

An underwater photograph showing a dense forest of kelp with large, yellowish-green leaves. A large school of small, silvery fish is swimming in the center, and a few larger fish are visible. The water is clear and blue.

Clean Ocean Energy: Sustainability Beyond Carbon

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Ørsted

A clean energy transition is increasingly urgent

2.7 °C

is the average global temperature increase by 2100 expected under current policies

74 %

of annual global greenhouse gas emissions are from energy

10 %

of all species will face a very high risk of extinction if global temperatures rise by more than 2.0 °C

50-75 %

of the global population is at risk of exposure to periods of life-threatening heat and humidity by 2100

USD 44 tn

of economic value generation globally is exposed to risks from nature loss

Offshore wind is a vital tool in the race to Net Zero

~65 GW

Current global
offshore wind
capacity at end
of 2022

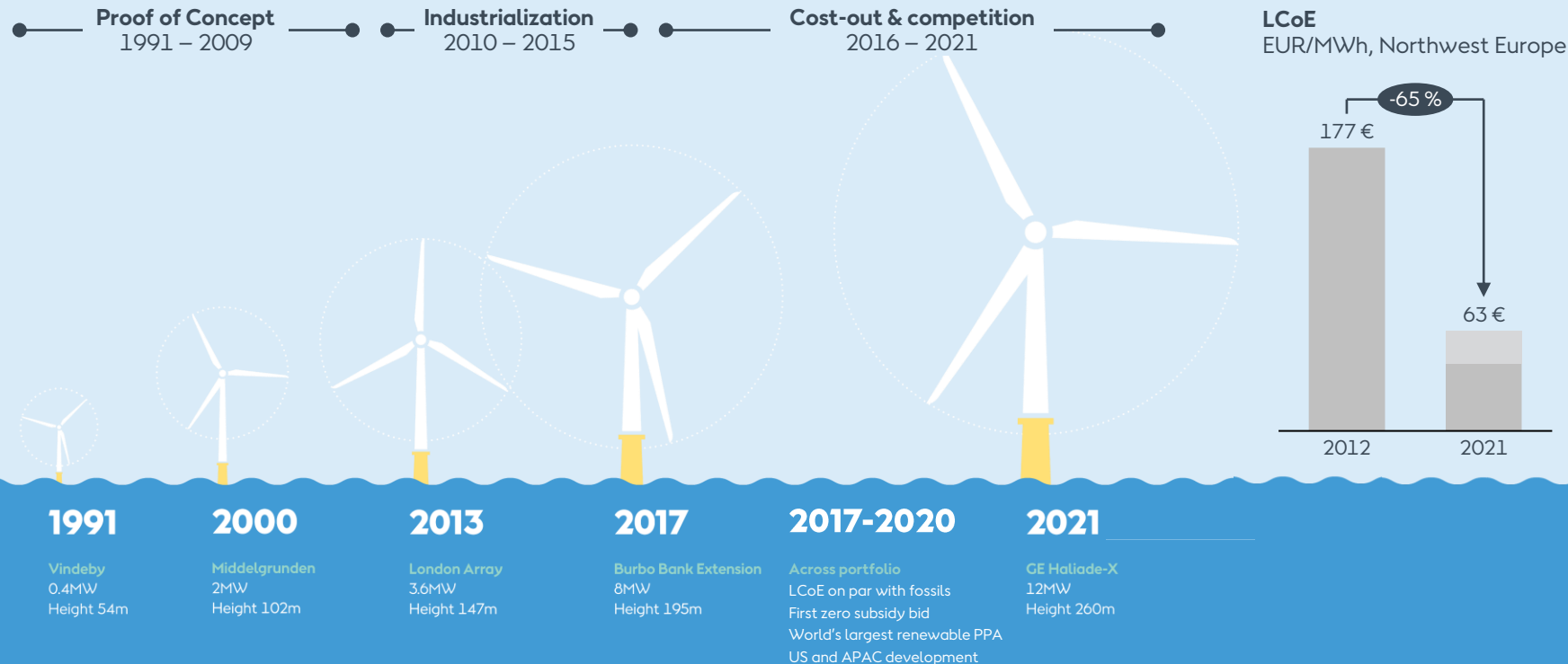
380 GW

Global offshore
wind capacity
needed by 2030
to hit Net Zero

2000 GW

Global offshore
wind capacity
needed by 2050
to hit Net Zero

In the past decades, Ørsted has pioneered offshore wind and spear-headed the industry with innovation to drive down cost of electricity



Today's Challenges

Mis-information

Addressing and overcoming misuse of information from whale strandings to comparisons to nuclear energy and visual impact disinformation, to help all communities make more informed decisions.

Reducing risk to vulnerable species

Healthy seas require action across industries. To reduce known risks to vulnerable species, innovation supports work to protect the local and wider marine environment.

Grid Infrastructure

Insufficient grid capacity and connection queues is a significant constraint on the buildout of offshore wind. We need civil society to engage on planning and advocacy to minimize conflict around siting onshore and offshore.

Lagging support for non-price factors

To avoid a race to the bottom on price, incorporating non-price factors tied to biodiversity, environmental justice, and workforce development will help deliver societal value as we tackle climate change.

Baseline data & data sharing

Baseline data is critical for developing impact assessments and identifying actions we can take for nature, best collected and managed by public agencies. Private data can supplement public data to address targeted questions and knowledge gaps.

