



# Analysis on the further- ing of competition in relation to the estab- lishment of large off- shore wind farms in Denmark.

Summary

The Ministry of Climate and Energy

April 28th 2011

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# 1. Summary

## 1.1 Introduction

This summary contains the most significant results of the analysis on the furthering of competition in relation to the establishment of large offshore wind farms in Denmark. The analysis has been performed by Deloitte in the period December 2010 to April 2011.

The object is to perform an analysis of the Danish tender model from an economic and corporate financial perspective as well as to make recommendations for which tender models that are appropriate to use on future calls for tenders for offshore wind farms so as to ensure the highest extent of competition for the concessions put up for tender.

The analysis has been delimited to concern large offshore wind farms, i.e., parks of 200 MW or more as such parks are generally always put up for tender. A number of the analyses and recommendations, however, will also be applicable in connection with potential calls for tenders for more near-shore offshore wind farms.

The analysis is based on comprehensive desk research, interview with 10 energy companies, 3 financial investors, relevant authorities, trade associations, wind turbine manufacturers and Energinet.dk. Finally, systematic analyses of framework conditions of calls for tenders for offshore wind farms in a number of key EU countries as well as analyses of competitive conditions within the offshore wind sector have been performed.

The overall reporting consists of this summary, a primary report and two background reports. The primary report contains an overall presentation of the results of the individual sub-analyses. Background report 1 contains a detailed analysis of the framework conditions for offshore wind farms in key EU countries, including Denmark, Great Britain, Germany and Holland. Background report 2 contains an analysis of competitive conditions within the offshore wind sector. The background reports are conducted in cooperation with GL Garrad Hassan.

## 1.2 Assessment of the call for tenders for Anholt Offshore Wind farm

### 1.2.1 General conditions of the call for tenders for Anholt offshore wind farm

The tender notice for Anholt Offshore wind farm was published on 30 April 2009. DONG Energy (DONG), as sole tenderer, won the concession on 22 June 2010.

The establishment of the offshore wind farm is to be completed before the end of 2013, and grid connection of the first turbine is to be completed before the end of 2012. As such it has been a total timeframe of a little more than 4½ years from the call for tenders was announced until the offshore wind farm is to be completed. In actual terms, DONG has, after the award in June 2010,

approx. 2½ years to ensure grid connection of the first turbine and approx. 3½ years to complete the establishment of the wind farm, which is to be considered a very short establishment phase.

The basis of the call for tenders for Anholt Offshore wind farm in several manners stands out from two other previous calls for tenders for offshore wind farms: Horns Rev II and Rødsand II. Firstly, the call for tenders has been performed pursuant to the provisions on ordinary public call for tenders, and secondly, especially the penalty requirements are significantly tightened in relation to previous calls. Furthermore, the Environmental Impact Assessment (EIA) and parts of the geo-technical and physical research were to exist before the tenderers submitted their tenders.

- *Public calls for tenders:* On public call for tenders, it is not legal to negotiate with the tenderers before nor after the call for tenders. The concession was awarded on the basis of one criterion: submission of the lowest price calculated in the following manner: *The size of the price in kWh paid for 20 TWh (corresponding to 400 MW in 50,000 full load hours).*
- *Keep-open penalty:* On termination of the contract within the first five months, the keep-open penalty amounts to DKK 100 million. After this, the penalty increases to DKK 200 million, and after a year, the penalty amounts to DKK 400 million. If, within six months, the winner of the concession decides not to establish the offshore wind farm, it is a requirement that the company or consortium that came in second in the tender round instead constructs the wind farm.
- *Delay penalty:* If the conditions of grid connection of the first turbine in 2012 and the full wind farm in 2013 are not observed, it will have consequences to the kWh price that is paid for the first 20 TWh. If all turbines are not connected to the grid no later than 31 December 2013, the concession holder will furthermore be imposed a penalty of DKK 400 million.

### 1.2.2 Reasons for the investors' decision not to submit tenders for Anholt Offshore wind farm

Initially, the significance of general market conditions is reviewed and secondly the significance of the most important contract conditions.

#### **The significance of general market conditions**

The timing of the Anholt call for tenders has not been beneficial in relation to the general market development. Potential investors have thereby stated the following market conditions as being significantly contributing reasons for their lacking interest in the Anholt call for tenders:

- *Alternative markets:* The investors saw great potential in alternative markets, especially in the British market where the government's massive plans for expansion of offshore wind farms subsidised by attractive financial subsidy schemes attracted much attention.
- *Scarcity of capital:* At the time of the Anholt call for tenders, there was scarcity of capital by reason of the financial crisis, and the prices in the value chain were high due to insufficient capacity in the supplier chain.

- *Insufficient plans and synergy potential:* The insufficiency of long-term plans for expansion in Denmark entails that, in the opinion of a number of foreign energy companies, they cannot achieve synergy effects – for instance, optimisation of the value chain and synergy effects in the tender, construction and operating phases – and accordingly they do not dare to aim at Denmark.
- *Difficult to enter the Danish market:* Foreign investors perceive the Danish market as relatively closed and thereby difficult to enter. The primary reason is a) DONG's strong position/competitiveness; (b) award history; the three offshore turbine concessions put up for tender so far, which have only been awarded to DONG and E.ON; (c) insufficient flexibility in contract conditions; (d) insufficient marketing by the authorities.

### **Significance of the most important contract conditions**

Several of the contract conditions have also signified potential investors' decision not to submit a tender, including:

- *Timeframe:* The timeframe for establishment of Anholt Offshore wind farm is very short and resulted in many of the investors not being able to mobilise the necessary resources and agreements for the construction phase and generally were unable to fit the project into their portfolio.
- *Inflexible tender process:* Several investors considered it a problem that the conditions in the Anholt call for tenders were very fixed, and that there was no possibility of negotiating the requirements.
- *Comprehensive penalty provisions:* The keep-open penalty and the delay penalty have only added increased risk on Anholt Offshore Wind farm for potential investors and have made Anholt Offshore Wind farm a less attractive investment.

However, some of the contract conditions also had a positive influence on potential investors' assessment of the call for tenders:

- *Settlement form:* The investors consider it a great benefit that the settlement form is based on a fixed high price of the electricity delivered for many years to come.
- *Guaranteed grid connection:* The fact that grid connection is performed, paid and guaranteed by the state helps reducing the risk for the investors.
- *One-stop-shop:* The Danish Energy Agency works as one-stop shop for licences for offshore wind turbines and coordinates with other relevant authorities about conflicting area interests and requirements of, for instance, natural protection or demarcation. According to the investors, this process is effective and unbureaucratic.

On the basis of the above, it is Deloitte's assessment that the most important reasons for the limited investor interest in Anholt Offshore Wind farm was that the conditions for the call for tenders were fixed to such degree that it did not give the investors sufficient flexibility. An example of this is the short timeframes subject to penalties. Furthermore, several potential investors perceive the Danish market as relatively closed and of limited strategic significance compared to the British and Ger-

man markets for which reason they have given up participating in the Anholt call for tenders in advance.

### 1.2.3 The investors' requests for future tender model and framework conditions

Below, the investors' requests for tender and framework conditions are summarised. Focus is on the areas where investors generally agreed.

- *The investors' requests for political framework, including plans for expansion:* All interviewed, potential investors emphasise the importance of determining a political action plan for the coming years' expansion of offshore wind farms in Denmark. This includes a target for the expansion amount and pace of offshore wind turbines over the next 10-15 years as well as actual plans and timeframes for the next two calls for tenders for offshore wind farms.
- *The investors' request for (tender) model, tender procedure and conditions:* Generally, there is agreement among the potential investors about concessions being awarded upon call for tenders for actual offshore wind farms. However, a group of investors would rather see award according to an open door procedure.
  - Most investors request significantly more flexibility and space in the timeframes and thus see a clear benefit in reintroducing the former procedures for call for tenders with negotiation as well as the award criteria apart from the price being extended to also comprising, for instance, timeframes and physical shape.
  - There is general agreement among the potential investors about avoiding a high delay penalty as they have a very strong incentive for connecting the offshore wind farm to the grid and generating income as soon as possible under any circumstances. Some suggest a sprinter bonus by German example instead of a delay penalty if you want to ensure extraordinarily quick establishment of an offshore wind farm.
  - There is general agreement about the fact that tying all tenderers for six months entails great costs to the tenderer who comes in second by way of unnecessary predisposition of resources, and accordingly this method should be avoided to avoid scaring off investors.
  - Furthermore, there is general satisfaction in the state conducting the environmental aspect of the EIA and that they exist as a part of the tender documents. In return, there is a request for significantly better research basis existing in relation to ground conditions and wind and wave conditions than existed for the Anholt call for tenders.
- *Requests for financial subsidy mechanisms:* Among the interviewed parties, there is broad recognition of the Danish settlement model with a fixed settlement price (independently of the market price of electricity) for a given amount of electricity corresponding to the electricity production over 10-15 years which gives great security for income.




- If you, as the majority of the investors, support a tender model by which competition is on price, there is good support in the Danish subsidy scheme whereas this scheme is requested changed in the direction of a fixed, uniform tariff, by the investors who request a more open award model (e.g. open door).
- *Requests of state involvement:* The potential private investors generally agree that it is not appropriate for the state to get involved and assume a role as investor as well as project developer of offshore wind farms.

The above reflects the investors' views and financial interests. Meeting some of the requests would create advantages to the society by way of increased probability of more investors competing about the future establishment of Danish offshore wind farms. However, this should be assessed in relation to the costs for the society of meeting the investors requests as in some cases there will be a *trade-off* between what is in the investors' interests and broader societal interests of the electricity consumers.

### 1.3 Framework conditions in central EU countries for offshore wind energy

As a part of the analysis, mapping has been made of relevant EU countries' framework conditions and tender models. In the below table, a transnational summary and comparison of framework conditions have been made on the dimensions that are most central from the investors' points of view.

The colours of table 1.1 (following page) indicate Deloitte's assessment of how attractive the individual condition would be expected to be from an investor point of view:

-  Green colour indicates very attractive conditions
-  Yellow colour indicates relatively neutral conditions
-  Orange colour indicates less attractive conditions

The interviewed potential investors have generally expressed that the British market is the most attractive one in their opinion, and the German market is the second most attractive market. The explanation of this is to be found in the beneficial framework conditions marked in green, especially in the upper part of the table, i.e., in relation to (1) expansion plans, (2) concession model, (3) award criteria and (4) timeframes.

With respect to the significant condition about the subsidy settlement for the sale of electricity, however, the Danish model is fairly competitive with the British and German models, based on settlement form and level of the Anholt call for tenders. The conditions on the Danish market are also relatively more attractive with respect to grid connection, EIA and regulatory procedures which the investors consider almost optimum in Denmark.

