Interest During Construction for TR2A offshore transmission assets

A report for Ofgem E-serve

March 2011

Contents

1 Executive summary

1.1 Background

Ofgem has been mandated by Government to run the offshore transmission licenses tender for three wind farms (Gwynt y Mor, Lincs and London Array phase I). Grant Thornton UK LLP (Grant Thornton) has been appointed by Ofgem E-Serve to review the case for a cap on Interest during Construction (IDC) for assets in Tender Round 2A (TR2A) and, if appropriate, to recommend a range for a reasonable cap on IDC.

The wind farm developer incurs IDC as its construction costs are not reimbursed until the assets are transferred to the operator. Ofgem determine the level of IDC that can be claimed by the developer. Ofgem make their determination based, among other things, on their view of the level of economic and efficient costs.

The analysis builds upon and is informed by the exercise undertaken in 2009 which reviewed the IDC for Tender Round 1 (TR1).

1.2 Analytical framework

Our approach has been to employ the Capital Asset Pricing Model (CAPM) as the core IDC estimation methodology, which is consistent with the analysis performed on TR1. Details of the methodology used and the underlying data relating to each of the components of the Weighted Average Cost of Capital (WACC) are in Section 4 and Appendix B. In performing the analysis we have taken account of:

- the cashflow profiles for TR2A and TR1 projects;
- the impact of the credit crunch and the resulting financial market illiquidity on financing costs, where applicable; and
- the specific companies responsible for construction of the TR2A assets and selected appropriate comparator companies to compute an estimated range of IDC.

1.3 Conclusions

Based on an examination of evidence on, among other things, the construction of TR2A assets, the costs of finance for comparable energy companies and our analysis we have concluded:

- as with TR1, where Ofgem adopted a cap on the level of IDC paid to developers, we conclude that there are still reasonable grounds for Ofgem to cap IDC costs. The key reasons are to:
    - protect current and future customers;
    - limit the incentive for developers to maximise and potentially overstate their IDC;
    - maintain consistency of approach between TR1 and TR2A IDC payments;
- we note that if the level of IDC paid to developers is capped there may be an incentive to target the IDC cap in information they supply to Ofgem. This could be mitigated by allowing a lower IDC where a developer has submitted a figure which is shown to be overstated;

- in our analysis, we have focussed on the cost of capital of Traditional Energy companies as a comparator but have also recognised the cost of capital of Renewable Energy and Electricity Transmission companies. This is because the TR2A assets are being built and financed by Traditional Energy companies, with the exception of Siemens and Masdar who are minority investors;
- we understand that a significant amount of debt funding has been provided by the European Investment Bank (EIB) to UK offshore wind farms. This has not been specifically adjusted for in our analysis;
- the abnormal capital markets conditions of the Credit Crunch (for the purposes of this analysis defined as the period from Q4 2007 to Q1 2009) to had a significant impact on the cost and availability of capital for energy projects. This was recognised by Ofgem in early 2010 by using the top of the recommended range as the cap on IDC for TR1 projects. We note that for TR2A projects and some later TR1 projects only a small proportion of capital expenditure and project funding occurred during the Credit Crunch. Thus it is appropriate to exclude this period from our analysis of the current level of IDC;
- the focus for our analysis is the period 2009-2010 during which 40% of the expected total cost of constructing the TR2A assets was spent. The remaining 58% of TR2A capital is expected to be funded after 2010;
- the IDC applied to TR2A assets where a significant proportion of the funding occurs in 2011 and later may have to be reconsidered in the future if market conditions change materially.

1.4 Recommendation

Based on analysis over the period of 2009 and 2010 as summarised in Table 1.1, the recommended range for the pre-tax nominal WACC is 7.6% to 9.7%. The range may require updating should financial market conditions differ materially from 2011 onwards. The corresponding range recommended for TR1 projects was 9.4% to 10.8% (see Appendix C).

Table 1.1: Recommended TR2A WACC range

WACC Computation	Low	High	Reference
Risk free rate (real)	1.27%	1.85%	note 1
Risk free rate (nominal)	3.80%	4.40%	Table 4.1
Market premium	4.50%	4.50%	Section 4.3
Asset beta	0.40	0.60	Table 4.3
Equity beta	0.54	0.69	Appendix B
Cost of Equity	**6.2%**	**7.5%**	
Risk free rate (nominal)	3.80%	4.40%	Table 4.1
Debt premium	1.50%	1.80%	Table 4.2
Cost of debt before tax	**5.3%**	**6.2%**	
Tax rate	28.0%	28.0%	Section 4.4
After tax cost of debt	**3.8%**	**4.5%**	
Industry indebtedness (D/(D+E))	33.3%	16.7%	
Industry gearing (D/E)	50.0%	20.0%	Section 4.3
Post-tax WACC	**5.4%**	**7.0%**	
Vanilla WACC	**5.9%**	**7.3%**	
Pre-tax WACC	**7.6%**	**9.7%**	

note 1: Assuming long term inflation rate of 2.5% per annum

Source: Grant Thornton analysis, Ofgem, Reuters

Our recommended range for the WACC is considered reasonable in the context of recent independent analysis in the National Infrastructure Plan 2010 and the Electricity Market Reform Consultation Document. These estimates are compared with our analysis in Table 5.1.

2 Introduction

2.1 Scope

Grant Thornton UK LLP (Grant Thornton) has been appointed by Ofgem E-Serve to review the case for a cap on developer's IDC for the construction of assets in TR2A and, if appropriate, to recommend a range for a reasonable cap on IDC. Ofgem has been mandated by Government to run the TR2A tender for offshore transmission licenses for three wind farms (Gwynt y Mor, Lincs and London Array phase I).

The analysis has been limited to the specific areas requested by Ofgem E-Serve in accordance with Contract Number: CON/SPEC/2008-57E. The scope of this report excludes accounting analysis and review of the costs of constructing the transmission assets. Ofgem wishes to compare the IDC claimed by the project developers with a view as to what an efficient company following an efficient financing approach should be able to achieve.

2.2 Important notice

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2.3 Limitations of the analysis

There is no precise method for determining the IDC as it is not directly observable and a certain amount of judgement is necessary. In performing this analysis we have used the Capital Asset Pricing Model (CAPM) which is the standard approach used by UK Regulators to determine the cost of equity but is underpinned by several documented assumptions / limitations. Thus while our approach is theoretically robust it remains only one of a number of approaches which could produce different estimates.

To maintain comparability between Tender Round 1 and 2A, our approach broadly follows that of the TR1 IDC report[1], except where detailed otherwise. As specifically requested by Ofgem we have considered an appropriate range for a cap on developer returns in the case where the majority of funding for construction was made during 2009 and 2010.

