

Our green business transformation

What we did and lessons learned



Ørsted

// Ørsted's green business transformation can inspire a path forward for the U.S. clean energy transition."

David Hardy

CEO Ørsted North America Offshore



Throughout its history, the United States has undergone several energy transitions. Our nation's early energy needs were met by wood and water mills. The use of coal powered the industrial revolution, until the discovery of oil in 1859 slowly started the petroleum era. The shale revolution of the early 2000's made our country a net oil and gas exporter almost overnight. Now, our nation is entering the next phase; a clean energy transition that is poised to be one of the most critical transformations our nation has ever faced – with vast benefits for our economy and environment.

Our company, just like the U.S., was once a heavy producer of fossil fuels, until a decade ago when we made a strategic decision to become a renewable energy company. This transformation took immense amounts of patience, vision, courage and innovation - leading us to today where we have been ranked the world's most sustainable energy company four years in a row and are one of the largest renewable energy companies globally.

Our journey through this transformation has been anchored in the scaling of Europe's offshore wind industry. Driving the industry's advancement has positioned Ørsted as the global leader in offshore wind, with 28 projects in operation around the world, and a goal to reach 30 GW of global offshore wind capacity by 2030. The maturation of the offshore wind industry in the U.S. will be vital in achieving not only our company's ambition, but also our nation's clean energy goals.

As we launch this new American industry, Ørsted's global experience combined with unrivaled local expertise will bring more than just a solution to mitigate climate change; as we build out our portfolio, we're bringing opportunity to America's skilled workforce through accessible, well-paying jobs. Ørsted already has more than 400 employees at work in states across the U.S. and is pursuing supply chain development that expands the geographic reach of domestic, clean energy jobs and

investment – from the East Coast to the Gulf Coast, to the Heartland and beyond. Together, we can develop the green workforce of tomorrow and secure a healthier, more equitable future for historically environmentally burdened communities.

At Ørsted, we have already taken concrete steps to deliver on these promises and continue to lead the way in ensuring tangible benefits from the offshore wind industry are felt throughout the country:

- Ensuring a just transition through a historic partnership with North America’s Building Trades Unions (NABTU)
- Investing with our joint venture partner in the construction of new American vessels such as the first-ever U.S. flagged “Jones Act” qualified Service Operations Vessel (SOV), to be built at Edison Chouest’s shipyards in Florida, Mississippi and Louisiana, and a new fleet of crew transfer vessels (CTVs), to be built at Rhode Island shipyards
- Expanding domestic manufacturing capabilities for key offshore wind components like our agreement with Maryland’s Crystal Steel fabricators
- Investing in environmental justice with innovative solutions like our electric truck initiative to improve air quality and support residents at the Port of Newark
- Strengthening communities in New Jersey by providing small, women-owned, minority-owned, and veteran-owned businesses with capital to enter the burgeoning offshore wind industry through the Pro-NJ Grantor Trust
- Revitalizing existing port facilities on the East Coast, turning New London State Pier into a heavy-lift cargo and deep-water port, Baltimore’s Tradepoint Atlantic into an offshore wind staging center and the Paulsboro Marine Terminal in New Jersey into the home of a new state-of-the-art monopile manufacturing facility

The positive economic impacts of the offshore wind industry will be felt nationwide, and we look forward to strengthening our communities and creating opportunities for even more Americans to benefit from the clean energy transition. This paper describes Ørsted’s transformation from fossil fuels to renewables, while offering a range of the most important learnings and recommendations on how to execute a green transformation.

The journey to transform the U.S. energy sector can and must happen at a fast pace. At Ørsted, we welcome the challenge and are excited to help our nation succeed in becoming a leader in climate action. Let’s be courageous, bold, and innovative together.



David Hardy
CEO of Ørsted Offshore North America

Key lessons from Ørsted’s green transformation

1. Confront your reality in a changing landscape
 2. Define a sustainable vision
 3. Engage and align stakeholders
 4. Mobilise behind your vision
 5. Drive tangible action
 6. Expect exponential change
 7. Go the distance
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Birth as a fossil fuel company

We were formed from the merger of six Danish energy companies in 2006, including Danish Oil and Natural Gas and five other power generation and distribution companies. The emergent DONG Energy was primarily a domestic integrated energy company, with business activities across the energy value chain, and majority-owned by the Danish state.

Upon our formation, we had a power and heat production mix that was 85% fossil fuel – mostly coal – as well as oil and gas production and exploration assets in the North Sea. We only had a small renewable energy business, including the world's first offshore wind farm, built in 1991 in Vindeby, Denmark. Earnings were 88% based in Denmark, with only 12% from international businesses.