**Table 1.1 The attractiveness of national conditions from the investors' points of view**

	Danish model	Dutch model	British model	German model
<b>Political plans for expansion of offshore wind energy</b>	<ul style="list-style-type: none"> <li>No targets or actual plans for expansion</li> </ul>	<ul style="list-style-type: none"> <li>Previously high ambitions replaced by postponement of plans</li> </ul>	<ul style="list-style-type: none"> <li>Ambitious and very specific plans for new capacity launched through successive tender rounds</li> </ul>	<ul style="list-style-type: none"> <li>Strategic, long-term ambition for offshore wind capacity, but no specific plans</li> </ul>
<b>(Tender) model for concessions</b>	<ul style="list-style-type: none"> <li>Single site auction</li> <li>State defines site</li> <li>Limited dialogue with tenderers as part of the most recent call for tenders</li> </ul>	<ul style="list-style-type: none"> <li>Multi site / open selection auction</li> <li>Investor finds and proposes sites</li> <li>Dialogue with tenderers</li> </ul>	<ul style="list-style-type: none"> <li>Multi site tender rounds</li> <li>State appoints zones - investor finds and proposes sites within these zones</li> <li>Competitive dialogue</li> </ul>	<ul style="list-style-type: none"> <li>Open-door procedure</li> <li>Investor finds and proposes sites</li> </ul>
<b>Award criteria</b>	<ul style="list-style-type: none"> <li>Lowest offered settlement price</li> </ul>	<ul style="list-style-type: none"> <li>Lowest offered tariff</li> <li>Permission is to be achieved for site in advance</li> </ul>	<ul style="list-style-type: none"> <li>Call for tender after negotiation</li> <li>Beauty contest (based on developer's project proposal and capacity)</li> </ul>	<ul style="list-style-type: none"> <li>First come, first served</li> <li>Permission to be achieved for site in advance</li> </ul>
<b>Timeframes for use/establishment</b>	<ul style="list-style-type: none"> <li>Fixed and tight (establishment to be completed 2-3 years from awarding)</li> </ul>	<ul style="list-style-type: none"> <li>Fixed, but moderate (construction to be initiated before 3 years from award)</li> </ul>	<ul style="list-style-type: none"> <li>Fixed, but spacious (2018 for round III call for tenders from 2008)</li> </ul>	<ul style="list-style-type: none"> <li>Flexible and spacious</li> </ul>
<b>Subsidy settlement for sale of electricity</b>	<ul style="list-style-type: none"> <li>Fixed settlement price defined by winning tender (10-15 years ahead)</li> <li>Full set-off of electricity income</li> <li>No settlement on negative market prices</li> </ul>	<ul style="list-style-type: none"> <li>Fixed tariff defined by winning tender (15 years ahead)</li> <li>Addition for distance to shore</li> <li>Partial set-off of electricity income</li> <li>Ceiling to total subsidised production</li> </ul>	<ul style="list-style-type: none"> <li>Renewable obligation certificates(ROC) on top of the price of electricity (until 2037)</li> <li>Extra credits for offshore wind</li> </ul>	<ul style="list-style-type: none"> <li>Fixed, uniform tariff (at least 12 years ahead)</li> <li>Full set-off of electricity income</li> <li>Extension of subsidy period on great distance to shore and depth</li> </ul>
<b>Supplemental incentives (penalty, sprinter bonus, etc.)</b>	<ul style="list-style-type: none"> <li>Keep-open penalty</li> <li>Delay penalties</li> </ul>	<ul style="list-style-type: none"> <li>Easy depreciation rules for investments</li> <li>Keep-open penalty</li> <li>Innovation bonus</li> </ul>	<ul style="list-style-type: none"> <li>Exemption of electricity buyers of Climate Change Levy</li> <li>Lease payment for sites</li> <li>Application fee and guarantee provision</li> </ul>	<ul style="list-style-type: none"> <li>Sprinter bonus (declining on taking into operation after 2015)</li> </ul>
<b>Grid connection</b>	<ul style="list-style-type: none"> <li>Free connection; state performs, finances and guarantees</li> </ul>	<ul style="list-style-type: none"> <li>Investor bears expenses of grid connection</li> </ul>	<ul style="list-style-type: none"> <li>Investor is in charge of and bears expense of grid connection</li> <li>Fee for use of cables</li> </ul>	<ul style="list-style-type: none"> <li>Free connection; state performs and finances (but only until 2015)</li> </ul>
<b>EIA</b>	<ul style="list-style-type: none"> <li>Performed before call for tenders</li> <li>Financed by state</li> </ul>	<ul style="list-style-type: none"> <li>Performed before auction</li> <li>Financed by investor</li> </ul>	<ul style="list-style-type: none"> <li>Performed in continuation of tender round</li> <li>Financing is split between state and investor</li> </ul>	<ul style="list-style-type: none"> <li>Performed in connection with application</li> <li>Financed by investor</li> </ul>
<b>Regulatory procedures and planning</b>	<ul style="list-style-type: none"> <li>Streamlined one-stop shop</li> <li>Detailed plan basis</li> </ul>	<ul style="list-style-type: none"> <li>Approx. to one-stop shop</li> <li>Detailed plan basis</li> </ul>	<ul style="list-style-type: none"> <li>Individual permission procedures, but work on one-stop shop</li> <li>Limited plan basis</li> </ul>	<ul style="list-style-type: none"> <li>Detailed plan basis</li> </ul>

The Danish model in several areas appear more attractive than the Dutch model as free grid connection and EIA as well as fixed subsidy settlement weigh relatively high in the investors' financial assessments. In Denmark, the subsidy scheme is thus not subject to a ceiling as is the case in Holland, and it is also more stable as it is not influenced by fluctuations in the price of electricity. In return, the timeframes are somewhat more reasonable in Holland than they were for the Anholt call for tenders which in combination with the multi site nature of the call for tenders and the free choice of sites was a contributory factor to the higher number of tenderers at the most recent auction round in Holland.

One of the more crucial areas is the overall financial incentives for the investors to invest in offshore wind farms. As appears from the table, it is very difficult to compare because it is constituted by many different subsidy components as well as supplementary penalty provisions and in some events also tax and depreciation rules with significance to offshore turbine investments. In addition

to this comes the financial significance of the market volume and related synergies as well as the value of grid connection and an efficient process for licences.

However, Deloitte has performed business case calculations of what the consequences would be from investing in the same offshore wind farm under the British and Danish subsidy schemes, respectively, applicable by the end of 2010:

- When adjusting for the increased risk of investing in an offshore wind farm under the British subsidy scheme where settlement varies with the market price of electricity as well as the market price of ROC certificates, the total return for the investors will only be higher than what can be achieved under the Danish scheme if it is assumed that the development in ROC prices as a minimum follows inflation.
- The overall discounted burdens to the state/electricity consumers of the granted public subsidy on top of the electricity price as well as grid connection are somewhat the same in Denmark and Great Britain.
- The marginally better conditions for the investors in Great Britain especially owe to the market price of electricity being higher in Denmark now and in the years to come.

The assessment thereby is that the British model in the present shape is the most attractive one, but that settlement at Anholt level gives almost the same return for investors when adjusting for the higher risk in the British model.

Whether this will also apply in future, however, depends on the financial implications of the coming adaptations in the British settlement model as well as how the tender conditions and the competitive situation develop in Denmark. For the German model, the subsidy level after 2015 is presently not cleared.

## 1.4 The competitive conditions on the international market

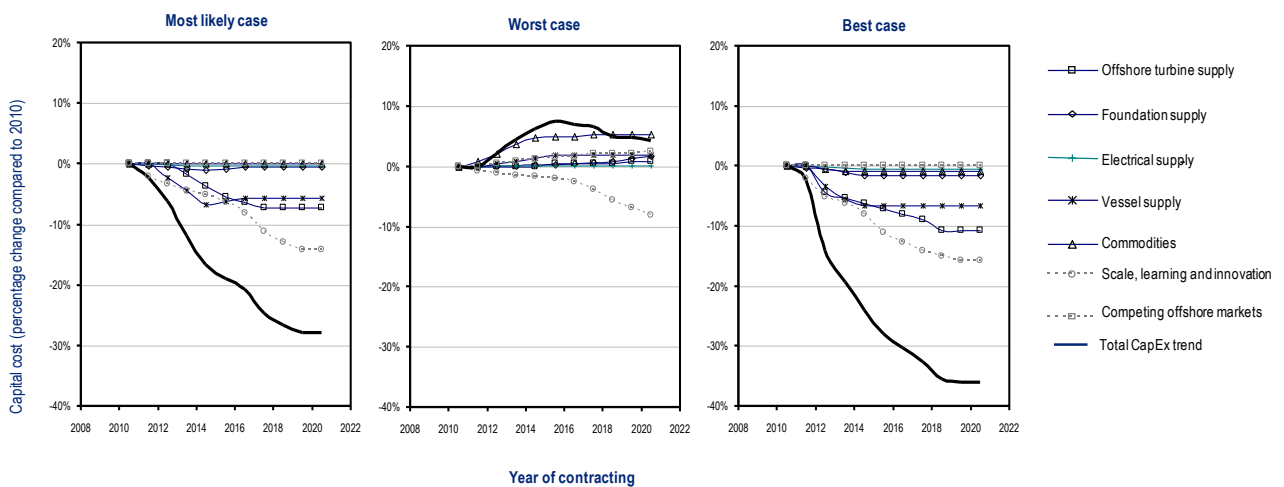
In the following, the results of the analysis of the competitive conditions on the international market for project development of offshore wind farms as well as the competitive conditions in the different parts of the supplier chain for offshore wind farms have been summarised. The section is a summary of comprehensive international market analyses – including conditions relating to supply and demand – within the individual markets.

### 1.4.1 Expectations of the supplier markets in the supply chain

The capital costs of an offshore wind farm are driven by a number of different market factors, for instance, calls for tenders for offshore turbines, foundations and installation capacity. On the basis of the historic development in prices of the market factors, present trends in relation to the market factors and an assessment of the development in supply and demand for offshore wind farms, a projection has been made of the market factors' influence on the capital costs.

Figure 1.1 shows three projection scenarios: *Most likely case*, *worst case* and *best case* of the capital costs of an offshore wind farm until 2020. On the basis of a *most likely* scenario, it is seen that the capital costs could be reduced by 28% in 2020 viewed in relation to 2010 measured in fixed prices. The capital costs, however, may drop by up to 36% in the *best case* scenario and increase by up to 4% in the *worst case* scenario. On the basis of the *most likely* scenario, it is furthermore seen that the calls for tenders for foundations and electricity infrastructure will see a stable development in supply and demand in the next 10 years while the supply of offshore turbines is most likely to exceed the demand and thereby affect the capital costs of an offshore wind farm in a downward direction. Scale, learning and innovation will furthermore have a beneficial effect on capital costs.

**Figure 1.1 Most likely case, worst case and best case for the development in capital costs**



Historically, ”imbalance” of supply and demand in the supply chain has driven capital costs upwards. The most likely scenario indicates that the capital costs of offshore wind farms will drop in the next ten-year period.

