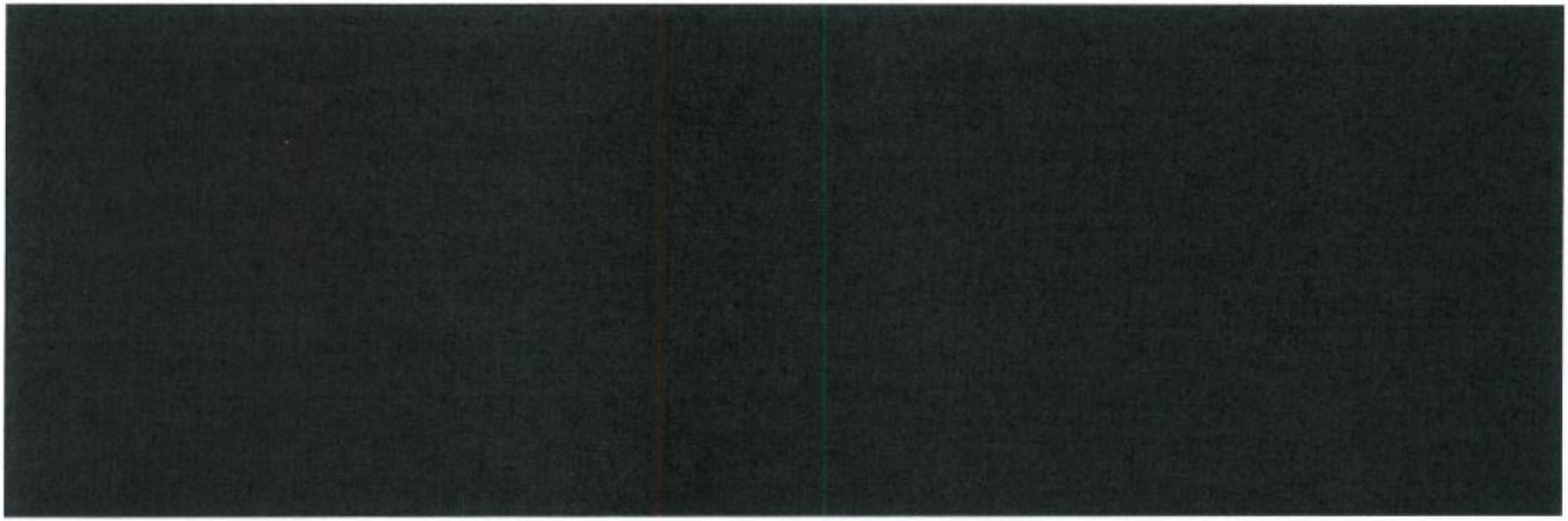












5 ELECTRICAL PACKAGE SHARED COSTS

5.1 The Electrical Systems contract covers the provision of electrical systems works, the manufacture, supply and construction of the onshore substation, the onshore cable works, the OSP and jacket foundation and the offshore transportation and installation of the OSP and foundation. Therefore, contract costs cover four CR categories in the CAT.

5.2 The costs from the contract pricing schedule (excluding those which relate to the Generation Assets) are set out in **Appendix 4**. As noted in paragraph 5.39 of this report, these have allocated on a line by line basis to either one of the four CR categories or for the Electrical Package shared costs, these have been shared between the four categories using the allocation rate as set out in paragraph 5.41 of this report.

5.3 Along with project management and spare costs included in the contract pricing schedule, the Electrical Package shared costs comprise:

	Ref	Total costs £
Project Management	Appendix 3	[redacted]
Spares	Appendix 3	[redacted]
Contract Option (O3) : Advanced Payment Bond	5.5	[redacted]
Prov Sum: OFTO Spares	5.5	[redacted]
Contract Variations	5.7	[redacted]
		[redacted]

Advanced Payment Bond

5.4 We agreed £[redacted] to variation instruction VI-009, relating to option O3.1 and O3.2 for 'Advanced Payment Bond'.

Operational spares

5.5 Measured Work Breakdown Option No.14 includes £[redacted] for operational spares. The Developer explained that estimated costs of £[redacted] for operational spares were included in the CAT (at [redacted]%) based on the forecast at February 2017, which saw a reduction of costs from the original budget of £[redacted].

