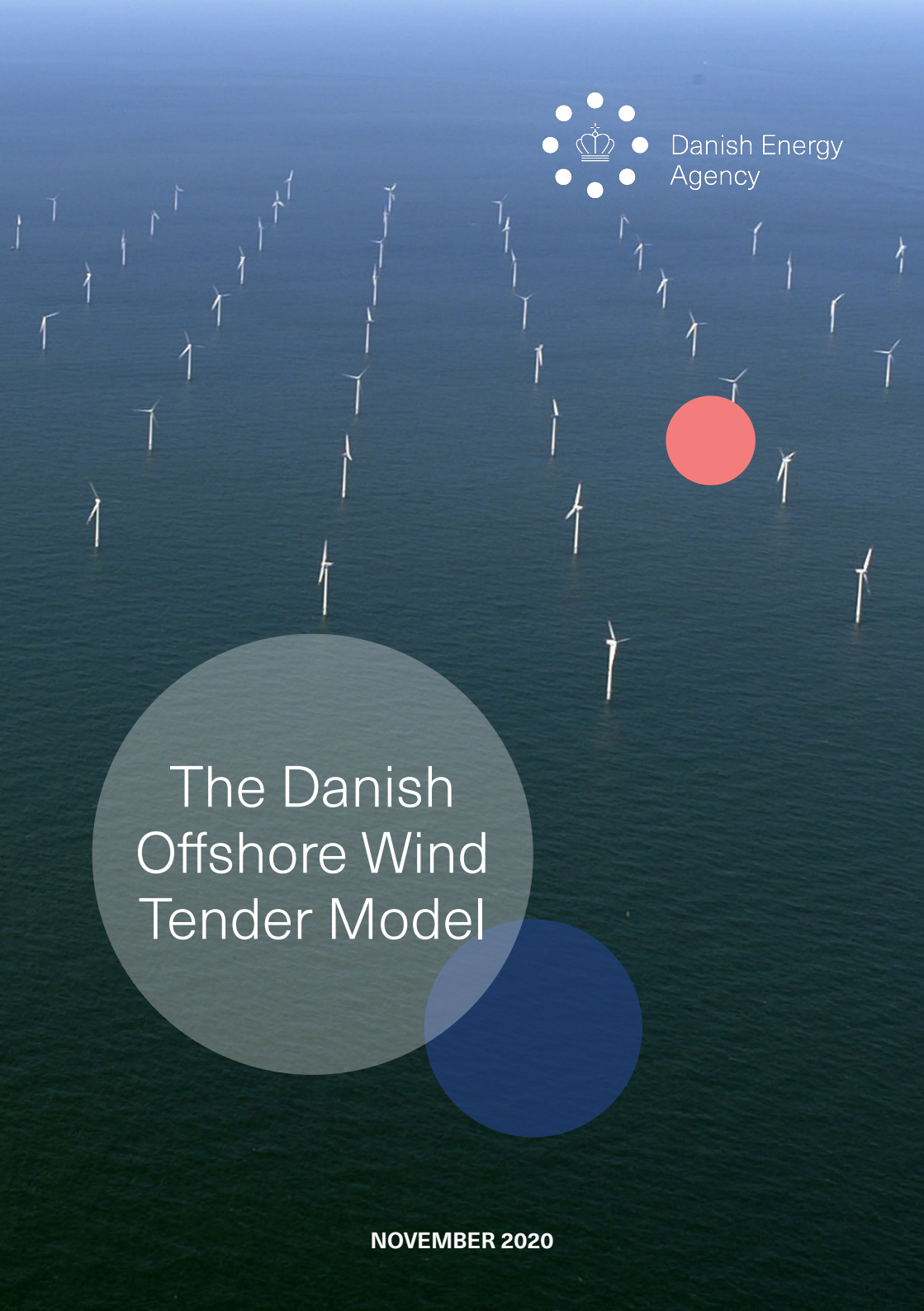


Danish Energy Agency

The Danish Offshore Wind Tender Model

NOVEMBER 2020

The current Danish model for tendering offshore wind farms is the result of many years of experience in planning and completing large-scale wind farm tenders. The strength of this model lies in elements which ensure low execution risk in Danish offshore wind projects including long-term, stable and broad political commitment to offshore wind. Today, Denmark has app. 1.7 GW offshore wind supplying app. 18% of our electricity consumption.

