

Getting on track for 1.5 °C

How governments
and businesses
can supercharge
decarbonisation

Taking the necessary action to stay within 1.5 °C is in essence neither a technology, nor an economic challenge. It's a leadership challenge.

To enhance and deliver on the pledges made at COP26, immediate steps must be taken to move from ambition to action.

Governments and businesses must look to the future and realise that it isn't only a moral imperative to act on climate change but also a financial one. The payback from taking action now to combat climate change and transform our energy system will be huge for jobs, health, economies, and our planet.

Those who fail to act will be less competitive in a net-zero world and will likely face negative impacts to their bottom line.

On these pages, we point to key actions that governments and businesses can and must take now if they want to remain competitive, while preserving our precious planet and shared home for future generations. We can't waste any more time.



Mads Nipper
CEO, Ørsted

A decade of action in one minute

Current policies are projected to result in a catastrophic temperature increase of 2.7 °C. Without an immediate ramp-up in action this decade, our shot at a 1.5 °C future is lost.

Page 4	Action is cheaper than inaction	A potential 1.5 °C future holds numerous benefits, which is in stark contrast to the detrimental consequences of runaway climate change.
Page 5	A global energy system in need of transformation	A decarbonised energy system can tackle 73 % of global emissions. We lay out why leadership is needed to supercharge the energy transition.
Page 6	How governments can decarbonise and scale power generation	The private sector is ready to deliver on the huge green electrification of the energy system. We highlight the steps governments can take to unlock that investment.
Page 7	How to scale renewable hydrogen for hard-to-electrify sectors	Hydrogen and green fuels can decarbonise activities that cannot easily be decarbonised through electrification. We highlight five steps to scale supply and demand for these technologies to achieve cost-effectiveness.
Page 8	What the private sector must do	The private sector must lead in delivering the investment and solutions needed to combat climate change. We showcase tangible actions companies can take to ensure climate and nature are at the heart of business.
Page 9	Ørsted's commitment	At Ørsted, we try to practice what we preach by decarbonising our entire supply chain and bringing biodiversity and circularity requirements front and centre.
Page 10	The energy system of the future	A world that runs entirely on green energy is within our grasp. Here is what the energy system of the future could look like.

Key actions, but not all actions

At Ørsted, we know that combating climate change and the other challenges humanity is facing is a complex undertaking with many potential pathways and actions that must be taken to transform to a fully decarbonised society. In this short publication, we focus on just a few of the key actions, but acknowledge that we are only scratching the surface – due consideration must also be given to the tailored approach that is needed in different sectors and geographies to transition in a way that is socially and environmentally just.

The consequences of unabated climate change

Each additional degree of warming will bring worse climate consequences and will exacerbate existing inequalities.



At 2 °C of warming, an estimated 37 % of the global population will be exposed to severe heatwaves.



The world's largest companies will face over USD 1 trillion in climate change impacts, likely within the next decade.



At 3 °C of warming, hundreds of millions of people will be displaced from their homes due to sea level rise.

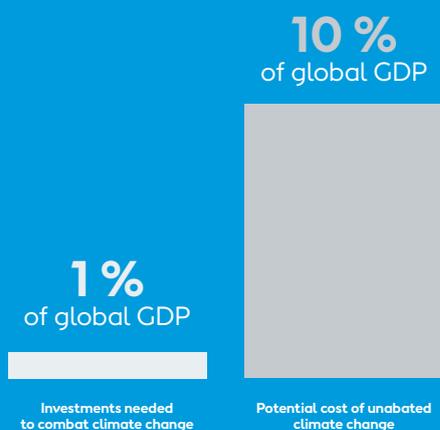


The effects of unabated climate change is expected to shave 14 % (around USD 23 trillion annually) off global economic output by 2050.

Source: Swiss Re Institute (2021), The Economics of Climate Change; CDP (2019) - Global Climate Change Report; IPCC (2018) - Global warming of 1.5°C.

A 1.5 °C world brings numerous benefits

Cost of action versus cost of inaction



IRENA estimates in their 1.5 °C scenario that every USD 1 spent on the energy transition would yield benefits valued at between USD 2 and USD 5.5.