5.6 We have agreed costs of £[redacted] to variation instruction VI-032 for spare ET and EAT Transformers. However, as operational spares are no longer sourced under the contract (but by the operational services team), the Developer has advised that the estimated costs should be reduced to £[redacted], for the known variation order of £[redacted] and an allowance of approximately £[redacted] for any additional costs. As such, we propose an adjustment to decrease the CAT by a total of £[redacted][94], spread over the four CR categories as detailed in the relevant sections of this report.

Contract variations

5.7 Included in the CAT is £[redacted] for expected future costs in relation variations to the Electrical Services contract. This is based on the 'in-package allowance' for expected variations to the contract at February 2017. In support of this estimate, the Developer has provided a breakdown of the latest register of variation orders, with expected variations totalling £[redacted]. We have reviewed the breakdown provided and have agreed the two amounts over £[redacted] (net total of £[redacted]) to supporting documentation as follows:

5.7.1 £[redacted] has been agreed to early warning notice (EWN) 501, which is a formal request for a variation (compensation event) under the contract to the value of £[redacted] in relation to Offshore UPS equipment. This is currently under review by the project; and

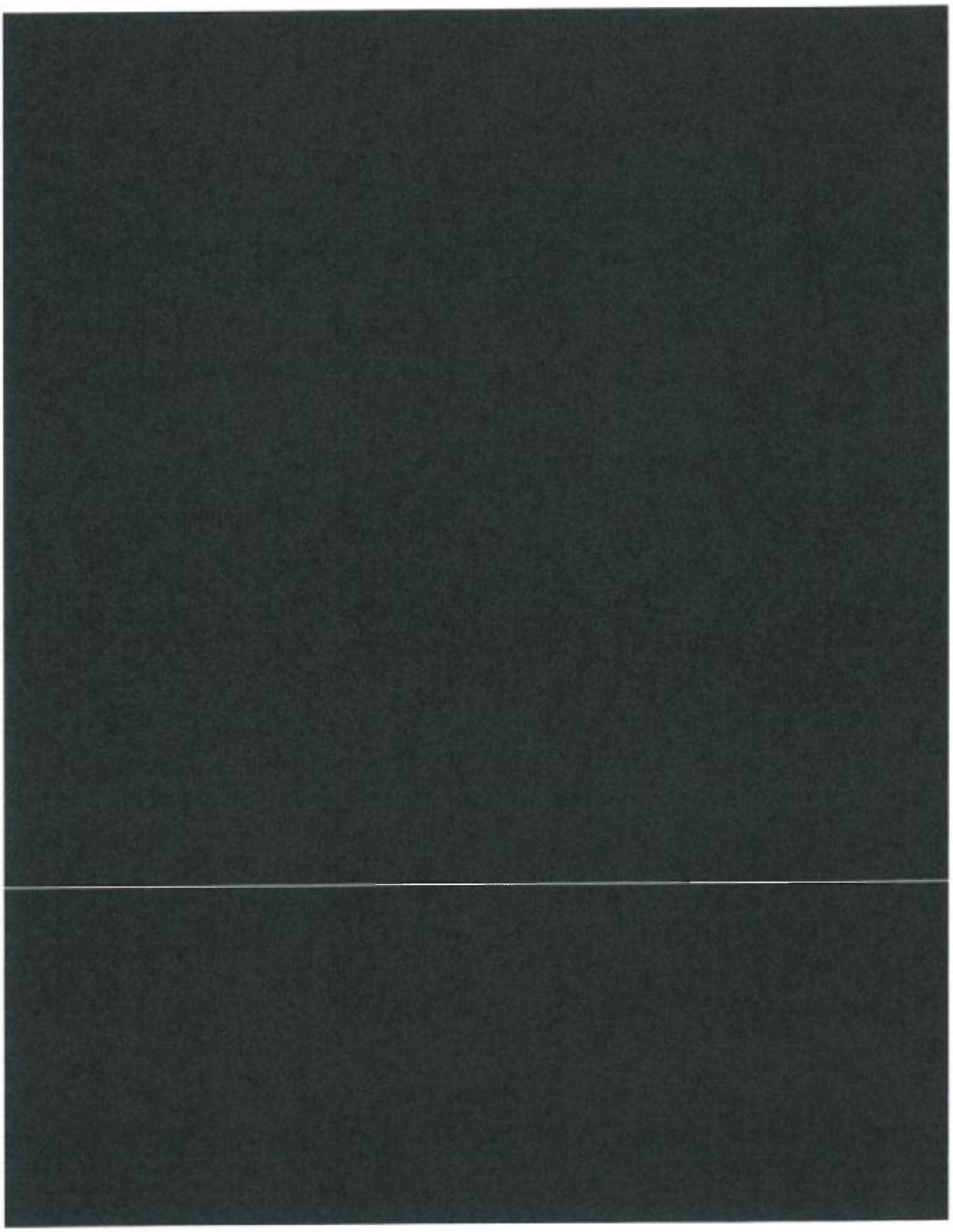
5.7.2 £[redacted]) has been agreed to variation instruction VI-044 for the exclusion of scope for testing HV cables.