[1] 'Interest During Construction - A report for Ofgem for UK transmission Round 1 Offshore Transmission Assets - 30 March 2010'

3 Analytical framework

This section provides an overview of TR2A, confirmation that in our view a cap on IDC is appropriate and an overview of our analytical framework.

3.1 Overview of TR2A

Ofgem has been mandated by Government to run the tenders for offshore electricity transmission licences. The Electricity (Competitive Tender for Offshore Transmission Licences) Regulations 1903 of 2010 provide in clause 4-(1) that: "In respect of a transitional tender exercise, the Authority shall calculate, based on all relevant information available to the Authority at that time, the economic and efficient costs which ought to be, or ought to have been, incurred in connection with developing and constructing the transmission assets in respect of a qualifying project".

TR1 commenced in 2009 and TR2A commenced in 2010. The assets covered by the TR2 licences (the TR2 Assets) will be constructed over a number of years and will incur material financing costs.

Six projects, with an aggregate generating capacity of up to 2.8 GW, have qualified for TR2. Ofgem E-Serve intends to run two tranches of tender exercises within Tender Round 2, Tranche A, comprising three projects (for a total of 1.5 GW), commenced in mid-November 2010 and Tranche B (three more projects, between 1.2GW and 1.3 GW) is currently scheduled to commence in spring 2012. An overview of the TR2A projects is presented in Table 3.1.

Table 3.1: Qualifying projects for Tender Round 2A

Project	Developer	Size (MW)	Initial Transfer Value
Gwynt y Môr	RWE/Siemens/Stadtwerke Munchen	576	£305.7m
Lincs	Centrica/DONG/Siemens	250	£310.5m
London Array (Phase 1)	E.On / DONG / Masdar	630	£475.7m
Total		**1,456**	**£1,091.9m**

Developers are expected to have financed the development of the TR2A assets mostly through corporate balance sheets combined, with the prospect of project financing and loans from the EIB (see Appendix D). Ofgem has entered into dialogue with TR2A developers to establish the appropriate level of IDC.

3.2 Appropriateness of an IDC cap

During TR1, Ofgem adopted a cap on the level of IDC paid to developers. Reviewing these arguments we conclude that there are still reasonable grounds for Ofgem to cap IDC costs. The key reasons are to:

- protect current and future customers;
- limit the incentive for developers to maximise and potentially overstate their IDC;
- maintain consistency of approach between TR1 and TR2A.

3.3 Methodology

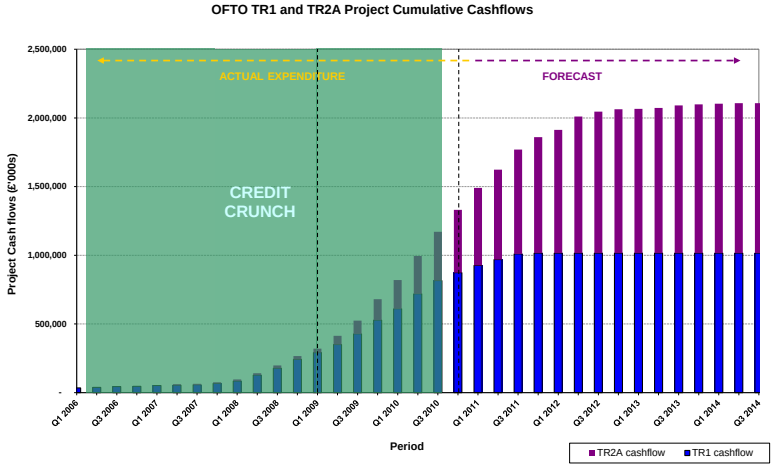
Our approach has been to employ CAPM as the primary IDC estimation methodology, which is consistent with the approach adopted for TR1. Details of the methodology used and the underlying data used to identify the WACC are included within Section 4 and Appendix B. In performing the analysis we have taken account of:

- the cashflow profiles for TR1 and TR2A projects;
- the impact of the credit crunch and the financial market illiquidity on TR1 financing costs;
- the specific companies responsible for construction of the TR2A assets and the comparator companies used in computing the estimated range of IDC for TR1.

Capital expenditure profile

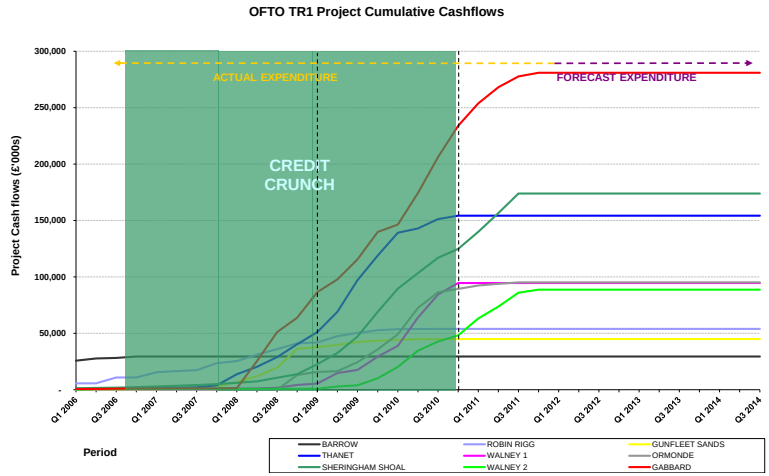
As a cap based on the IDC calculated within this report may apply to financing costs incurred by the TR2A developers, we believe that it is important to review the timing of the expenditure on TR2A projects. Figures 3.1, 3.2 and 3.3 show the expected capital expenditure on TR1 and TR2A assets. From these graphs it is apparent that a low proportion of the total TR2A capital expenditure (c.2%) occurred prior to January 2009.

Figure 3.1 - Capital expenditure profiles of TR1 and TR2A



Source: Ofgem and Grant Thornton analysis

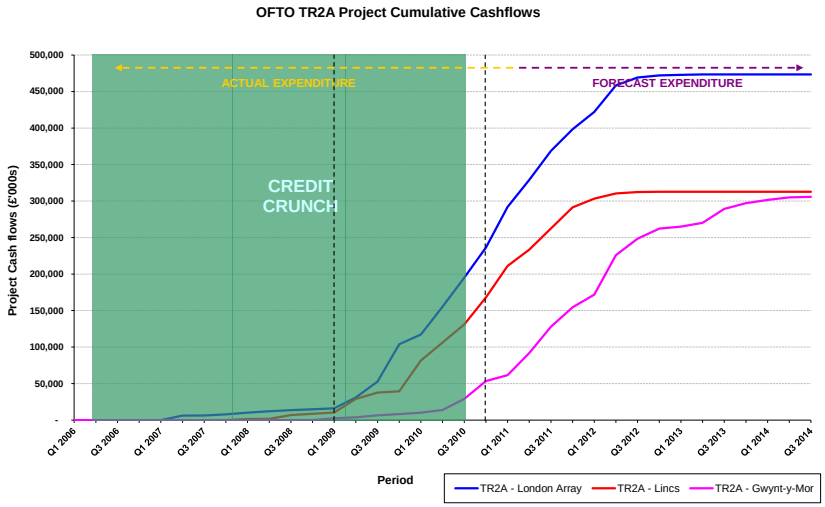
Figure 3.2 - TR1 cumulative capital expenditure



Source: Ofgem and Grant Thornton analysis

While 24% of the projected TR1 capital expenditure took place prior to January 2009, some 62% was spent in the period of this review: 2009 and 2010.