### 1.4.2 Expectations of the international and Danish markets for expansion of offshore wind farms

The market for expansion of offshore wind farms consists of a supply side by way of national states’ calls for tenders for concessions for establishment of offshore wind farms as well as a demand side by way of project developers in demand of concessions and related areas for expansion.

On the basis of the interviews performed with potential investors and the analyses of the international markets for offshore turbines, a number of basic expectations can be set up for the future competitive situation.

#### The general investor interest

Deloitte assesses that increased competition cannot be expected about the concession for the next large wind farms in Denmark unless as a minimum a change takes place in relation to the conditions about timeline and tying of other tenderers than the winner which applied to the Anholt call for tenders. If the timeframes and the contractual conditions are arranged more flexibly, it will be

more attractive to certain European energy companies to submit tender. How high the number of tenderers will actually be will especially depend upon the following conditions:

- When and under which actual conditions Kriegers Flak is put up for tender as well as the further expansion plans for subsequent offshore wind farms in Denmark.
- Which additional changes are performed in the Danish tender model and the related framework conditions (apart from adjustment of timeframes and contractual conditions).
- How the demand for expansion of offshore wind farms develops in the competing international markets. If Holland, Spain and France increase the expansion pace to reach their targets, and the ongoing massive expansions in Great Britain and Germany as expected fulfil the interest in additional offshore wind farms of several of the large energy companies, it will require relatively more attractive conditions in Denmark, if the next large offshore wind farms are to attract more tenderers.
- How the competitive conditions develop in the most important markets in the supply chain. The more competition and the more beneficial tender conditions and prices on the markets for wind turbines, foundations and installation vessels, the less risky it will be to invest in offshore wind farms, and the more energy companies and financial investors will want to submit tender for the large Danish and foreign offshore wind farms.

### **Energy companies**

Deloitte expects that it will still predominantly be energy companies that submit tenders for project development of Danish offshore wind farms. The energy companies have the necessary experience, competences and value optimisation potential in relation to their remaining business – energy production and construction and operation of energy infrastructure – to want to assume responsibility and the capital ties for the construction of the parks.

In the short term, the British "Round 3" expansion has to some degree fulfilled potential investors' interest in calls for tenders for offshore turbine. A number of energy companies, however, will still have room in the portfolio to commit to a number of additional offshore turbine projects towards 2020. Besides, a few new, especially Asian, energy companies are expected to enter the European markets for offshore wind farms within the same period. Furthermore, it is to be expected that the development will go in the direction of energy companies forming new company structures and finding new ways of structuring the financing of the offshore turbine projects.

### **Pension funds and other financial investors**

In Denmark, there are several examples of pension funds having contributed to the financing of offshore wind farms, including Pension Danmark's commitment in Rødsand (Nysted), where according to agreement with DONG, a significant ownership share has been acquired in the *post construction* phase, and recently PensionDanmark's and PKA's acquisition of half of Anholt Offshore Wind farm at DKK 6 billion.

Several of the interviewed parties assess that within the nearest future there is not much chance of the Danish pension funds becoming co-investors already in the concession and establishment

phases. According to interviews, the pension funds see great risks in construction of offshore wind farms and therefore generally do not wish to step in as co-investors before the parks have been taken into operation or at least after the more risky parts of the establishment phase are done.

In return, it seems that investment banks and mortgage credit institutions will increasingly give offshore turbine projects access to cheap loan capital as risks on establishment of offshore wind farms are reduced and the competition between financing institutions has increased in this area. Accordingly, Nykredit has recently announced publicly that the company is ready with new financing models for both onshore and offshore wind turbines.

## 1.5 Business case for an offshore wind farm at Kriegers Flak

The object of the business case is to analyse the influence of varying market and framework conditions on the investors' behaviour and return potential to thereby give insight into the dynamics that affect the settlement price. The analysis is structured on the basis of how a potential investor will prepare a business case for Kriegers Flak. The result of the analysis, the business case, could subsequently enter as basis for planning calls for tenders for offshore wind farms in Denmark.

A base case has been prepared which comprises the expected capital expenditures, income and expenses on establishing and operating Kriegers Flak.

The base case is structured on the basis of a number of central assumptions of which the most significant ones have been presented in table 1.2. For a detailed review of all assumptions in the business case, please refer to the main report.

The business case is structured on the basis of an NPV model ("Net Present Value model"), by which the future income, capital expenditures and costs are discounted at a rate reflecting the project risk to the investor (i.e. cost of capital).

**Table 1.2 Central assumptions for base case**

Parameter	Assumption	Comment
Operating period	Runs over 25 years	• From the park is fully grid connected
Time horizon on establishment	Awarded in 2015 and fully installed by the end of 2019	• Feasibility studies performed in 2015-2017 • Foundations mounted in 2017-2018 • Turbines installed 2018-2019
Bottom conditions	Constituted by sand and gravel	• Due to uncertainty of bottom conditions, a buffer of 30% has been included
Capacity	Assumed capacity of 600 MW	• Capacity is put up for tender via a single site model
Date of measurement	Settlement price calculated at 1 January 2015	• After this, the value is discounted back to 2010 prices
Turbines	Constructed with 6.0 MW turbines	• A scenario calculation has been performed of a 3.6 MW technology
Price addition	The fixed tariff is given for the first 30 TWh	• The level is based on an upscale of the conditions from Anholt Offshore wind farm
Feed-in tariff and balance sheet costs	Feed-in tariff has been fixed at 3.0 DKK/MWh Balancing costs have been fixed at 23 DKK/MWh	• The stated costs are in 2010 prices
Capital expenditures	Calculated at DKK 10.0 billion in 2010 prices	• Of this, 53% constitutes purchase of turbines

### 1.5.1 Weighted Average Cost of capital

The Weighted Average Cost of Capital (WACC) is an important element in connection with an assessment of the profitability of the business case. The WACC in base case has been estimated at 7.9% after tax based on benchmarking with comparable investment opportunities, industry and analyst reports as well as the interviews performed.

The applied WACC in base case is 1.1 percentage points lower than the WACC applied for the third party assessment relating to Anholt Offshore wind farm, which is primarily attributable to two factors. Firstly, a reserve has been recognised in the capital expenditures for Kriegers Flak, which is not the case in the third party assessment of Anholt Offshore wind farm. This reserve compensates the additional risk in the construction period. Secondly, the penalties and timeframes for the call for tenders for Kriegers Flak are expected to be less strict compared to the Anholt call for tenders, which means that the business case does not include risk premium as a consequence of exceeding deadlines, etc.

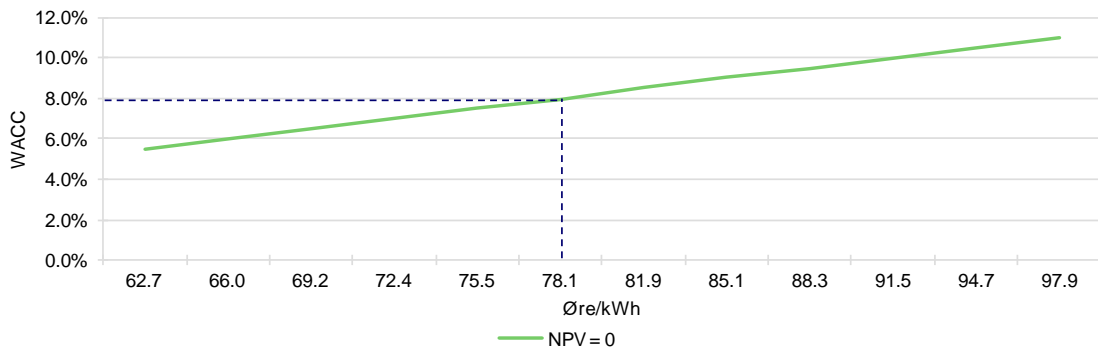
Furthermore, calculation has been made of the expected settlement prices if the investors' internal rate of return is at the same level as so far observed in the market, i.e., with a premium of 2 – 3%-point above the applied WACC.

### 1.5.2 Result of base case calculations

On the basis of the presented assumptions, the base case of the analysis results in a minimum settlement price of 78.1 øre/kWh in 2010 prices for the production of the first 30 TWh.

The minimum settlement price is the price which is expected achieved in intensive competition and which just ensures the winning investor the necessary return (7.9%), but no value above this (NPV=0). In the WACC of 7.9%, a risk premium of 1.5% has been recognised, which is assessed to be appropriate for an offshore wind farm at Kriegers Flak.

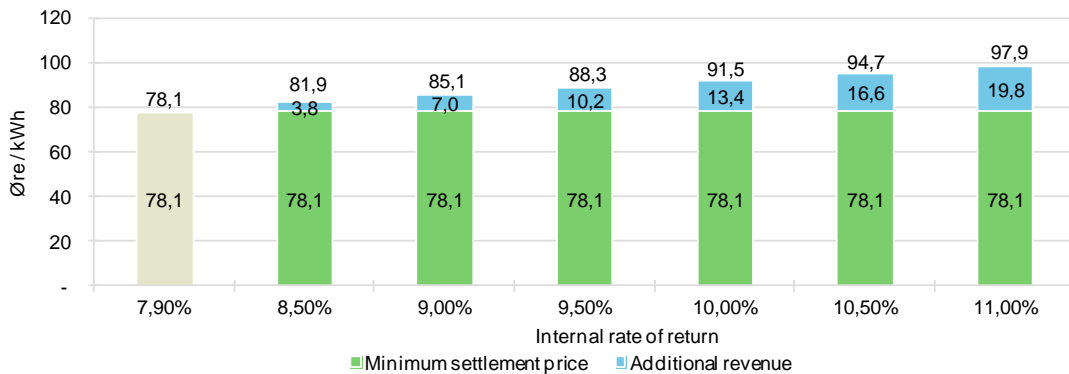
**Figure 1.2 Relation between settlement price and WACC**



The analysis has discovered that in recent years the investors have been able to achieve an annual return on their investment of 2-3%-points above the applied WACC. If the analysis is based on a return requirement of 11%, the settlement price will increase to 97.9 øre/kWh. If the WACC is fixed at 7.9% and the settlement price is equal to 97.9 øre/kWh, the investor achieves an additional return of 3.1% per year, i.e., a positive NPV.

The relationship between the investor’s WACC and internal rate of return (IRR) has been illustrated below.

**Figure 1.3 Settlement price on varying return**



In total, the business case results in an expected settlement price at the interval 78.1-97.9 øre/kWh in 2010 prices.

The degree of competition between potential investors will be a significant factor for determining how high the requirement of extra return will be for the lowest bid, and thereby how high the settlement price is expected to be in the above stated interval. The higher the competition, the better the potential for finding a winner who will construct at a lower return/price.