We were one of the most coal-intensive companies in Europe and accounted for a third of Denmark's national emissions. Our growth strategy was to expand coal, oil, and gas activities in North-western Europe.

In the years following the formation of DONG Energy, we started to sense the need for a change in direction. Climate change became a political priority. In 2007-8, the EU adopted a target of 20% renewable energy by 2020 and in 2009, COP15 was held in Copenhagen, aiming to strike a global agreement to reduce greenhouse gas emissions. The renewables industry was experiencing growth. Meanwhile, we saw increased stakeholder concerns about our coal power project under development, the 1600 MW Greifswald Power Station in North-east Germany.

↓ The Siri oil production platform in the North Sea, Denmark, previously owned and operated by DONG Energy.





Anholt Offshore Wind Farm, Denmark. 

Green vision and action

In 2008 we saw the need to transform and to change from fossil fuel to sustainable energy. Then CEO, Anders Eldrup, set out a vision of the green energy transformation. In an op-ed article, Eldrup wrote that:



We must create a completely different energy system, where the majority of the world's energy comes from the infinite amounts of naturally occurring energy sources, such as the wind and sun. //

For us, it meant that we wanted to flip our ratio of heat and power production from fossil fuel sources compared to green so that within a generation, by 2040, 85% would be green and only 15% fossil fuel. Senior leadership saw that growing societal focus on climate change would fundamentally challenge and eventually erode the fossil-based business. Our decision to change was based on the desire to tackle climate change as the most pressing problem of our generation and on the analysis that we had to develop a sustainable business model to stay relevant and competitive.

The new vision faced some internal and external resistance. Fossil fuels were our core competence, employees were proud of our world-class coal power plant efficiency and many, both internally and externally, saw the transformation as commercially risky.

However, Anders Eldrup was clear about the need to transform and communicated the vision clearly and distinctly. In the years following the change in vision, we started closing coal-fired power plants and avoided several large investments in new fossil assets, including halting the development of the Greifswald Power Station.

Instead we decided to increase our investments in offshore wind, which was then a part of a small wind energy department. We took final investment decisions on the London Array and Anholt wind farms and entered into a landmark framework agreement for 500 3.6 MW turbines with manufacturer Siemens – more offshore turbines than the then existing global fleet – to enable our build-out of offshore wind. This was considered very ambitious at the time. We acquired wind turbine installation company A2SEA to directly control this critical part of the supply chain. We also, for the first time, divested an ownership stake in an offshore wind farm to an institutional investor, PensionDanmark, to bring in more capital to support the financing of our investment programme.

Acceleration of our green transformation

In 2012 we came under intense financial pressure when earnings turned to losses in the global gas market. We saw a drop in earnings that challenged the significant investments planned in offshore wind and in oil and gas production, which at the time was still a growth area. As a consequence, S&P downgraded us to BBB+ with a negative outlook. A further downgrade would mean an unsustainable increase in the cost of capital, jeopardising our offshore wind investment plan and putting our green transformation at risk.

We needed to get ourselves back on track and so new CEO Henrik Poulsen, who joined the company in 2012, put a financial action plan in place. We distilled our portfolio into 4 business areas instead of 12: offshore wind, oil and gas production, conventional power plants, and energy sales and distribution grids, with offshore wind and oil and gas as growth areas. We divested non-core assets worth more than USD 3.5bn (DKK 23bn), including gas-fired power stations and hydroelectric plants.

