Interreg
North Sea Region
Inn2POWER
European Regional Development Fund

EUROPEAN UNION

OFFSHORE
wind energy

DENMARK

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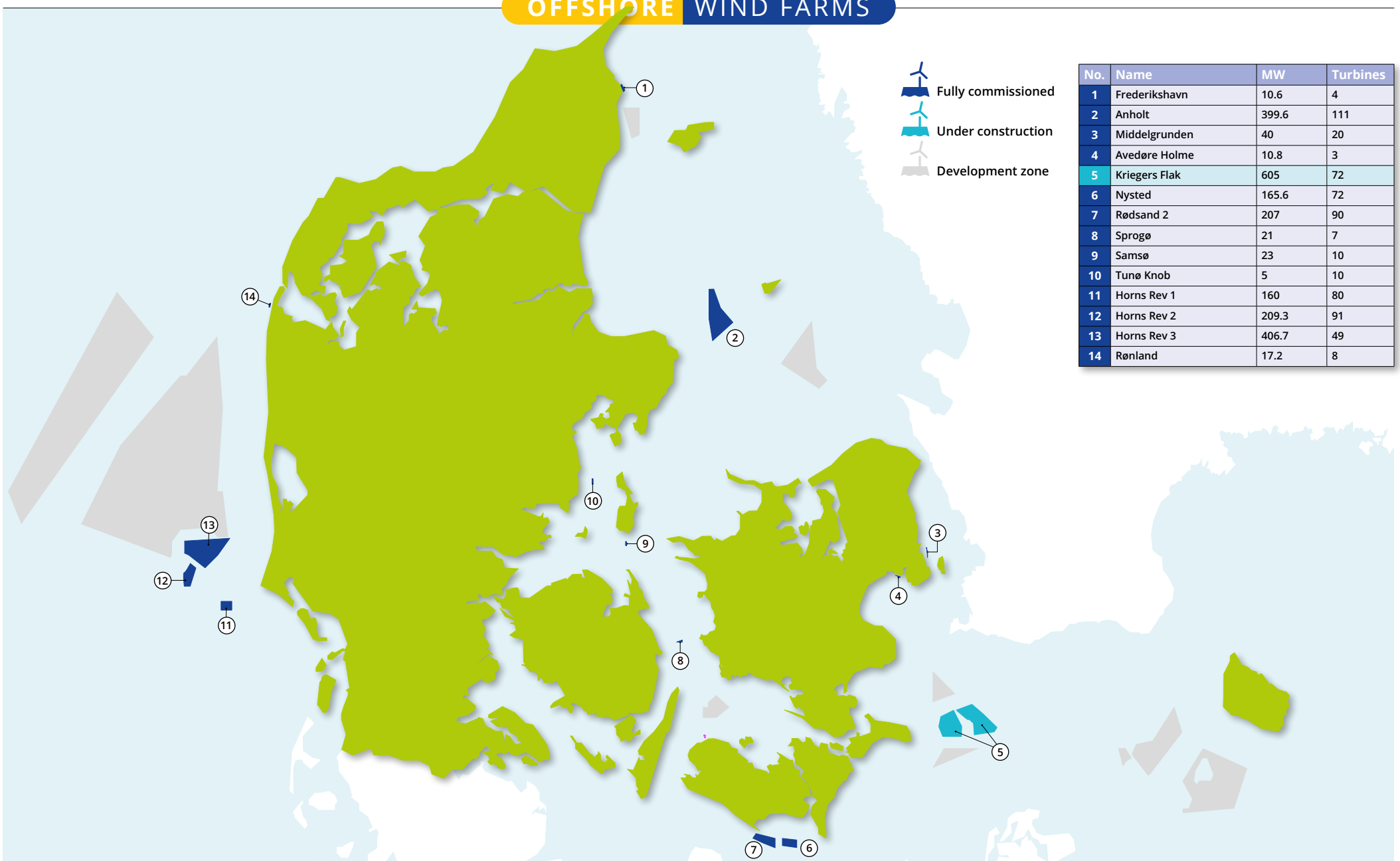
OFFSHORE WIND FARMS



No.	Name	MW	Turbines
1	Frederikshavn	10.6	4
2	Anholt	399.6	111
3	Middelgrunden	40	20
4	Avedøre Holme	10.8	3
5	Kriegers Flak	605	72
6	Nysted	165.6	72
7	Rødsand 2	207	90
8	Sprogø	21	7
9	Samsø	23	10
10	Tunø Knob	5	10
11	Horns Rev 1	160	80
12	Horns Rev 2	209.3	91
13	Horns Rev 3	406.7	49
14	Rønland	17.2	8