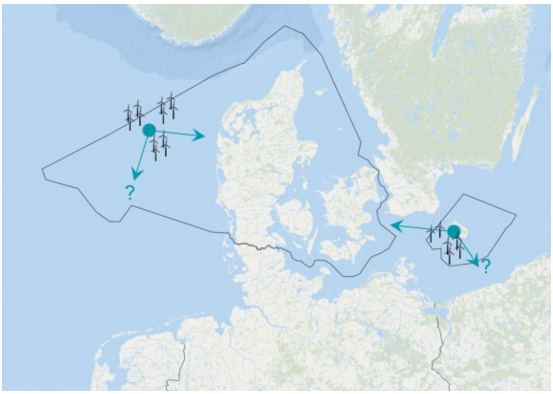
Future Danish offshore wind projects

The government and a broad majority in Parliament signed an ambitious climate agreement on 22 June 2020 taking offshore wind development in Denmark to the next level. With the new agreement, two energy islands will be established accommodating for additional 5 GW by 2030. The North Sea energy island alone with a capacity of 3 GW but designed to accommodate for at least 10 GW in the long term.

This is a paradigm shift from planning individual offshore wind farms to expand offshore wind capacity and connect them via energy islands.

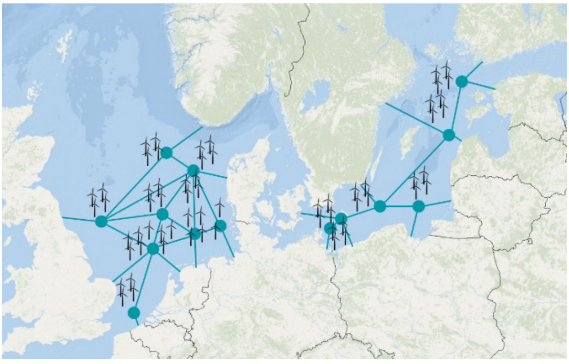
The energy islands will act as hubs for cables and platforms for AC/DC converters, AC transformers as well as operation and maintenance facilities. Energy Islands can be constructed differently depending on sea depth and foundation conditions. They can be physical structures, such as platforms or artificial sand islands. In either case, they are connected to surrounding offshore wind farms and serve as hubs interconnecting several countries' electricity grids. Hence the energy from the energy islands can also be exported to our neighboring countries and thus contribute to the green transition in Europe – an important milestone making the North Sea and the Baltic Sea the battery of Europe. There are several benefits for other countries from connecting to one of the Danish energy islands. For a number of countries, consumers are expected to receive lower electricity prices by a connection, since the electricity market will be connected to a larger production of electricity, leading to lower prices. Furthermore, security of supply will be improved, as countries get access to a larger production and access to the Nordic electricity market. Neighboring countries connected to the islands

could also be expecting to see green electricity replace electricity based on fossil fuels, and thus contribute to the green transition in the respective country. Moreover, energy islands ensure a more efficient utilization of offshore wind resources far from shore with less need for transmission grid on shore. Furthermore, the energy islands support the integration of large amounts of offshore wind and potentially will provide the power for producing green "Power-to-X" fuels, such as hydrogen and ammonia. The more specific framework conditions for the energy islands and the associated wind farms are to be further developed.



One artificial energy island will be located in the North Sea with a capacity of 3 GW but designed to accommodate for at least 10 GW in the long term. Connection to Denmark and a neighboring country in the North Sea is expected. Bornholm in the Baltic Sea will function as the second energy island to accommodate a capacity of 2 GW. HVDC facilities are to be established enabling transmission to Zealand and neighboring countries.

(Disclaimer: Hub locations and connections are merely illustrative)



In the longer term, the energy from the energy islands can be further connected to our neighboring countries and thus contribute to the green transition in Europe.