However, the final price is also sensitive to a number of other matters, including especially the competitive situation from offshore turbine projects in other countries, the development in market price of electricity, the price development in the supply chain and thereby the capital expenditures as well as the level of the current operating costs. Accordingly, there is no guarantee for the price being placed within the stated interval.

The reasons for the settlement price being expected to drop in relation to the most recent call for tenders in Denmark are the following:

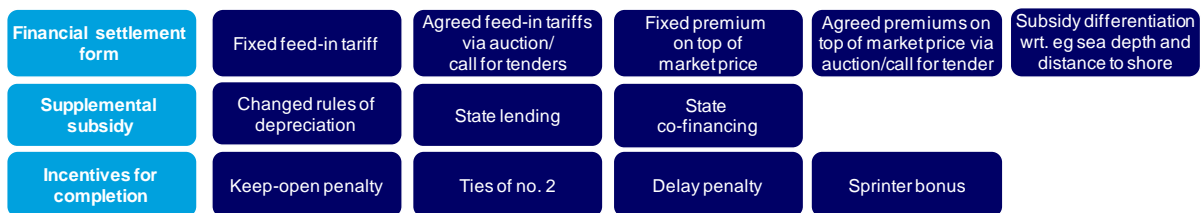
- The capital investments per MW are expected to be lower on the basis of an expectation of declining prices on the supplier markets (see figure 1.1).
- Kriegers Flak is established with 6.0 MW turbines, which is a more cost efficient technology compared to the 3.6 MW turbines in Anholt Offshore wind farm.
- Investor achieves a number of economies of scale as a result of a larger installed capacity at Kriegers Falk (600 MW vs. 400MW in Anholt). This entails savings especially on project design, installation and operating expenses per MW.
- Finally, a longer timeframe has been assumed for establishment of Kriegers Flak, which reduces the investor’s risk and thereby the final settlement price.

The influence of varying market and framework conditions has been illustrated through a number of scenario and sensitivity analyses. Among other things, the analyses discover the specific economies of scale of larger park capacity as well as synergy effects of nearby parks. The results of the scenario analyses appear from the main report.

## 1.6 Financial framework conditions

Deloitte has performed an assessment of which financial settlement forms, supplemental subsidy mechanisms and incentives for completion are most appropriate to apply for ensuring a future expansion of offshore turbines on attractive conditions for potential investors as well as for the electricity consumers.

**Figure 1.4 Alternative framework conditions for the financial superstructure**



In all four primary EU schemes for expansion of offshore turbines (Great Britain, Germany, Denmark and Holland), subsidies related to the settlement price of the produced electricity is the bearing element in the financial incentives for establishment of offshore wind farms whereas other types of subsidy, such as beneficial tax rules, investment grants and loans on favourable conditions, have either been waived or play a more secondary role.

### 1.6.1 Price subsidy relating to electricity production

Price subsidy relating to production volume ensures a transparent financial model for offshore wind farms and enables comparisons of competitiveness in connection with auction rounds and tender competitions where energy companies bid on the concession with an amount for the subsidy

settlement they require to establish and operate the proposed offshore wind farm. Price subsidy attached to the produced volume of electricity by way of increased fixed tariff over a given number of years (alternatively for a given electricity volume) also gives an extra incentive to efficient production as it will be a benefit to produce as much electricity as possible during the subsidy period (alternatively producing the agreed electricity eligible for subsidy as quickly as possible).

A percentage investment award or tax benefit will generally not create the same incentives for efficiency as price subsidy for the production unless they are differentiated in relation to the efficiency of the technologies which may be difficult. In addition, larger public and private transaction costs are to be expected in relation to management of investment grants and tax rules than for subsidy settlement directly related to the electricity production.

### 1.6.2 Fixed feed-in tariffs

Fixed feed-in tariffs (uniform fixed tariffs) represent a price adjustment model by which the price subsidy for electricity production from offshore wind farms has been stated, and where the project developers focus on determining the offshore turbine capacity that maximises their profit.

Fixed feed-in tariffs give high security for the project developers as to the future earnings for the produced electricity as all electricity fed into the grid in the first many years is settled at a fixed tariff that appears from the current national sets of rules on the area. As such, there is no sensitivity towards fluctuations in the price of electricity in the period in which the fixed tariff applies, nor possibility for above-normal profit if the price of electricity should suddenly rise drastically.

So far, uniform fixed tariffs have predominantly been applied in connection with open door models for award of offshore turbine concessions such as, for instance, in Germany. Viewed in relation to an open door model where the project developers find and propose suitable sites and achieve concessions on a first come, first served basis, a uniform fixed tariff has the advantage of encouraging the investors to find the sites that are most cost efficient with respect to capital and operating expenses viewed in relation to the production potential.

One of the most significant disadvantages of fixed feed-in tariffs is that the authorities by reason of insufficient knowledge about the actual costs of establishment of offshore turbines may fix the tariff too high or too low so that either too high or too low capacity expansion is realised. However, there is nothing stopping the regulating authorities from performing adjustments over time of the level of the fixed tariff if the requested expansion cannot be achieved. However, there will be transaction costs connected to the tariff adjustments under price adjustment, which is intensified by the fact that it will be necessary under any circumstances to currently adapt the tariffs over time as the cost conditions in the market change.

### 1.6.3 Agreed fixed tariffs via auctions or calls for tender

As alternative to fixed feed-in tariffs, the authorities may select to regulate the offered amount of offshore turbine capacity instead of the settlement price. So far, two alternative models have been applied for this:

1. Agreed tariffs fixed through auctions (the Dutch model). Here, the tariffs are not stated in advance, but determined through auctioning of a certain amount of capacity. In such auc-

tion model, the project developers maximise their profit by offering a price as well as an amount corresponding to one or several sites they propose in due consideration of their expectation of the competitors' behaviour and the total capacity ceiling of the auction.

2. Agreed tariffs fixed through individual calls for tender of sites (the Danish model). Viewed in relation to the Dutch model, it is a matter of tighter regulation as the state defines the location, capacity volume and certain other characteristics of the sites put up for tender. Contrary to the Dutch auction model, the project developers thereby do not determine the amount they offer, but only an agreed price which is expected to maximise the project in due consideration of the competitors' expected tender behaviour.

Common for the agreed tariffs is that they are determined dependently of the outcome of the performed auctions or calls for tender as concessions are awarded and tariffs are determined on the basis of the lowest incoming tenders for settlement price. As such, the authorities discriminate in terms of price from site to site with respect to the tariffs contrary to the uniform fixed feed-in tariff.

One of the stated arguments of applying an auction model with price discrimination among the individual sites is that it would, to a higher degree than the fixed price adjustment, ensure that the state and thereby the electricity consumers will not pay too much subsidy to the project developers of offshore wind farms. This, however, fully depends on whether there is sufficient competition between the project developers about winning concessions. In this connection, there are some special challenges of the quantitative regulation models where the price is not known in advance, but depends on the outcome of the auction or the tender competition.

- Firstly, so far there is quite limited competition among the energy companies on the international market for establishment of offshore wind farms. The limited competition entails a special challenge to the pricing within the quantitative regulation models as a reduced supply from the energy companies will lead to significantly higher prices than expected as was the case for the latest auctions in Holland and France.
- Secondly, auctions or calls for tenders with biased focus on the lowest offered price will have more difficulty in retaining a sufficient degree of competition in the tender side because, other things being equal, it is less attractive to the investors than a suitable fixed feed-in tariff that opens up to better earnings potential for the most profitable sites. Thereby, there is a risk of the tender curve changing upwards and prices increasing as the tenderers drop out of markets based on quantitative regulation in favour of alternative markets with more attractive conditions.

#### 1.6.4 Price regulation vs. quantitative regulation

Based on the analyses performed, no clearcut general conclusion can be drawn as to price regulation or quantitative regulation (including the auction model or the tender model) for generating the highest socio-economic profit. The table below shows the conditions under which one or the other basic model will be more efficient.

**Table 1.2 Factors conditioning whether price or quantitative regulation is more efficient**

Price regulation (fixed feed-in tariffs) will be relatively more efficient if:	Quantitative regulation (the auction model) will be relatively more efficient if:
<ul style="list-style-type: none"> <li>• The state's and the consumers' demand for offshore turbine capacity is relatively inflexible (flat demand curve), for instance, if many sites are to be established to reach the targets</li> <li>• Competition in terms of calls for tenders with respect to project development of offshore turbine parks is limited to a few, large companies</li> <li>• Regulating authorities have fairly good knowledge of the companies' marginal costs and capacity or possibilities of adapting tariffs as they gain better knowledge of this</li> </ul>	<ul style="list-style-type: none"> <li>• The state's and the consumers' demand for offshore turbine capacity is relatively flexible (steep demand curve), for instance if only few sites are to be established to reach the targets</li> <li>• The competition in terms of calls for tenders with respect to project development of off shore turbine parks is relatively intense</li> <li>• The tenderers are not pressed so much on price that it will undermine competition in the long term because they leave the market for other markets with more attractive conditions and</li> <li>• There are great uncertainties as to the companies' marginal costs and capacity</li> </ul>

If the demand and the targets are of such nature as to make it given in advance that only few large sites are to be established, it will not make sense to try to determine a fixed feed-in tariff as it will be difficult to hit a level which is as suitable as the prices that can be found by putting them up for tender. Besides, there is a risk of a political negotiating game arising as to the tariff between the state and the project developers, in which the latter attempts to force the authorities to raise the tariff by not proposing sites until it happens. In such events, quantitative regulation and call for tenders with price competition will be preferable.

If, on the contrary, many and relatively homogenous sites are to be established, there will be benefits from fixed feed-in tariffs applied in connection with an open door model. First of all, the transaction costs will be lower by awarding concessions at a fixed price according to an open application procedure instead of performing calls for tenders with related price competition for every site. Tender rounds where concessions are awarded to a larger number of sites in one round, however, could be a possible solution for limitation of the transaction costs.

Secondly, there will be benefits from controlling the price instead of the quantity when many sites are to be established. This especially applies if there is limited competition on the site put up for tender with respect to project development of offshore wind farms. If many sites are to be established and there is limited competition, quantitative regulation may result in the state accepting much higher prices or reducing amounts significantly in relation to plan as it was for instance the case in the state auction/tender rounds in Holland and France.

As the situation is in Denmark at present, only few sites are to be established to reach the targets until 2020. This speaks in favour of agreed tariffs via controlled calls for tender constituting a more robust model than fixed feed-in tariffs in relation to ensuring the socio-economically optimum expansion rate. On the other hand, it is to be expected that the market for establishment of offshore wind farms will also in future be characterised by relatively limited competition among few, large European energy companies. If in future a significant increase of the expansion rate is to take place in Denmark and many new offshore wind farms are to be established in a short period of time, it

may be relevant to consider a fixed feed-in tariff model for offshore turbines as it is known from Germany and which Great Britain is also introducing, however, more specifically by way of fixed feed-in premium.

