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Denmark's Ambitious Energy Policy

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Gefördert durch:

Bundesministerium für Wirtschaft und Klimaschutz

aufgrund eines Beschlusses des Deutschen Bundestages

ÜBER UNS

- Gründung am 01. Januar 1992
- Ca. 650 Mitgliedsunternehmen
- Über 1000 Anfragen jährlich
- Über 1300 Kunden aus DE und DK jährlich
- Ca. 30 Mitarbeitende

Focus areas

What is important for the future German-Danish co-operation and trade?

#techandinnovation

AI - Automation - Digitalization

#sustainableinfrastructure

Building - Infrastructure - Mobility - Smart City - Urban Development

#greentransition

Carbon Management - Energy Efficiency - Green Hydrogen - Renewable Energies

German-Danish Dialogues on Energy Transition

🙏 Thank you so much to DIHK for hosting today's event. Also thank you to our partners Green Power Denmark, Danish Industry and the Royal Danish Embassy 💛

#GreenTransition #Hydrogen #GermanyDenmark #PartnerinDaenemark #PartnerforTyskland

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Making the hydrogen adventure happen

Disse og andre udfordringer tager vi op sammen med eksperterne til den tredje German-Danish Dialogue on Energy Transition den 4. december 2023 🌬️ Vi vil diskutere, hvor udvidelsen af fjernvarmenetværk giver mening, hvordan brugen af fjernvarme kan gøres mere bæredygtig, og hvilken rolle varmepumper kommer til at spille. Kommunal varmeplanlægning, udnyttelse af geotermisk energi og forøgelse af energieffektiviteten er centrale emner her 🔋

Tilmeld dig og få mere at vide om den seneste udvikling og strategier til at reducere emissioner i opvarmningssektoren:
👉 https://lnkd.in/eZa-embW

https://lnkd.in/ekUGPzCr

#partnerfortyskland #energiforsyning #fjernvarme

See translation

Challenges and Solutions for Sustainable Heating

Heute findet die erste von drei Veranstaltungen zum Thema #Energie statt, um den deutsch-dänischen Energiedialog zu stärken⚡

Das heutige Thema lautet "Quadrupling Offshore Wind Capacity by 2030". Vielen Dank für die interessanten Vorträge und gute Diskussionen an Heike Winkler (WAB e.V.), Nils Leseberg (RWE Denmark), Magnus Brogaard Larsen (Copenhagen Infrastructure Partners) und Albert Winnemuller (Vestas).

Und ein großes Dankeschön an Copenhagen Infrastructure Partners für das Ausrichten der Veranstaltung💛

#greentransition #energydialogue #parnterfortyskland #partnerindaenemark #offshorewind #energy

Quadrupling Offshore Wind Capacity by 2030

Green Transition Frontrunner Denmark

DANISH GREEN TRANSITION

The Climate Agreement from 2020 contained many important initiatives:

- More onshore solar PV and wind power
- More offshore wind power
- More energy efficency
- More sector coupling
- More sustainable district heating
- Transformation of remaining gas-based heating systems
- Carbon capture and storage ambitions
- Development of a hydrogen economy

DANISH GREEN TRANSITION

- Denmark is a European leader in many of these areas
- Offshore wind has a long tradition in Denmark and the potential in Danish waters is far higher than national demand
- The future build-out will be large and energy exports are a central part of the equation