Adding the agreed 5 GW to projects already in the pipeline ("Krieger's Flak" of 600 MW, "Thor" of approx. 1 GW and "Hesselø" of approx. 1 GW.) means that Denmark will have around 9 GW in operation by 2030. The offshore wind development will ensure that Denmark can electrify more parts of society in the coming years and at the same time contribute to ensuring that all Danish households and companies are covered by green electricity. This will facilitate a green transition of the Danish society and assist in meeting a climate target of 70% reduction in greenhouse gas emissions by 2030, compared to 1990. The target is supported by a strong political commitment including also the aim to be climate neutral by 2050, while maintaining security of electricity supply.

De-risking measures for the Thor and Hesselø offshore wind tenders

A range of de-risking measures are made in relation to the ongoing tender proceses for Thor and Hesselø offshore wind projects.

The Thor offshore wind farm is to be located in the North Sea, outside of Nissum Fjord, at a minimum distance of 20 km from the coast. Tendering process of Thor offshore wind farm (800-1000MW) was initiated with a market dialogue in 2019 and Thor offshore wind farm is scheduled to be in operation by 2027. For more details and updates see: https://ens.dk/en/our-responsibilities/wind-power/ongoing-offshore-wind-tenders/thor-offshore-wind-farm/news-about.

Hesselø offshore wind farm is to be placed in Kattegat at a distance of 30 km north of Zealand and has to be fully commissioned by the end of 2027, which is at the same time as Thor offshore wind farm. The Danish Energy Agency (DEA) plans to start the tendering process, with a market dialogue in 2020, and announce the winner of the tender at the end of 2022. It will have an installed capacity of between 800-1.200 MW and can thus potentially become the largest offshore wind farm in Denmark, depending on the capacity that the winner of the tender chooses to install. 1.000 MW can be delivered to the collective electricity grid. For more details and updates see: https://ens.dk/en/our-responsibilities/wind-power/ongoing-offshore-wind-tenders.

Environmental assessments and preliminary investigations

The environmental assessments is following a new approach, based on a Strategic Environmental Assessment (SEA) of the plan for the offshore wind farm prior to final bids. In addition to the SEA, the Transmission System Operator (TSO) will carry out a range of pre-investigations as has been practiced previously. The purpose of these additional assessments is to provide critical data for as much risk-mitigation as possible. These additional assessments focus on bird surveys, safety of navigation, radio links and radar, fisheries, marine archaeology, noise, and cumulative impacts etc.

Preliminary investigations to de-risk the site development include; wind resources, geophysical and geotechnical analyses of the seabed as well as MetOcean data collection and environmental assessments. Before the submission of tenders, the results of the preliminary investigations will be published. These will provide tenderers with the opportunity to submit a qualified bid price for the offshore wind farm. The winning bidder will nonetheless have to undertake project-specific Environmental Impact Assessments (EIA) in accordance with European and Danish legislation.

Thus, after the deadline for bidding, the concession winner will carry out the EIA of the final project at sea - i.e. wind farm, offshore substation and export cables forward to the landfall. In addition to this, the TSO in collaboration with municipalities will undertake an EIA of the project on land, i.e. from the landfall to the onshore substations, the onshore substations themselves as well as onwards to the 400 kV transmission grid.

Offshore substation and grid connection

Also as a new approach, the offshore substation and the grid connection from the offshore substation to the point of connection will be included in the tender for Thor. This means that it is the responsibility of the winner to construct, own and operate these installations. See figure illustrating the grid connection for Thor below. For Hesselø offshore wind farm the entire grid connection up to the 400kV public transmission grid is included in the tender.

