KEMA Limited

Ofgem

Technical Advisors for the OFTO Tender Process:

Offshore Transitional Project Report

THANET

Rev 1.1

25 June 2009

Table of Contents

Revision History

Rev.	Date	Description	Author	Review	Approver
1.0	5/06/09	Final Report	DK	DPop/JS	DP
1.1	25/06/09	Minor amendments to the final report	DK	DPop	DP

Registered Address

KEMA Limited is a wholly owned subsidiary of:	The registered address of KEMA Limited is:	The trading address of KEMA Limited is:
NV KEMA Utrechtseweg 310 6812 AR Arnhem The Netherlands	8-12 Priestgate Peterborough PE1 1JA United Kingdom	Hudson House 8 Tavistock Street London WC2E 7PP United Kingdom

Disclaimer

Any information provided by KEMA and relating to the technical compliance and cost assessments of relevant offshore transmission assets will be 'as is', without any representation or endorsement made and without warranty of any kind whether express or implied, including, but not limited to, the implied warranties of satisfactory quality, fitness for a particular purpose, security and accuracy, other than as separately agreed in writing with our Client who has requested us to prepare this report.

The Regulatory Asset Values determined will reflect the opinion of KEMA as to the value of the transmission assets if they had been developed in an economic and efficient manner. The primary source in preparing this opinion has been information provided by the offshore wind farm developer during the period from February 2009 up and until 22 May 2009 and we have not sought to establish the reliability of the sources by reference or other evidence. We do not accept responsibility for such information, and the report does not incorporate the effects, if any, of events and circumstances that may have occurred or information that may have come to light after said dates. The issues covered in this report, and the emphasis placed on them, may not address the issues relevant to others than our Client, or reflect their specific requirements, objectives, interests or circumstances.

The purpose of this opinion is to facilitate the competitive tender process of our Client for the appointment of offshore transmission licensees only. The opinion will not constitute legal or other professional advice. Although this report was prepared in good faith, KEMA will not accept any responsibility for the accuracy, completeness or otherwise of the information. KEMA (including its Directors and employees) will not accept liability for any loss or damage, howsoever arising, from the use, misuse of or reliance on this information, including but not limited to any errors, omissions or misleading or inaccurate statements. In no event will KEMA be liable for any loss or damage including, without limitation, direct, indirect or consequential loss or damage, or any loss or damages whatsoever arising from use or misuse of the information.

Executive Summary

This document provides an assessment of the Thanet offshore wind project that is being developed by Thanet Offshore Wind Limited (TOWL), owned by Vattenfall Vindkraft AB (Vattenfall). The report addresses project qualification in respect of Ofgem's preconditions, capital costs and equipment volumes only. The assessments undertaken have considered the information provided by TOWL to Ofgem, up to and including 22 May 2009. The information was not sufficiently complete to allow a full review of the project's technical requirements and operational performance criteria.

The Thanet wind farm will be located approximately six nautical miles from the Kent coast at Foreland Point and will have a total installed generation capacity of 300MW, with a corresponding Transmission Entry Capacity (TEC) of 300MW. The offshore transmission assets for transfer comprise a single offshore substation, two 27.5 km 132kV submarine cables connecting the offshore substation to shore, two 2.4km land cables and a 132kV switching station containing reactive compensation equipment adjacent to the EDF Energy 132kV substation at Richborough. The developer's forecast cost for developing and constructing these assets is £172.5 million. Onshore substation construction works and cabling are underway as is the submarine cabling work. The offshore substation work is due to commence in early 2010. Construction completion is planned for March 2010 with final commissioning to be completed by the end of the same month.

The developer's proposed offshore transmission ownership boundary is on the 33kV outgoing wind turbine feeder circuit breakers. The interface point with the EDF distribution system remains to be finalised, but is proposed to be at the overhead busbar disconnectors at Richborough 132kV substation.

The extent to which TOWL, as project developer, has met the qualifying project pre-conditions[1] is summarised below:

C1. **Securing a Connection Agreement**: TOWL has secured a 300MW connection agreement with EDF Energy. `Articles of Agreement' which includes the appropriate connection agreement was signed with EDF Energy on 2 August 2006. TOWL entered into a CUSC[2] Bilateral Embedded Generation Agreement (BEGA) and a CUSC Construction Agreement with NGET on 4 October 2007.

C2. **Obtained all necessary property rights and environmental and planning consents**. TOWL has obtained all necessary property rights and environmental and planning consents.

1 Offshore Electricity Transmission: Updated Proposals for the Competitive Tender Process, Ofgem, 5 March 2009.

2 Connection and Use of System Code

C3. **Entered into all necessary contracts for the construction of the offshore transmission assets:** TOWL has entered into letters of intent for the generation assets supply and transmission assets construction contracts. Actual signing of contracts awaits confirmation.