Wind Pioneer Denmark

Poul la Cour shows that the technology works

Henrik Stiesdal's inventions scale the industry

World's first offshore wind farm Vindeby

84% renewable power largely thanks to wind

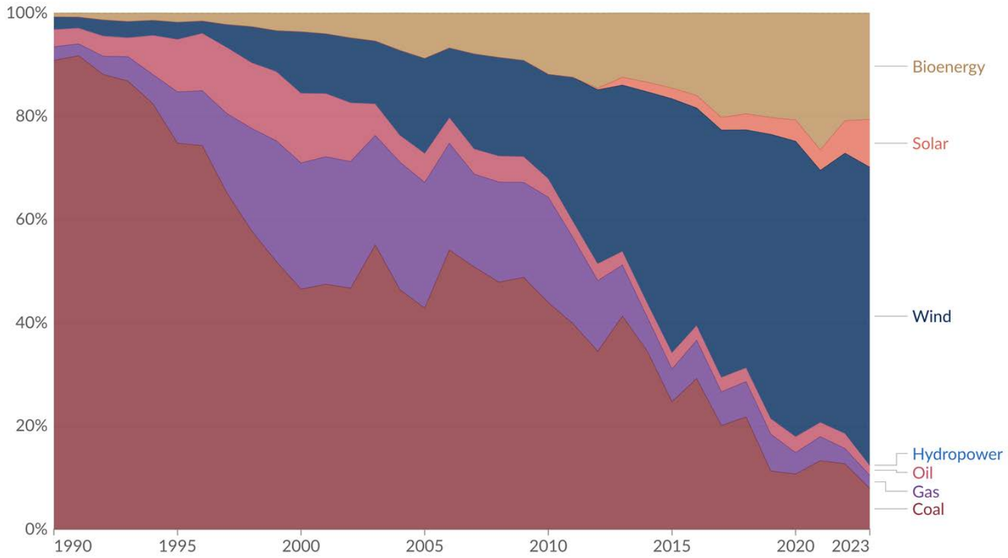
Danish companies are leading in the wind industry

Changing the Power Mix

Source: Ember Yearly Electricity Data 2023

Electricity production by source, Denmark

Measured in terawatt-hours[1].



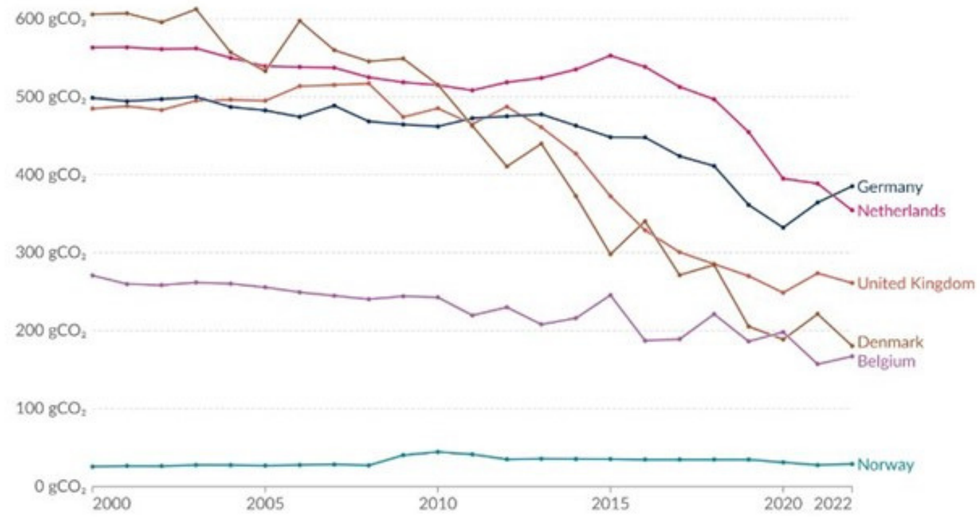
Data source: Ember (2024); Energy Institute - Statistical Review of World Energy (2023)
Note: "Other renewables" include waste, geothermal, wave, and tidal.