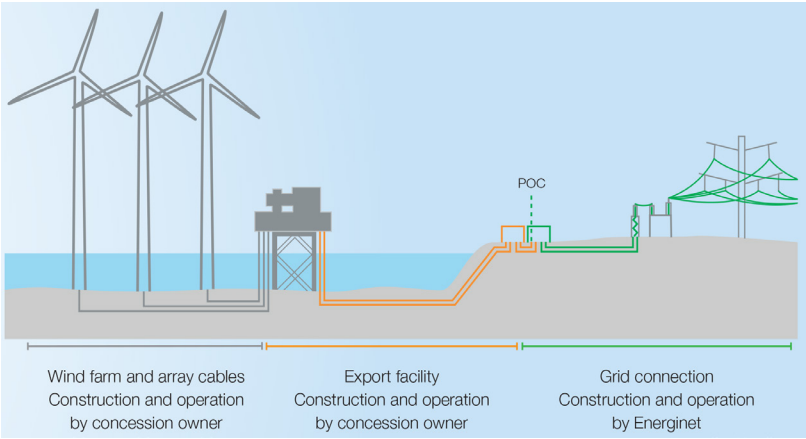


Illustration of the Thor grid connection concept.

The rationale behind the political decision to include the grid connection in the tender is to stimulate critical innovation in design, construction and operation of the grid connection, and ultimately to lower total cost of the entire offshore wind farm project.

Additional de-risking measures

- The tender material includes draft licenses from the DEA ensuring early transparency on license conditions.
- The initial technical dialogue on the scope and depth of the planned site investigations will enable tenderers to influence the outcome of the investigations, thereby lowering commercial risks.
- A preliminary technical dialogue and especially a market dialogue with potential tenderers and investors concerning the preliminary tender conditions will optimize their bid, benefitting the bidder as well as the DEA. The negotiated tender approach following the first bid round will allow the bidders to optimise even further. This process ensures flexibility and attractiveness of the tender conditions. It has proved successful in allowing tenderers to influence the tender conditions, thus ensuring optimal sharing of risk and ultimately achieving extremely competitive bid prices.

- Full flexibility to design the wind farm, including offshore substation(s) and export cable(s), as well as to choose an individual park layout within the awarded site (area allowed for the construction of the Thor offshore wind farm is 0.22 km^2/MW).
- The duration of the license for electricity production for the wind farm will be expanded from 25 to 30 years in order to align the expected technical lifetime of the turbines even further. In addition, there will be a possibility to prolong the license with additionally 5 years at a later stage.
- Priority access to the grid provides assurance to connected generators of renewable power that they will be able to sell and transmit their power in accordance with connection rules at all times.
- An efficient and transparent electricity market where market data is made easily available by the Danish TSO.

Open Door

It is possible for project developers to apply for a so-called open door concession in locations outside designated offshore wind areas. This is regulated through separate process by DEA. The project developer carries all application costs, grid connection, etc. but can compete in upcoming technology neutral tenders. For more information in Danish see: https://ens.dk/ansvarsomraader/vindenergi/aaben-doer-ordningen-havvindmoeller and https://ens.dk/service/aktuelle-udbud/teknologineutrale-udbud.

Finance

The subsidy scheme in Denmark has so far been a fixed price per kWh based on Contract for Difference (CfD) for the electricity generated during 50.000 full-load-hours. This, corresponds to approximately 11-12 years of operation depending on the site and the technical solution. The CfD strike price is defined by the winning bid price, where the subsidy is determined as a variable premium covering the difference between the fluctuating spot price and the fixed strike price. The remaining years of production are on the electricity market price conditions. During CfD-period, no support is given in hours with a negative spot price, which Denmark typically experiences only a few hours per year. Hence, the fixed tariff consists of the spot market price plus (or minus) a premium totaling the fixed price. However, there is no market price risk to be carried by the developer. The lower the market price of electricity is the higher the premium becomes until it hits a cap and consequently is the cost of the system.

Previously, all costs incurred from the premium subsidy as well for the substation, the export cable and onshore cabling was paid by the electricity consumers directly through the Public Service Obligation tariff (PSO) and grid tariffs. The PSO scheme has since 2015 been phased out according to EU state aid regulations. Hence, the PSO spending has gradually been shifting to be financed through the fiscal budget with the objective that the expenditure is fully phased in to the Finance Act in 2022. The shift from a consumer funded support scheme - PSO - to public tax funding, has called for a need to further limit the cost of the support scheme trough capped budget for support.