C4. **Secured financing to the satisfaction of the Authority:** A translation of a board minute of 6 November 2008 provided by Vattenfall indicates internal approval for the acquisition of the windfarm project, for the investment of [redacted] in the project and the issue of any necessary parent company guarantees.

C5. **Provided its financial model and all other necessary financial and other data for the offshore transmission infrastructure:** TOWL has provided the relevant transmission infrastructure financial model and other information to assess efficient and economic costs in the form of cost spreadsheets and subsequent information releases. The financial information provided by the developer has been sufficient in order to carry out the cost assessment process.

Costs and Volumes

The costs assessment process undertaken by KEMA analyses the submitted developer cost information and reports on the extent to which the capital costs are reasonable and therefore could be judged as economic and efficient.

For that purpose capital asset valuations for two boundary options[3] are provided in the table below with explanations of significant variances. For each boundary option, KEMA has derived a normalised version of the developer's valuation, the "Normalised Valuation" and a benchmark valuation based on mean values derived from the transitional projects, the "Comparator Valuation". Both valuation methods are described below:

- **Normalised Valuation**: uses the developer cost information and removes elements relating to contingencies, project financing and project purchases to provide a baseline figure relating to the actual (or forecast) costs associated with establishing the transmission assets. The Normalised Valuation is based upon submitted cost information incorporating contract cost data as provided by the project developer[4]. The Normalised Valuation is used throughout the report as the baseline against which comparisons are made.

- **Comparator Valuation**: KEMA has derived the benchmark Comparator Valuation using a set of cost drivers, calculated from the information provided by the transitional projects. These cost drivers are mean unit cost values that are used to create cost benchmarks that can be compared with the Normalised Valuation. Where disaggregated cost data has not been provided, independent KEMA benchmark costs have been adopted.

TOWL cost information was adjusted to derive the Normalised Valuation as follows:

[3] A 33kV offshore switchgear ownership boundary is proposed by TOWL. The CUSC boundary is the default commercial ownership boundary contained in the industry framework document, which, for this project, is the transformer side of the 132kV switchgear.

[4] All of the figures are extracted from the cost summary sheets provided in the data room in April 2009.

- - £7.1M, removal of a contingency amount; and
- - £4.0M removal of financing costs.

These adjustments resulted in a reduction of Thanet's stated project costs from £172.5M to £161.4M.

Table 1 Overview of project valuations

Ownership boundary	Developer Valuation	Normalised Valuation	Comparator Valuation
33kV busbars	£172.5M	£161.4M	£121.1M
CUSC boundary	Not provided	£103.7M	£76.3M

33kV Busbar boundary

For an ownership boundary at the 33kV switchgear on the offshore platform (as proposed by TOWL), the Normalised Valuation exceeds the Comparator Valuation by £40.3M (33%). This variance comprises:

- +£28.5M higher costs for capitalised development;
- +£7.9M higher costs for the reactive compensation equipment;
- -£0.2M lower costs for land cable supply and installation;
- +£2.9M higher costs for the offshore substation; and
- +£1.2M higher cost for the onshore substation connection.

The variations for the land cable supply and installation and offshore substation are within 3% and 15% respectively of the total costs for these elements of the project and are not considered unreasonable.

Although the cost of the electrical equipment appears high due to the provision of two spare 33kV feeder ways and complex transformer connections, the overall cost of the offshore substation is 8% higher than the Comparator Valuation and is regarded by KEMA as reasonable.

The variation on the capitalised development cost is a significant variation, with TOWL's submission containing capitalised development costs representing 29% of the Normalised Valuation compared to a project peer group mean of 15%. The KEMA Comparator Valuation suggests an adjustment to the Thanet development costs to bring them in line with the average peer comparator would reduce the capitalised development costs by £28.5M.

The cost of reactive compensation equipment is considered high. Even after making allowances for harmonic filters, the developer's valuation is more than double KEMA's benchmark value.

CUSC Boundary

For a CUSC default boundary at the 132kV transformer connections on the offshore platforms TOWL development costs have been pro-rated in line with the reduction in capital item costs. Thus, a total of £57.7M has been removed from the Normalised Valuation and £44.8M from the Comparator Valuation respectively. This reduction represents the platform and all electrical equipment operating at less than 132kV, the transformers and the pro-rated development cost. The CUSC default boundary shows a variance between the Normalised Valuation and the Comparator Valuation of +£27.4M (+36%).

The variance comprises:

- +£18.5M higher costs for capitalised development;
- +£7.9M higher costs for reactive compensation equipment;
- +£1.2M higher costs for the onshore substation; and
- -£0.2M lower costs for land cable supply and installation.

The normalised cost valuation of the Thanet project appears high compared to the peer group, particularly with respect to the capitalised development and reactive compensation equipment costs.