8+ million lives per year could be saved from premature death due to air pollution caused by the burning of fossil fuels.



A 1.5 °C pathway will lead to 122 million energy sector jobs globally by 2050 (of which 43 million will be in renewables).



Transitioning to a low-carbon growth path could deliver economic gains of USD 26 trillion through to 2030 compared to business as usual.

Sources: IRENA (2021), World Energy Transitions Outlook; IRENA (2021), Renewable Energy and Jobs; The New Climate Economy (2018): Unlocking the inclusive growth story of the 21st century; Accelerating Climate Action in urgent times; Vohra et. al (2021), Global mortality from outdoor fine particle pollution generated by fossil fuel combustion: Results from GEOS-Chem.

A global energy system in need of transformation

Energy accounts for 73 % of global emissions due to the continued dominance of fossil fuels. Our collective chance of delivering on COP26 promises and getting on a 1.5 °C pathway lies in immediately scaling up renewables.

The global energy system includes all uses of energy for power, transportation, heating, cooling, and industrial processes. Today, around 80 % of the world's consumption of energy is based on coal, oil, and gas, while the share of modern renewable energy is around 11 %.

Governments can and should take immediate and effective steps to move from ambition to action and to unlock a decarbonised, reliable, and cost-efficient energy system. Decarbonising the power sector followed by direct and indirect electrification of other sectors through a massive deployment of wind power, solar power, and renewable hydrogen will be crucial to decarbonise the global energy system.

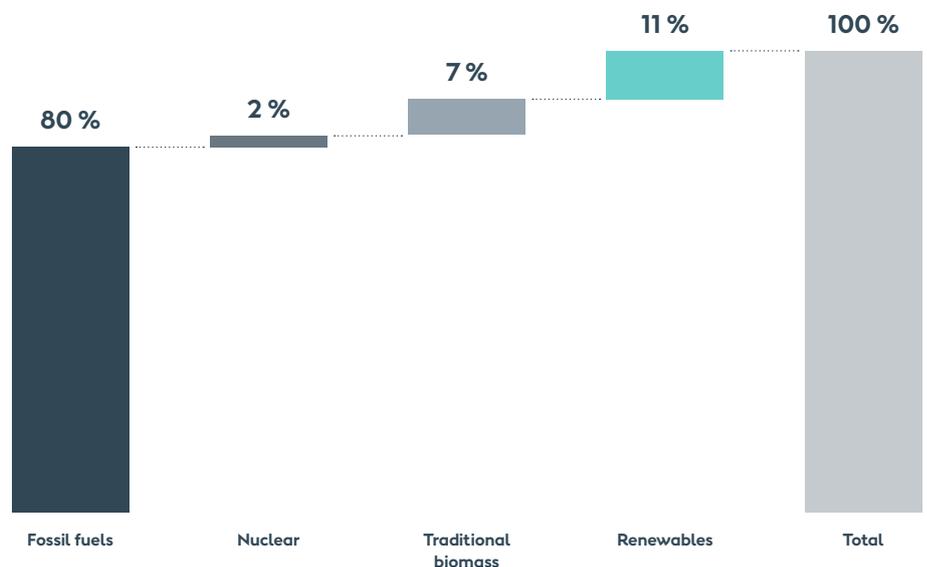
For the power sector, industry has been successful in driving down costs on green energy technologies, such as wind and solar power. Renewables being the most cost-competitive solution combined with more ambitious

climate targets means that new renewable power generation continues to come online at record speed. Yet, progress is still far too slow.

By 2030, investment in the renewable energy system must quadruple from today's level. This includes measures to electrify the energy system directly and indirectly. Currently, only around 20 % of the world's energy use comes from electricity. To get on a pathway to a net-zero world in 2050, direct electrification should account for 60 % of global energy consumption, with a further 20 % from indirect electrification through hydrogen and green fuels for hard-to-electrify sectors.

In the following two pages, we layout some of the key steps governments can take to get on track for a quick and cost-competitive transformation of their energy system.

Global energy mix
% of total energy consumption, 2019



Source: REN21 (2021), Renewables 2021 – Global Status Report.