For the upcoming tender of Thor offshore wind farm, a price premium will be payed from the Danish State for a 20-year period based on the principals of the CfD. The size of the premium will be calculated as the difference between the bid price and the simple average of the electricity spot prices in the previous calendar year (reference price). Following the EU State Aid regulations, the premium will be discontinued in hours with non-positive prices on the spot market. Further, a so called symmetric payment principle also apply where the owner receives the premium

in years in which the bid price is higher than the reference price, but correspondingly pays the state in years in which the reference price is higher than the bid price. There is no opt-out option. The requirement will lapse in hours in which the spot price is lower than the size of the concession owner's payment per kWh that year. The purpose is to provide investors with a high degree of security for their investment while reducing state aid costs. The payment ceilings in this way divide the risk of unforeseen high or low electricity prices between the parties.

A budget evaluation threshold of DKK 3.7 billion over the 20-year aid period applies for the Thor tender. Bids expected below the cap will automatically be accepted. Otherwise, a further approval from the parties to the Energy Agreement of June 2018 is needed. The expected total subsidy costs over the 20-year aid period will be calculated based on the installed wind farm capacity and an estimated 4,500 full-load hours production per year for 20 years. The total cap the Danish State can pay over the 20-year aid period is DKK 6.5 billion. Similarly, there is a cap on the symmetric payment that the concession owner can be required to pay to the Danish State of DKK 2.8 billion over the 20-year period. For further details see: https://ens.dk/sites/ens.dk/files/Vindenergi/3_subsidy_scheme_and_award_criteria.pdf. A subsidy scheme for Hesselø will await input from the market dialogue in the end of 2020.

A penalty for defective performance has been a standard requirement in recent Danish call for tenders and in other countries e.g. the Netherlands and Germany. A penalty for defective performance will take effect if, irrespective of the reason, the concession winner withdraws from the project or fails to construct the wind farm and connect it to the grid. A guarantee for payment of the penalty will be provided as security by a recognized financial institution. A parent company guarantee may be considered. The guarantee obligation will expire fully when the first kWh from the first turbine has been delivered to the collective grid or when the concession owner has documented to pay all public costs associated for the offshore windfarm including the grid connection preparations (generally around DKK 1 billion).

The concessionaire must connect

95% of the Thor and Hesselø wind farms to the onshore point of connection by 31 December 2027 at the latest. For the Thor offshore wind farm the terms for non-compliance is detailed here: Annex 3 Draft agreement on obligation to establish Thor Offshore Wind Farm and connect to the grid.

Large-scale demonstration projects and the evolution of the Danish Tender Model

Back in 1996, the Danish government launched the energy action plan "Energy 21", with the objective of establishing 4GW offshore wind by 2030. Subsequently the Danish Utilities received in 1998 an obligation to construct large-scale offshore wind demonstration projects resulting in the commissioning of Horns Rev in 2002 and Nysted (Rødsand) in 2003 – at that time the World's largest offshore wind farms totaling more than 300MW. Information on technological, economic and environmental aspects served as basis for the Danish Energy Agency (DEA) to lay out future framework condition of offshore wind.

Meanwhile, with the 1999 electricity reform and the liberalization of the European electricity markets inter alia EU-regulation, a change took place in the framework condition for new offshore wind farms in Denmark - from administrative planning in the form of utility-obligations towards tendering as a market-oriented management tool.

DEA published in 2002 guidelines for tendering procedures and terms for offshore wind, that stipulated the general framework conditions still in place today, but refined in between consecutive bidding rounds:

- The DEA functions as a one-stop-shop for all necessary licenses in the territorial sea and in the exclusive economic zone.
- Obligation for bidder's financial and technical capacity including documented experience in electricity generation from wind power and in establishing offshore windfarms.
- Conditions for the wind farms maximum geographical extent within the offered area as well as both minimum and maximum for the total capacity of the wind farm.
- Bidders informed of all requirements

before submitting tender bids.

- Subsidy premium in addition to market price.
- Concessionaire obtain exclusive rights to set up offshore wind turbines and exploit wind resources in a given area.
- The Concessionaire pays for the authorities pre-bid environmental screening costs.
- Concessionaire's collateral for e.g. the dismantling costs for the wind turbines after end lifetime.