Figure 3.3 - TR2A cumulative capital expenditure



Source: Ofgem and Grant Thornton analysis

Table 3.2 shows that only 2% of the projected TR2A capital expenditure took place prior to January 2009, with 40% being spent in the period of this review: 2009 and 2010.

Table 3.2 - Estimated Capital expenditure for TR1 and TR2A (£)

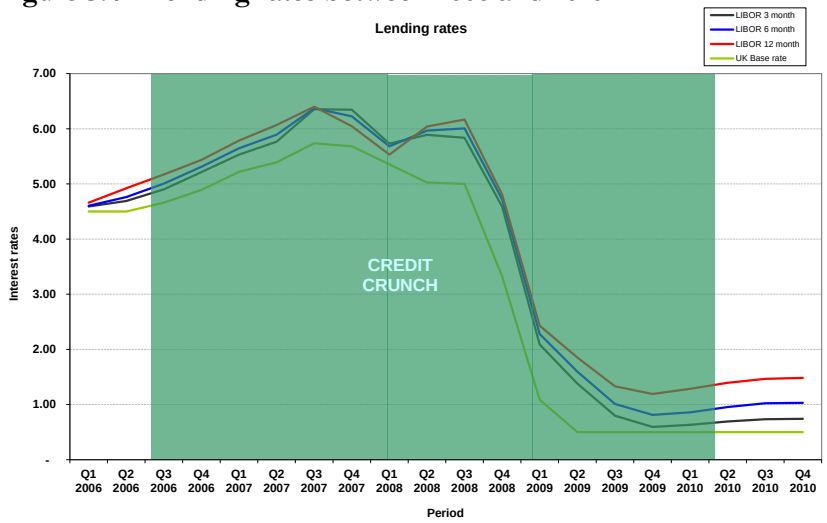
Capital expenditure	Up to Dec '08	From Jan '09 to Dec '10	Jan '11 onwards	Total Capex
TR1	242,510,198	630,617,165	142,609,721	1,015,737,085
TR2A	23,415,609	434,390,419	634,140,247	1,091,946,275
Total	**265,925,807**	**1,065,007,584**	**776,749,969**	**2,107,683,359**
TR1 % of total	24%	62%	14%	100%
TR2A % of total	2%	40%	58%	100%

Source: Ofgem

Financing Costs

For TR1 the analysis was performed over a five year period. If this approach was repeated then this analysis would cover the period from January 2006 to December 2010, which includes a period of high cost of finance for large corporates as a result of the Credit Crunch. Figure 3.4 illustrates the relationship between 3 month, 6 month and 12 month LIBOR rates and the UK Benchmark rates over the period of the global financial crisis. This indicates the increase in borrowing costs for Traditional Energy companies, among others.

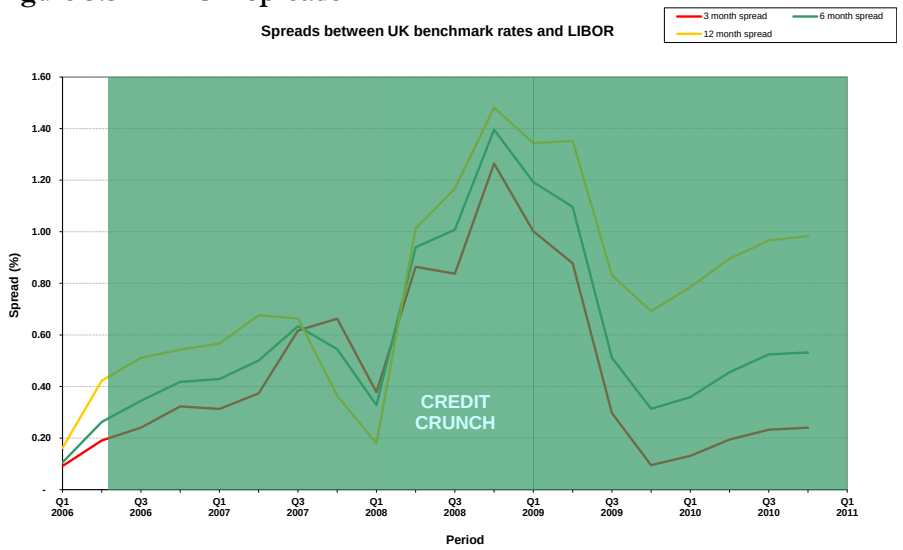
Figure 3.4 - Lending rates between 2006 and 2010



Source: Grant Thornton analysis, Reuters

Figure 3.5 shows the LIBOR spread versus UK benchmark index and again shows the high borrowing costs during the Credit Crunch.

Figure 3.5 - LIBOR Spreads



Source: Grant Thornton analysis

From a comparison of Figures 3.3 and 3.5 it can be seen that almost all of the TR2A capital expenditure is in the period after LIBOR spreads peaked. Thus construction of the TR2A assets will be largely post Credit Crunch (and partially for TR1 assets).

Sources of finance for TR2A assets

Different sources of capital have a different cost for developers. We understand that Ofgem have requested confirmation of the source of finance of TR2A assets but details and supporting documentation have not been provided. We are aware that the EIB has financed a number of offshore wind projects including London Array and Greater Gabbard, but we do not know what part, if any, of this finance relates to the transmission links (see Appendix D) and the impact on the IDC incurred by the TR2A developers.

Period of analysis

As forty percent of the expected TR2A capital expenditure is expected to be in 2009 and 2010, with the remainder by mid-2014, we consider that it is most appropriate to perform the IDC calculation over the period 2009 - 2010. We have reviewed the components of the IDC over both a five year and two year period in order to allow comparability with the report on TR1 and also to identify the impact of this change in methodology on the estimated IDC.