### 1.6.5 Fixed tariff versus fixed premium on top of the market price

In Denmark and Germany, fixed tariffs are applied – a general fixed feed-in tariff in Germany and agreed fixed tariffs for the individual sites in Denmark, respectively – which in both events take the place of the price of electricity and thereby give the investors a high degree of certainty for the settlement of the produced electricity. In Holland, agreed fixed tariffs are also applied, but in reality they are much less fixed than in Denmark as the settlement system entails fluctuations above or below the fixed tariff in the event of the market price of electricity going above or below certain limits. Contrary to this, the settlement system for the Danish open door model for onshore and near-shore turbines is based on a fixed premium on top of the market price for electricity, i.e., the total settlement varies with the development in the market price of electricity. The British settlement model with VE certificates also functions as a premium on top of the electricity price.

The conclusion is that a fixed tariff is preferable to a fixed premium as first of all it reduces the risk of fluctuations in the price of electricity, and thereby, encourages the individual investor to determine a somewhat lower return requirement and thereby a lower offered tariff than what would have applied with a fixed premium. A further argument for the fixed tariff is that it has a tendency to evening out the fluctuations in the consumers' prices of electricity as the subsidy up to the fixed settlement price will fluctuate opposite to the market price of electricity whereas the subsidy under a fixed premium is constant and thereby will not change with fluctuations in the price of electricity.

Potentially, a fixed premium on top of the market price for electricity would entail the benefit that it to a higher degree would encourage the owner of the offshore wind farm to produce electricity when the market price and thereby the demand for electricity is high and inversely when it is low. As the production is subject to the wind conditions and the electricity cannot yet be stored, however, it is not practicable to react to these price signals. Thereby, there are no strong arguments for preferring a fixed premium.

## 1.7 Analysis and selection of tender models

The tender models are to contribute to ensuring that:

- Sufficient capacity expansion and production of wind energy is performed in accordance with political targets. This means that the models are to be sufficiently attractive for energy companies and investors to bid on concessions and in continuation thereof to handle the establishment of the offshore wind farms.
- The capacity expansion and production is performed at the lowest possible costs, including the lowest possible price for the electricity consumers and the lowest possible public costs. The tender models should thereby be composed in such manner as to ensure sufficient competition, but that the competition is not performed at the expense of a subsidy scheme with too high public costs. Hereby, the price per unit of wind energy is kept sufficiently low.

The figure below illustrates which selections in connection with development of tender models are to be considered. The light-blue boxes represent primary elements which the tender models basically consist of, and the dark-blue boxes represent different varieties and/or outcome boxes of actual main elements.

**Figure 1.5. Selection of core conditions on development of tender models**



In connection with selection of tendering procedure, it is important to be aware of the fact that concessions on the construction area are exempt from the common form rules of the Public Procurement Directive, see section III of the Public Procurement Directive. The fundamental principles of EU law about equal treatment, transparency, etc. still apply, but in addition to this, there are only few requirements of procedure for concessionary contracts. In spite thereof, it may be an advantage to operate within one or perhaps a combination of several of the known tendering procedures. Thereby, it is ensured that the procedure is transparent and known to both commissioning party and tenderer.

The tender models have been developed on the basis of Deloitte’s interpretation of the Public Procurement Directive as well as practical experience in performance of calls for tender. The actual shape and practical performance of the tender models are to be carried out in cooperation with the attorney to the Government.

In the following, the analysis of the three identified tender models is summarised.

### 1.7.1 The single site tender model

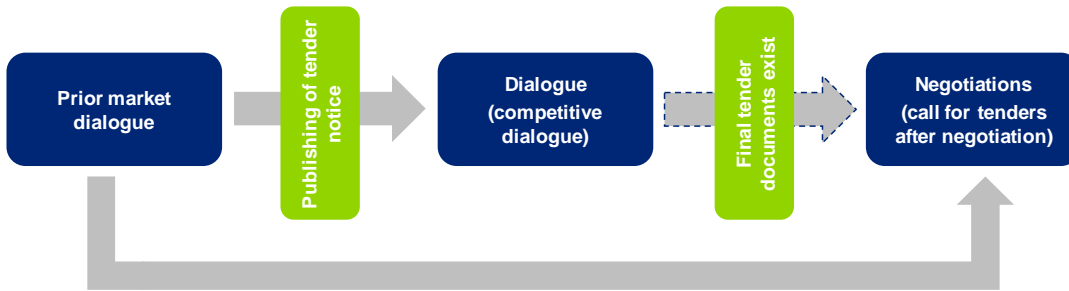
The single site tender model is characterised by the commissioning party putting one specific geographic area up for tender within which tenders can be submitted for constructing an offshore wind farm. In Denmark, so far three calls for tenders for offshore wind farms have been performed, and all these three calls for tenders have been based on a single site tender model.

In connection with interview of potential investors, it has been expressed that dialogue and/or negotiation with the Danish authorities is preferable to a model without such possibilities. A prior dialogue partly loosens up this issue, but it is the assessment that direct dialogue and negotiations with the individual tenderer is more committing and thereby has greater effect on the investors’ perception of the Danish market.

On the basis of the above, it is Deloitte’s assessment that within a single site tender model, procedures should be composed which ensure sufficient dialogue and negotiation options. If relevant, it

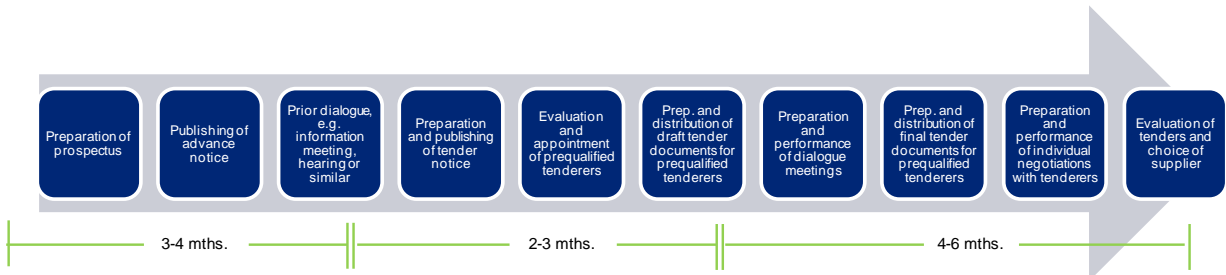
may be selected to use dialogue as well as negotiations, or it may be selected only to make use of this one type. However, it is important to the tenderers to clearly inform of which procedure is applied. If a dialogue is requested about the tender documents, the procedures from competitive dialogue can advantageously be applied, and if negotiations are subsequently requested about the investors' tenders, the procedures from call for tenders after negotiation can be applied. The figure below shows these options for combinations.

**Figure 1.6. Steps for dialogue with the market**



If a model is applied where dialogue as well as negotiations with the tenderers are requested, the activities for the public commissioning party will be as stated in the figure below.

**Figure 1.7. Activities for the commissioning party on single site tender with dialogue and negotiations**



If prior dialogue is conducted with the market before the formal tender process is initiated, and the tenderers are subsequently invited to a dialogue about the tender documents as well as negotiations about the actual tenders, it is the expectation that it will take around one year before a contract can be signed with a supplier. The time consumption will depend upon how much prior dialogue is requested, and how many dialogue and negotiation meetings are performed.

Apart from the above proposals for change of procedures for a single site tender model, it is also Deloitte's assessment that it will be appropriate to change the award criteria on future calls for tenders. In the former tender processes, price has been the only award criterion. This one award criterion has the advantage that it is transparent to all parties exactly what is emphasised on award of concession. However, the disadvantage is that the commissioning party by this method is forced to selecting the least expensive tender for settlement price of the electricity, irrespective of whether other tenders will be able to deliver a better project in socio-economic respect, for instance, because they offer a more attractive timeline or matters that ease the state assignment about grid connection. In addition, a uniform focus on price combined with absolute conditions in any other aspect may very well entail that some potential investors fully abstain from submitting a tender and instead seek towards other and more interesting projects in other countries.

Accordingly, Deloitte proposes that a more nuanced assessment be made of the incoming tenders where other criteria play an important role in the final selection. Accordingly, the financially most beneficial tender should be selected. The offered settlement price, however, should be ascribed relatively more weight than the other criteria. Among the other criteria, it will be especially relevant to involve timeline and milestones for establishment of the park, including documented reliability of delivery as the project developers will often have different options for quick delivery and as this may be of socio-economic significance as well as affecting the offered settlement price.

Further to this, it may in some events be considered to let the project developers' proposals for physical/technical shape enter as criterion. If Kriegers Flak is split up into several concessions, it could, for instance, be relevant to assess which technologies and measures the tenderers will take to limit the state's costs of transformer stations, etc. when performing the grid connection. Measures for securing the highest possible up-time in the operating phase is another parameter that could be considered. However, it should be clarified in the dialogue phase whether such additional award criteria are necessary or it would be handled by the state determining a number of acceptable general conditions to be met by all tenders.

Deloitte's recommendation of shape of the single site tender model if this model is applied for future tenders, can be summarised in the following recommendations (please also refer to overall table of these in the main report): The settlement form should be fixed as is with a fixed tariff determined on the basis of the winning tender. Further to this, the state should also in future be in charge of and paying for the EIA and the grid connection. The potential investors have expressed great satisfaction with these elements in the model, and it is Deloitte's assessment that in terms of socio-economy they provide the best solutions under a single site model.

As mentioned above, the primary changes will therefore be in relation to tender procedure and award criteria. Furthermore, it is proposed that separate delay penalty and ties of tenderer no. 2 be omitted. It should suffice with a keep-open penalty which will trigger if the winning tenderer opts out of the assignment as well as if there is inactivity to such degree that very considerable delay will be seen of the mounting of the first turbine in relation to the timeline. A sprinter bonus would hardly be relevant either for Kriegers Flak given the long planning horizon and spacious timeline, but if in future there is a need for creating special incentives for quick completion, it would be preferable to a delay penalty. If the offered timeframe for completion of the offshore wind farm is included as award criteria, however, it will be relevant with a special delay penalty that commits the tenderer to the tender whereas a sprinter bonus will not be relevant.

### 1.7.2 The multi site tender model

The multi site tender model is characterised by several sites being put up for tender in one process. This will provide the investors with better possibilities of pointing out suitable projects for their portfolio in consideration of synergies with other projects and comparative advantages about the project development for certain geographic areas. A multi site tender round will thereby be able to increase the attractiveness of the market and bringing more tenderers into play, partly because the individual tenderers have greater possibilities of winning at least one concession and creating synergies between projects, partly because, other things being equal, a higher number of tenderers will be attractable, when the total call for tenders has a higher scope.

A multi site model would in principal be possible to shape as a model by which concessions for several individual sites predefined by the state are offered, or as a model, by which the project de-

velopers can more openly make their own proposals for sites within the area which the tender round comprises. In a transitional phase, it may be considered to combine the two models, you could for instance imagine that the already appointed site at Kriegers Flak be divided into two or three concessions that enter in the coming tender round in line with open proposals for sites that are nearer to shore.