1. Introduction

Ofgem and the Department for Energy and Climate Change (DECC) have been developing the regulatory arrangements for offshore electricity transmission. These arrangements cover projects that are already built or are expected to be under construction before the new regulatory arrangements reach the 'Go Active' or 'Go Live' dates in June 2009 and June 2010 respectively. Such projects are known as transitional projects and developers have to meet certain pre-conditions in order to be tendered under these arrangements. Projects where the new transmission assets would be designed, financed and constructed by an offshore transmission owner (OFTO) are known as enduring projects.

The offshore electricity transmission licences will be granted by way of a competitive tender process that aims to deliver fit for purpose transmission infrastructure to connect offshore generation economically and efficiently whilst simultaneously attracting new entrants to the sector. The first round of tenders in the transitional arrangements is expected to commence shortly after the Go Active date.

This document provides KEMA's initial review and assessment of Thanet Offshore Wind Limited's (TOWL's) Thanet project in meeting Ofgem's transitional qualifying project criteria and cost rationality.

2. Project Assessment Approach

KEMA's approach for assessing each transitional project wishing to enter into the first tender round has been designed to confirm:

- Compliance with the proposed qualifying pre-conditions[5];
- Technical and operational compliance including the project 'fit for purpose' design; and
- Estimates of economic and efficient costs incurred during the development and construction of the transmission assets.

The responses to Ofgem's Developer Information Request (DIR) that TOWL submitted on 21 April and 7 May 2009, have been used as the primary source of information, in conjunction with subsequent correspondence and notes on bilateral meetings held between the developer and Ofgem. As TOWL's response to date has been incomplete, this assessment report covers the areas of transitional qualifying project preconditions and cost rationality only. Lack of information has precluded a full review of the specified technical requirements and operational performance criteria as set out in relevant industry codes and standards. During the course of this assessment, no additional modelling, simulation of

[5] Offshore Electricity Transmission: Updated Proposals for the Competitive Tender Process, Ofgem, 5 March 2009.

individual components or physical testing has been undertaken. Areas requiring clarification or further information have been identified and are noted in this report.

3. Technical Assessment

3.1 Project Overview

Name	Thanet Offshore Wind Project
Developer	TOWL (Thanet Offshore Wind Limited)
Location	Approximately 6 nautical miles off the Kent Coast at Foreland Point
Generating Capacity	300MW (100 wind turbine generators, 3MW each); Transmission Entry Capacity (TEC): 300MW
Construction timetable for transmission assets	Onshore and offshore works started with construction completion expected by January 2010.
Commissioning timetable for transmission assets	31 March 2010 (full TEC available)

The Thanet offshore wind farm is owned by Thanet Offshore Wind Ltd (TOWL). Warwick Energy and its partners sold TOWL to a money management fund CRC Energy Jersey 1 Limited (CRC) in September 2007. Vattenfall Vindkraft AB (Vattenfall) acquired the Thanet Offshore Wind project from CRC in November 2008.

The construction works for land cables and onshore substation works have commenced and are planned to be completed by June 2009. The construction works on the offshore substation is due to commence in early 2010 with work on the submarine cables already in progress. The commissioning date for the whole project is scheduled to be 31 March 2010 when the full Transmission Entry Capacity (TEC) will be available.

A simplified project diagram is shown in Appendix A1.

3.2 Project status in relation to meeting the pre-conditions

The status of TOWL in respect of the transitional project pre-conditions is as follows:

C1. Secured a connection agreement with National Grid Electricity Transmission (NGET) or a connection offer with a Distribution Network Operator (DNO) for a connection at 132kV or above.

TOWL signed a CUSC Bilateral Embedded Generation Agreement (BEGA) and a CUSC Construction Agreement with NGET on 4 October 2007.

TOWL has secured a distribution `Connection and Use of System Agreement' with EDF Energy, for a 280MW connection at the existing Richborough 132kV substation. `Articles of Agreement' which includes the appropriate Connection Agreement (Schedule 13) was signed with EDF Energy on 2 August 2006. The agreement was subsequently updated so as to increase the connection capacity to 300MW on 22 September 2008. Correspondence between TOWL and EDF Energy of 22 May 2009 indicates that the connection offer is still valid with only the final payment to be made by TOWL and with some outstanding technical and interface issues to be finalised.

C2. Obtained all necessary property rights (e.g. consents and leases) and all environmental and planning consents for the offshore project and offshore transmission assets.

TOWL has obtained all necessary property rights and environmental and planning consents for the offshore project and regulated assets. These include marine consents and licences and planning permissions and land agreements.

It is a condition of the FEPA license that no piling works are take place between mid February and the end of May to avoid disturbance to spawning Thames estuary fish.

KEMA's assessment of environmental and planning consents is included in Appendix A2.

C3. Completed construction of, or entered into all necessary contracts for the construction of, the offshore transmission assets.