Project developers

Following the TR1 report, we note that there are no listed companies in Western Europe who derive the majority of their earnings from offshore wind transmission and indeed no OFTO has financed construction of offshore transmission. Therefore we looked at the best available comparators, in particular:

- the quoted integrated European utilities (Traditional Energy) who have actually financed and constructed the offshore transmission assets; and
- the quoted transmission companies who normally construct and finance transmission assets (Electricity Transmission)

In addition, we have analysed a selection of major European renewable energy companies (Renewable Energy). A description of the listed companies used as comparators in our analysis is set out in Appendix A.

The key private sector shareholders of the TR1 assets are large Traditional Energy companies, namely: Centrica, Dong, E.On, RWE, SSE and Vattenfall. Similarly, as identified above, most of the companies developing TR2A projects are also Traditional Energy companies.

Therefore, it has been agreed with Ofgem to continue using in our analysis the same sample of companies used in the TR1 report. Table 3.3 provides the list of these companies. In addition, it is noted that the Traditional Energy companies may be involved in the construction of future offshore transmission links and so their continued inclusion in the evidence base informing the computation of IDC is considered appropriate.

Table 3.3 - Comparator companies used

Organisation	S&P Credit rating
Traditional Energy	
Centrica	A-
E.On	A
RWE	A
SSE	A-
Statoil	AA-
Renewable Energy	
Nordex	Not rated
Gamesa	Not rated
Repower	Not rated
Vestas Wind	Not rated
Iberdrola Renovables	A-
Terna Energy SA	Not available
Electricity Transmission	
Terna	A+
Red Electrica	AA-
ITC Holdings	BBB
National Grid	A-

Source: Reuters 3000

The most significant difference between these Traditional Energy and Electricity Transmission groups is that as the latter are economically regulated they are regarded as lower risk. This is apparent in their asset betas (see Table 4.3):

- Traditional Energy - 0.44 (2 year average) and 0.53 (5 year average)
- Electricity Transmission - 0.34 (2 year average) and 0.37 (5 year average)

Consequently Electricity Transmission companies are, on average, able to achieve a greater level of gearing (see Table 4.4):

- Traditional Energy - 35% (2 year average) and 20% (5 year average).
- Electricity Transmission - 85% (2 year average) and 77% (5 year average)

4 Calculation of Interest During Construction

In this section we present our methodology then show our analysis of each of the components required to calculate the IDC using CAPM.

4.1 Methodology

The IDC estimated in this report is an indication of the cost of finance for these companies for the construction of TR2A assets. The WACC we compute is a 'pre-tax, nominal' WACC based on prevailing financial market conditions in the UK. Further details of the data sources used to estimate the WACC are contained in Appendix B.

The IDC is calculated as the average of a company's cost of debt and equity weighted by its gearing. The cost of debt is the effective interest rate a company pays for its debt. The cost of debt is calculated as the risk-free interest rate plus the debt premium of a company. For this analysis the cost of equity has been estimated by applying CAPM.

We summarise the IDC formula using CAPM below:

$$\text{IDC pre-tax} = (k_d \times D / (D + E)) + (k_e \times E / (D + E) \times 1 / (1 - t))$$

where,

k_d = Cost of debt
k_e = Cost of equity
D = Net debt
E = Equity Market capitalisation
t = tax

The pre-tax nominal IDC has been calculated based on data obtained for the companies detailed in Table 3.3.

4.2 Cost of debt (k_d)

The cost of debt is calculated under the WACC as the risk free rate plus a debt premium using the following formula:

$$k_d = R_f + Dp$$

where:

R_f = Risk free rate; and
Dp = debt risk premium

Risk free rate

The risk-free interest rate is the theoretical return required over a particular period of time on a loan with zero risk. The risk free interest rate is based on benchmark government bond yields. As the investment is to be based in the UK the sterling risk free rate has been used to construct a yield applicable to an investment in the UK.

Table 4.1 shows the yield over the last five years on UK benchmark Government gilts for 10, 15, 20 and 30 years. The OFTO contracts are for a period of 20 years, therefore we consider that long gilts best reflects the long-term nature of the assets and the risks associated with investing over this time period.

Table 4.1 - Risk free rate on selected UK Gilts

	Average over			
	10 year	15 year	20 year	30 year
2010	3.58	4.03	4.24	4.31
2009	3.66	4.16	4.26	4.31
2008	4.48	4.71	4.67	4.42
2007	5.00	4.93	4.71	4.51
2006	4.50	4.45	4.30	4.12
5 Year Average	**4.24**	**4.46**	**4.44**	**4.33**
Median	4.48	4.45	4.30	4.31
Minimum	3.58	4.03	4.24	4.12
Max	5.00	4.93	4.71	4.51
2 Year Average	**3.62**	**4.10**	**4.25**	**4.31**
Median	3.62	4.10	4.25	4.31
Minimum	3.58	4.03	4.24	4.31
Max	3.66	4.16	4.26	4.31

Source: Thomson Reuters DataStream and Grant Thornton analysis

For the purpose of our analysis we have utilised the risk free rate of 3.8% to 4.4%. This range is reflective of the range from the 2 year average yield on 10 year gilts to the five year average on 20 year gilts. We believe that over the last two years the yield on the 10 year gilt has been reduced by Quantitative Easing by the Bank of England and hence the bottom of our range is above the 2 year average for the 10 year bond.

Risk premium

The risk premium is the excess of the market yield on a basket of companies' debt over the risk-free interest rate. Our approach to calculating the debt premium for the WACC calculation involved:

- obtaining the annual average of market yields for fixed rate corporate bonds from Thomson Reuters DataStream;
- obtaining the annual average of the corresponding UK Gilts; and
- deriving the market premium by calculating the additional yield from corporate bonds over the UK GILT rates.

Table 4.2 sets out the average spread in yields of long-term AAA to BBB rated corporate bonds relative to the UK 20 years Gilt. Reviewing the corporate ratings of the Traditional Energy companies, the most prevalent corporate credit rating is 'A'. The credit ratings for each of the Traditional Energy companies are contained in Table 3.3.

The decision has been made to use data for 'A' rated corporate bonds with a maturity of 15 years and longer as these best reflects the actual borrowing profile of the wind farm developers, i.e. Traditional Energy companies issue bonds with a range of maturities some of which may be well in excess of 15 years. In addition, if the transmission links were being project financed then it is likely that this would be undertaken with an average loan life of c.15 years.

