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Supply Agreement Issues for Wind Turbines

This paper discusses informally the key issues relating to turbine supply and installation agreements ("TSA") for wind farm projects in the current market. It may not be relied upon as legal advice and these issues may change as market conditions change from time to time.

This paper only deals with issues specific to wind farm projects. The usual construction matters - such as material cost fluctuations, foreign exchange risk and consenting - should be considered in addition to the issues mentioned below. This paper only addresses the construction related issues in the TSA and does not address the issues associated with the other agreements that the Owner will enter into as part of a wind farm project including Power Purchase Agreements, Interconnection Agreements and Operation and Maintenance Agreements ("O&Ms").

1. DISAGGREGATED PROCUREMENT AND INTERFACE RISK

1.1 Whilst we are beginning to see a number of smaller onshore wind farms being developed using a single contractor, with scope and risk allocation closer to that seen in traditional power projects, in our experience it is still more the norm for the larger onshore projects, particularly in jurisdictions where certainty as to grid code and permit issues is of concern, and for offshore projects to be procured on a disaggregated basis and therefore involve a number of contractors rather than an EPC Contractor taking single point responsibility.

In the onshore context we are, however, tending to see developments involving fewer disaggregated contracts, often with only a wind turbine generator ("**WTG**") TSA and a balance of plant contract, as opposed to the more traditional split of:

1.1.1 TSA - contract for the supply and installation of the WTGs and the supervisory control and data acquisition system ("**SCADA system**");

1.1.2 Civil works agreement/ foundations contract - contract for the construction of the foundations for the WTGs and other miscellaneous civil works for the development. This contract is not that different from a typical EPC contract for civil works but is a key interface in a wind project;

1.1.3 Electrical works agreement/ cables contract - contract for the cables from the WTGs to the substation including relevant work for the construction of the onshore or offshore substation or upgrade of existing substations. In some projects the foundations contract and cables contract will be combined; and

1.1.4 Installation vessel contract - relevant for offshore wind projects (see section 2 below).

1.2 As a result of the obligations being disaggregated into these many different contracts, the Owner is left with the interface risk, including the risk of the various contractors causing delay and disruption to each other.

1.3 There are certain contractual provisions that Owners and their funders ("**Funders**") will seek to include in TSAs to mitigate the risk as far as possible, including an interface schedule that regulates the main points of interface for the contractor under the TSA (the "**WTG Contractor**"), cables contractor and foundations contractor, as well as consolidation provisions for the resolution of related disputes between contractors.

1.4 In addition to the contracts described in paragraph 1.1 there is usually an O&M, otherwise called long term services agreement, service and warranty agreement or service and availability agreement - this contract is usually with the WTG Contractor and contains not only the operation and maintenance obligations but also the warranties for availability of the WTGs. The O&M obligations and warranties for availability may also be contained within the TSA itself rather than in a separate contract, however this is increasingly less common.

2. OWNER'S OBLIGATIONS

2.1 In addition to providing site access, the Owner is likely to have obligations beyond what would be considered normal for traditional power projects, especially if there is a disaggregated contract procurement as described in paragraph 1.1.

2.2 One of the main issues facing Owners on offshore wind projects is the installation vessel risk. Ideally, Owners and Funders would prefer the WTG Contractor to retain this risk. Given the growing demand for offshore wind projects and the limited number of installation vessels appropriate for installation of offshore wind farms and the risk of extended procurement due to weather and interface delays, WTG Contractors are unlikely to be prepared to retain this risk.

2.3 It should be noted that the installation vessel referred to in this section may be more than one vessel (such as a jack up vessel) depending upon the capabilities of the individual vessel. For example, there may be supporting vessels such as transfer vessels and supporting tug boats. The particular requirements relating to the installation vessel for each project need to be examined in detail including:

2.3.1 the technical requirements for the installation vessel;

2.3.2 the time period for which the installation vessel is required (and whether this is a fixed or a shifting window);

2.3.3 the apportionment of costs for having the installation vessel for a longer period of time than originally envisaged; and

2.3.4 the remedies if the installation vessel does not function in accordance with the specified requirements or is not available.

2.4 Given the supply constraints for appropriate installation vessels, some Owners are investigating other non traditional types of vessels. Technical advice should be sought from the Owner's technical adviser or Funders' technical advisers to confirm that these alternative solutions will be appropriate for the relevant WTGs and particular sites (e.g. sea bed conditions, wave movements and depth of water).

2.5 The availability of installation vessels and the allocation of the various contractual risks associated with their use are without doubt two of the main issues presented by the upcoming development of the Round 3 offshore wind projects in the UK. The technical challenges of dealing with increased foundation depths, longer trip times and more extreme environmental conditions, coupled with an exponential growth in demand for installation vessels in UK, French and German waters, makes what was an existing problem even more acute and may well require project companies intending to develop offshore sites to enter into long lead reservation agreements for installation vessels many years in advance.