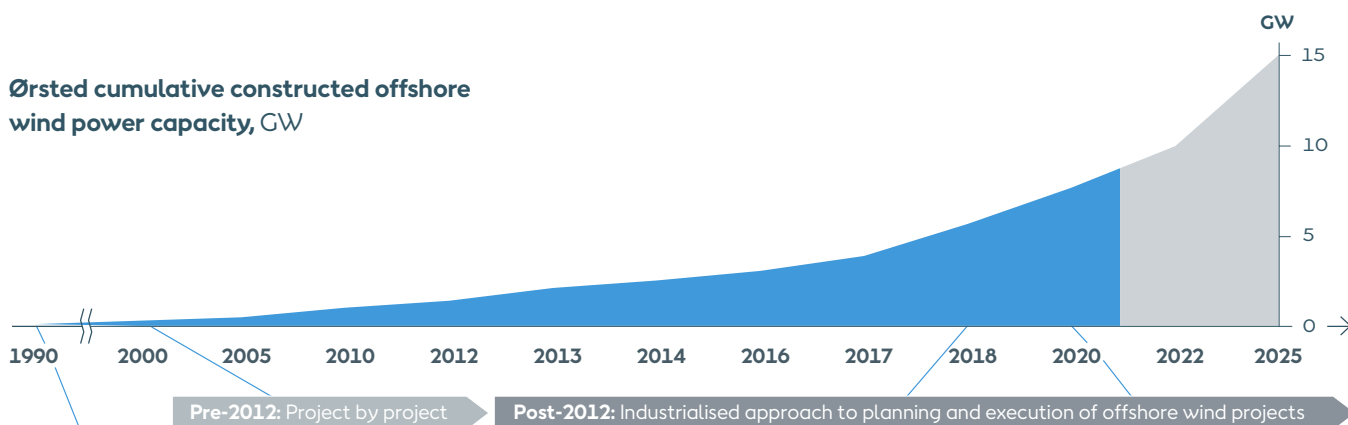
We enacted a cost-reduction plan, and new investors injected equity of over USD 2bn (DKK 13bn) to fund our future growth.

The plan made it possible to sustain and even increase the pace of our green transformation. Henrik Poulsen decided to reinforce our carbon-reduction target for 2020 from 31% to 44% compared to 2006. We put plans in place to build a global renewable energy business and ultimately to dismantle the legacy fossil fuel and utility business.

Building our renewable energy business

Now, even more than before, we put all our bets on offshore wind as our new strategic core and the best opportunity to accelerate our green transformation. We expanded investment in offshore wind farms in the UK and Germany and established a market leadership position in Europe, laying the foundation for future expansion globally.

Ørsted cumulative constructed offshore wind power capacity, GW



5 MW

Vindeby
First offshore wind farm in the world

Turbine capacity	0.45 MW
Nr. of turbines	11
Rotor diameter	35 m
Distance to shore	1.8 km

160 MW

Horns Rev 1
First large scale offshore wind farm in the world

Turbine capacity	2 MW
Nr. of turbines	80
Rotor diameter	80 m
Distance to shore	18 km

659 MW

Walney Extension
The first offshore wind farm to deploy two different wind turbines

Turbine capacity	7-8.25 MW
Nr. of turbines	87
Rotor diameter	154-164 m
Distance to shore	19 km

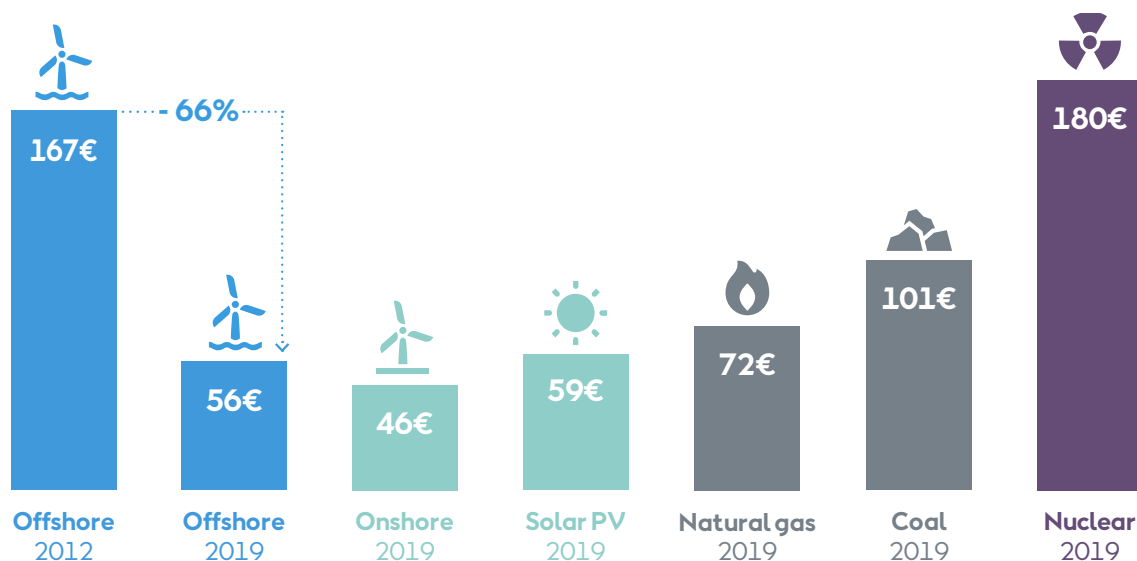
1,218 MW

Hornsea 1
The world's largest operating offshore wind farm

Turbine capacity	7 MW
Nr. of turbines	174
Rotor diameter	154 m
Distance to shore	120 km