The project is to be constructed on a fixed price multi-contract basis with separate contracts for wind turbine generators supplied by Vestas, electrical design and supply of onshore and offshore cables with the Siemens Prysmian Consortium, design and supply for the offshore substation jacket with McNulty and design and supply of the substation subcontracted to SLP Engineering Limited. Letters of intent have been issued to cover interim contractual arrangements but confirmation is still needed that formal contracts are in place.

KEMA's assessment of TOWL 's procurement and contracts status is included in Appendix A3.

C4. Secured financing to the satisfaction of the Authority.

A translation of a board minute of 6 November 2008 provided by Vattenfall indicates internal approval for the acquisition of the windfarm project, for the investment of £745M in the project and the issue of any necessary parent company guarantees.

C5. Provided its financial model and all other necessary financial and other data for the offshore transmission infrastructure.

TOWL has provided the relevant transmission infrastructure financial model and other information to assess efficient and economic costs in the form of cost spreadsheets and subsequent information

releases. The financial information provided by the developer has been sufficient in order to carry out the cost assessment process.

3.3 Proposed Boundary Options

The proposed offshore transmission ownership boundary is on the 33kV outgoing wind turbine feeder circuit breakers. The interface point with EDF's distribution system remains to be finalised, but is proposed to be at the busbar overhead disconnectors at Richborough 132kV substation.

TOWL has proposed the ownership boundary outlined above as it aligns with the metering point on the offshore substation. It is deemed impractical to install metering voltage transformers and current transformers on the offshore transformer 33kV circuit breakers due to lack of space.

The proposed ownership boundary will give the successful OFTO ownership of the offshore platform, transformers, associated 33kV circuit breakers and 33kV busbars with all other equipment proposed to be owned by the developer.

4. Cost Assessment

This section provides a cost assessment of the Thanet offshore windfarm transmission assets which are planned to connect 300 MW of wind generation capacity at a developer estimated cost of £172.5M. Details of the cost assessment methodology applied to the developer sourced cost data are described below. A commentary is also provided regarding the relative magnitude of total project costs and the main disaggregated cost components to highlight any anomalies, inconsistencies, information shortfalls and/or mitigating factors with respect to the Thanet project. The comments provided in this report reflect the information provided to Ofgem by TOWL up to and including 22 May 2009. All figures have been extracted from either TOWL cost and asset spreadsheet documents submitted to Ofgem or from associated clarification documentation. These together provided sufficient information to undertake the following cost assessment process.

4.1 Cost Assessment Process and Assumptions

The costs assessment process undertaken by KEMA analyses the submitted developer cost information and reports on the extent to which the capital costs are reasonable and therefore could be judged as economic and efficient.

The overall approach normalises the cost information provided by developers, allocates costs consistently to the main project components[6] of the offshore transmission system and also creates a set of comparator cost drivers that can be used as peer benchmarks. KEMA regards the peer comparators as the most useful indicators of reasonable costs as these relate to projects being developed over a similar timeframe, in the same regulatory and legal framework, with comparable economic drivers and a similar supplier base.

In preparing this cost assessment the following general assumptions have been made:

- For projects yet to complete construction, all costs used are at their contractual values at the time of signing;
- For projects that are commissioned, the comparator costs that are presented (but are not included in the comparator average) are adjusted downwards for copper prices for the cable supply costs and general inflation for the remainder of the project costs to be comparable to developer submitted information;
- All contingency costs have been excluded where these have been explicitly stated;
- All financing costs have been excluded where these have been explicitly stated;
- All project purchase costs have been excluded where these have been stated;

[6] The main components being the offshore substation, supply and installation of the submarine and land cables, onshore reactive power equipment and substation connection and development costs (capitalised operations costs, e.g. project management, overheads, leases and consents etc).

- Maintenance costs have not been included in the capitalised cost valuation;
  - It is assumed that each project has procured a similar level of spares as part of the capital cost across the main components of all projects (i.e. no analysis has been completed to normalise for spares costs[7]); and
  - Capitalised development costs are presented on a percentage of total Normalised Valuation or percentage of total Comparator Valuation cost basis[8].

Two valuations are created for each offshore OFTO boundary considered, the "Normalised Valuation" and a benchmark valuation the "Comparator Valuation" as described below:

- **Normalised Valuation**: uses the developer cost information and removes elements relating to contingencies, project financing and project purchases to provide a baseline figure relating to the actual (or forecast) costs associated with transmission asset construction. The Normalised Valuation is based upon submitted cost information incorporating contract cost data as provided by the project developer[9].
- **Comparator Valuation**: KEMA derives the benchmark Comparator Valuation using a set of cost drivers, calculated from the information provided by the transitional projects. These cost drivers are mean unit cost values (for example, cable supply cost per kilometre) that are used to create cost benchmarks for comparison with the Normalised Valuation. Where disaggregated cost data has not been provided, independent KEMA benchmark costs have been adopted[10].

