Case Study

A birds-eye view of a successful transition: Ørsted A/S – August 2023

A low-carbon transformation

Ørsted's spectacular transformation from arch-polluter Danish Oil and Natural Gas (DONG) into a clean energy titan makes the company a role-model for a successful climate transition. But how did they get there?

DONG started life as an oil and gas extractor in the North Sea, in 1973. While continuing its fossil fuel extraction business, the company adopted the new name of DONG Energy[1] after merging with 5 Danish energy companies in 2006, marking its foray into the heat and power generation business. This new system, 85% based on coal, was incredibly polluting, accounting for one third of Danish carbon emissions in 2007[2,3]. The scale of change, then, was huge but was matched by ambition.

In 2009, the company initiated a campaign to be a top-to-bottom renewable energy company, aiming to flip the generation of heat and power from 85% coal to 85% renewables by 2040[4].

From Intention to Action

To raise capital for this goal, DONG sold eight of its businesses, including all gas firms, hydro and waste-fired power plants, as well as issuing debt[2,5]. With the capital available, it acquired the wind turbine installation company A2SEA, and entered into the world's largest offshore wind turbine agreement with Siemens, consisting of 500 turbines manufactured in an assembly line concept and installed across Northern Europe.

By 2014, DONG had made significant progress towards its low carbon transition and became the largest offshore wind farm operator in the world, claiming around 30% of the global market for offshore wind power. In 2017 they changed their name to Ørsted – after the Danish physicist Hans Christian Ørsted. By 2019, the company had begun to generate heat and power from 86% renewable sources – 21 years ahead of schedule[4].

Although pushed back by state intervention in reaction to the Russia-Ukraine war, the company plans to phase-out coal from its power stations by 2025[6], transitioning to sustainable biomass, and to achieve a 99% share of energy generation from green sources in the same year[7]. It has also, since, 2019, began to expand its solar and onshore wind generation capacity and planned for a phase out of its gas-selling operations towards a net-zero target of 2040[8].

The low-carbon transition through the eyes of the Model of Resource Efficiency (MoRE)

Osmosis' proprietary model of resource efficiency is based on a data collection process capturing and validating corporate environmental data and standardising it within our sectoral frameworks. By creating environmental balance sheets and linking them to the financial statements, the model identifies the most efficient companies and is able to objectively assess corporate low-carbon transition claims.

Since the start of Ørsted's transition, our models have accurately tracked the decrease in carbon intensity of their operations. Indeed, Ørsted's transformation is clearly visible, with carbon intensity dropping from over 1,200 tCO2e/$million revenue to under 200tCO2e/$million revenue (Fig. 1), making them one of the least carbon intensive companies in the energy sector.

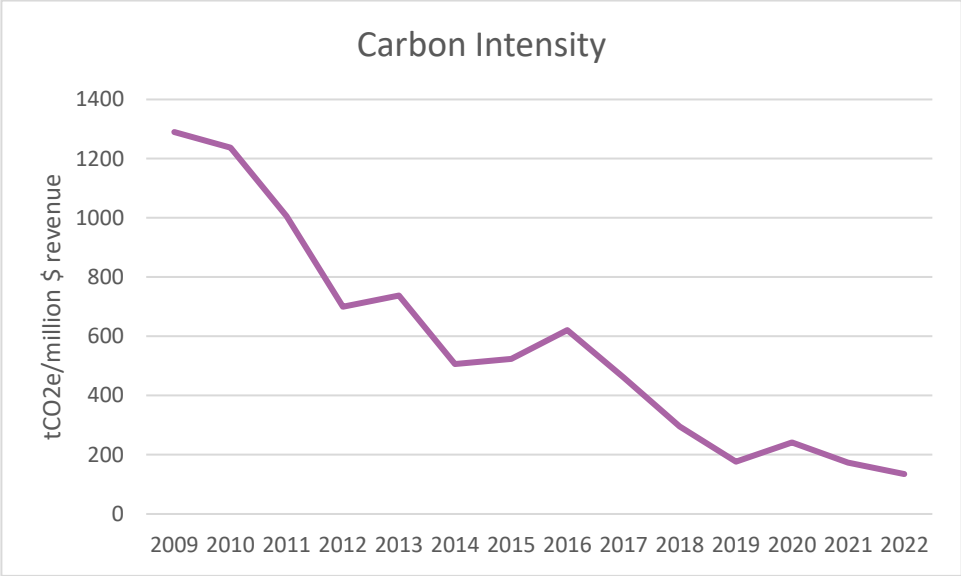

Figure 1: Source: Osmosis

While carbon reduction is clearly an important factor in the shift to a greener business model, it is not, and should not be, the only consideration. In order to take a broader view on environmental impacts our models go beyond carbon and look at water usage and waste generation too.