Levelised cost of electricity (LCoE)

EUR/MWh, 2012¹ and 2019²



However, our decision to focus even more on offshore wind was not an easy one and involved calculated but significant risk-taking. At the time, offshore wind was still relatively expensive compared to other new-build power generation technologies, as it was a fairly young technology – the first commercial-scale wind farm, Horns Rev 1, was only commissioned in 2001. The future scale, cost reduction potential and thereby commercial viability of the industry was uncertain. As a consequence, and following the 2012 financial pressure, which also hit numerous other European energy companies, many competitors decided to withdraw or scale down their participation in the capital-intensive and nascent offshore wind industry.

We found ourselves at a critical juncture where we believed that if we managed to take the next step in providing scale to the industry, we could reduce cost significantly. But at the same time, governments increasingly wanted to see cost reduction before continuing to invest in the industry through subsidies. That was the catch-22.

To maintain the governmental and societal support needed to bring down costs we decided to set a highly ambitious target to reduce levelised cost of electricity from offshore wind to EUR 100/MWh by 2020. This goal was set top down as a visionary statement rather than relying on bottom-up engineering calculations and was beyond what many thought was possible at the time.

This cost goal was quickly picked up by the whole industry. The target helped governments, especially in the UK but also in Denmark and Germany, to maintain ambitious offshore wind build-out targets in a time of financial austerity. Long-term price support regimes in these countries enabled the industry to make strategic investment decisions in offshore wind. One of the most significant investments was another framework agreement we made with Siemens, this time for 300 6 MW turbines, which helped us to further scale the industry.

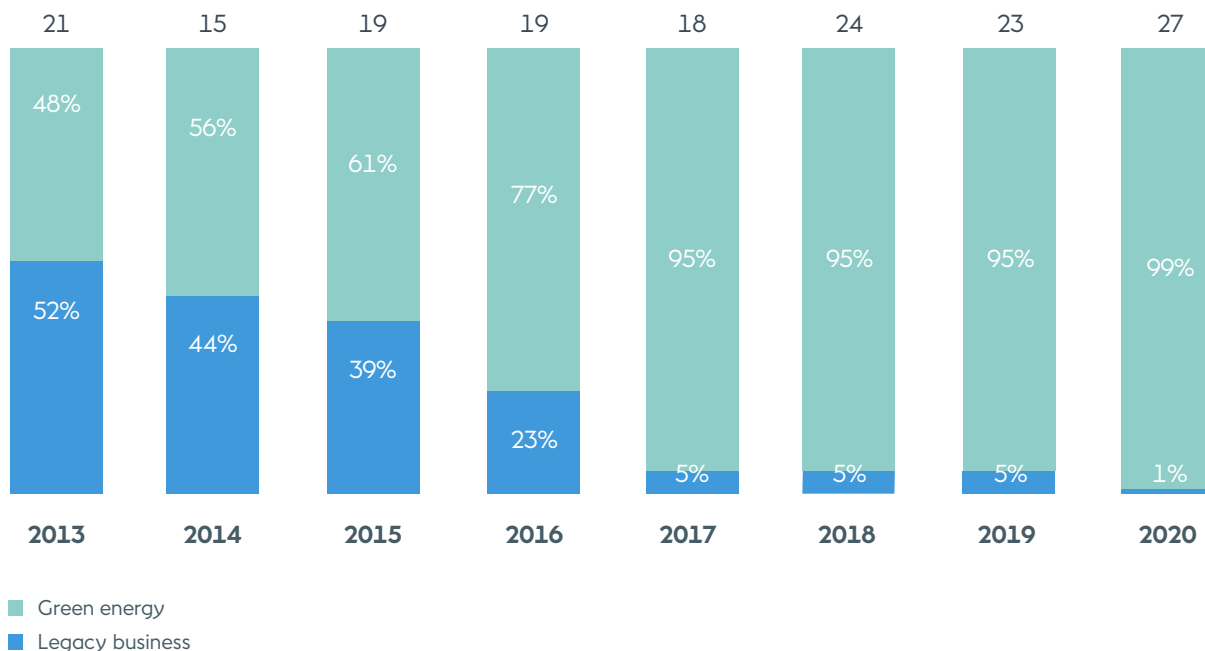
Exactly because the target was ambitious it encouraged a transformative approach and innovation that would not have happened had we set the target bottom up and incrementally. In the following years, we systemically drove down costs together with the industry. Cost reductions occurred through scale and innovation, e.g. through developing larger sites, installing larger turbines, innovating to reduce cost across all components, and optimising procurement, construction, operations, and maintenance. We crossed the EUR 100 threshold four years early, in 2016, when offshore wind became competitive with coal- and gas-fired power plants. The cost of offshore wind is now below that of conventional fossil fuel plants, having fallen by 66% since 2012, and at a similar level to onshore wind and solar.