The Normalised Valuation is used throughout the report as the baseline against which comparisons are made.

The following sections describe the cost assessment as applied to the Thanet project.

4.2 Equipment Costs and Volumes

At 300MW generating capacity, Thanet is one of the larger transitional offshore developments in terms of electrical capacity and this is reflected in TOWL's OFTO asset valuation of £172.5M.

7 The costs of any spares included have been found to be small and unlikely to make a material difference to the comparator cost estimates.

8 In the Comparator Valuation capitalised development costs are calculated by taking the normalised costs, deducting the capitalised development costs from the total and then calculating the capitalised development costs as a percentage of the remainder, i.e. the percentage is calculated net of the capitalised development costs themselves.

9 All of the figures are extracted from the cost spreadsheet documents submitted by TOWL in May 2009.

10 This captures the majority of the costs for each project. KEMA independent benchmarks are used to form a cost for comparison for elements not covered by the comparator metrics. Where neither is possible, the developer number is used in the comparator cost valuation and a comment will be included to that effect.

TOWL's valuation has then been normalised by adjusting the following costs to allow consistent assessment between projects:

- - £7.1M, removal of a contingency amount; and
- - £4.0M removal of financing costs.

These adjustments resulted in a reduction of stated project costs from £172.5M to £161.4M.

As for all the transitional projects, the main offshore transmission costs relate to the offshore substation, the submarine and land cable supply and installation works, the onshore reactive compensation equipment and grid connection works. Following disaggregation and peer comparison of the stated costs for each of the considered ownership boundaries, a number of inconsistencies and areas meriting further investigation have become apparent as shown in Table 2

Table 2 redacted

4.2.1 Cost assessment comparisons

Offshore substation: At [redacted]M, the offshore substation represents a significant project cost. However, the Thanet offshore substation is comparable on a mean unit cost basis to its peer group. The cost of the offshore substation has been evaluated in two ways:

- By comparing the offshore substation cost with the peer comparator mean based on the offshore substation cost per MW secure[11].
- By separating the electrical costs from the non-electrical costs, using a peer comparator to evaluate the electrical costs and ignoring the more variable platform costs for the purposes of comparison.

The results of these two approaches are shown below:

Normalised Valuation £M	Comparator Valuation £M	Per MW (Secure) Valuation £M
[redacted]	[redacted]	[redacted]

The Thanet offshore substation valuation lies within 8% of the Comparator Valuation but is 19% higher than the valuation based on MW secure. As the MW secure valuation does not consider variances in platform construction, installation and transport costs (accounted for in the Comparator Valuation) KEMA would regard the Thanet offshore substation cost as reasonable.

[11] The MW that are able to be transmitted during the outage of any one transformer on the offshore substation

Submarine cables supply and installation: The Thanet normalised submarine cable supply and installation cost is very close to the comparator cost derived from the peer group and KEMA would regard the Thanet submarine cable costs as reasonable.

Land cable supply and installation: The Thanet normalised land cable supply and installation cost is approximately 3% lower than the comparator cost derived from the peer group and KEMA would regard the Thanet submarine cable costs as reasonable.

Reactive compensation equipment: The normalised cost for the provision of reactive compensation equipment and the connection facilities to the local DNO of [redacted]M is double that derived from the peer comparator. This is largely due to three elements; a high cost assigned to the SVC equipment, the inclusion of harmonic filtering for which the requirement is still to be confirmed and contract suspension costs listed as a variation. In the absence of additional information KEMA regards this cost as high.

Onshore substation connection: This cost, [redacted]M, is approximately 15% higher than the comparator benchmark and is at the upper threshold of what KEMA regards as reasonable.

Capitalised development costs: The normalised capitalised development cost of [redacted]M relating to Thanet is the highest of any project, representing 29% of the Normalised Valuation. This figure is significantly higher than the mean average of the peer projects at 15%. The KEMA Comparator Valuation suggests an adjustment to the Thanet development costs to bring them in line with the average peer comparator would reduce the capitalised development costs by [redacted]M. TOWL has stated that the cost levels provided are at an early stage of development and will be refined over the coming months.

4.2.2 Impact of different ownership boundary options

TOWL has proposed the 33kV circuit breakers controlling the wind turbine generator circuits on the offshore substation as the offshore transmission ownership boundary. In addition to this a valuation has been created that reflects the standard boundary described in the CUSC, at the high-voltage side of the step-up transformer. Each of these two ownership boundaries has been analysed to establish the capital asset valuation and associated variances as described below.

TOWL's proposed boundary – 33kV generator string circuit breakers on the offshore platform

TOWL's Normalised capital valuation varies from the Comparator Valuation of [redacted]M by [redacted]M (33%) and this variation is explained by:

- [redacted]M higher costs for capitalised development;
- [redacted]M higher costs for the reactive compensation equipment;
- [redacted]M lower costs for land cable supply and installation;

- [redacted] higher costs for the offshore substation; and
- [redacted] higher cost for the onshore substation connection.