An Equitable Blue Economy

Enabling coastal communities to access careers in the new blue economy, including a sustainable transition of fishing to lower impact methods, can support a just transition and reduce pressure on struggling ecosystems.

Scaling Net Positive Action

Supporting capacity-building, development of measurement frameworks, and innovative finance for net-positive biodiversity action will help to deliver integrated restoration and protection activities alongside clean energy infrastructure.

Land Use & Spatial Planning

As renewables grow, conflicts over siting become more frequent. Generation and transmission facilities located in areas unaccustomed to development will require strong engagement to deliver projects. Climate and nature targets should align.

The importance of sector innovation

- ***“The EINA shows significant value to the UK in continued (and accelerated) innovation. To 2050, the cumulative benefit of innovation in offshore wind is £18.8 billion.”*** - The Energy Innovation Needs Assessment (EINA), Vivid Economics, 2019
- ***“Without innovation, LCOE is approximately 10% higher in 2030 and 20% higher in 2040.”*** - Floating Offshore Wind: Cost Reduction Pathways To Subsidy Free, ORE Catapult, 2022
- **Many businesses and those in the academic community are doing fantastic things to create new solutions and bring them to market, but this needs to happen at scale**

Sector innovation priorities – where innovation is needed

- Spatial planning and accelerating deployment
- Project cost drivers
- Energy integration
- Supply chain bottlenecks
- Sector Sustainability

We have a strong track record of working with and enabling other innovators

Spoor

Investment case and pilots

Start-up developing a novel solution for bird detection

Ørsted took minority equity position and entered strategic partnership to pilot solution

Pict

Investment case

Start-up developing novel solution for offshore turbine access

Ørsted took majority equity position, co-developed solution and deployed across asset base

Prosperity Partnership

Academic research programme

A 5-year, £7.64m collaboration between Ørsted, Siemens Games Renewable Energy, and the universities of Sheffield, Durham and Hull

20 individual PhD or post-doc projects addressing cost and risk reduction in offshore wind

Propel

Accelerator programme

Start-up acceleration program focused on system integration

Cohort of 8 finalists selected to undergo 10 week acceleration program

Venture-client collaborations now underway with 4 finalists

PREDICT

Academic research project

Executed by the University of Aberdeen and the University of the Highlands and Islands, and fully funded by Ørsted

Cutting-edge investigation of fish migration patterns and how this relates to offshore wind farm siting



Ørsted's Biodiversity Programme

Four principles for a biodiversity-positive energy transition



Science-based decarbonization

There are no credible claims to nature protection or sustainability without this.

- Ørsted is a renewable energy company through and through – 99% of our capital expenditure goes towards green energy.



Avoid and mitigate negative impacts

As we work to address climate-driven biodiversity loss, diligent application of the mitigation hierarchy ensures no net less to biodiversity.

- Ørsted is led by experts in avoiding, minimizing and mitigating impacts, from tested methods to innovative improvements.



Set and deliver positive impacts

Taking action to deliver positive impacts in support of global restoration goals, through clearly defined and measurable action.

- Ørsted's net-positive biodiversity programme is core to our business strategy.



Holistic sustainability action

Reducing the environmental and social impact of energy through action on circularity, supply chains and just transition.

- Ørsted tailor solutions the local social and ecological context, acting across our supply chain.

Action to deliver biodiversity-positive energy

Working out the details while we act now

- Integrating biodiversity across our business.
- Investing in projects to test and develop scalable NPI. And continued R&D investment.
- Engaging with local communities and partnering with experts to we ensure implement the right solutions in the right places.

Making this scalable




- Developing and testing a measurement framework for NPI.
- Raising additional finance for biodiversity as the world's first energy company to issue a blue bond.
- Establishing partnerships with academic institutions and NGOs to co-create and advocate for solutions.

Prioritizing people and planet

- Reducing our demand for new metals and minerals.
- Creating positive social impact amongst local communities.
- Integrating water quality and replenishment into our work.




...plus building a multi-GW pipeline of clean energy projects on and offshore by 2050.

Humber Estuary Restoration Pilot

- Partnership with the Lincolnshire and Yorkshire Wildlife Trusts to restore biodiversity around the Humber, a large tidal estuary on the east coast of Northern England.
- Restoring seagrass and salt marsh and introducing half a million native oysters to improve the health and resilience of the estuary's ecosystem
 -  Restoring 3 ha of saltmarsh
 -  Restoring 4 ha of seagrass
 -  Introducing 500,000 native oysters
- Creating benefits for multiple biodiversity features and providing insights into how to deliver restoration



SeaGrown Partnership

- Yorkshire-based SeaGrown already runs an offshore seaweed farm in the North Sea, which could be provide a useful tool to help support native species and habitats.
- Partnership aims to develop biodiversity monitoring and measurement guidelines for offshore seaweed farms, using:
 -  eDNA
 -  Remote Cameras
 -  Sonar
- Will validate another tool to protect and enhance marine habitats



ReCoral by Ørsted™

Coral restoration experiment

- How could offshore structures help climate-vulnerable species like coral adapt to changing ocean temperatures?
- Surplus indigenous coral spawn collected from shoreline of Penghu Islands, west of Taiwan mainland
- Spawn incubated in laboratory to coral larvae and transferred to Greater Changhua turbine foundations for settlement in proof-of-concept trial
- We are testing how to best integrate climate and biodiversity solutions at the monopile scale through innovative nature inclusive design



Greater Changhua 1 & 2a Offshore Wind Farms