Despite the significant transformation in the company's carbon emissions, there has been no consistent decline in their water usage (Figure 2). After directly engaging with the company's management team, it was confirmed that while coal has been replaced by biomass for thermal electricity generation – a decisive step in the low-carbon transformation – the energy source hardly makes a difference from a water requirement perspective. Electricity generated by biomass is roughly as water intensive as electricity generated by coal. What's more, our conversations with Ørsted revealed that water use isn't considered a priority, as the water used for low-carbon energy generation isn't seen as a problem internally[9]. While a carbon focus is understandable in such an energy intensive sector, the Osmosis three-tiered approach has demonstrated, that each individual factor is important in its own right.

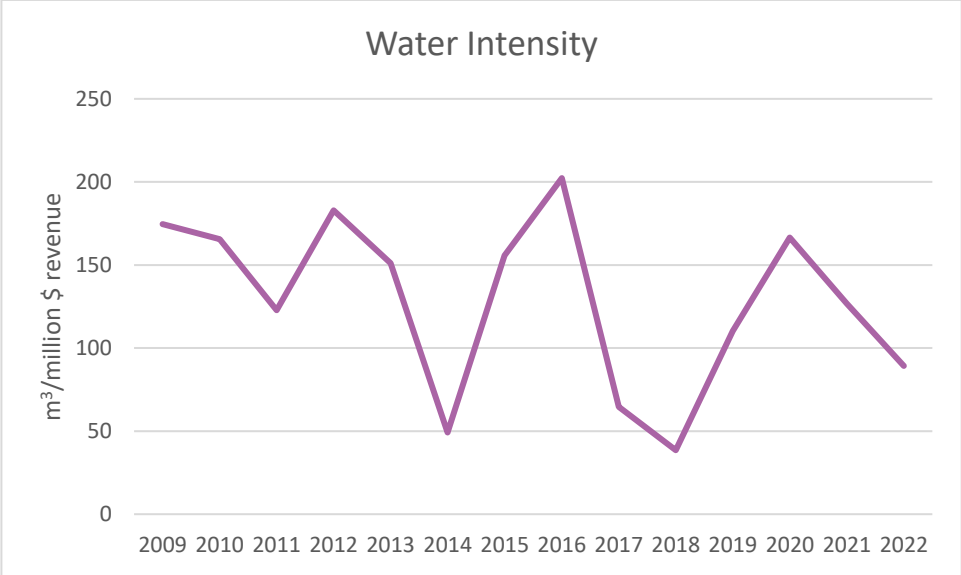

Figure 2. Source: Osmosis

Waste Generation

Ørsted's waste intensity dynamics show an interesting story: one both of the transition away from a polluting business and of the importance of considering waste intensity after transition.

2009 to 2014 in Figure 3 shows years in which the company was able to treat its oily wastewater and, therefore, dispose of it as water. In 2014, the wastewater from the company's Fredericia crude oil terminal had become so polluted that it could not be treated adequately and so was reclassified as waste to be incinerated, leading to the rise in waste intensity in that year[10]. An even greater fraction of this wastewater had to be incinerated in 2017, contributing to the spike in waste intensity in that year[11]. By 2022, Ørsted has installed a new cleaning reactor to deal with this wastewater, still being produced by the company's Fredericia oil terminal, which has driven down waste intensity[7]. Ørsted inked a deal with Energienet, the Danish national transmission system operator, to sell the Fredericia terminal[12], but this deal appears to have stalled as of 2022. Once this transaction occurs, we might expect to see Ørsted's waste intensity to further decline.

However, the spike in waste intensity in 2017 was also a reflection of Ørsted's new low-carbon business operations. In 2017, Vindeby, the world's first offshore windfarm and owned by Ørsted, was decommissioned into more than 12,000 tonnes of non-hazardous waste[7]. Just as with the importance of water to electricity generation from biomass, waste from wind farms is an important consideration to assess Ørsted's true sustainability, which Osmosis' three-tiered approach helps to capture.