A multi site model with open proposals for sites within specific geographic zones and with a ceiling of number of MW has the advantage that it encourages the project developers to finding suitable sites that are more cost-efficient than the ones the state has so far appointed concurrently with the state retaining a significant degree of control of the scope and location of offshore wind farms. The disadvantage is that in such event it will not to the same degree be possible for the state to carry through detailed EIA, etc. of the individual sites before the call for tenders by which the costs and the risk are transferred to the project developers.

A multi-site model with open possibilities for proposing sites within geographic zones, however, has so far only proven to work in the British tender round 3. The zones have been appointed by the state as being suitable for offshore turbine projects on the basis of prior research and screening, which increases the chances of achieving licenses for actual sites on the basis of EIA which the state co-finances in continuation of the concession award. The British market, however, is notably larger than the Danish, and therefore Deloitte assesses that it should at least be a concession award of 5-10 Danish sites before a multi site tender round with open proposals within geographic zones is relevant. This may become real if synthesising with tender of more near-shore offshore wind farms is made, and/or if the Danish targets for capacity expansion of offshore wind energy is increased in future.

In order to improve the basis for proposing actual sites within the geographic zone or zones to be included in the call for tender to the best possible extent, Deloitte recommends that the state perform a thorough screening of the zones in due time before the tender round for the purpose of defining areas where there is a prior expectation of no or only limited problems in relation to environmental and natural protection considerations, reserves, sailing routes and other conflicting area interests. This will be supplemented by the project developers' own feasibility studies as a part of the preparation of project proposals for the proposed sites. Before final license for establishment of offshore wind farms can be awarded, it will also be necessary to conduct a full EIA of the proposed sites. The costs of the full EIA could, as in Great Britain, be divided between the state and the project developers who have been awarded concession conditional upon subsequent environmental approval.

As under the single site tender model, it is Deloitte's assessment that a prior dialogue should be performed with the market before the formal tender process is initiated. Since multi site tenders are comprehensive and make specific requirements of the commissioning party as well as the tenderer, it is also the assessment that, also after the formal tender process has been initiated, there should be as much dialogue and negotiation as possible. As under the single site model, it is also Deloitte's assessment that there should be competitive dialogue as well as subsequent negotiations with the tenderers about the proposed sites.

Since it should be expected that several independent tenders are to be handled, multi site tender processes will be more time-consuming than single site tender processes. However, it should be noted that considerable synergies can be achieved in planning and performance of the tender pro-

cedure, as several concessions can be awarded at once instead of one site at a time being put up for tender at years' interval.

The dialogue with the potential investors about the actual tender documents may for instance include themes such as probability of subsequently achieving of environmental approval for the proposed site, timelines for establishment and documented reliability of delivery, proposals for technical/physical shape, consideration about grid connection and purchase of the produced electricity, and other socio-economic advantages and disadvantages related to the geographical location of the proposed sites (especially if any of them are nearer to shore). These themes should be reflected in the award criteria so that the concessions are awarded to the financially most beneficial tender on an overall assessment.

The multi site tender model stands out from the single site model by applications being made for several sites at once, and accordingly, it is recommended that the price will have less weight than under the single site model. The price can still advantageously be made subject to most weight among the set-up criteria, but the other – including not least probability of achieving environmental approval and documented timeline and reliability of delivery for the offshore wind farm – should be given relatively more weight than under the single site model.

Provided that it be decided to proceed with a multi site model for the expansion of offshore turbines in Denmark, it is Deloitte's assessment that the tender model should overall have shape and related framework conditions as described above. As for the single site model, the financial framework should be a fixed tariff which is agreed on the basis of the incoming tenders. As the project developer is responsible for proposing a given site and the financial implications thereof, it is furthermore Deloitte's assessment that the project developer should pay Energinet.dk or other supplier for performing the grid connection as well as assuming a considerable part of the costs for financing of the subsequent EIA.

### 1.7.3 The open door model

The open door model stands out from the single site and multi site models by the concessions not being put up for tender. Instead, the project developers apply with the Danish authorities for access to constructing offshore wind farms on sites, which they have identified themselves. It also applies to the open door model in Denmark that a mandatory fixed premium has been defined which the project developers are guaranteed on top of the market price of electricity for a given period if they are awarded and utilise the site applied for.

As appears from *Offshore Wind Turbine Action Plan 2008*, the state has appointed a number of sites which have been assessed as being the socio-economically most suitable sites to apply for utilisation of wind energy. However, it cannot be assumed without a second thought that all relevant sites have been identified and several potential investors have acknowledged that they consider it an advantage if they are able to identify and develop sites themselves. As applicable to the multi site tender model, it is Deloitte's assessment that the open door model should be delimited to certain zones with a ceiling to number of MW, as it is hereby ensured that the expansion be performed at the proper pace in relation to the determined political targets.

The open door model is applicable to further offshore and near-shore zones, though especially in relation to the settlement form, a change in relation to the present model should be considered if the model should also promote the expansion of offshore wind energy further from shore as well as

in the near-shore zone. Firstly it is recommended that a fixed tariff be made applicable which is not sensitive to the development in price of electricity as is the fact today where the project developers receive a fixed premium on top of the current market price of electricity.

Under an open door model, the project developers initially apply for permission for feasibility studies which will also comprise EIA with respect to an offshore wind farm. After this, the actual application is submitted, including results of the feasibility studies to the authorities after which it will be relevant to conduct a number of dialogue activities. Contrary to single site and multi site models with formal calls for tenders there will be less dialogue and negotiations and thereby a correspondingly lower resource consumption. The dialogue will for instance concern timeline for establishment of the offshore wind farm, the actual physical shape, grid connection conditions, etc.

Presently, the first come, first served basis is applied for the open door model which entails that the one first applying for an actual site is basically also awarded a concession. This model should be maintained in the short term. In the longer term, it is Deloitte's assessment that efforts should be made to creating a model for which the award is to a higher extent based on an assessment of objective factors, including, for instance, timelines of establishment and documented reliability of delivery, proposals of technical/physical shape, considerations for grid connection and purchase of the produced electricity, etc.

Apart from the above, certain changes are recommended in relation to the model which is presently applied for open door in relation to onshore turbines. The central changes are that the concession award should be delimited to certain geographic zones and within a ceiling of the total number of MW. Besides, the settlement form is recommended changed from a premium on top of the market price of electricity to a fixed tariff which, for instance, is divided into three levels of offshore wind farms in near-shore zone, in mid-zone and in a zone further offshore, respectively. These tariff zones are of course conditional upon it being selected to proceed with an open door model for offshore turbines which Deloitte under the present conditions does not consider realistic or appropriate, see the comparative assessment.

#### 1.7.4 Communication with the market prior to a call for tender

Establishment of offshore wind farms are complex projects which, by reason of current technical development, changes in the supplier situation, changes in financial cycles, changed public investment potential, etc. make great requirements of determination of framework and conditions for preparation of tender materials. In a situation in which massive expansions are made within offshore turbines abroad, it is especially important to ensure that the call for tender arouses sufficient interest with potential investors. In addition, a small country such as Denmark must to a higher degree than large countries be aware of the conditions of the tender documents being sufficiently attractive to domestic as well as foreign potential investors. These factors make it relevant to communicate with the market before the formal call for tender is initiated.

On the basis of the above, it is Deloitte's assessment that irrespective of which tender model is applied it will be appropriate to have a prior dialogue with the market before the formal tender process is initiated.

It is important to keep in mind that an offshore wind farm represents a billion DKK investment for the project developers. The assignment put up for tender is thereby characterised as an investment prospectus viewed in contrast to, for instance, a call for tenders for services to which a supplier can

submit a tender without the same degree of prior considerations for alternative investments, market conditions, financing costs, etc.

Accordingly, Deloitte recommends that, prior to the performance of a call for tenders, a communication strategy be planned and a related dialogue process and a number of information activities aimed at the potential investors be performed, including:

- Preparation and distribution of an advance notice (The Official Journal of the European Union).
- Preparation of investment prospectus applied as a part of the prior dialogue with the investors.
- Holding of information meetings.
- Performance of a hearing round on the basis of draft tender materials.

The above activities will signal that Denmark is open to domestic as well as foreign investors, and that competition is desirable as to the concessions put up for tender. In addition, the commissioning party achieves valuable input for the preparation of tender documents that take into consideration potential tenderers' requests and requirements, including especially in relation to the timeframe for establishment of the offshore wind farm.

## 1.8 Other framework conditions

This section summarises analyses of framework conditions which are independent upon the tender models, but which may be significant to an actual call for tenders for offshore wind farms, including concession size, timelines for establishment, the political plan basis and the degree of state involvement.

### 1.8.1 Size of the concession

Determination of the proper concession size is a weighing between utilising economies of scale on the one hand and creating attractive conditions for potential investors on the other hand.

In connection with large capital investments, it is often seen that economies of scale can be realised in connection with optimisation of processes, organisation, management and sourcing. From scenario calculations on the basis of the business case, it appears that the economies of scale from putting a 600 MW offshore wind farm up for tender in relation to putting a 200 MW offshore wind farm up for tender could potentially reduce the settlement price per KWh by up to 10-15 øre (2010 prices). It therefore seems – from a consideration of economies of scale – more beneficial to put a 600 MW offshore wind farm up for tender than a 200 MW offshore wind farm.

On the other hand, several concessions (e.g., 3x200 MW, 200+400 MW or 2x300 MW) would also represent more possibilities for the investors. The interviewed investors have expressed that it is important that there are several possible investments as well as a fair chance of winning at least one concession, as there are a number of one-off costs involved in investing in the tender process as well as in cultivating a new market.

From the state point of view, a division into several concessions will enable the entry of new energy companies to the market, which may contribute to long-term development of increased competition and spreading of risks in relation to realisation of the parks. Very large concessions (of 400 MW and above) will furthermore be so capital-intensive that it will limit the interest from small energy companies and force large energy companies to a considerable degree of loan financing. This may result in higher return requirements and thereby the economies of scale are reduced for the settlement price to a significantly lower level than as stated above.

The potential economies of scale – including potential savings on the part of grid connection relating to transformer stations – for one large concession are to be compared to the financial benefits realisable through the increased competition which several concessions encourage. Furthermore, a part of the economies of scale will still be landable via operating communities and cooperation between the different concession holders in the construction phase.

In order to ensure an actual weighing of economies of scale to attractive conditions for the project developers by several concessions, Deloitte recommends that the concession size be included in the introductory market dialogue with project developers.

### 1.8.2 Timelines of establishment

For coming calls for tenders for offshore wind farms it will be expedient to operate with a more spacious timeline for establishment of the offshore wind farm than was the case for Anholt offshore wind farm.

On the basis of Deloitte's extensive discussions with players on the offshore turbine area, we assess that there are two significant reasons for a tight deadline affecting the price in an upwards direction.