How governments can decarbonise and scale power generation

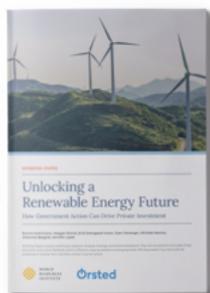
Governments have a threefold task to decarbonise the power sector, support electrification of other sectors, and meet this massive increase in electricity demand with renewable energy.

Wind and solar power are already the cheapest options for new power in two-thirds of the world, and costs are predicted to further decline as a part of the industrial renewable energy revolution. However, predicted build-out rates are still massively insufficient since achieving a 1.5 °C pathway requires the construction of twice as much wind and solar in the coming eight years than what has been constructed throughout history.

Governments across the world face dual challenges of decarbonisation and providing access to cost-competitive renewable energy sources as an essential framework condition for hosting globally competitive economic activity. However, government inaction and insufficient regulatory frameworks are causing costly delays to the energy transition in many regions. To unlock the private sector's ability to deliver at the required scale, governments can take several actions.

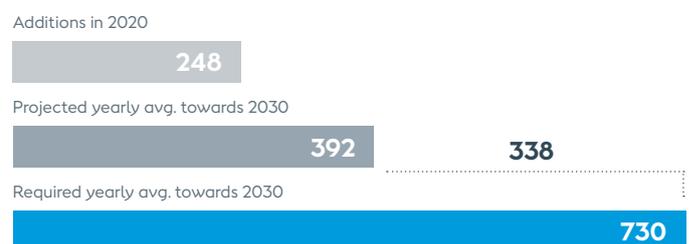
1 Set higher renewable energy targets	Short- and long-term targets, including a solid pipeline of solar and wind projects and a transparent market framework, will reduce the cost of capital and send a strong signal to the renewable energy industry to invest.
2 Find the space	Making land and seabed available faster for the deployment of renewables, including through marine spatial planning and siting allocation on land that takes existing use cases and biodiversity concerns into account.
3 Streamline consenting processes	Processes to ensure that onshore and offshore wind farms as well as solar farms that live up to announced requirements get approved fairly and transparently without undue and costly delays.
4 Modernise electricity grids	Future-proof energy storage, transmission, and distribution to better match supply and demand and to improve transmission line siting processes.
5 Green public procurement as a key emissions reduction lever	Public procurement spend amounts to ~13 % of global GDP and can help ensure a sustainable build-out of renewables by integrating climate criteria in public tenders and leveraging global corporate climate standards.

These are just a few very concrete steps that governments can take to support a net-zero economy. Their success depends on the implementation of a policy ecosystem that ends fossil fuel subsidies, introduces carbon taxes, accelerates energy efficiency improvements, supports electrification of other sectors, enhances biodiversity, and ensures a just transition.



← Want to read more on how to decarbonise power generation? Check out the WRI/Ørsted working paper

Projected versus required yearly net capacity additions for a 1.5 °C world, GW



Sources: Ørsted's calculations based on IEA (2021), World Energy Outlook 2021.

How to scale renewable hydrogen for hard-to-electrify sectors

To achieve deep decarbonisation, governments must introduce policies and regulation to support a massive scale-up of renewable hydrogen.

Replacing fossil fuels with renewable energy for power production and direct electrification with green power can deliver deep emission cuts. But it will not get us all the way to zero emissions.

High-emitting areas such as heavy road transport, deep sea shipping, aviation, and some heavy industries are challenging to decarbonise through clean electrification alone and are today dependent on fossil fuels for energy and feedstocks.

However, using renewable energy, hydrogen can be produced from electrolysis of water. This renewable hydrogen can serve as either a sustainable feedstock to replace fossil-based hydrogen in industry or as a potent

energy carrier, either in its pure form, or, if combined with carbon or nitrogen, as sustainable e-fuels.

Full decarbonisation means reaching the carbon intensive, hard-to-abate sectors with hydrogen and green fuels. These technologies are proven, but have still not arrived at the end destination in their journey to commercialisation.