The variations for the land cable supply and installation and offshore substation are within 3% and 15% respectively of the total costs for these elements of the project and are not considered unreasonable.

Although the cost of the electrical equipment appears high due to the provision of two spare 33kV feeder ways and complex transformer connections, the overall cost of the offshore substation is 8% higher than the Comparator Valuation and is regarded by KEMA as reasonable.

The variation on the capitalised development cost is a significant variation, with TOWL's submission containing capitalised development costs representing 29% of the Normalised Valuation compared to a project peer group mean of 15%. The KEMA Comparator Valuation suggests an adjustment to the Thanet development costs to bring them in line with the average peer comparator would reduce the capitalised development costs by [redacted].

At a value more than double the Comparator Valuation the cost of the reactive compensation equipment is considered high, even making allowances for the harmonic filters.

CUSC default boundary - 132kV transformer connections on the offshore platforms

Under the CUSC default boundary, it has been assumed that TOWL's view of development costs would be pro-rated in line with the reduction in the cost of the capital items. A total of [redacted]M has been removed from the Normalised Valuation and [redacted]M from the Comparator Valuation respectively. This reduction represents the platform and all electrical equipment operating at less than 132kV, the transformers and the pro-rated development cost. The CUSC default boundary shows a variance between the Normalised Valuation and the Comparator Valuation of [redacted]M (+36%).The variance comprises:

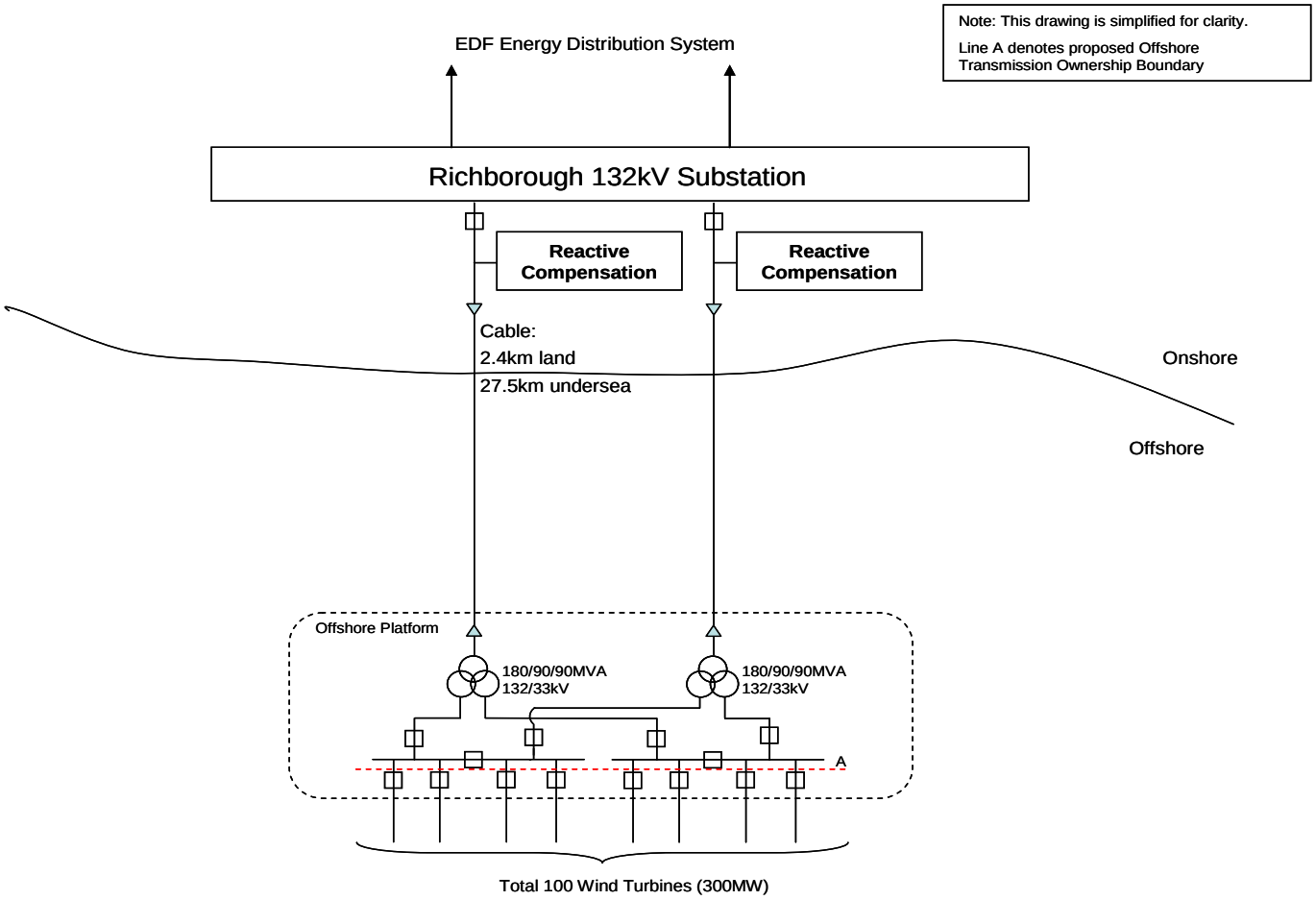
- [redacted] higher costs for capitalised development;
- [redacted] higher costs for reactive compensation equipment;
- [redacted] higher costs for the onshore substation; and
- [redacted] lower costs for land cable supply and installation.