2.6 By way of contrast, in relation to onshore wind farm projects, the majority of WTG Contractors are now willing to assume full risk for the supply of onshore installation cranes.

3. QUALITY WARRANTIES

3.1 General quality warranties, such as compliance with the relevant grid codes, may be difficult to achieve under the TSA unless the relevant requirements are specifically incorporated in the specification of the WTGs. We are, however, starting to see a general move towards WTG Contractors accepting grid code compliance risk in jurisdictions where a number of wind farms are already on-line and supplying power to the grid.

3.2 A fitness for purpose warranty is not commonly achieved in TSAs. Given the other protections available in the TSA and O&M (including the warranties for power curve, availability and defects) the absence of a fitness for purpose warranty is generally not problematic for Owners/Funders.

3.3 Owners usually take the risk of compliance with laws and permits insofar as it relates to noise emissions for offshore projects (regardless of whether it is a requirement of the relevant permit). In onshore projects, the risk of noise emissions is often debated (see also paragraph 6.2 below).

3.4 As regards other laws, WTG Contractors will usually seek entitlement to EOTs and cost for changes in such laws (including changes in permits) after the agreed base date.

3.5 With regards to warranties for the power curve, availability and defects see paragraphs 6.1 and 6.3 and section 7 below.

4. VARIATIONS

4.1 WTG Contractors usually insist upon restrictions on the Owner's right to order variations (which is perhaps not surprising given the specialist and proprietary nature of WTGs). It does, however, tend to be the case that these restrictions are becoming more narrowly focused on changes in WTG numbers and the technical/logistical feasibility of the variation request.

5. TAKE OVER

5.1 In contrast to traditional power projects, wind farm projects have no standard approach to requirements for Take Over and liability for delay liquidated damages ("**delay LDs**"). However, the common feature across the board is that at least the following will be required for achievement of Take Over:

5.1.1 each WTG to be mechanically complete;

5.1.2 each WTG to be commissioned; and

5.1.3 test results equivalent to a stipulated minimum level to have been attained over the relevant number of hours for the Tests on Completion and subject to adjustments for certain events (unlike a traditional power project, these tests will be pass/fail rather than being required to achieve minimum performance standards for certain guarantees and the balance of the guarantees being subject to buy down/performance LDs).

5.2 What differs from project to project is whether the WTGs will be taken over on an individual basis or in strings of WTGs, or whether the whole of the wind farm will be taken over at once.

5.3 The approach selected from the options described in paragraph 5.2 will impact on the approach to be taken on delay LDs. Owners will ideally not want to have Take Over, and therefore bring to an end the WTG Contractor's liability for delay LDs, until the whole wind farm has passed the relevant Tests on Completion. This is difficult to achieve in the current market, even for onshore wind farm projects.

5.4 The approach selected from the options described in paragraph 5.2 will also impact on the approach to be taken on sharing of any early generation revenue between the Owner and the WTG Contractor.

5.5 In relation to the SCADA system, a simpler testing and commissioning regime exists. The WTGs can operate without the SCADA system being completed, although Owners and Funders will generally require that the SCADA

system has been installed and has passed the relevant Tests on Completion prior to the Take Over of the whole of the wind farm.

5.6 WTG Contractors may insist upon Take Over being deemed to have been achieved in certain circumstances.

6. POWER CURVE, NOISE AND AVAILABILITY WARRANTIES

6.1 There will typically be performance tests after Take Over ("power curve tests"). In broad terms, the power curve test is carried out to determine whether the actual power output meets or exceeds the warranted level. If the test demonstrates that less than the warranted power output over the test period is achieved (subject to various adjustments) then the WTG Contractor will be liable for liquidated damages (similar to performance LDs under a power plant contract). Conducting this test will be the responsibility of the Owner, with the WTG Contractor in attendance. There are various issues surrounding power curve tests which need to be considered such as:

6.1.1 the period for the Owner to notify the WTG Contractor that it wishes to carry out a power curve test;

6.1.2 the number of retests allowed and over what period;

6.1.3 the events giving rise to adjustments in the warranted power curve;

6.1.4 how many WTGs are included in the testing sample to be representative of the whole wind farm;

6.1.5 the duration of the tests; and

6.1.6 the basis for calculation of LDs.

6.2 For onshore projects, the Contractor may agree to noise/acoustic tests. These tests will be carried out by the Owner over the same time period as the power curve test and will also result in liability for performance LDs if the warranted levels are exceeded.

6.3 Unlike traditional power projects, where availability tests are generally used only where there is an unproven element in the turbine or other key technology (in which case other forms of support may be required, e.g. to supplement any insurance gaps), availability tests are relatively standard for wind farm projects. Like the power curve tests, the consequences for failing to achieve the warranted availability will result in the WTG Contractor being liable for availability LDs. The availability tests and the availability warranty are key elements of the O&M.

7. DEFECTS LIABILITY

7.1 Typically, the defects liability period ("**DLP**") in a TSA lasts 2 years, however we are seeing examples of longer periods depending upon the continuation of an associated O&M. Depending upon the structure of the TSA (see the issues discussed in section 5) there will be differences as to whether there is a DLP for each individual WTG or string of WTGs or whether the DLPs for all of the WTGs end at a common date.