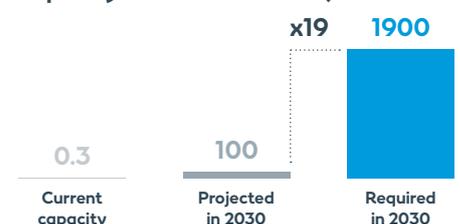
In order to deploy these technologies at scale at the lowest possible costs, supply and demand must grow simultaneously. Governments can break the cycle of inertia by creating the right regulatory framework and supporting pioneering scale-up initiatives.

1 Accelerate renewable energy build-out	Immediate action to put in place a manifold increase of renewable electricity capacity is a pre-requisite for the required renewable hydrogen expansion.
2 Deliver demand-side pull	Strong demand-side policies – such as quotas and carbon pricing – are needed to secure early offtake for renewable hydrogen and e-fuels.
3 Support supply-side push	Access to low-cost capital, funding for scale-up, particularly investment and operational support, as well as the setting up of innovative contracting models will help to kick-start production of renewable hydrogen.
4 Create hydrogen clusters and backbone	To support the first industrial scale-up, governments will need to support the development of regional renewable hydrogen clusters as well as 'backbones' between production and demand centers.
5 Standards and definitions	Approved standards and definitions of renewable hydrogen and carbon feedstocks for Power-to-Liquids are needed to clearly recognise and boost the additional value of genuinely renewable hydrogen.



← Want to read more on how to scale renewable hydrogen?
Check out the Ørsted whitepaper on PtX

Projected versus required electrolyser capacity for a 1.5 °C world, GW



Sources: Bloomberg New Energy Outlook (2021), IRENA: World Energy Transitions Outlook (2021), IEA (2021): World Energy Outlook

What the private sector must do

As governments step up their ambitions towards COP27, businesses must be equally intent on raising the bar on near-term corporate climate action, which can, in turn, boost their competitiveness.

Future-proofing companies for a 1.5 °C world means fully integrating climate concerns across the business. Those that do will be best positioned to address future climate risks. Customers, investors, and employees are

increasingly expecting this. The private sector should expect exponential change and must recognise that long-term sustainability and profitability go hand-in-hand.

1 Commit to science-aligned climate action

Corporate net-zero pledges have grown rapidly. By the end of 2021, over 34 % of the largest 2000 companies had committed to reaching net-zero. Yet, the integrity of most plans still lag behind. Companies must align their net-zero targets with science. There are no shortcuts here: SBTi's Net-Zero Standard shows that most companies must slash emissions by 90 % before utilising offsets.

2 Report transparently on climate

On emission reductions, genuine progress requires genuine transparency. Businesses must account for and disclose their full value chain climate footprint.

3 Help accelerate the energy transition

With the right policy frameworks in place, the private sector can scale the energy transition through corporate renewable power purchase agreements and energy efficiency improvements.

4 Invest in 1.5 °C

Money talks, so investors must play their part by aligning investment portfolios to back companies that are creating the 1.5 °C world. Those who move furthest and fastest will reap the biggest benefits.

5 Become a corporate climate champion

Businesses should use their voice to advocate for net-zero aligned policy action, and continually seek to empower their customers, partners, and employees to speak and act for the climate.

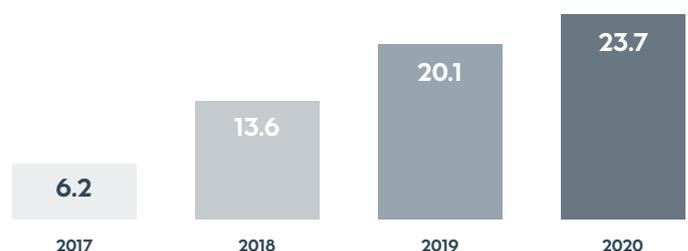
6 Use only high-quality, certified carbon removals

Carbon removals used to offset any residual emissions should be done through high-quality projects that are certified to remove carbon from the atmosphere (e.g. nature-based solutions)

7 Tackle climate change and biodiversity loss together

The biodiversity and climate crises mutually reinforce each other, so companies must embrace net-positive biodiversity strategies alongside climate plans, aligning goals and actions.

Corporate purchases of green power through long-term agreements, GW



Sources: BNEF (2021) Corporate Clean Energy Buying Grew 18% in 2020, Despite Mountain of Adversity.



