

FACT SHEET ABOUT ENERGY HUBS

What is an energy hub?

- The advent of energy hubs signals a paradigm shift for offshore wind energy. Until now, offshore wind farms have been constructed as individual non-connected units. But by deploying several continuously connected offshore wind farms to a hub, it will create a green, offshore power plant that can distribute power to the surrounding countries.
- The energy hub in the North Sea will be an artificially constructed island that can be connected to the power grids in countries around the North Sea. Thus, the hub will collect and distribute the electricity to consumers in several countries.
- The goal is that the energy hub can store electricity and use electrolysis to produce sustainable fuels such as green hydrogen.

What are the benefits of an energy hub?

- The energy hub in the North Sea allows us to produce renewable power at a previously unseen scale. Thus, the hubs will help to phase-out the use of fossil fuels used for electricity generation.
- Offshore wind energy in the North Sea holds a tremendous potential. In 2040, the deployment in the North Sea is estimated to reach 150 GW, which can meet the electricity demand of 150 million European households. Furthermore, the size of the hub and its location far from the shore allows us to reap the benefits of higher wind speeds and the ability to deploy larger wind turbines.
- The EU has set a goal to achieve climate neutrality by 2050 and the Commission has proposed to build 300 GW offshore wind energy in order to attain. By constructing the world's first energy hub with a potential capacity of 10 GW, Denmark significantly contributes to this aim
- The current Danish electricity-mix consists of numerous sources, including offshore wind, solar PV, onshore wind, biomass and hydropower. As electricity production and consumption have to be balanced at all times, cross border power trade is vital to stabilize the national grids. Thus, if more countries are connected to the hub, it will increase the efficiency of the electricity production from the wind farms by distributing it across the European power grid.
- Electricity cables and transformers can be deployed on the island upon completion. In a few years, the hub can also host utility-scale batteries to store electricity and dispatch it when needed.
- Furthermore, renewable power from the hub can be used to produce fossil-free fuels for shipping, aviation, industry and heavy-duty vehicles that are difficult to decarbonize.

What will the size of the energy hub be?

- The island is expected to cover an area between 120.000 and 460.000 square meters (the equivalent of 18 to 64 soccer fields), depending on whether the hub will be host to 3 or 10 GW. The exact size and outline of the island is subject to negotiations with the private partner that wins the bid to construct it.
- The hub will have an initial capacity of 3 GW offshore wind energy, which is approximately half of the current Danish offshore production. In the coming years, the capacity can be scaled to 10 GW (almost 1.5 times current Danish electricity consumption) enabling it to power 10 million European households.
- The scale and number of wind turbines will be decided by the winning tender, but could be between 200-600 turbines. In any case, the turbines will be at a previously unseen scale, potentially measuring more than 260 meter from sea level to the tip of the blade.
- The hub is the largest construction project in the history of Denmark. The total cost of constructing the island, building a capacity of 10 GW wind farms and deploying the necessary infrastructure will be around 210 billion DKK (34 billion USD).

What has been decided today?

- A broad political majority in the Danish parliament has agreed that the energy hub in the North Sea will be located on an artificially constructed island.
- Moreover, the Danish government will be the majority owner of the hub, but with one or more private companies as minority owners. Denmark has been leading offshore wind development, and private companies will be crucial for the project to ensure innovation, cost-effectiveness and export.
- The electricity transmission from the energy hub to Denmark is going to be build and owned by the TSO *Energinet*. While the electricity transmission from the energy hub to other countries will be built and owned in collaboration between *Energinet* and foreign electricity transmission operators.
- The exact details regarding the construction of the energy hub and ownership remains subject to further discussion.

What is the next step?

- The Danish Ministry of Climate, Energy and Utilities will initiate a discussion with potential private investors create a useful framework for private partnerships.
- Furthermore, the Danish Energy Agency, relevant ministries and Kammeradvokaten (the legal advisor to the Danish government) will conduct extensive analyses, in order to create a conducive tender framework.
- The next political step is to negotiate the conditions of the tender, passing new legislation and embarking on the environmental impact assessments.
- At a later stage decisions will be made regarding tender of the offshore wind farms, a potential expansion of the island and deployment of hydrogen production or similar technologies.