4.3 Overall summary

The normalised cost valuation of the Thanet project appears high in relation to the peer group, subject to any adjustments or clarifications to align the capitalised development and reactive compensation equipment costs.

Appendix A: Review & Assessment Templates

A1. Simplified project diagram



A2. Planning and Environmental Assessments

Consents and licence requirements	Reference	Info provided	Assessment result	Action Required (if any)	Cost of action
FEPA licence	FEPA Act 1985	FEPA licence no 33119/09/1 (effective 13/02/2009, expires 31/12/2012) enclosed.	FEPA licence granted and valid but will need to be shared with potential OFTO. Condition includes for no piling works between mid February to end of May	None in the short term. Awaiting decision on treatment of shared consents and leases.	
Crown Estate lease		Crown Estate lease C/04/0389A/BOND granted and signed in September 2008; enclosed.	Lease granted and valid but will need to be shared with potential OFTO.	None in the short term. Awaiting decision on treatment of shared consents and leases.	
CPA licence	Sec 34 of the CPA, 1949; amended by sec 36 of the Merchant shipping Act 1988	CPA consent no 33119/06/0/CON (granted 18/12/06, expires 18/12/09) enclosed.	CPA licence granted and valid but will need to be shared with potential OFTO.	None in the short term. Awaiting decision on treatment of shared consents and leases.	
Any site specific consent needed		n/a	n/a	n/a	

Planning permissions					
Sec 36 of Electricity Act consent for construction and operation of a wind farm. Sec 36A of Electricity Act to extinguish the public rights of navigation.	Electricity Act 1989, Sec 36	Consent 36 and 36A (no GDBC/001/00164C) granted on18/12/2006 and enclosed.	The consent is subject to certain conditions to include commencement of construction no later than the expiry of 5 years, an approved decommissioning programme and an agreed Active Safety Management system as per MCA recommendations. Monitoring of bird movements around the site. Resolution, to the satisfaction of the CAA, of potential RADAR interference at Kent International Airport. In addition, this consent will need to be shared with potential OFTO. A full public enquiry could be considered it TOWL were to declare a safety zone around the windfarm	None required for now; need regular progress update incl. resolution on shared consents.	
Land Agreements / Easements		EA consent LD 07/CA/50 was issued on 13 November 2007 for installation of the cable under the sea defence (this covers both options for landfall) Lease agreed, 18th January 2007, between Richborough A limited and Thanet Offshore Wind Limited for land at former Richborough Power Station, Kent, Easements have been agreed for laying of 132kV cables with Beanstone Limited adjacent to A256 at Ramsgate, The National Trust and Kent Wildlife Trust for mudflats and saltings at Pegwell Bay Ramsgate, Thanet District Council for the landfall and Kent County Council for the land to the East of Sandwich Road, Richborough		None	
Crossing Agreements)		Offshore cable crossing agreements: Global Crossing: Pan European Cable at Dumpton Gap, Kent Level (3) Communications: Tangerine Telecommunications Cable at Dumpton Gap, Kent		None	
Wayleaves (local councils / highways etc)		Section 50 Consent granted by Kent County Council, 12 January 2009, under NRSWA to lay cable between landfall and Richborough substation.			
River Works (if appropriate)	Water Resource Act 1991, Sec 109	n/a	n/a	n/a	
CAA		Need to satisfy CAA that adequate operational controls are in place to avoid interference with the RADAR systems at Kent International Airport	Awaiting report from Kent International Airport/TOWL	None	

Environmental Assessments					
Environmental Statement	EIA regulations (Directive85/337/EEC as amended by 97/11/EC)	not provided	n/a		
Appropriate Assessment (AA)	Habitats and the Wild Birds Directives and regulations 1994	not provided	n/a		
MGN requirements	Maritime and Coastguard agency marine guidance note MGN 275	Need to satisfy MCA that all the appropriate navigational systems are in place prior to construction	Report awaited	Regular progress reports will be needed to ensure timely compliance with this issue	
Flora & Fauna	FEPA License Condition	There is a necessity to monitor bird movements around the site both pre and post construction. Also there conditions for monitoring of sea mammals and for cessation of work if and when such mammals enter the area of the site. There are other restrictions on piling to avoid the spawning season for fish in the Thames Estuary	Report awaited	Regular progress reports will be needed to ensure timely compliance with this issue	
Flood risk assessment	Environment Agency	not provided	n/a	None	