Over the years, we continued to accelerate our capital investment shift to renewables. Our model of partnering with institutional investors on offshore wind farm projects

1. 2012 generic offshore wind, Northwest Europe, FID 2012. In 2012 our goal was to reduce offshore wind costs to EUR 100 per MWh in 2020
 2. Offshore wind 2019: Ørsted calculations from UK CfD Round III. Onshore wind: average of DE, NL and UK mid-scenarios. Solar PV, Gas: average of DE, UK mid-scenarios. Coal: DE mid-scenario. Nuclear: UK mid-scenario. Exchange rate EUR:USD: 0.89, YoY inflation 2017-2018: 1.75%. Source: Bloomberg New Energy Finance – 1H 2019 LCOE Update, current LCOE and Ørsted Calculation.

CAPEX allocation to new strategic core 2013-2020³

DKK bn



enabled us to further expand investment, including in our first offshore wind farm in the Netherlands and the first gigawatt-scale offshore wind farm, Hornsea 1 in the UK.

Dismantling our legacy fossil fuel business

While building our offshore wind business we converted or divested our legacy fossil fuel businesses which saw significant write-downs of almost USD 6bn (DKK 33bn) during those years. We continued our shift away from coal – overall closing around half of our coal-fired power plants and converting the rest to certified sustainable biomass. We set a target to phase out coal by 2023.

Events showed that the oil and gas business was increasingly becoming a financial liability. Following sharp oil price decreases in 2014, we re-evaluated and deprioritised the division – limiting new investment. Thus, for the upstream oil and gas business, the strategy was changed to create a means of cash generation for green investment. We later decided to divest our oil and gas production assets, given the lack of strategic fit with our green energy transformation.

Going public, becoming Ørsted

By 2016, our financial performance had picked up, driven by rising offshore wind operating earnings, which that year surpassed those from oil and gas, previously the company’s largest source of operating earnings. We took Ørsted public in the world’s second-largest Initial Public Offering (IPO) of the year, with a unique equity story of a global leader in offshore wind with a platform for further development of renewable technologies. The IPO offered greater flexibility and potential access to equity to fund growth. It also gave investors the opportunity to take part in our green growth journey.

In 2017, once the sale of our oil and gas production assets was completed, we changed our name, which originally was an abbreviation of Danish Oil & Natural Gas and no longer fitted our green direction. To reflect the transition to a green energy leader, we became Ørsted – after the Danish scientist Hans Christian Ørsted who discovered electromagnetism, the scientific foundation for the way power is produced and a key component in green energy.

We also formulated a new, purpose-driven, company vision – to help create a world that runs entirely on green energy.

In the coming years, we put greater focus on globalising our business and diversifying our renewable energy portfolio. 2017 saw our first investment in an offshore wind project in Asia, in a partnership on the Formosa offshore wind farm in Taiwan.

In 2018, we expanded our operations in the US by acquiring two renewable energy companies – Deepwater Wind, a leader in offshore wind development, and Lincoln Clean Energy, a company building a strong onshore wind and solar platform. The same year we announced our intention to invest USD 30bn in green energy towards 2025. Our diversification into onshore wind and solar markets added to our offshore wind competences. We have since diversified further into green hydrogen and energy storage.



Oak Solar farm, Fairfield Township, New Jersey, the US



Amazon Texas onshore wind farm, Snyder, Texas, the US



A global renewable energy major

The original target of flipping the ratio of fossil fuel compared to renewable energy production turned out not to take an entire generation after all. Thanks to our determination to decisively focus on offshore wind, invest in its cost reduction, and move away from fossil fuels, as well as to the supportive policy environment, it was in 2019 that we first hit 85% of renewables as a share of energy generation and not in 2040 as originally stated. So, the target took ten years to reach and was achieved 21 years ahead of schedule. Harvard Business Review ranked the Ørsted transformation as one of the top business transformations of the decade³.