← Want to read lessons learnt from a green business transformation? Check out our transformation story

Ørsted's commitment

Over the last decade, we have transformed from one of Europe's most carbon-intensive energy companies to a global green energy company. We are working intensely to decarbonise in line with science and drive a sustainable business model fit for a 1.5 °C world.

While we have a clear goal of reaching 50 GW of green power capacity by 2030, our mission is to be a trusted decarbonisation partner for governments and companies. This means we are not just delivering green

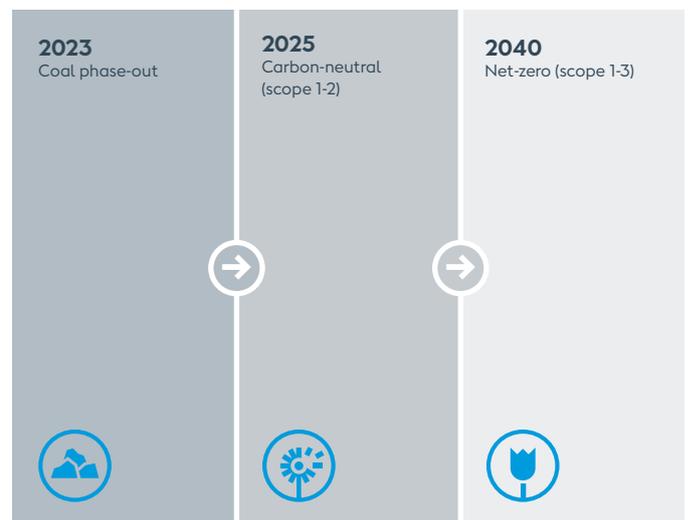
energy generation assets, but full-fledged sustainability solutions. To achieve this, we have set out a number of key sustainability objectives that underpin our entire business. Some of these include the initiatives below.

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|---|---|
| <p>1 Setting a science-based net-zero target for 2040 (scope 1-3)</p> | <p>Ørsted is the first energy company in the world with a science-based net-zero target. This 2040 target is ten years ahead of what science requires and puts emission reductions at the heart of our climate action.</p> |
| <p>2 Reaching carbon neutrality in scope 1-2 by 2025</p> | <p>By 2025, we will become carbon-neutral by reducing emissions in Scope 1-2 at least 98 % (CO₂ per kWh from 2006) and offset residual emissions through certified carbon removal projects.</p> |
| <p>3 Developing a supply chain decarbonisation roadmap</p> | <p>Ørsted engages its strategic suppliers to set science-based targets and develop decarbonisation roadmaps, increase their emissions reporting, and utilise renewable power. We also work across industries to accelerate the development of and demand for low-carbon steel and green shipping fuels.</p> |
| <p>4 Delivering nature-positive projects</p> | <p>We have committed to ensure that, no later than by 2030, all projects commissioned must have net-positive biodiversity impact. We will do this by drawing on our unparalleled experience and data in offshore wind to measure biodiversity impact in the ocean environment.</p> |
| <p>5 Leveraging circularity across the value chain</p> | <p>Our efforts on circularity include a ban on wind turbine blade landfilling, as well as ensuring the reuse, recycling, or recovery of all blades in our global portfolio of onshore and offshore wind farms upon decommissioning.</p> |