Table 4.2 - Debt Premium

	AAA 15Y+	AA 15Y+	A 15Y+	BBB 15Y+
2010	0.35	1.39	1.45	1.52
2009	0.50	1.47	1.72	2.71
2008	0.57	1.78	2.05	2.51
2007	0.46	0.76	0.99	1.37
2006	0.33	0.57	0.82	1.21
Average - 5yr	**0.44**	**1.19**	**1.41**	**1.87**
Median	0.46	1.39	1.45	1.52
Minimum	0.33	0.57	0.82	1.21
Maximum	0.57	1.78	2.05	2.71
Average - 2yr	**0.43**	**1.43**	**1.58**	**2.12**
Median	0.43	1.43	1.58	2.12
Minimum	0.35	1.39	1.45	1.52
Maximum	0.50	1.47	1.72	2.71

Source: Thomson Reuters DataStream and Grant Thornton analysis

For the purpose of calculating our recommended IDC range we have used a debt premium range of 1.5% to 1.8%. This range broadly encompasses

the range of the debt premium on A rated debt (the typical rating for Traditional Energy and Electricity Transmission companies, see Table 3.3) during 2009-2010 which was 1.45% to 1.72%.

4.3 Cost of equity (k_e)

The cost of equity has been estimated using the CAPM which describes the cost of equity as equal to the risk free rate plus a premium that investors bear to reflect the systematic risk inherent in the market. Systematic risk arises as a result of a range of macroeconomic factors that affect all asset classes with different magnitudes. The value of the premium (beta or ß) is reflected by the volatility of the company's equity compared to the broader investment market.

The cost of equity can be expressed using the following formula:

$k_e = R_f + (ß \times MRP)$

where:

k_e = Cost of equity
R_f = Risk free rate
ß = Equity beta
MRP = Market risk premium

Risk free rate

The risk free rate has been as analysed in Section 4.2.

Market risk premium

The market risk premium is an economy-wide generic parameter that represents the excess return of the equity market over the risk-free interest rate and hence reflects compensation for exposure to systematic risk.

For the purpose of calculating our recommended IDC range we have used the market risk premium of 4.50% calculated by Elroy Dimson, Paul Marsh and Mike Staunton using globally diversified data from 1900 to 2010.[2]

Beta (ß)

The equity beta ($ß_e$) of a company is defined as the covariance between the share price of the company and the market price index. The beta is a measure of systematic, or undiversifiable, risk.

The value of the equity beta not only reflects business risks but also the risks induced by financial leverage. Equity betas have therefore been adjusted to normalise for different gearing across companies and for the same company over time. This measure, the Asset Beta ($ß_a$) is calculated as:

$ß_a = ß_e / (1 + D/E \times (1- t))$

where:

$ß_a$ = Asset Beta
$ß_e$ = Equity Beta
D = Net debt
E = Market capitalisation
t = tax

The asset betas for the comparator companies we have analysed are presented in Table 4.3. These betas were derived for each company based on a regression of (i) two years of weekly data and (ii) 5 years of monthly data against the MSCI World Index.

[2] Credit Suisse Global Investment Returns Yearbook 2011

Table 4.3 - Asset Betas

	31/12/2010		31/12/2009	
	2 years	5 years	2 years	5 years
TRADITIONAL ENERGY				
Centrica	0.33	0.29	0.37	0.27
E.On	0.50	0.77	0.72	0.89
RWE	0.57	0.49	0.62	0.59
SSE	0.13	0.37	0.47	0.43
Statoil	0.68	0.74	0.84	0.48
Average	**0.44**	**0.53**	**0.60**	**0.53**
RENEWABLE ENERGY				
Nordex	1.30	1.57	1.74	2.39
Gamesa	1.30	1.61	1.71	1.93
Repower	0.09	0.32	0.37	0.44
Vestas Wind	0.92	1.77	1.94	2.09
Iberdrola Renovables	0.32	0.57	0.94	2.06
Terna Energy SA	-	-	0.89	0.38
Average	**0.65**	**0.97**	**1.27**	**1.55**
ELECTRICITY TRANSMISSION				
Terna	0.14	0.25	0.20	0.25
Red Electrica	0.40	0.44	0.33	0.45
ITC Holdings	0.61	0.57	0.59	0.58
National Grid	0.20	0.22	0.23	0.18
Average	**0.34**	**0.37**	**0.34**	**0.36**

Source: Thomson Reuters DataStream and Grant Thornton analysis

As most of the corporate funding for the TR2A assets came from Traditional Energy companies, and to maintain continuity with the TR1 analysis, we believe that the betas used to derive the WACC should be based on the betas of the Traditional Energy companies.

The Traditional Energy companies have an average two year asset beta of 0.44 and a five year average of 0.53. For the purpose of calculating our recommended IDC range we have used a range of asset betas of 0.4 to 0.6. This range is less wide than the range for Traditional Energy companies but includes the average values for Traditional Energy and Electricity Transmission Companies. In general the betas of renewable energy companies are above this range reflecting their higher risk.

Gearing

For the purpose of this analysis, we use actual gearing, obtained from the most recent audited financial statements (see Table 4.4). Gearing has been calculated based on external debt (i.e. bank loans and bonds) and is defined as: external debt/(market value of equity).

Table 4.4 - Gearing (Net debt/Market cap)

	31/12/10	31/12/09	31/12/08	31/12/07	31/12/06	Average	Average
TRADITIONAL ENERGY						**5yrs**	**2 yrs**
Centrica	14%	15%	-14%	-1%	10%	**5%**	**15%**
E.On	74%	54%	61%	15%	10%	**43%**	**64%**
RWE	58%	39%	13%	1%	-14%	**19%**	**48%**
SSE	31%	31%	26%	14%	15%	**23%**	**31%**
Statoil	17%	15%	5%	1%	8%	**9%**	**16%**
Average	**39%**	**31%**	**19%**	**6%**	**6%**	**20%**	**35%**
RENEWABLE ENERGY							
Nordex	21%	2%	10%	1%	-15%	**4%**	**12%**
Gamesa	32%	9%	-4%	2%	12%	**10%**	**21%**
Repower	20%	6%	4%	11%	10%	**10%**	**13%**
Vestas Wind	15%	-2%	-2%	-4%	-5%	**0%**	**7%**
Iberdrola Renovable	59%	1%	-1%	1%		**15%**	**30%**
Terna Energy SA	-2%	-8%	-32%	-20%		**-16%**	**-5%**
Average	**24%**	**1%**	**-4%**	**-2%**	**1%**	**4%**	**13%**
ELECTRICITY TRANSMISSION							
Terna	72%	64%	75%	48%	45%	**61%**	**68%**
Red Electrica	82%	59%	60%	45%	60%	**61%**	**70%**
ITC Holdings	76%	89%	101%	93%	74%	**87%**	**83%**
National Grid	104%	138%	119%	79%	57%	**99%**	**121%**
Average	**83%**	**87%**	**89%**	**66%**	**59%**	**77%**	**85%**

Source: Thomson Reuters DataStream and Grant Thornton analysis

For the purpose of calculating our recommended IDC range we have used a range of gearing of 20% to 50%, reflecting the range of gearing of Traditional Energy companies. The bottom end of this range is just above

the low gearing levels of renewable energy companies, while the top end is below the high levels of gearing achieved by the regulated Electricity Transmission companies.