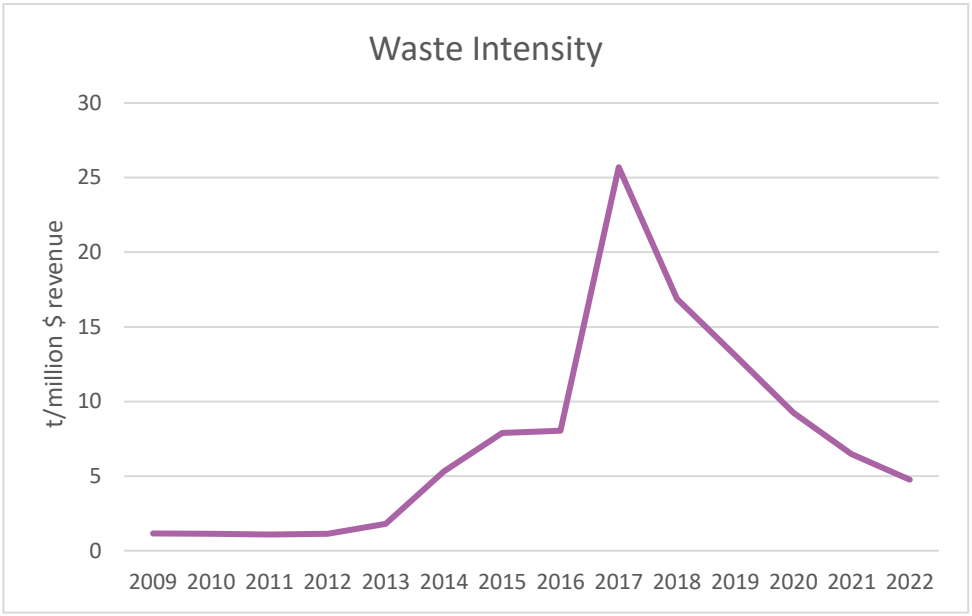

Figure 3. Source: Osmosis

Conclusion

Combining the three metrics into our proprietary Resource Efficiency (RE) score, Ørsted's transformation is rewarded by our model with a RE positive score, and placed in the top third of the resource efficiency distribution, testament to the radical ambition of its transition.

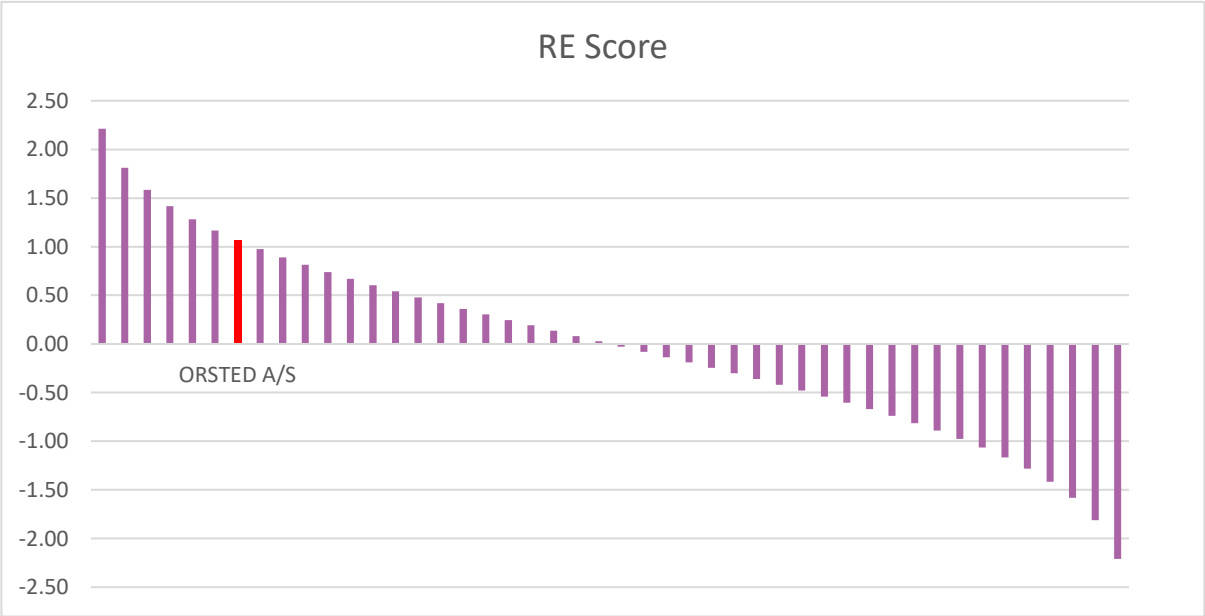

Figure 4. Source: Osmosis

Looking forward, Ørsted maintains several targets set for 2025, including[6]:

- To reduce Scope 1 and 2 carbon emissions by 98% from 2006 levels, having already reached a drop of almost three quarters
- A 40% reduction in freshwater withdrawal intensity (m^3 per GWh)
- To phase out coal from the generation mix

We look forward to tracking the progress made against these targets within our models. Ørsted is a good example of a transformation much needed within the sector and a clear manifestation that environmental and economic success need not be mutually exclusive.

We also hope to see the company making more of a concentrated effort on improving the efficiency of use of water and waste. Water consumption, for example, may be reduced by innovating their process to become less water intensive, or even divesting away from thermal power production altogether. Eversource Energy, a competitor, found, in 2018 for example, that most of their water risk was associated with generation and as a result have now divested from their water-cooled fossil-fired generation[13].

Sources

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4. *Ørsted's renewable-energy transformation* (2020) *McKinsey & Company*. Available here
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13. Eversource Energy Sustainability Report 2018

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