Extract from Harvard Business Review top business transformations of the decade

No	Company	Headquarters
1	Netflix	US
2	Adobe	US
3	Amazon	US
4	Tencent	China
5	Microsoft	US
6	Alibaba	China
7	Ørsted	Denmark
8	Intuit	US
9	Ping An	China
10	DSB Group	Singapore

Today, Ørsted is the largest offshore wind company in the world and amongst the largest global renewable energy companies, with over 11 GW of capacity installed. We have been named the most sustainable energy company in the world for the past three years, and the most sustainable company overall in 2020⁴. Our stock is held by most sustainability-focused investment funds. We have globalised our business, with 90% of earnings now coming from outside Denmark, following the 2019 divestment of our Danish power distribution and residential customer businesses.

The Ørsted transformation can be seen in key metrics. Between 2007 and 2020, our carbon emissions have decreased 86%. At the same time, our operating profit has almost doubled, and the share of that profit coming from renewables has increased to 98%.

Ørsted wants to help create a world that runs entirely on green energy. Our starting point was to undertake our own green transformation, and in the process to lead the emergence of the offshore wind industry. By 2025, our own energy generation and operations will be carbon neutral, the first major energy company to achieve this. By 2040, our supply chain will be carbon neutral. This timeframe is far ahead of science-based decarbonisation requirements to meet the goals of the Paris Agreement.

Our next step is to help more countries and companies transform by decarbonising. We want to contribute globally by scaling and accelerating the solutions that are already there, but also by remaining an innovation leader in crafting new solutions. Our ambition is that our contributions to solutions like green hydrogen will support other industries on their decarbonisation journeys.

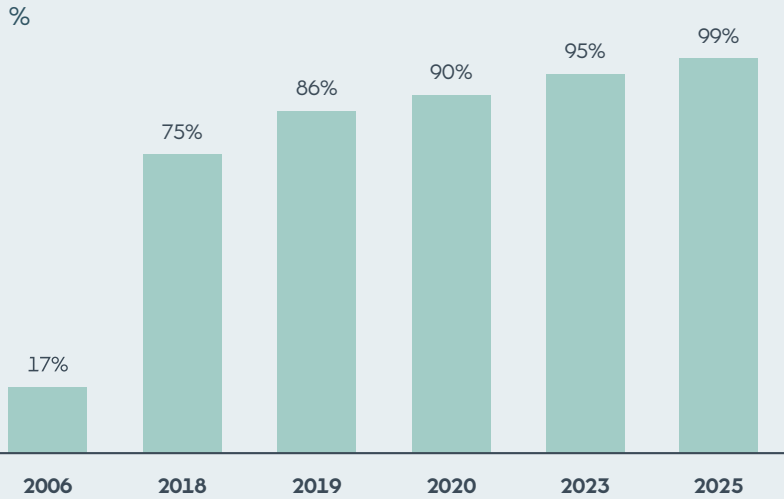
Ørsted to become carbon neutral by 2025

Carbon intensity of energy generation & operations (scope 1-2)

3. Harvard Business Review (2019), 'The Top 20 Business Transformations of the Last Decade' <https://hbr.org/2019/09/the-top-20-business-transformations-of-the-last-decade>

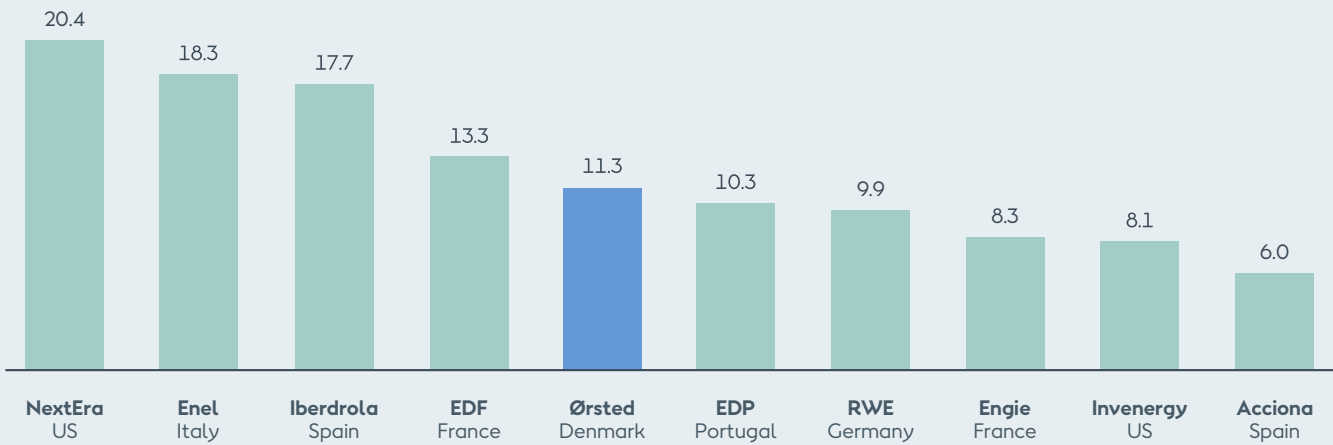
4. Corporate Knights, 'Global 100' <https://www.corporateknights.com/reports/global-100/>