4.4 Tax rate

As dividends are paid out of post-tax profit, the pre-tax equity return has to be adjusted for corporation tax. The adjustment is made based on the UK corporation tax rate in 2009 and 2010 of 28%.

5 Conclusions

5.1 Conclusions

Based on examination of evidence on, among other things, the construction of TR2A assets, the costs of finance for comparable energy companies and our analysis we have concluded:

- As with TR1, where Ofgem adopted a cap on the level of IDC paid to developers, we conclude that there are still reasonable grounds for Ofgem to cap IDC costs. The key reasons are to:
    - protect current and future customers;
    - limit the incentive for developers to maximise and potentially overstate their IDC;
    - maintain consistency of approach between TR1 and TR2A IDC payments;

- we note that if the level of IDC paid to developers is capped there may be an incentive to target the IDC cap in information they supply to Ofgem. This could be mitigated by allowing a lower IDC where a developer has submitted a figure which is shown to be overstated;

- In our analysis, we have focussed on the cost of capital of Traditional Energy companies as a comparator but have also recognised the cost of capital of Renewable Energy and Electricity Transmission companies. This is because the TR2A assets are being built and financed by Traditional Energy companies, with the exception of Siemens and Masdar who are minority investors;

- we understand that a significant amount of debt funding has been provided by the EIB to UK offshore wind farms. This has not been specifically adjusted for in our analysis;

- the abnormal capital markets conditions of the Credit Crunch had a significant impact on the cost and availability of capital for energy projects. This was recognised by Ofgem in early 2010 by using the top of the recommended range as the cap on IDC for TR1 projects. We note that for TR2A projects and some later TR1 projects only a small proportion of capital expenditure and project funding occurred during the Credit Crunch. Thus it is appropriate to exclude this period from our analysis of the current level of IDC;

- the focus for our analysis is the period 2009-2010 during which 40% of the expected total cost of constructing the TR2A assets was spent. The remaining 58% of TR2A capital is expected to be funded after 2010;

- the IDC applied to TR2A assets where a significant proportion of the funding occurs in 2011 and later may have to be reconsidered in the future if market conditions change materially.

Our recommended range for the WACC is considered reasonable in the context of recent independent analysis in the National Infrastructure Plan 2010 and the Electricity Market Reform Consultation Document. These estimates are compared with our analysis in Table 5.1. The Vanilla WACC does not take into account the impact of taxes on required returns,

Table 5.1: Comparison with other relevant WACC estimates

Model	Type of WACC[3]	Source	Range	Comparable IDC*	Comment
Regulated markets[4]	Post-tax nominal	National Infrastructure Plan, Table A.1	4.2% to 6.9%	5.4% to 7.0%	Includes allowance for construction risk
Availability based payment[5]	Vanilla WACC	National Infrastructure Plan	5.9% to 7.7%	5.9% to 7.3%	OFTOs receive an availability based payment
Offshore wind hurdle rates (R1/R2)	Equivalent to Vanilla WACC	Electricity Market Reform Consultation	10.1% to 11.2%	5.9% to 7.3%	Reflects construction risk, price risk and volume risk

* This is the most comparable estimate of the recommended TR2A WACC from Table 5.2

5.2 Recommendation

Based on analysis over the period of 2009 and 2010 as summarised in Table 5.2, the recommended range for the pre-tax nominal WACC is 7.6% to 9.7%. The corresponding range recommended for TR1 projects was 9.4% to 10.8% (see Appendix C).

[3] GT interpretation
[4] Regulated asset base model, e.g. water, electricity, regulated airports
[5] PPP/PFI schemes

Table 5.2: Recommended TR2A WACC range

WACC Computation	Low	High	Reference
Risk free rate (real)	1.27%	1.85%	note 1
Risk free rate (nominal)	3.80%	4.40%	Table 4.1
Market premium	4.50%	4.50%	Section 4.3
Asset beta	0.40	0.60	Table 4.3
Equity beta	0.54	0.69	Appendix B
Cost of Equity	**6.2%**	**7.5%**	
Risk free rate (nominal)	3.80%	4.40%	Table 4.1
Debt premium	1.50%	1.80%	Table 4.2
Cost of debt before tax	**5.3%**	**6.2%**	
Tax rate	28.0%	28.0%	Section 4.4
After tax cost of debt	**3.8%**	**4.5%**	
Industry indebtedness (D/(D+E))	33.3%	16.7%	
Industry gearing (D/E)	50.0%	20.0%	Section 4.3
Post-tax WACC	**5.4%**	**7.0%**	
Vanilla WACC	**5.9%**	**7.3%**	
Pre-tax WACC	**7.6%**	**9.7%**	

note 1: Assuming long term inflation rate of 2.5% per annum

Source: Grant Thornton analysis, Ofgem, Reuters

A Comparator profiles

Comparator	Country	Description
Centrica Plc - Traditional Energy Company Rating = A- (S&P)	United Kingdom	Centrica Plc is an integrated energy company operating predominately in United Kingdom and North America. In the United Kingdom, it operates three segments: upstream, downstream and storage. • Upstream includes production, generation and processing of gas and oil and trading in physical and financial energy contracts • Downstream includes supplying of gas and electricity to residential and business customers and offer a range of home energy solutions and low-carbon products and services In North America, the Company supplies gas, electricity and energy solutions to residential and business customers. In addition, it is also involved in the gas production, power generation and procurement and trading activities in the North American wholesale energy markets. During the year ended 31 December 2009, the Company acquired 100% of the issued share capital of Venture Production Plc (Venture) and 50% of the issued share capital of Segebel SA (Segebel).

Comparator	Country	Description
E.On AG - Traditional Energy Rating = A (S&P)	Germany	E.On AG (E.On) is a power and gas company. The company's operations are organised into separate market units: • the Central Europe market unit focuses on the company's electricity business and the downstream gas business in central Europe • the Pan-European Gas market unit operates its upstream and downstream gas business, and also holds interests principally in the energy business in Europe outside of Germany. • the UK market unit includes the energy business in the UK • the Nordic market unit is focused on the energy business in Northern Europe • the U.S. Midwest market unit involves the regulated energy market in the United States, state of Kentucky • the Energy Trading market unit combines its European trading activities for electricity, gas, oil and carbon dioxide allowances • the New Markets segment consists of the activities of climate and renewables in the Italy and Russia market units, as well as the Spain market unit.
RWE AG - Traditional Energy Rating = A (S&P)	Germany	RWE AG is engaged in the business of generation, trading, transmission and supply of electricity and gas. The company operates through seven divisions. Germany, Netherlands/Belgium, UK, Central and Eastern Europe, Renewables, Upstream gas and oil, and Trading/gas midstream. The company acquired the Dutch energy utility Essent N.V. as of 30 September 2009. The company's Germany division consists of the Generation and Sales and distribution networks business areas. It also includes the German regional utilities, which operate their own electricity generation facilities to a small extent, besides handling the network and end-customer business. The UK business division encompasses its entire UK generation and supply business with the exception of electricity production from renewables.