Danish offshore wind tenders 2003 onwards

By 2005, tenders on Horns Rev II (209 MW) and Rødsand II (207 MW) included a prequalification and negotiations with the prequalified tenderers in order to endure a competitive process, hence a low final bid price. The awarding criteria for both projects were the price per kWh for the production corresponding to 50.000 full-load-hours, the park design as well as the timeline for the execution of the project. The tenders were based on the one-stop-shop regime. This included, apart from license to construct and produce, a license to conduct the pre-investigation to inform what to be included in the EIA. The concessionary had the possibility of withdrawing after the completed EIA, but before the time for the TSO to place its order for connection to the grid; otherwise, compensation to the TSO was mandatory. Horns Rev II tender was concluded with a low bid price and commissioned in 2009, while the winner of the Rødsand II tender decided to withdraw after completing the EIA, and was only commissioned in 2010 after a re-tender process.

Consequently, the DEA adjusted the tender framework in 2009 for the 400MW Anholt wind farm by; including the EIA in the tender materials provided to the bidders, narrowing down the award criterion to the price only, as well as adding defective performance penalty. Only a single company submitted a bid, which was much higher than expected. The high bid price was due to a combination of international supply and demand constraints for raw materials as well as supply constraints on wind turbines and installation vessels e.g. driven by development of the British offshore wind market. Other explanations

include a tight project delivery schedule and the size of the penalties for any delays imposed in the tender material. The government decided nonetheless to accept the offer to keep track on decided targets.

In 2014, the tender process was improved for the Horns Rev III 400MW wind farm by inviting to dialogue on specific topics having a significant effect on the final bid price with the; industry, potential bidders, consultants and financial institutes. As a result, the size of the penalties as well as the time allocated to the development of the project was adjusted, resulting in significantly lower bid prices.

In 2015, the same procedure with a pre-tender dialogue was used for the 600MW Kriegers Flak project currently under construction to be commissioned in 2021. The main difference was a scale-up of the penalties as well as the time allocated to the development, since the size of the wind farm was 50% larger than the previous one. With a strike price of only 37.2 øre per. kWh in 2016, this was among the lowest worldwide.

The table below summarizes and compares the tenders of the offshore wind farms in Denmark for the period from 2003 to current time.

Overview of the evolution of the content of the tenders of offshore wind farms in Denmark

Wind Farm Name / Capacity [MW]	Year of tender closing	Price (DKK/kWh) for 50,000 full-load-hours (Contract for Difference)	Year of full operation	License to conduct pre-investigations	License to construct the electrical power plant	License to produce electricity from the electrical power plant	Authorization to produce electricity	Guarantee for decommissioning	Offshore transformer platform and grid connection delivered by TSO	SEA and pre-investigation provided	EIA provided by DEA	Penalties for defective performance	Penalties for non-completion of the wind farm	Guaranties for covering the penalties	Pre-tender dialogue	Prequalification	Negotiations under the tender process	Concession agreement
Horns Rev II / 209	2005	0.518	2009	+	+	+	+	+	+	-	-	-	-	-	-	+	+	-
Rødsand II / 207	2005	0.499	-	+	+	+	+	+	+	-	-	-	-	-	-	+	+	-
Rødsand II (2nd)	2008	0.629	2010	+	+	+	+	+	+	+	+	+	-	-	-	-	+	-
Anholt / 400	2010	1.050	2013	+	+	+	+	+	+	+	+	+	+	+	-	-	-	+
Horns Rev III / 407	2015	0.770	2018	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Kriegers Flak / 600	2016	0.372	2021	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Thor / 800-1000	2021	Tbd*	2027	+	+	+	+	+	-	+	-	+	+	+	+	+	+	+
Hesselø / 1000-1200	2022	Tbd*	2027	+	+	+	+	+	-	+	-	+	+	+	+	+	+	+

** Price premium TBD for a 20-year period based on the principals of the CfD. See para on Finance.*

This leaflet outlines the essence of the Danish Offshore Wind tender model. Other publications regarding Offshore Wind are also available at **www.ens.dk**.

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