Ørsted share of green power and heat



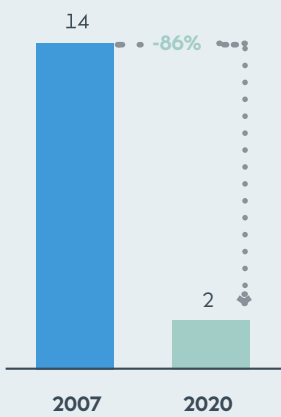
2020 – Top 10 global renewables players excl. China

Installed capacity⁵, GW



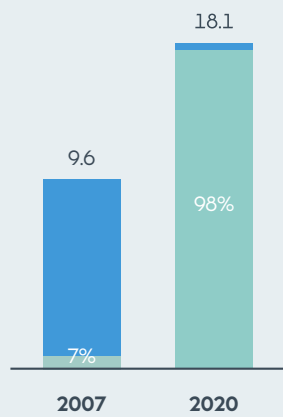
CO₂ reduction

Mt CO₂e



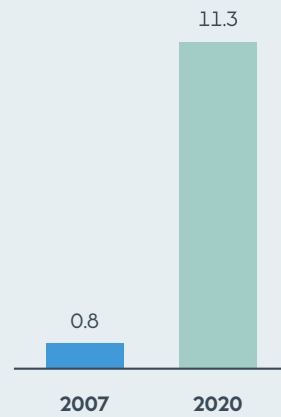
Green transformation

EBITDA, DKKbn, %



Renewable capacity

GW



5. Capacities allocated on a developer basis. Data from BNEF Company Rankings database. Renewables include offshore wind, onshore wind, solar PV and biomass.



Hornsea One offshore windfarm, the current largest in the world, total capacity 1.2GW, off the Yorkshire coast, UK.

Lessons learned for green business transformations

Increasingly, companies all over the world are realising the need to transform to a sustainable business model. This is difficult and brings challenges, not least because of psychological barriers to change. It often feels easier to hold on to what you have and what you know rather than to pursue a radical transformation. We know because we have been there.

In this section, we put forward seven key learnings that can be distilled from the Ørsted story about how to perform a green transformation. We have attempted to frame these on a level that is generally applicable for most companies rather than making them specific to our sector.

However, we acknowledge that all individual company cases are different, and so there will be aspects that may be more or less applicable depending on context.

Despite the differences across industries, there is a golden thread; what often seems to be a technological or financial challenge is in its essence a leadership challenge. What we try to do with the seven learnings is to give our take on the leadership approach required to perform an accelerated transformation to a more sustainable business model. Because we believe profitability and sustainability are not in competition, but in the 21st century, go hand in hand.

Seven key lessons learned through the Ørsted green business transformation

1 Confront your reality in a changing landscape – Understand the context in which you are doing business and how this is likely to change. Do not become too absorbed in the themes that are high on the societal agenda right now. Look to the fringes of your stakeholder landscape to identify the risks and opportunities that will shape and impact your business environment in the future. Take into account your likely future competitive advantage.

For Ørsted this meant understanding the long-term challenges to fossil fuel business models given societal concern over climate change, the actual climate impact, and the opportunities arising from the growing market for renewable energy.

Once the opportunities and risks are identified, use the information to confront the reality your business will face. Take an honest view of the long-term viability of your current business model in light of the changing context, even if it is unpleasant and challenges what you do or who you are. Be careful not to explain away the risks of maintaining the status quo and a stable worldview.

We had to overcome inertia and long-held views and reconsider who we are as a company as part of this process. This was difficult, including on an individual psychological level, as we had to leave behind old areas of expertise that thousands of colleagues took great pride in.

2 Define a sustainable vision – Define an aspirational, purpose-driven vision that is not about what the company can become but how the company can contribute to a more sustainable world. The vision should at the same time express company strategy and guide it. For Ørsted, this vision is to create a world that runs entirely on green energy.