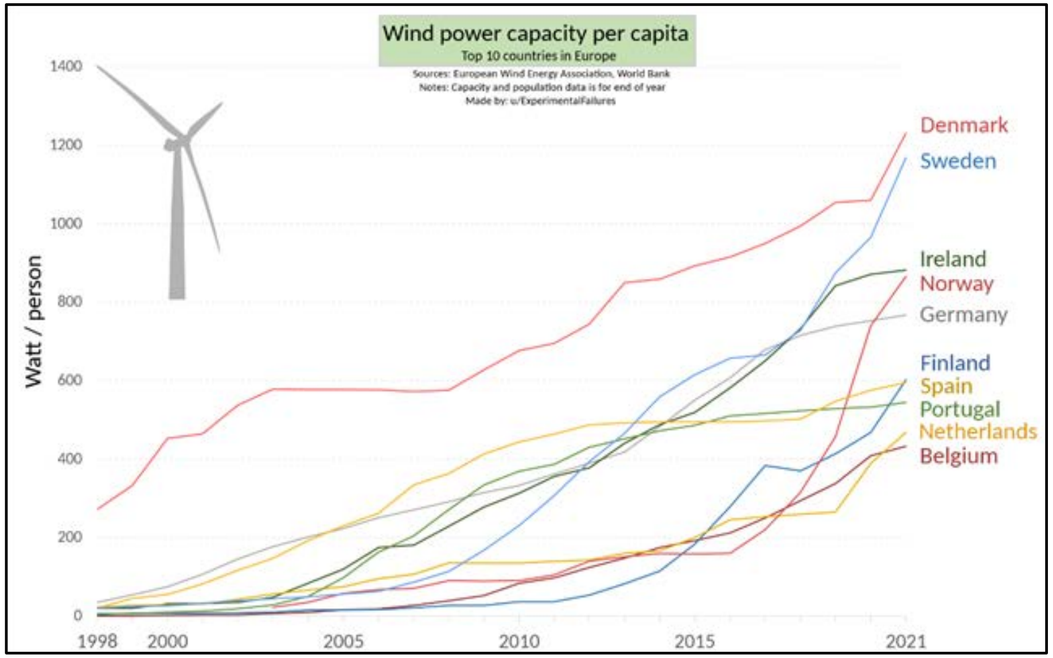
OurWorldInData.org/energy | CC BY

1. Watt-hour: A watt-hour is the energy delivered by one watt of power for one hour. Since one watt is equivalent to one joule per second, a watt-hour is equivalent to 3600 joules of energy. Metric prefixes are used for multiples of the unit, usually: - kilowatt-hours (kWh), or a thousand watt-hours. - Megawatt-hours (MWh), or a million watt-hours. - Gigawatt-hours (GWh), or a billion watt-hours. - Terawatt-hours (TWh), or a trillion watt-hours.

Carbon intensity of electricity generation, 2000 to 2022

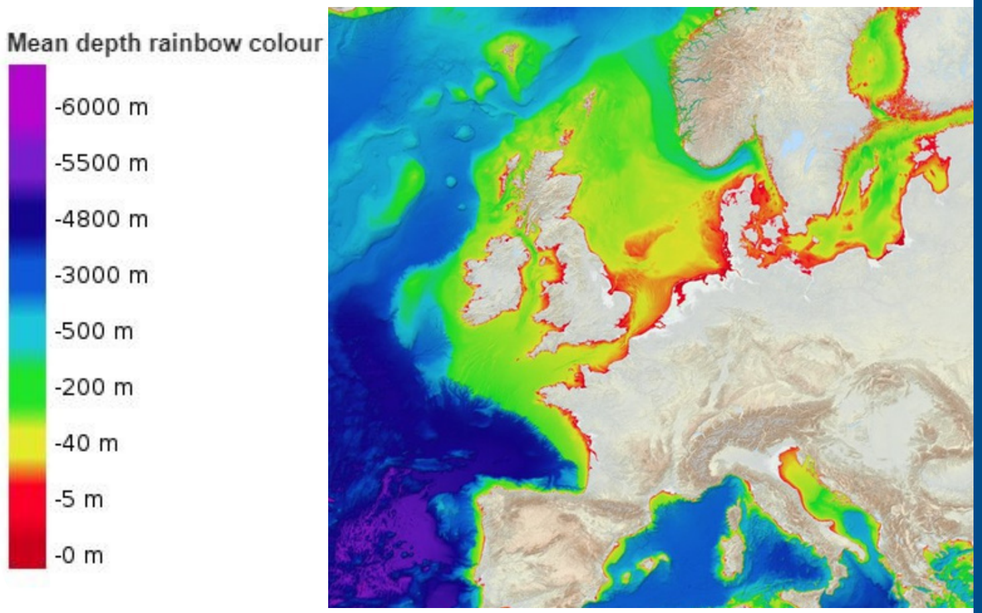
Carbon intensity is measured in grams of carbon dioxide-equivalents[1] emitted per kilowatt-hour[2] of electricity generated.