If the timeline results in insufficient time for conducting negotiations with a sub-supplier, including also reservation of vessels, the negotiation position will deteriorate whereby the capital costs would increase, other things being equal. However, this risk is reduced if the project developer has entered into more fixed framework agreement with sub-suppliers. In the same manner, the price will be pushed upwards if the investor does not have the possibilities for thinking the project put up for tender into its project portfolio as the possibilities for planning of when it is most optimum to initiate the establishment phase, from the investor's point of view, deteriorate. In such situation, the investor will add a risk premium to the price.

In consideration for keeping costs down and ensuring attractive framework conditions, Deloitte accordingly recommends that the timelines for the future offshore wind farms be made spacious with respect to milestones as well as completion. However, in relation to each concession there should be a deadline for setting up the first turbine so that the authorities can plan the capacity expansion in relation to the targets for renewable energy. The project developers have an especially strong incentive for completing the park after having invested significant resources in setting up the first turbine which is why there is no great demand for more binding timelines than this one. Similar to the concession size, timeline and actual milestones may enter in the prior dialogue with potential investors as well as potentially in the award criteria.

For the specific call for tenders for Kriegers Flak, it is Deloitte's assessment that if the process with preparation of dialogue, call for tender and feasibility studies is initiated during 2012 and the

concession(s) awarded no later than in 2015, there will be plenty of time for an offshore wind farm of 600 MW to be established in the period 2018-2020. Such timeframe will also be sufficiently spacious for the project developer to be able to enter into the necessary supplier agreements in a reasonable manner and for ensuring the necessary flexibility in the establishment phase in relation to coordination with other projects.

Further to this, it is considered beneficial to capital costs that establishment of the park not be initiated until after 2015, when the large expansions of the British "Round 3" offshore wind farms are expected to have been purchased, where the large 5-7 MW offshore turbines are expected to be in production, and when the tender situation on the supplier markets will therefore be more beneficial,

### 1.8.3 Political plan basis

The determination of the proper political plan basis for the expansion of offshore wind farms is a *trade-off* between on the one hand signalling attractive conditions for the potential investors and on the other hand not binding the state over a very high number of years as fluctuations in prices of raw materials or the development of technologies for renewable energy will potentially involve more attractive alternatives for achieving the environmental targets than offshore wind energy.

A very concrete signal of the future expansion such as specific expansion plans with number of MW and the precise year of call for tenders over a 10-15 year period – based on a consideration not to tie up the state – does not seem expedient. Furthermore, the state should not commit to a very high number of years (e.g. 10-15 years) for specific individual sites as the chance of meanwhile being able to find even more attractive sites or requests for other expansion of renewable energy than offshore wind will be relatively high.

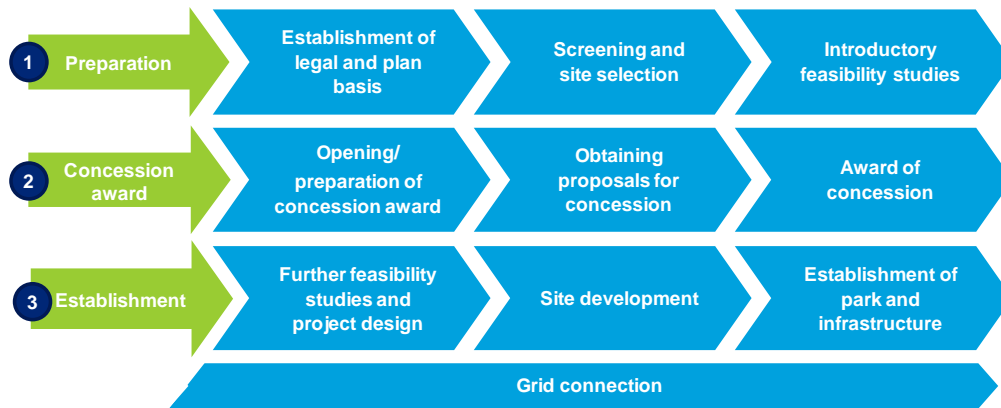
On the other hand, a signal to potential investors will be profitable in relation to creating increased competition for Danish calls for tenders for offshore wind farms. Deloitte accordingly finds it expedient to announce a long-term level of ambition for the expansion with offshore wind. Such announcement needs not be a determined model until 2050, but it will signal a clear direction for the investors. This in combination with the targets for expansion with renewable energy will signal higher reliability for potential energy companies' investment in Denmark.

### 1.8.4 The degree of state involvement

A central consideration on calls for tenders for large offshore wind farms is the degree of state involvement. In the following, analyses and assessments of central potential interfaces between project developer and state are summarised, including advantages and disadvantages of the state playing a more active role with respect to subsidising the expansion.

Different degrees of state involvement can be enlightened on the basis of the state's role in different phases of an offshore turbine project. Figure 1.8 illustrates the overall phases of an offshore turbine project which has been applied in the assessment of advantages and disadvantages of state involvement.

**Figure 1.8 Three overall phases in the performance of an offshore turbine project**



**The preparatory phase**

Deloitte recommends that the preliminary feasibility studies – EIA, preliminary geotechnical research and measurements of wind and wave conditions – be conducted by the state when the call for tenders is conducted according to a single site model. The procurement of the necessary information basis is characterised by a collective benefit which is best maintained in total by the state instead of each investor attempting to procure them individually. Further benefits are that all tenderers are thereby equal as well as that it reduces their risk premium and thereby the tender price, provided that the state’s feasibility studies are sufficiently detailed and timely.

In the events in which the project developers select sites (multi site calls for tender within geographic zones or open door model), it is recommended that the project developers take responsibility for conducting the preliminary feasibility studies for the proposed sites. However, it will be appropriate that the state has introductorily performed a screening of the geographic zones forming the basis of the call for tenders or the applications, especially with respect to definition of areas within which setting up of offshore turbines is not immediately expected to be incompatible with environmental considerations or other conflicting area interests. In relation to multi site tender rounds, it may furthermore be considered that the state and the project developers in cooperation conduct and finance the subsequent EIA of the sites which have achieved conditional concessions.

**The establishment phase**

Deloitte does not assess it to be expedient to let the state be responsible for project design and land development. The disadvantages would be that it may lead to an anti-competitive situation as well as to important synergies in the establishment phase being lost. Furthermore, the state will assume a considerable risk concurrently with the state under any circumstances having to put large parts of the assignments up for tender in connection with land development. The performance of project design and land development as well as the call for tenders for large parts of the assignments also requires a project and market insight which the state, including Energinet.dk, does not necessarily avail itself of.

Also, Deloitte does not assess it to be expedient that the state assumes the full establishment of the future offshore wind farms as it would hamper the competition between private project developers on the market. Furthermore, it will be difficult to recruit and retain the necessary competences. Finally, the state will thereby assume the full risk of the establishment of the offshore wind farms

with resulting risk of fluctuations in prices for the electricity consumers if the costs are higher than expected. There is no reason for assuming that the state should be able to solve the establishment assignment in a more cost-efficient manner and thereby being better at bearing the risk than a private market for project development where the return requirements are instead attempted limited through stimulation of the competition.

Deloitte recommends that the state as starting point conducts and finances grid connection as it reduces the risk for the investors, increases the attractiveness of the Danish market and is cheaper than if the project developer does it. In the events in which the project developer selects sites (multi site calls for tender within geographic zones or open door model), it is, however, recommended that the project developer pays Energinet.dk or other suppliers for performing grid connection as the project developers are responsible for proposing the relevant sites.

With respect to additional degrees of state involvement (operator/co-investor), Deloitte assesses that:

- It will not be expedient for the state to be operator as the state will be competing in an area where there are good competitive conditions and competences which the state cannot match.
- It will not be expedient for the state to be silent co-investor, partly because it may lead to an anti-competitive situation, which will potentially be in conflict with the rules on state subsidy, partly because several potential investors are on their way into the financing of offshore wind farms for which reason there is no reasoned expectation of lack of venture capital.

## 1.9 Concluding assessment

Deloitte has recommended three tender models which are each assessed to be suitable for supporting the future expansion of offshore turbines in Denmark if they are structured on the basis of the recommended framework conditions.

Which tender model is the most suitable in a Danish context depends upon a number of preferences and variable background conditions which can be summed up below:

- The weighing of different assessment criteria (1) ensuring sufficient and suitable capacity expansion, (2) ensuring attractive, pro-competitive conditions and (3) ensuring the lowest possible costs to the state and the electricity consumers.
- The targets applicable from time to time and the demand for offshore turbine capacity in Denmark, including the number and size of sites that are requested established within a given timeframe.
- The degree of competition in the market for establishment of offshore turbines.
- The degree of competition from alternative EU markets with attractive subsidy schemes.
- The degree of uncertainty as to the costs of establishment of offshore turbines.

As the preferences as well as the background conditions will change over time, the recommendation for selection of one model over the other ones cannot be unambiguous. However, the open door model appears to be the least suitable one as long as the Danish targets for expansion of offshore wind farms are limited to relatively few sites within the actual planning horizon.

As appears from the above analyses, as well as the below Table 1.3-1.5 with comparative assessment of the models' advantages and disadvantages within the three central assessment criteria, the following conclusions can be drawn:

- The single site and multi site models are strongest in relation to ensuring sufficient and suitable capacity expansion of which single site is the most suitable one if the need is limited to having offshore wind farms at many years' interval whereas multi site is more suitable if a considerable expansion of the Danish offshore turbine capacity is to be made in several different (preferably 5-10 sites) within a few years. The latter may become relevant if the expansion pace is requested increased or if near-shore turbines are included in a multi site tender round.
- The multi site model basically stands stronger than the single site model in relation to ensuring attractive, pro-competitive conditions and the lowest possible costs to the state and the electricity consumers. Multi site calls for tenders within geographic zones are thereby more attractive to a broader circle of investors due to the open market model where there are several different possibilities of proposing sites which can create synergies in the project portfolio and where there is greater potential for winning a concession. The possibility for proposing more cost-efficient sites than the ones the state has already appointed via the offshore wind turbine committee is another aspect of this model which in the longer term will contribute to creating lower prices for the electricity consumers.
- Multi site calls for tenders within geographic zones, however, have the disadvantage in relation to the single site model that the project developers will see greater risk in relation to the grid connection as well as to achieving environmental approval on the basis of an EIA in continuation of the tender round. Deloitte assesses that it is central to the multi site model's efficiency and the resulting prices that the state conducts a general preliminary screening of the zones which are to be included in the tender round as well as that a pragmatic solution be found for the subsequent EIA procedures, perhaps inspired by the manner in which this has been handled in the British tender round 3.
- The open door model is generally attractive to the investors and entails low transaction costs, but has a number of other decisive disadvantages in relation to the two other models. Firstly, it is difficult to manage the capacity expansion under an open door model as there is generally no control of how much offshore turbine capacity is constructed and when (apart from a potential top ceiling to the capacity). Secondly, an open door model with fixed feed-in tariff entails a particular risk to socio-economic sub-optimisation in the event the capacity ceiling is so low that only very few sites are to be established.