OFFSHORE wind energy

Status

	2018
Wind farms connected	14
Cumulative capacity (MW)	1,329
Turbines connected	514
Net capacity connected in 2018 (MW)	61
Turbines connected in 2018	42
Total investments (€ BN)	1.1
New capacity financed (MW)	605
Number of projects	1

Future

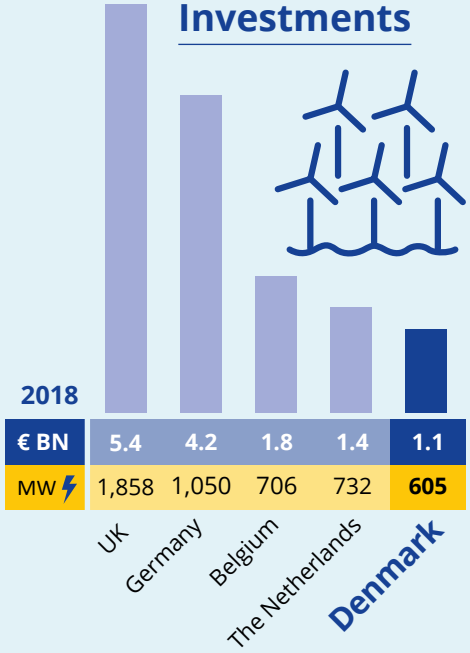
2030	Capacity installed	8,130 MW
2030	Electricity produced	22,659 GWh

(0.5 GW/yr in 2021 and 2022,
and 0.7 GW/yr from 2023-2025)

Ecological impact

- **Benthic fauna and flora:** Overall the wind farms increased habitat heterogeneity as well as the abundance and biomass of benthic communities.
- **Fish:** Overall studies showed that offshore wind farms did not have any negative impact on fish abundance. Some species appear to use the foundation and associated scour protection as refuge areas for hiding and forage. The positive effect may be enhanced by the exclusion of commercial fishing inside the wind farm area an thus function as a small marine protected area.
- **Birds:** Birds tend to avoid wind turbines and this was confirmed by a study.

Investments



Capacity

2013 1.27 GW

2020 2.24 GW

2030 15 GW

Social impact

The wind industry has a big impact on the Danish economy and employment. Today, the wind industry generates

85,500 jobs

direct and indirect (offshore and onshore combined)

> Denmark is already a great offshore wind location, and the survey shows that we have the potential for much more. We have such good conditions for offshore wind that we can contribute significantly to cover the need for green electricity, not just in Denmark, but also in many other countries.
>
> *Energy and climate minister Lars Christian Lilleholt*

Home to some of the leading manufacturing players of the offshore wind industry, the Danish industry leveraged the full potential of its first mover advantage to become the defacto world leader in offshore wind manufacturing and offshore wind farms' development.

In addition, the Port of Esbjerg is the leading port in Europe in terms of handling and shipping out wind power. Today, the Port of Esbjerg has specialized facilities and flexible areas for transporting, pre-assembling, shipping out and servicing offshore wind turbines. The companies at the Port of Esbjerg represent the entire supply chain for the wind industry, including several of the world's leading companies specialized in handling and servicing wind installations. 4/5 of the offshore wind capacity installed in Europe was shipped out from the Port of Esbjerg[1].

Denmark already has the largest penetration of wind in its power production portfolio worldwide, and wind farms seem to be widely adopted by the public. Obviously, the immense workforce active in this industry (85.000 direct and indirect jobs) contributes to the population's embracing this evolution.

In the Danish waters, there is still incredible potential for further expansion of offshore wind. According to the Danish TSO, Energinet[2], 'the Danish energy consumption in a fully electrified society will constitute approx. 13 GW in 2040, while the wind power potential in Danish waters alone is as much as 40 GW. The enormous Danish offshore wind resources can therefore not only be utilized for Danish energy consumption but can also become a significant contribution to the green transition of European energy supply.'

Inn2POWER partners

- Energy Cluster Denmark
- Business Academy SouthWest

Inn2POWER started in October 2016 and runs for 4 years. 50% of the budget is subsidized by the EU and the other half comes from public and private financing. More information about Inn2POWER: visit northsearegion.eu/inn2power

Sources

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Partners

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Kent County Council kent.gov.uk

Provides co-funding for

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