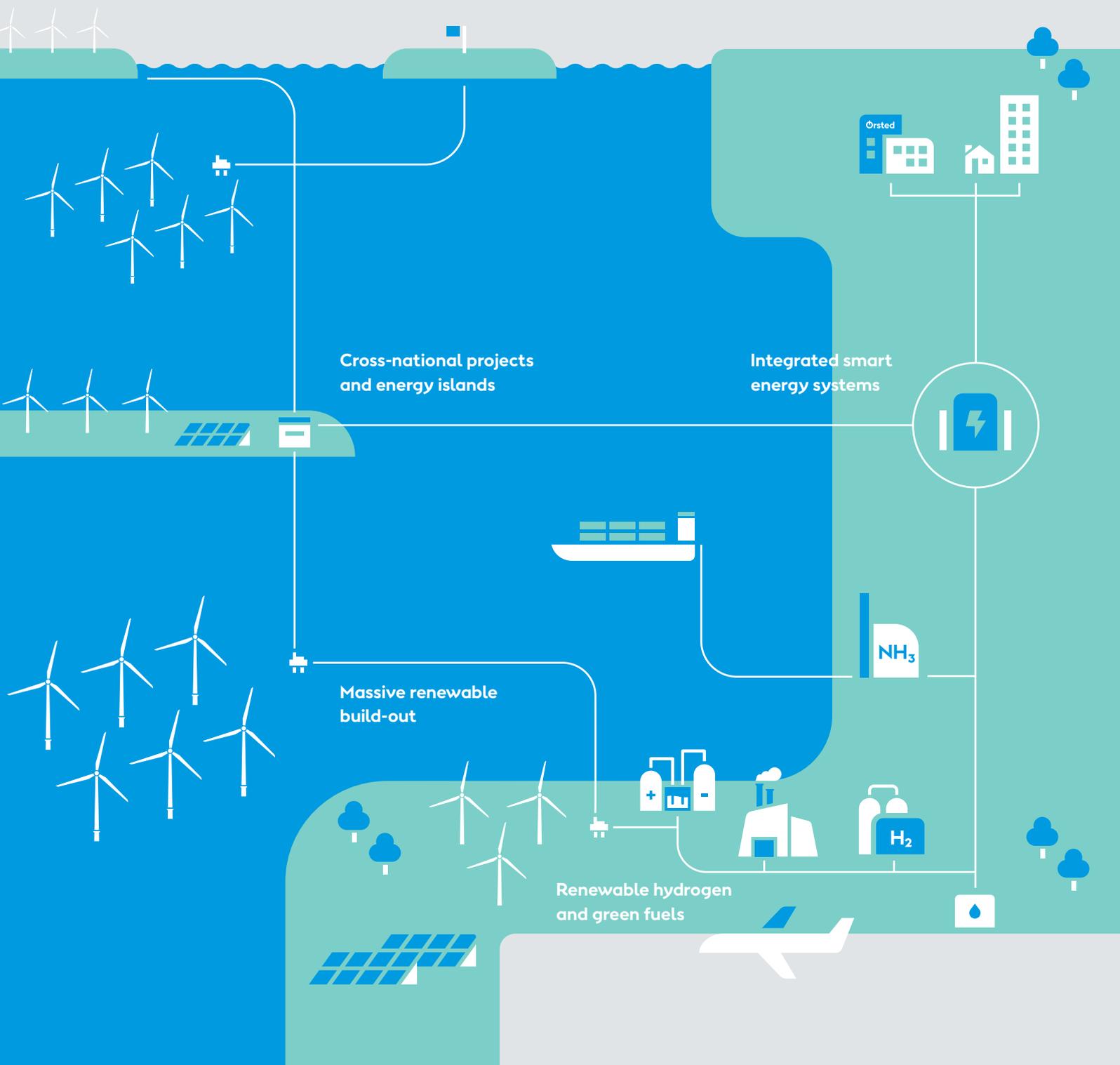


← Want to read more on what has made Ørsted the most sustainable energy company in the world? Check out orsted.com/sustainability

Our climate action roadmap highlights



Let's create a world that runs entirely on green energy



A goal without
a plan is just
a wish.

- Antoine de Saint-Exupéry

At Ørsted, we have a vision of a world that runs entirely on green energy. We develop, construct, and operate offshore and onshore wind farms, solar farms, energy storage facilities, and bioenergy plants, and provide energy products to our customers. By scaling renewable energy solutions, we're doing our part to develop the world's future energy system, one that promises to meet the demand for integrated solutions to decarbonise industry and society alike.

Ørsted ranks as the world's most sustainable energy company in Corporate Knights' 2022 Global 100 index and is the first energy company in the world with a science-based net-zero emissions target as validated by the Science Based Targets initiative.

We want to be a global catalyst for systemic change by helping governments and companies to realise a sustainable future that benefits all, keeps the average global temperature increase within 1.5 °C, and ensures economic vitality and positive impacts on biodiversity and nature. Headquartered in Denmark, Ørsted employs +6,600 people.



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Get in touch

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