Here, a negotiation game between the state and the private project developers may arise as to the uniform tariff where no sites are established until the state has raised the tariff to a level that risks getting higher than the average of the tariffs which would alternatively appear on individual calls for tenders.

It follows from the above that the open door model would hardly be suitable given the relatively limited number of sites for offshore turbines in pipeline in Denmark. Accordingly, it would be most natural to apply either a multi site or a single site model.

**Table 1.3 Comparative assessment of the models in relation to the criterion of suitable capacity expansion**

	Single site model with award on the basis of price and other criteria, agreed fixed tariff and state-financed grid connection	Multi site model delimited to zones, price and other award criteria, agreed tariff and own-financing of grid connection	Open-door model, first come, first served and rule-bound criteria, fixed feed-in tariff and own-financing of grid connection
<b>Ensuring sufficient and suitable capacity expansion</b>	<p><b>ADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Authorities highly control when and where offshore turbine parks are to be constructed as well as the amount of capacity</li> <li>• The model supports targets of capacity expansion limited to a few large offshore turbine parks at many years' interval</li> <li>• Possibility for especially detailed planning and coordination of grid connection with energinet.dk</li> </ul>	<p><b>ADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Authorities to a fairly high degree control the amount and timing of capacity expansion through the ceiling to number of MW in the zones</li> <li>• Greater incentive for investing in offshore turbine parks than under single site</li> <li>• This model would support significant expansion of the Danish offshore turbine capacity in several different sites within a few years, including integration of near-shore offshore turbines</li> </ul>	<p><b>ADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Authorities to some degree control the amount of capacity expansion through the ceiling to number of MW in the zones (however, zones are more broadly defined than under multi site)</li> <li>• Project developers will have strong incentive for investing in Danish offshore turbine parks if the tariff is sufficiently high</li> </ul>
	<p><b>DISADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Project developers' incentives are more limited under this model than the others which entails a certain risk of individual projects not being realised</li> <li>• If, at some point, a considerable expansion is to be made of the Danish offshore turbine capacity in different sites within a few years, it will be heavy and costly to realise through successive individual calls for tenders.</li> </ul>	<p><b>DISADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• The authorities have somewhat less control of the placement of sites than under the single site model</li> <li>• The model may turn out superfluous if it is still only the ambition to establish few large offshore turbine parks at many years' interval or if no integration is performed with near-shore turbines</li> </ul>	<p><b>DISADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Misestimation of costs and wrong tariff level may lead to too much or too little expansion</li> <li>• Authorities have less control of placing of sites and timing of expansion</li> <li>• The model will be directly inappropriate unless the ambition is to establish relatively many offshore turbine parks in Denmark</li> </ul>

**Table 1.4 Comparative assessment of the models in relation to pro-competitive conditions**

	Single site model with award on the basis of price and other criteria, agreed fixed tariff and state-financed grid connection	Multi site model delimited to zones, price and other award criteria, agreed tariff and own-financing of grid connection	Open-door model, first come, first served and rule-bound criteria, fixed feed-in tariff and own-financing of grid connection
<b>Ensuring attractive pro-competition conditions</b>	<p><b>ADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• The fixed tariff and state financing of grid connection limit risks on investment</li> <li>• Through intensified dialogue with investors before and during the tender process and involvement of other criteria than price in the award, calls for tenders can be made more attractive</li> </ul>	<p><b>ADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Enable tendering for several sites, which increases the chances of winning and creating synergies between sites</li> <li>• Project developers have incentive for finding and proposing financially attractive sites to which the authorities can deduce to award concession</li> <li>• The fixed tariff limits risks on the investment</li> </ul>	<p><b>ADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Gives great flexibility with respect to when it is suitable to apply for and develop an offshore turbine park</li> <li>• The project developers have strong incentive for finding and proposing financially attractive sites</li> <li>• Fixed feed-in tariffs limit risks on investment and create good possibilities of profit</li> </ul>
	<p><b>DISADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Individual calls for tender at long intervals are less attractive to investors than pools</li> <li>• Massive focus on price in the individual call for tenders weakens the tenderers' earnings expectations</li> <li>• Less flexibility as the state determines the site, the size, the timeframe and other requirements of the offshore turbine park (however, dialogue about the tender documents would help)</li> </ul>	<p><b>DISADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Investors have higher costs of preparation of project proposal than for single site</li> <li>• Investors are to finance grid connection and partly EIA which entails recognition of risk premiums for these costs</li> </ul>	<p><b>DISADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Applications come in ad-hoc, which gives less comparative basis and competition among project proposals (however, possibility of rejecting unfavourable applications on the basis of general statutory award criteria)</li> <li>• Investors are to finance grid connection and EIA and risk premiums will therefore be included</li> </ul>

**Table 1.5 Comparative assessment of the models in relation to the criterion of low costs and prices**

	Single site model with award on the basis of price and other criteria, agreed fixed tariff and state-financed grid connection	Multi site model delimited to zones, price and other award criteria, agreed tariff and own-financing of grid connection	Open-door model, first come, first served and rule-bound criteria, fixed feed-in tariff and own-financing of grid connection
<b>Ensuring the lowest possible costs to the state and the electricity consumers</b>	<p><b>ADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Due to price competition on the individual call for tenders, the individual tenderer is pressed on price so that a higher amount of the profit from sites put up for tender is allocated to the state/electricity consumers (but the limited competition will dampen how low the price will go)</li> <li>• Investors' risk premium is kept down by reason of the fixed tariff and the state's financing and guarantee of EIA and grid connection</li> </ul>	<p><b>ADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Competition on price as one among several parameters, attached to freedom in finding cost-efficient sites, in total creates potential for low prices</li> <li>• Investors' risk premium is kept down by the fixed tariff</li> <li>• Pooling calls for tenders should, other things being equal, reduce transaction costs viewed in relation to calls for tenders for single sites (but costs are due in a concentrated period)</li> </ul>	<p><b>ADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• The model creates the biggest incentive for finding cost efficient sites and thereby a potential for low prices (but only if the tariff is not fixed too high)</li> <li>• Transaction costs on performing open-door procedure will be lower than for models with tender procedure</li> </ul>
	<p><b>DISADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Competition on the market for establishment of offshore turbine parks is generally limited, which creates a risk of high prices in the tender competition</li> <li>• The model is less attractive to investors, and many would therefore prefer alternative markets which weakens the competition and pushes up prices on the Danish market (may be countered somewhat by making the remaining conditions as attractive as possible)</li> </ul>	<p><b>DISADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• Competition on the market for establishment of offshore turbine parks is generally limited, which results in risk of high prices in the tender competition (however, the model is more attractive than single site and the competition will therefore be more fierce)</li> <li>• There is a certain price risk connected to pooling several calls for tenders in one round as it may come at a bad time for the market</li> <li>• The model is somewhat more demanding to implement than single site</li> </ul>	<p><b>DISADVANTAGES</b></p> <ul style="list-style-type: none"> <li>• The project developers achieve a relatively higher share of the socio-economic profit and many of these are foreign companies</li> <li>• If only few sites are to be established, there is a risk of a negotiating game arising by which the potential investors refrain from establishing sites until the tariff is adjusted to level which is unnecessarily high from a socio-economic perspective</li> <li>• Adjustment of the tariff entails transaction costs</li> </ul>

If the targets are that at least 5-10 sites are to be established over a consecutive period within a foreseeable future, or if it is considered to let large offshore turbines and more near-shore turbines be comprised by the same tender rounds, Deloitte assesses that a multi site model limited to specific geographic zones to be the most suitable one for promoting competition.

If, on the contrary, the targets are a fewer number of sites than the above within a foreseeable future, or if there are no intentions of integrating large offshore turbines and more near-shore turbines under the same public procurement rules, a single site model is still assessed to be the most suitable one. In such event it could be considered that relatively large sites (such as Kriegers Flak) be split up in 2-3 smaller concessions to thereby promote competition. However, in each event, a weighing of the expected competitive effect of several concessions viewed in relation to potential economies of scale may be lost.

Deloitte considers it possible in a transitional phase to use a combination of the two models, for instance, so that the pre-appointed Kriegers Flak site enters in a total multi site tender round in line with open site proposals within appointed geographic zones, where a ceiling is predetermined for the number of MW for which concessions are awarded in these zones.

Apart from the question about the selection of the most suitable tender model, the following central conclusions can be emphasised from the overall analysis which it was especially important to take into consideration in the prospective efforts to promote competition for establishment of large offshore wind farms in Denmark

- Given the limited size of the Danish market, the absence of detailed long-term plans for the expansion of offshore turbines in Denmark, and the expectation of a continued inten-

sive competition from the capacity expansion in other countries, it is especially important that the other framework conditions, including financial settlement form, penalty provisions, tender procedures, timelines, concession sizes, etc. are as attractive as possible. It particularly applies if Denmark decides to continue with a single site model, which is generally hardly as attractive to the investors as the other models.

- To create as attractive conditions for the investors as possible entails, for a single site model, that the state procures the best possible basis of information for the potential investors, i.e., the preliminary feasibility studies (EIA, preliminary geotechnical studies and measurements of wind and wave conditions) supplied by the state in the required degree of detail. In addition, it is about creating flexible conditions to the investors in relation to the timing of the offshore wind farm (and perhaps letting this and other matters enter in the award criteria) as well as selecting the division into concession sizes that is most attractive to the market.
- To create attractive conditions for a multi site model is especially about selecting and screening the geographic zones so that they are prepared sufficiently so as to limit the problems arising in relation to the subsequent EIA as well as that the state being co-responsible for the performance and financing of the latter. Furthermore, it is important that the award be made on the basis of transparent criteria and the possibility of negotiations being used for creating satisfactory partnership-oriented solutions viewed from the project developers' and the state's point of view.
- Deloitte recommends that a considerably more comprehensive dialogue with the market than formerly be conducted both in the preparation of and as a part of performance of the tender procedures. The dialogue is firstly a significant element in mobilising increased interest from potential investors that have formerly perceived the Danish market as relatively closed and which have therefore kept from submitting tenders for Danish concessions. Secondly, increased dialogue with the market is necessary for finding appropriate terms and conditions for establishment of offshore wind farms on the sites or zones that are to be put up for tender. Given the complex nature of offshore turbine projects and the comprehensive investment prospectus connected to the required billion DKK investments, from a financial point of view, it is beneficial to attempt to adapt timelines and other requirements of establishment in relation to the possibilities in the market instead of locking the conditions in advance.
- There is general satisfaction with the present settlement model where a fixed tariff is agreed on the basis of the winning tender. Deloitte's analyses also show that the settlement should in future be based on fixed tariffs.

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