7.2 Commonly, the DLP will be extended if a part is replaced during the DLP but, unlike in other power projects where an evergreen DLP may be achievable, if a part is continually replaced on a wind farm project, only a limited extension of the DLP in respect of that replaced part is usually provided.

7.3 There is the possibility that the DLP will be reduced for certain events, for example, a suspension ordered by the Owner.

7.4 The interrelationship between defects protection under the TSA and the obligations and liabilities under the O&M is of crucial importance.

7.5 WTG Contractors will not usually accept liability for latent defects, unless it is illegal to contract out of such liability in the jurisdiction of the site where the wind farm project is located (e.g. civil law countries where decennial liability applies). Similarly, WTG Contractors will not usually accept liability for serial defects or, if some serial defect cover is offered, it will not usually be as extensive as in traditional power projects (for example, any re-design obligation may well be excluded).

8. **CAPS**

8.1 As with traditional power projects, it is increasingly the case that WTG Contractors on onshore projects will offer caps equivalent to 100% of the TSA contract price. However, unlike traditional power projects, there will normally only be very limited exclusions to this cap. In the offshore context caps are usually much lower and are still only subject to limited exclusions.

8.2 Delay LDs and performance LDs (e.g. for breach of noise emission and power curve warranties) are typically sub-capped. Separate caps will apply for availability LDs under the O&M, normally based on the value of the O&M annual base fee.

9. **PERFORMANCE SECURITY**

9.1 WTG Contractors are often unwilling to provide bonds in addition to a parent company guarantee. The credit-worthiness of the WTG Contractor should be assessed by the Owners and Funders, as would be the case for any project.

9.2 WTG Contractors may insist upon Owners providing payment security, such as advance payments, parent company guarantees and bonds particularly where, as is often the case, an Owner is a straw man (i.e. a special purpose vehicle established purely for the relevant project without any financial history and no real assets).

10. **OWNER'S INFORMATION**

10.1 It is common in wind farm projects for Owners to carry the risk of certain categories of information, such as design information regarding other interface contractors (see section 1) as well as site data (including sea bed conditions) and climatic conditions. The Owner will usually be asked to retain the risk of any inaccuracy in this information as well as any delay in providing the same to the WTG Contractor.

11. **WEATHER RISK**

11.1 In a wind farm project, whilst it sounds simplistic, weather is an important factor. This is not only in terms of the wind distribution studies that will be important for the basis of forecasting the potential cash flow once the wind farm is in commercial operation, but also in terms of the construction phase (including testing and commissioning).

11.2 Weather risk needs to be assessed over the various phases of the project. The parties will discuss on a case by case basis as to which party bears the weather risk and whether this changes for the various phases of the activity under the TSA.

12. **TERMINATION RIGHTS, REJECTION AND FULL REPAYMENT OR COST TO COMPLETE CLAIM**

12.1 Unlike in the case of traditional power projects where, if the plant fails to meet the minimum performance standards by the time the delay LDs are exhausted, Owners/Funders ideally seek a rejection and full repayment remedy, on wind farm projects this is generally not achievable. WTG Contractors will usually only accept a cost to complete/rectify remedy.

12.2 It used to be the case that WTG Contractors would generally contest termination for the Owner's convenience, even if the Owner were prepared to pay the WTG Contractor's loss of profit. However, recently we have seen a softening of this position, with termination for the Owner's convenience being accepted so long as profit is paid on the remaining amount of the TSA contract price.

12.3 Cross defaults under the TSA and O&M leading to termination need to be considered on a case by case basis (e.g. what happens if the TSA is terminated before the wind farm is complete, is the O&M continuing and will this differ where the work for the WTGs is complete but defects liability remains under the TSA?).

13. **TURBINE TECHNOLOGY**

13.1 Turbine technology is the key to any power project, in terms of efficiency, risk and supply/demand dynamics. Technical advice is needed to ensure that the choice of turbine has been adequately investigated, especially as the market is increasingly demanding larger turbines which are not currently proven on completed projects.

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If you would like to know more about Clifford Chance's Construction Group in London or across our network, please contact David Metzger (david.metzger@cliffordchance.com), Tim Steadman (tim.steadman@cliffordchance.com), Sandy Hall (sandy.hall@cliffordchance.com), Matthew Buchanan (matthew.buchanan@cliffordchance.com), or your usual Clifford Chance contact.

Contacts

David Metzger
Partner

T: +44 20 7006 4240
E: david.metzger
@cliffordchance.com

Tim Steadman
Partner

T: +44 20 7006 4012
E: tim.steadman
@cliffordchance.com

Sandy Hall
Partner

T: +971 2613 2343
E:sandy.hall
@cliffordchance.com

Matthew Buchanan
Partner

T: +65 91773126
E:matthew.buchanan
@cliffordchance.com