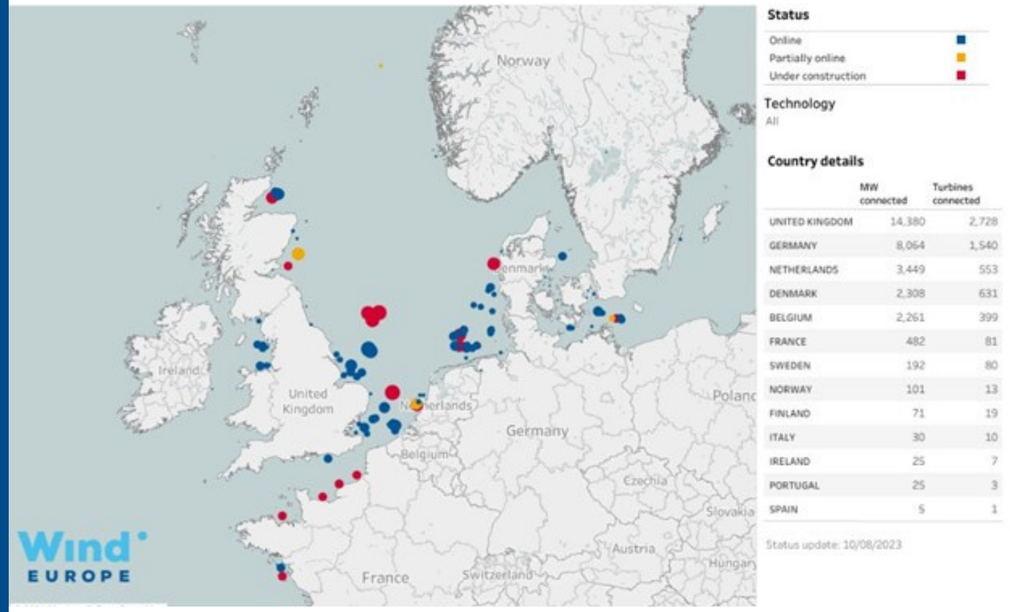
Source: European Wind Energy Association, World Bank

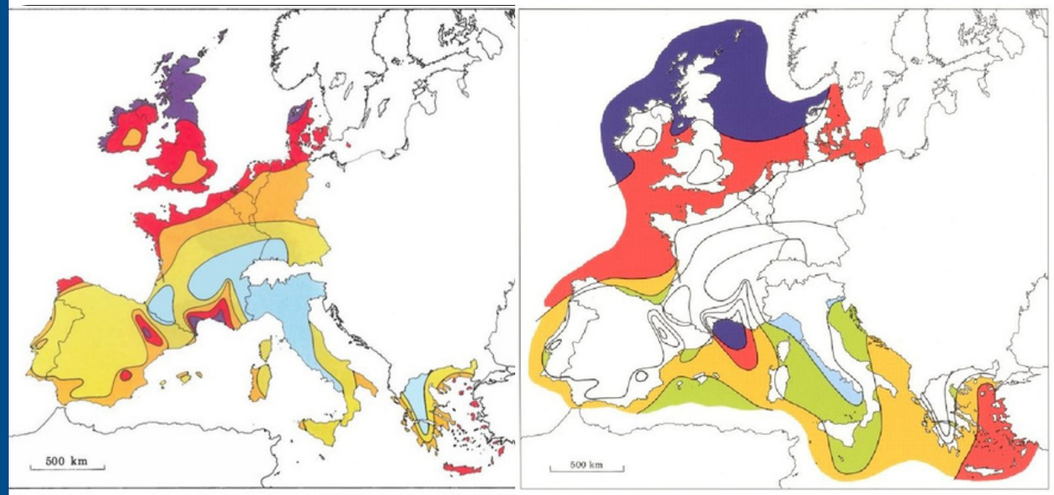
High Offshore Wind Potentials in the Danish Part of the North Sea



Source: DTU

Source: Wind Europe





Wind resources[1] at 50 metres above ground level for five different topographic conditions