Comparator	Country	Description
SSE Plc - Traditional Energy Rating = A- (S&P)	UK	Scottish and Southern Energy Plc (SSE) is a holding company. Its subsidiaries are organised into the businesses of: • electricity generation, transmission, distribution and supply; gas storage, distribution and supply • electrical and utility contracting • home services, supplying a range of electrical and gas appliances and complementary products, and • telecommunications SSE is involved in the generation of electricity; the supply of electricity and gas; electricity, gas and telecoms networks; and other energy-related services, such as gas storage, contracting, connections and metering. SSE owns around 10,700 megawatt of electricity generation capacity in the UK and Ireland, consisting around: 4,500 megawatt of gas- and oil-fired capacity; 4,000 megawatt of coal-fired capacity (with biomass co-firing capability) and 2,200 megawatt of hydro, wind and dedicated biomass capacity. In May 2010, the Company sold its 100% interest in Ardrossan Wind farm (Scotland) Ltd to Infinis.
Statoil ASA - Traditional Energy Rating = AA- (S&P)	Norway	Statoil ASA (Statoil), formerly StatoilHydro ASA is an integrated energy company based in Norway with locations in approximately 40 other countries worldwide. As of 31 December 2009, the Company had proved reserves of 2174 million barrels (mmbbl) of oil and 514 billion cubic meters (bcm) (equivalent to 18.1 trillion cubic feet (tcf)) of natural gas, corresponding to aggregate proved reserves of 5408 million barrels of oil equivalent (mmboe). The Company operates in four business segments: Exploration and Production Norway (EPN), International Exploration and Production (INT), Natural Gas (NG) and Manufacturing and Marketing (M&M). In July 2010, Statoil ASA sold its Tampnet subsidiary to HitecVision.

Comparator	Country	Description
Nordex AG - Renewable Energy No Rating	Germany	Nordex SE is a Germany-based manufacturer and supplier of wind energy systems, specialising in wind turbines. The company's principal focus is on high-capacity units. Under the Nordex brand name, it offers wind turbines for various geographic regions, whether onshore or offshore. The company's product portfolio includes Nordex N100/2500 kilowatts (kW); Nordex S70/1500 kW and Nordex S77/1500 kW turbines for onshore use; Nordex N90/2300 kW, Nordex N90/2500 kW; Nordex N80/2500 kW turbines for offshore use, and a series of small units for international markets. In addition, it is engaged in the provision of rotor blades with a length of up to 45 meters and the development of electrical and control technologies for wind turbines, as well as technical planning of wind park systems. It has representative offices and subsidiaries in 19 countries.
Gamesa Corporation Technologica SA - Renewable Energy No Rating	Spain	Gamesa Corporacion Tecnologica SA is a Spain-based holding company that, through its subsidiaries and affiliates, is primarily engaged in the renewable energy sector. The company's activities include the promotion, construction and sale of wind parks, as well as the engineering, design, manufacture and sale of wind turbines. The company is a parent of the Grupo Gamesa, a group which comprises Gamesa Energia SA, Cametor SL, Gamesa Technology Corporation Inc, Gamesa Nuevos Desarrollos SA, Compass Transworld Logistics SA, Gamesa Wind Turbines SL and Windar Renovables SL. The company has operations established in America, Europe, Africa and Asia. In addition, the Company is a 14.5%-owned affiliate of Iberdrola SA.
Repower - Renewable Energy No Rating	Germany	REpower Systems AG is a Germany-based technology company engaged in the development, licensing, production and sale of wind energy turbines, as well as after-sales service for the German wind energy sector. Its product range comprises several types of wind turbines with rated outputs of between 1.5 to 6.15 megawatts and rotor diameters ranging from 70 to 126 meters. In fiscal year 2009/2010 the company launched its onshore series REpower 3.XM and the 6.15 megawatt offshore turbine Repower 6M. In fiscal year 2009/2010, the Company had three German production plants located in Husum, Trampe as well as Bremerhaven; and two international plants in Oliveira de Frades, Portugal, as well as in Baotou, China. REpower Systems AG operates worldwide numerous wholly owned as well as majority owned subsidiaries, including REpower Espana SL in Spain, REpower Australia Pty Ltd in Australia, REpower Wind Systems Trading in China and REpower USA Corp in the United States, among others.

Comparator	Country	Description
Vestas Wind Systems A/S - Renewable Energy No Rating	Denmark	Vestas Wind Systems A/S is a Denmark-based company active within the wind power industry. The company is engaged primarily in the development, manufacture, sale, marketing and maintenance of wind power systems that use wind energy to generate electricity. Its product range includes land and offshore wind turbines capable of generating between 850 kilowatts and 3 megawatts as well as supervisory control and data acquisition (SCADA) products, supplying a range of monitoring and control functions, allowing the wind power plants to be remotely supervised. The company is operational internationally through a network of subsidiaries.
Iberdrola Renovables SAU - Renewable Energy Rating = A- (S&P)	Spain	Iberdrola Renovables SAU is a Spain-based company primarily engaged in the development, construction, operation and exploitation of power plants that use renewable energy sources, as well as the sale of electric energy. Additionally, the company is involved in the research and development of such technologies as marine biomass and tidal energy. The company's facilities include wind, mini-hydroelectric and thermo-solar energy power stations with operations established in North, Central and South America, Europe, Africa, the Middle East and Asia. Iberdrola Renovables SAU is also involved in the development of natural gas storage and wholesale business. The company is a member of the group of companies headed by Iberdrola, SA which is an 80% owner of the company.
Terna Energy SA - Renewable Energy	Greece	Terna Energy SA is a Greece-based company engaged in the renewable energy sector. The company is actively involved in the construction and operation of wind farms, small hydroelectric plants and integrated process units for the overall management and energy utilisation of wastes and biomass. It undertakes the full spectrum of activities and works required for the materialisation of renewable energy sources installations, which includes: investigation of available renewable energy potential, design, licensing and construction, as well as operation, maintenance and commercial exploitation of renewable energy sources. Terna Energy SA operates nine wind power parks in Greece with a total output capacity of 142 megawatts. The company is also active in the construction industry as a contractor in the private and public works sectors where it undertakes energy, industrial, building and other engineering projects.