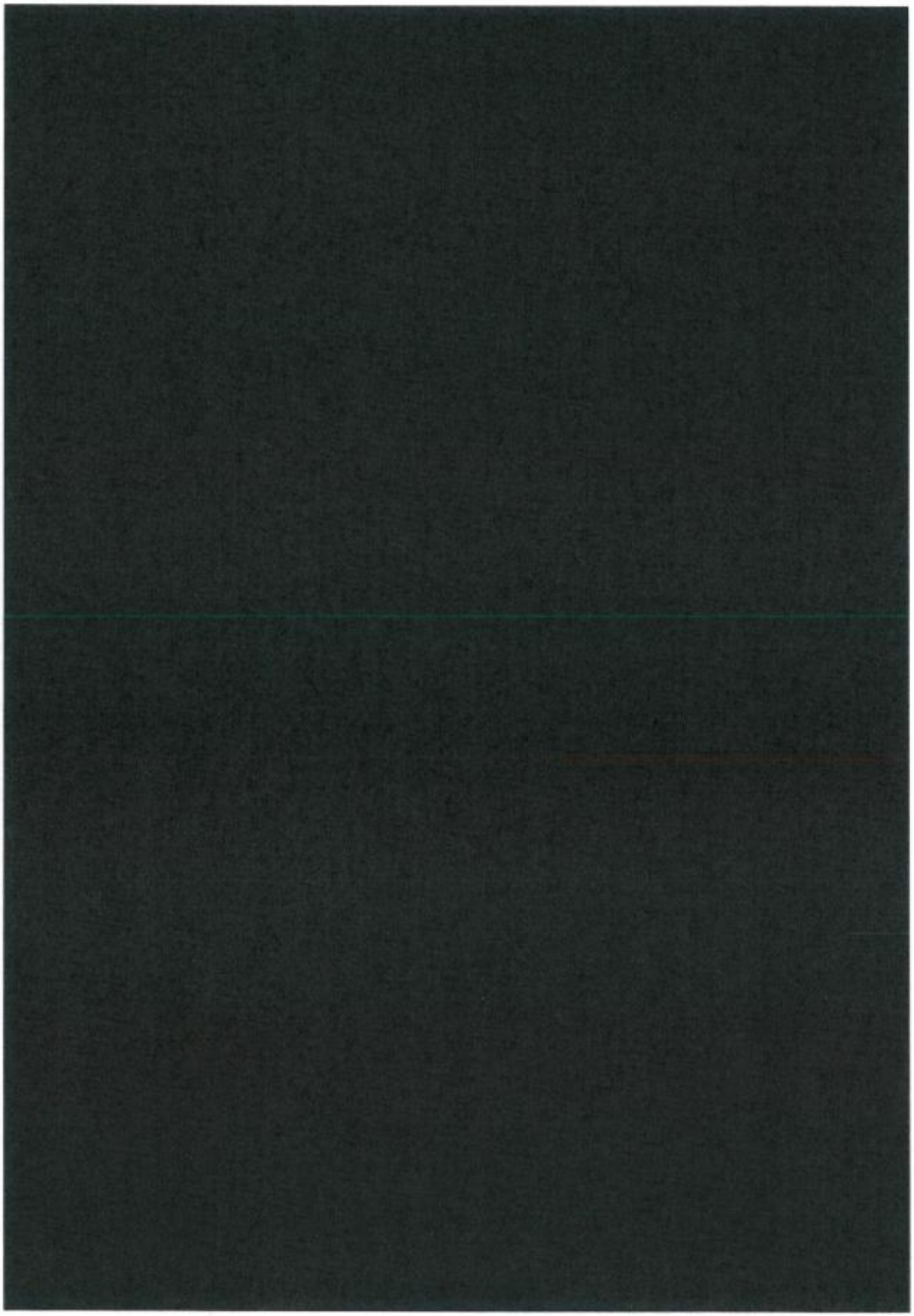
5.8 To reflect the latest estimate of expected variations of £[redacted] we propose an adjustment to decrease the CAT by a total of £[redacted][95], spread over the four CR categories as detailed in the relevant sections of this report.