	Sheltered terrain[2]		Open plain[3]		At a sea coast[4]		Open sea[5]		Hills and ridges	
	m s⁻¹	W m⁻²	m s⁻¹	W m⁻²	m s⁻¹	W m⁻²	m s⁻¹	W m⁻²	m s⁻¹	W m⁻
	> 6.0	> 250	> 7.5	> 500	> 8.5	> 700	> 9.0	> 800	> 11.5	> 18
	5.0-6.0	150-250	6.5-7.5	300-500	7.0-8.5	400-700	8.0-9.0	600-800	10.0-11.5	1200-1
	4.5-5.0	100-150	5.5-6.5	200-300	6.0-7.0	250-400	7.0-8.0	400-600	8.5-10.0	700-1
	3.5-4.5	50-100	4.5-5.5	100-200	5.0-6.0	150-250	5.5-7.0	200-400	7.0-8.5	400-7
	< 3.5	< 50	< 4.5	< 100	< 5.0	< 150	< 5.5	< 200	< 7.0	< 40

Wind resources over open sea (more than 10 km offshore) for five standard heights

	10 m		25 m		50 m		100 m		200 m	
	m s⁻¹	W m⁻²	m s⁻¹	W m⁻²	m s⁻¹	W m⁻²	m s⁻¹	W m⁻²	m s⁻¹	W m⁻²
	> 8.0	> 600	> 8.5	> 700	> 9.0	> 800	> 10.0	> 1100	> 11.0	> 1500
	7.0-8.0	350-600	7.5-8.5	450-700	8.0-9.0	600-800	8.5-10.0	650-1100	9.5-11.0	900-1600
	6.0-7.0	250-300	6.5-7.5	300-450	7.0-8.0	400-600	7.5- 8.5	450- 650	8.0- 9.5	600- 900
	4.5-6.0	100-250	5.0-6.5	150-300	5.5-7.0	200-400	6.0- 7.5	250- 450	6.5- 8.0	300- 600
	< 4.5	< 100	< 5.0	< 150	< 5.5	< 200	< 6.0	< 250	< 6.5	< 300

Source: DTU

Ambitious Expansion Targets for Wind Power in Denmark

THE ESBJERG DECLARATION

on The North Sea as a Green Power Plant of Europe

Energy security and the fight against climate change are crucial to the future of the European Union. Recalling the Versailles conclusions on energy, the European Commission's communication on Joint European Action for more affordable, secure and sustainable energy, and the most recent IPCC report and taking note of the European Commission's REPowerEU announcement of 18 May, we aim to take urgent and immediate action. The recent geopolitical events will accelerate our efforts to reduce fossil fuel consumption and promote the deployment of renewable energy for more energy resilience in Europe.

Therefore, we will increasingly **replace fossil fuels, including Russian oil, coal and gas, with European renewable energy from the North Sea,** including offshore wind and green hydrogen, contributing to both EU climate neutrality and energy security.

To achieve this and to pave the way for the further expansion of offshore wind, we have **decided to jointly develop The North Sea as a Green Power Plant of Europe, an offshore renewable energy system** connecting Belgium, Denmark, Germany and the Netherlands and possibly other North Sea partners, including the members of the North Seas Energy Cooperation (NSEC). As Members of NSEC, we will build on the work already accomplished and will implement strategies to achieve our goals in close cooperation with the other regional countries and the European Commission. In doing so, we will strive for a balanced coexistence of economic and ecological needs.

The North Sea as a Green Power Plant of Europe will consist of **multiple connected offshore energy projects and hubs**, offshore wind production at massive scale as well as electricity and green hydrogen interconnectors. We aim for a cost-efficient buildout of offshore wind that will harvest the potential of the North Sea in the most beneficial way for both the connected countries and the European Union overall.

Together, we have set ambitious combined **targets for offshore wind of at least 65 GW by 2030**. Based on the North Sea as a Green Power Plant of Europe, together we aim to **more than double** our total capacity of offshore wind to **at least 150 GW by 2050, delivering more than half of capacity needed to reach EU climate neutrality** according to the European Commission's Strategy on Offshore Renewable Energy.