To achieve the vision, a green business transformation is likely to be needed. This may require a leap of faith in making the strategic choice to transform. Some analysis will be necessary to inform the decision. But exactly because you are faced with a transformation

you can rarely clearly account for the precise upside to transforming or the downside to maintaining the status quo. Don't get too caught up in cost-benefit analyses to decide whether you should make the change.


3 Engage and align stakeholders – Align with stakeholders, including policymakers, investors, employees, and customers, regarding the risks and opportunities driving transformational change, and the need for a green business transformation. Get them all on board with the journey. Explain how the transformation creates value for each of your stakeholders, so they all have a stake in the process. If certain groups lose out, take the time to explain the reasons for change and listen to their views.

Ørsted was able to undergo its green transformation, and learn these lessons, partly due to the existence of a supportive policy environment. In particular, there was sufficient visibility and certainty of offshore wind policy support and capacity volumes to allow investment and innovation at scale, which led to a virtuous cycle of technology maturity and reducing costs. The success of such an 'ambition loop' is an additional policy learning that could be applied to other technologies and industries.

Rarely can one company undertake a successful transformation alone. Identify which partners and stakeholders outside your company you need to join forces with in order to move forward and achieve your goals. For Ørsted, this included working with our supply chain to scale technology and bring down costs and with new investors to leverage capital, among others.

4 Mobilise behind your vision – Move decisively on your green business transformation to pursue the vision. Identify the options that you can build your future business platform around in alignment with the vision. Make decisions on how to move out of the legacy business and build the new platform. Once you have your blueprint and concept you should go all in and devote



 Permian Energy Center, Andrews County, Texas, Solar PV plus storage project, which will produce enough clean electricity to power approximately 100,000 U.S. homes.

yourself, your capital, and your talent to mobilising behind the opportunity in order to scale and learn quickly.

We took this leap of faith into offshore wind, to go all in. Our learnings from successive offshore wind projects were key in building a competitive advantage for us and bringing down the cost of energy for that technology.

5 Drive tangible action – Set medium-term, stretching, science-based emission reduction targets anchored in the vision to guide the transformation and drive action. Any targets have to be ambitious enough to drive change and innovation yet realistic enough to not demotivate and overwhelm the organisation. Remember to roll back targets to concrete one-year actions so that all employees know what to do in their daily work to execute strongly. Review progress and targets frequently to drive action and innovation.

At Ørsted, we have set a number of targets for decarbonisation, cost of energy of offshore wind, and coal phase-out, and in hindsight they have been instrumental in setting the pace, mobilising resources, and aligning the organisation behind a shared objective.

6 Expect exponential change – When systems, such as the energy system, are changing, do not expect incremental change. Experience has repeatedly shown, across industries, that such transformations happen slowly at first, in an emergence phase, and then exponentially, in a diffusion phase⁶.

But we tend to predict the future based on the recent past, so we underestimate the speed of change. During a transformation, what was true yesterday or even today will not be true tomorrow, which makes change happen much faster than expected. The challenge to leadership in the context of exponential change is to stay ahead of the curve and to be open to the new change possibilities as they arise.

We were also surprised at our own pace of change – reaching our transformation goals in ten years rather than 30 and reaching the offshore wind cost-reduction target four years ahead of time. This is a demonstration that with the right momentum in the organisation you can achieve much more than you could originally imagine.

7 Go the distance – Be persistent. There might be setbacks along the way but stay true to the course you have set. Have your blueprint ready but do not try to chart a linear path all the way to your long-term vision. That is impossible when dealing with large-scale transformations fuelled by external factors that you work in interplay with. You need to take a big step that makes sense and points you in the right direction. If it works, you can review and then take another step. Iterate the process to reach your targets.

6. Grub et al (2020), 'Shape and Pace of Change in the Electricity Transition: Sectoral dynamics and indicators of progress'



About Ørsted

The Ørsted vision is a world that runs entirely on green energy. Ørsted develops, constructs, and operates offshore and onshore wind farms, solar farms, energy storage facilities, and bioenergy plants, and provides energy products to its customers. Ørsted ranks as the world's most sustainable energy company in Corporate Knights' 2021 index of the Global 100 most sustainable corporations in the world and is recognised on the CDP Climate Change A List as a global leader on climate action. Headquartered in Denmark, Ørsted employs 6,179 people. Ørsted's shares are listed on Nasdaq Copenhagen (Orsted). In 2020, the group's revenue was DKK 52.6 billion (EUR 7.1 billion). Visit orsted.com or follow us on Facebook, LinkedIn, Instagram, and Twitter.

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