Connection Agreements					
Bilateral Agreement with NGET		CUSC BEGA and CUSC Construction Agreement signed in October 2007. Copy of agreements enclosed.	Completed.	None	
Connection Agreement with EDF Energy		A connection offer has been agreed with EdeF for a 300MW connection at the current Richborough 132kV substation. Copy of offer enclosed	It has been confirmed in correspondence with EdeF, 22 May 2009, that the offer is still effective. There are some technical and interface issues still to be resolved	TOWL to confirm that final payment in respect of the connection has been made and a resolution reached on the outstanding issues	

A3. Procurement Status Assessment

Contracts

Contract	Info provided	Assessment result	Action Required (if any)	Cost of action
Contracts strategy	The project is to be constructed on a multi-contract basis with separate contracts for wind turbines and construction works. There will be three separate contracts for the onshore and offshore elements of the project that cover the wind turbines, platform and substation, undersea cable and the land cable. Letter of intent are in place for the contracts with formal confirmation awaited that contracts have	Comprehensive contracts strategy. Aimed at ensuring an economic and efficient procurement. Formal confirmation awaited that contracts have been signed (currently only letters of intent in place)	Confirmation that signed contracts are in place	
Procurement process and procedures	Detailed information on a procurement process and its current status enclosed.	Appropriate	Confirmation that signed contracts are in place	
Contract Overview	Overview of all relevant contracts and arrangements provided along with TOWL's requirements and functional specifications for each package.	Very detailed overview of contracts incl. their current status has been provided. Summary of contracts awarded have been provided in the responses to Ofgem	Confirmation that signed contracts are in place	
Wind turbines supply	n/a for OFTO	**n/a**		
Wind turbines installations	n/a	**n/a**		
Foundations supply	n/a	**n/a** (assumption that offshore substation foundation is not included)		
Foundations installations	n/a	**n/a** (see above)		
Export cables supply (onshore and offshore)	Preferred bidder identified.	Completed, subject to contract	Confirmation that signed contracts are in place	
Installation of export cables offshore	Preferred bidder identified.	Completed, subject to contract	Confirmation that signed contracts are in place	
Installation of export cables onshore	Preferred bidder identified.	Completed, subject to contract	Confirmation that signed contracts are in place	
Array cables supply	n/a	n/a	n/a	
Array cables installation	n/a	n/a	n/a	
Offshore platform - topsides and jacket supply	Preferred bidders identified - one for topsides, one for jackets.	Completed, subject to contract	Confirmation that signed contracts are in place	
Offshore platform - topsides and jackets installation	Preferred bidder identified.	Completed, subject to contract	Confirmation that signed contracts are in place	
Offshore substation GIS switchgear (HV and LV)	Preferred bidder identified.	Completed, subject to contract	Confirmation that signed contracts are in place	
Offshore substation transformer	Preferred bidder identified.	Completed, subject to contract	Confirmation that signed contracts are in place	
Onshore substation and cabling	Preferred bidder identified.	Completed, subject to contract	Confirmation that signed contracts are in place	
Substation SCADA and protection	Preferred bidder identified.	Completed, subject to contract	Confirmation that signed contracts are in place	

Surveys and Feasibility Studies

Surveys and Feasibility studies	Info provided	Assessment result	Action Required (if any)	Cost of action
Geophysical surveys	None provided	n/a	None	
Geotechnical investigations	None provided	n/a	None.	
Onshore geological survey	None provided	n/a	None.	
Marine survey	None provided	n/a	None.	
Metocean surveys	None provided	n/a	None.	
Working drawings of the building envelopes	None provided	n/a	None	
Seabed surveys	None provided	n/a	See above - geotechnical and marine surveys	
Land surveys	None provided	n/a	See above - geotechnical and marine surveys	
Planned cable routes	Agreed within Crown Estates Lease dated 02/04/2008	Cable coordinates for the submarine route have been agreed in the license	None	
Onshore electrical design	Onshore cable will connect to the existing 132kV substation at Richborough. There are two bays to provide for the windfarm connection, but with the condition that there will be no paralleling of the EDF or NGET systems via the windfarm connection. The offshore 33kV connection 'cross over' on the LV side of the offshore 132/33kV transformers requiring the bus sections switches to be run open in normal operations. These can be closed in an outage situation to maximise the export capacity from the windfarm.			
Reactive compensation	Designed to comply with Grid and Distribution Code requirements at the onshore interface point.	Use of the combination of MSC, MSR and SVCs will provide the necessary control and neutral MVAR requirements.	None.	