Comparator	Country	Description
Terna REN SpA Electricity Transmission Rating = A+ (S&P)	Italy	Terna provides transmission and dispatches the high voltage (HV) grid throughout Italy through more than 60,000 kilometres of electric network. The Company is also involved in the management of the national high voltage electricity infrastructures. The Company operates through its subsidiaries: Telat Srl which is involved in the design, construction, management, development, operation and maintenance of high-voltage power lines; SunTergrid SpA and RTR Srl which are involved in the construction and maintenance of electricity transmission grids and power stations, including renewables generation, for own use and sale in Italy and abroad.
Red Electrica - Electricity Transmission Rating = AA- (S&P)	Spain	Red Electrica Corporacion SA is a Spanish company primarily engaged in the energy sector. The Company specializes in the transmission of electric energy, as well as in the operation of electric systems. It manages the majority of the Spanish high-voltage transmission grid and is responsible for the development, maintenance and improvement of the network's installations. The Company's activities also include the coordination between the generation, transmission and distribution of electric energy. The Company is a parent of Grupo Red Electrica. Through its subsidiaries and affiliates, the Company has operations established in the Netherlands, France, Bolivia and Peru.
ITC Holdings - Electricity Transmission Rating = BBB (S&P)	USA	ITC Holdings Corp. is a holding company whose business consists of the operations of its regulated operating subsidiaries, International Transmission Company, Michigan Electric Transmission Company, LLC and ITC Midwest LLC. The Company's regulated operating subsidiaries transmission facilities are located in the lower peninsula of Michigan and portions of Iowa, Minnesota, Illinois, Missouri and Kansas.
National Grid Plc - Electricity Transmission Rating = A- (S&P)	United Kingdom	National Grid plc. (National Grid) is an international electricity and gas company. The Company owns electricity transmission networks in England and Wales, and operates the system across Great Britain. It also owns and operates the high pressure gas transmission system in the United Kingdom, and its distribution business delivers gas to 11 million homes and businesses. In the United States, National Grid delivers electricity to approximately 3.3 million customers in Massachusetts, New Hampshire, New York and Rhode Island, and manages the electricity network on Long Island. The Company is the distributor of natural gas in the north-eastern United States, serving approximately 3.4 million customers in Massachusetts, New Hampshire, New York and Rhode Island.

B Data sources and definitions

Unless otherwise specified, data has been sourced from Thomson Reuters DataStream.

Data	Source	Period	Definition
Risk free rate	DataStream	UK 10Y, UK 20Y and UK 30Y	5 year average of daily yields from UK 10Y, 20Y and 30Y gilts
Market risk premium	Elroy Dimson, Paul Marsh and Mike Staunton	1900 - 2011	Equity risk premium calculated by Elroy Dimson, Paul Marsh and Mike Staunton (LBS) in their paper: The Worldwide Equity Premium - a smaller puzzle
2 year weekly equity beta	DataStream	2Y weekly	Individually for each of the companies, weekly equity beta of the company, calculated over a period of 2 years preceding the date against the MSCI World Index
5 year monthly equity beta	DataStream	5Y monthly	Individually for each of the companies, monthly equity beta of the company, calculated over a period of 5 years preceding the date against the MSCI World Index
Debt premium	DataStream	15Y	Spread between average 15Y UK Benchmark rate and 15Y 'A' rated Corp bonds
Tax rate	Finance Act 2008	-	28% as prescribed in Finance Act 2008
Debt / equity ratios	DataStream	Annual average	Individually for each of the companies, ratio of net debt (as defined below) divided by market capitalisation (also defined below)
Net debt	Fact Set	Annual average	Individually for each of the companies, annual average of monthly: long term debt (book value) + short term debt (book value) - cash and short term investments (book value)
Market capitalisation	Fact Set	Annual average	Individually for each of the companies, annual average of the end of month market value of quoted equity instruments.

C TR1 and TR2A WACC computation

TR1

WACC Computation	Low	High
Risk free rate (real)	2.4%	2.4%
Risk free rate (nominal)	4.5%	4.5%
Market premium	5.0%	5.0%
Asset beta	0.50	0.70
Equity Beta	0.61	0.80
Cost of Equity	**7.5%**	**8.5%**
Risk free rate	**4.5%**	**4.5%**
Debt Premium	1.3%	1.3%
Cost of debt before tax	**5.8%**	**5.8%**
Tax rate	28.0%	28.0%
After-Tax Cost of Debt	**4.2%**	**4.2%**
Industry indebtedness (D / (D+E))	23.1%	16.7%
Industry gearing (D / E)	30.0%	20.0%
Post tax WACC	**6.8%**	**7.8%**
Vanilla WACC	**7.1%**	**8.1%**
Pre tax WACC	**9.4%**	**10.8%**

TR2A

WACC Computation	Low	High	Reference
Risk free rate (real)	1.27%	1.85%	
Risk free rate (nominal)	3.80%	4.40%	Table 4.1
Market premium	4.50%	4.50%	Section 4.3
Asset beta	0.40	0.60	Table 4.3
Equity beta	0.54	0.69	
Cost of Equity	**6.2%**	**7.5%**	
Risk free rate (nominal)	3.80%	4.40%	Table 4.1
Debt premium	1.50%	1.80%	Table 4.2
Cost of debt before tax	**5.3%**	**6.2%**	
Tax rate	28.0%	28.0%	Section 4.4
After tax cost of debt	**3.8%**	**4.5%**	
Industry indebtedness (D/(D+E))	33.3%	16.7%	
Industry gearing (D/E)	50.0%	20.0%	Section 4.3
Post-tax WACC	**5.4%**	**7.0%**	
Vanilla WACC	**5.9%**	**7.3%**	
Pre-tax WACC	**7.6%**	**9.7%**	

D Funding provided by EIB for UK offshore wind farms

The table below lists a number of EIB loans to fund UK wind farms served by TR1 or TR2A transmission assets. We have not been able to establish the extent to which these loans were used to fund the offshore transmission.

Name	Signature date	Signed Amount (€)
GREATER GABBARD	16/11/2010	**604,000,000**
DONG UK RENEWABLES (Gun fleet Sands)	19/12/2008	**250,000,000**
LONDON ARRAY OFFSHORE WINDFARM	08/06/2010	**294,592,461**
LONDON ARRAY OFFSHORE WINDFARM	01/07/2010	**305,829,103**
LONDON ARRAY OFFSHORE WINDFARM	09/09/2010	**242,483,026**
SCOTTISH & SOUTHERN RENEWABLES I	29/03/2010	**448,078,862**
BARROW OFFSHORE WINDPOWER	20/12/2005	**95,286,960**
Total:		**2,240,270,412**

Source: Ofgem initial analysis and EIB

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