This will contribute to large-scale onshore and offshore production of **green hydrogen. We have set combined targets of about 20 GW production capacity already by 2030** and look to expand our production even further for 2050.

OSTEND DECLARATION OF ENERGY MINISTERS

ON

THE NORTH SEAS AS EUROPE'S GREEN POWER PLANT

DELIVERING CROSS-BORDER PROJECTS

AND ANCHORING THE RENEWABLE OFFSHORE INDUSTRY IN EUROPE

Recalling the declaration on the North Seas as a Green Power Plant of Europe in Esbjerg signed by the energy ministers of Belgium, Denmark, Germany and the Netherlands on 18 May 2022.

The energy ministers of France, Ireland, Luxembourg, Norway and the United Kingdom are joining this Ostend declaration.

Underlining that energy security and the fight against climate change are crucial to the future of Europe, we need to strengthen our cooperation to ensure affordable, secure and sustainable energy, while at the same time, continuing our efforts to protect the marine ecosystem. In response to Russia's aggression against Ukraine and attempts of energy blackmail against Europe we will accelerate our efforts to reduce fossil fuel consumption as well as dependence on fossil fuel imports and promote the rapid upscaling and deployment of renewable energy for an energy resilient Europe.

Further underlining that the goal of the development of infrastructure, production of offshore renewables and market design for the North Seas, is to accelerate the energy transition and maximise the benefits for households, industry and society as a whole.

Together, we have set ambitious combined targets for offshore wind of about 120 GW by 2030 in the North Seas. Based on the North Seas as a Green Power Plant of Europe, together we aim to more than double our total 2030-capacity of offshore wind to at least 300 GW by 2050.

We acknowledge the progress made since the last summit including through the conclusion of both bilateral agreements on offshore renewable generation and non-binding agreements to cooperate on goals for offshore renewable generation for the North Seas, under the revised framework for trans-European energy networks (TEN-E). We fully support the ongoing work to develop a high level strategic integrated offshore network development plan for the North Seas, including by enhanced cross-border coordination of grid and maritime spatial planning.

In that respect we also welcome the initiative that the Transmission System Operators (TSO's) from Belgium, Denmark, Germany and the Netherlands have undertaken to develop a meshed offshore grid and to identify the next steps for its realisation. We invite them to continue the work and extend the process to the TSO's of the five countries that have joined this declaration.

This will contribute to large-scale onshore and offshore production of renewable hydrogen. Germany, Denmark, The Netherlands and The United Kingdom have set combined targets of about 30 GW production capacity by 2030 and look to expand their production even further for 2050.

North Sea

Declarations

Concrete Expansion Plans

Source: Danish Energy Agency

- Denmark's largest procurement procedure for offshore wind power was launched this April
- 6 GW of new capacity with potential to establish up to 10 GW
- More capacicity around Bornholm to be tendered
- Current capacity: 2.7 GW
- Offshore wind plans are also connected to an ambitious hydrogen agenda in Denmark
- A hydrogen pipeline to Germany is under discussion

KONKRETE CHANCEN FÜR DEUTSCHE UNTERNEHMEN

- Während in Deutschland eine Vervierfachung der Offshore-Wind Kapazitäten geplant ist, könnte es in Dänemark bis um das Jahr 2030 zu einer Versechsfachung kommen
- Entsprechend muss die gesamte Lieferkette wachsen und es bieten sich viele Potenziale
- Beispiele sind Logistik, Maintenance und Servicing für Anlagen, Zulieferer Aktivitäten für Windkraftanlagenhersteller, Fundamente, Monopiles, Komponenten für Stromnetze und elektrische Installationen aber auch Anbieter smarter digitaler Lösungen (z.B. digitale Zwillinge)

The North Sea Offshore Summit

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- Mündliche Vereinbarungen und Vertrauen
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18.06.2024

VIELEN DANK!

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IHK Industrie- und Handelskammer Nürnberg für Mittelfranken

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Picture Sources:

- https://ourworldindata.org/electricity-mix
- https://www.reddit.com/r/Nordiccountries/comments/tfc7u3/top_10_countries_in_europe_by_wind_power_capacity/#lightbox
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