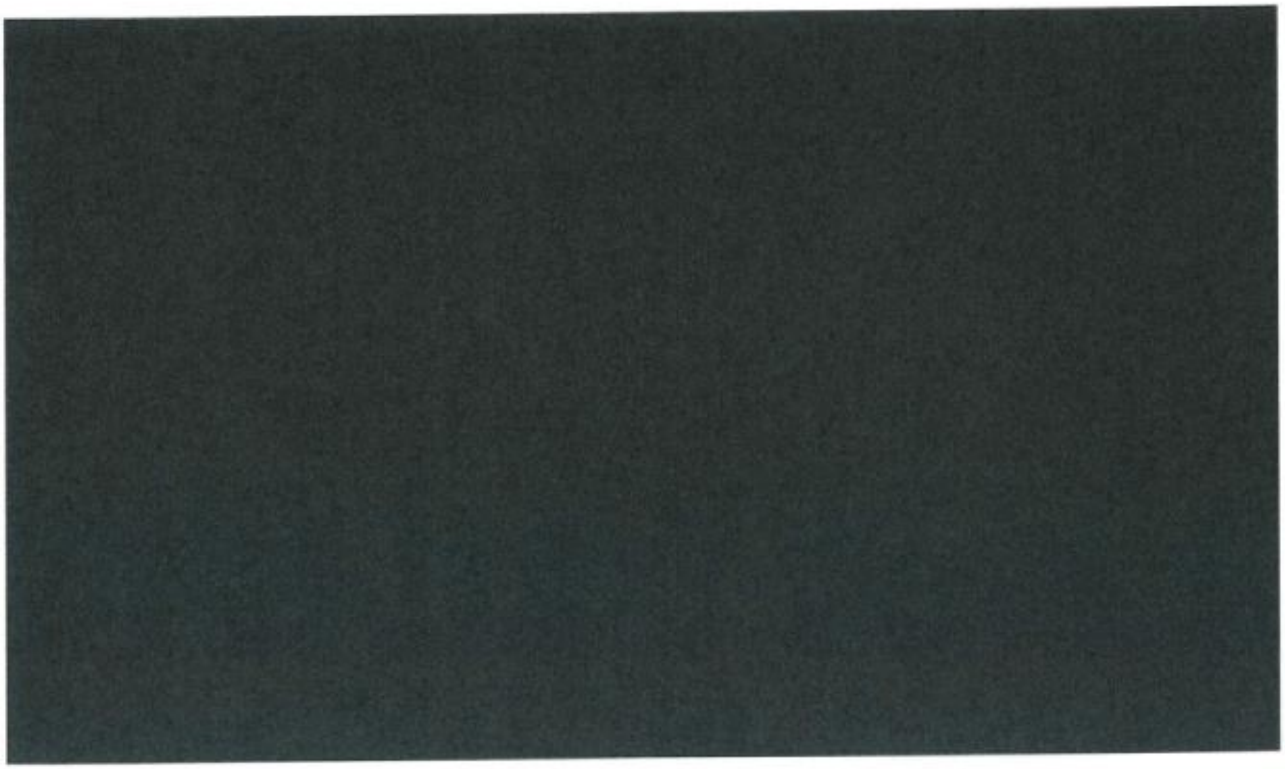
[94] Being (£[redacted] - £[redacted]) = £[redacted] allocated to the Transmission Assets at [redacted]%

[95] Being (£[redacted] - £[redacted]) = £[redacted] allocated to the Transmission Assets at [redacted]%

6 EXPORT CABLES PACKAGE SPECIFIC STRATEGIES AND TENDER PROCESS







[100] Company name change from VSMC

Grant Thornton

An instinct for growth™