

More than a surface

Strategic protection for offshore wind foundations

Power of Less

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Introduction

Offshore wind is scaling fast, with bigger turbines, deeper waters, and longer asset lifespans.

In this environment, foundation coating isn't just a finishing touch.

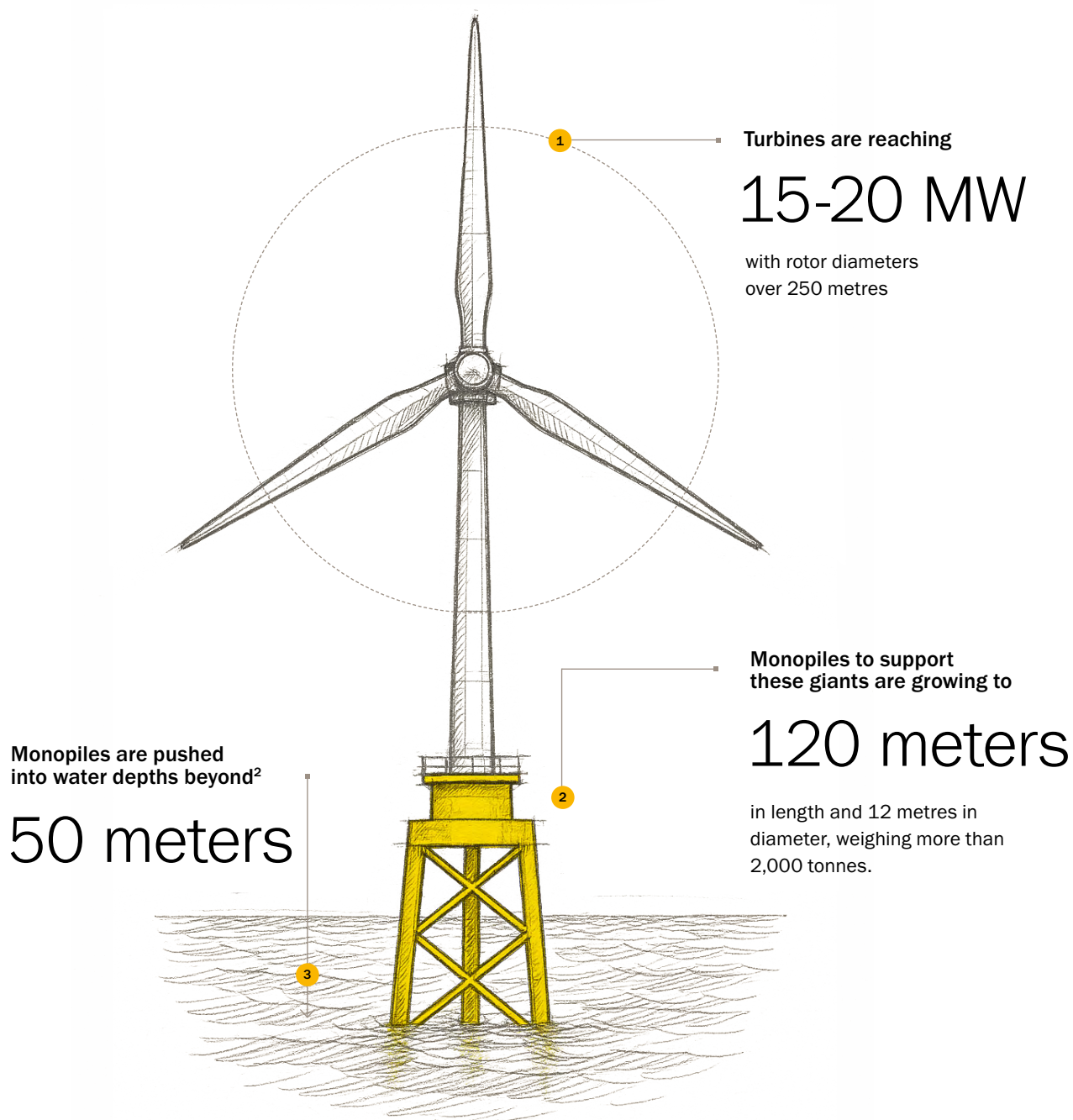
It's a strategic safeguard that drives performance, profitability, and sustainability. The right coating system protects the investment behind every megawatt. But with supply chains stretched and regulations evolving, specifiers face a complex landscape of decisions.

This guide is designed to help you navigate those challenges and explore the solutions that meet the demands of modern offshore wind.



Profitability: Going larger while staying profitable

Larger turbines placed farther offshore deliver more energy and reduce the cost per megawatt¹, but they also introduce heavier loads, harsher conditions, and more complex installation and maintenance. Staying profitable means rethinking design, materials, and long-term maintenance strategies.



1. <https://www.databridgemarketresearch.com/case-studies/deployment-of-specialty-coating-solutions-for-wind-turbines>

2. <https://www.boslan.com/offshore-wind-farms/monopile-foundations>

Durability:

Long live the turbines – and their foundations

Because of the high upfront investment, the industry expects offshore wind assets to live beyond 20-30 years. That means the coating must perform for decades.

3

coating truths

That matters for you as a specifier



Durability starts at the surface

The coating layer is the first line of defence. If it fails, corrosion can set in quickly, even with premium materials underneath.



Think long-term performance, not just the result

Choose coating systems that have proven to perform over decades and have resisted nature's forces without degrading.



Real-world documentation matters

Select coating systems backed by field data, not just lab tests, for greater confidence under real-world conditions.



How the coating system affects operating cost

The day-to-day costs involved in running an offshore wind farm (OPEX) can make up for around **30% of the Levelised Cost Of Energy (LCOE)**³. Investing in high-performance coating and applying it correctly before installation extends the maintenance cycles and reduces OPEX by lowering the risk for premature degradation, costly repairs or recoating – especially in hard-to-reach offshore sites⁴.

3. https://www.icorr.org/wp-content/uploads/2024/08/Offshore-Wind-Turbine-Coatings_Isbelis-Lopez-ACF-27-08-24-Aberdeen.pdf

4. <https://www.energieforschung.de/en/home/project-insights/2021/protecting-wind-turbines-from-corrosion>

Sustainability: Standards rising. Complexity growing

Choosing the right coating for offshore wind foundations isn't just about technical specs. Specifiers are now navigating a broader landscape shaped by global standards, regulatory complexity, and sustainability goals.

Here are three key areas
driving today's decisions:

International and national standards



Frameworks like ISO 12944, NORSOK M-501, GB, and VGB are becoming the norm across markets. They help ensure consistency, safety, and compliance, but they vary by region and project type. As a specifier, you aren't just picking the best-performing product; you're aligning with regulatory, environmental, and strategic requirements within international frameworks⁵.

Regulatory approvals and design compliance



Regulatory demands are growing. Environmental assessments, noise limits, and spatial planning make permitting more complex. At the same time, design standards now require detailed documentation of test results, lifecycle forecasts, and performance data. Your coating choice must meet multiple criteria to reduce risk and speed up approval⁶.

CSRD-reporting and ESG goal alignment

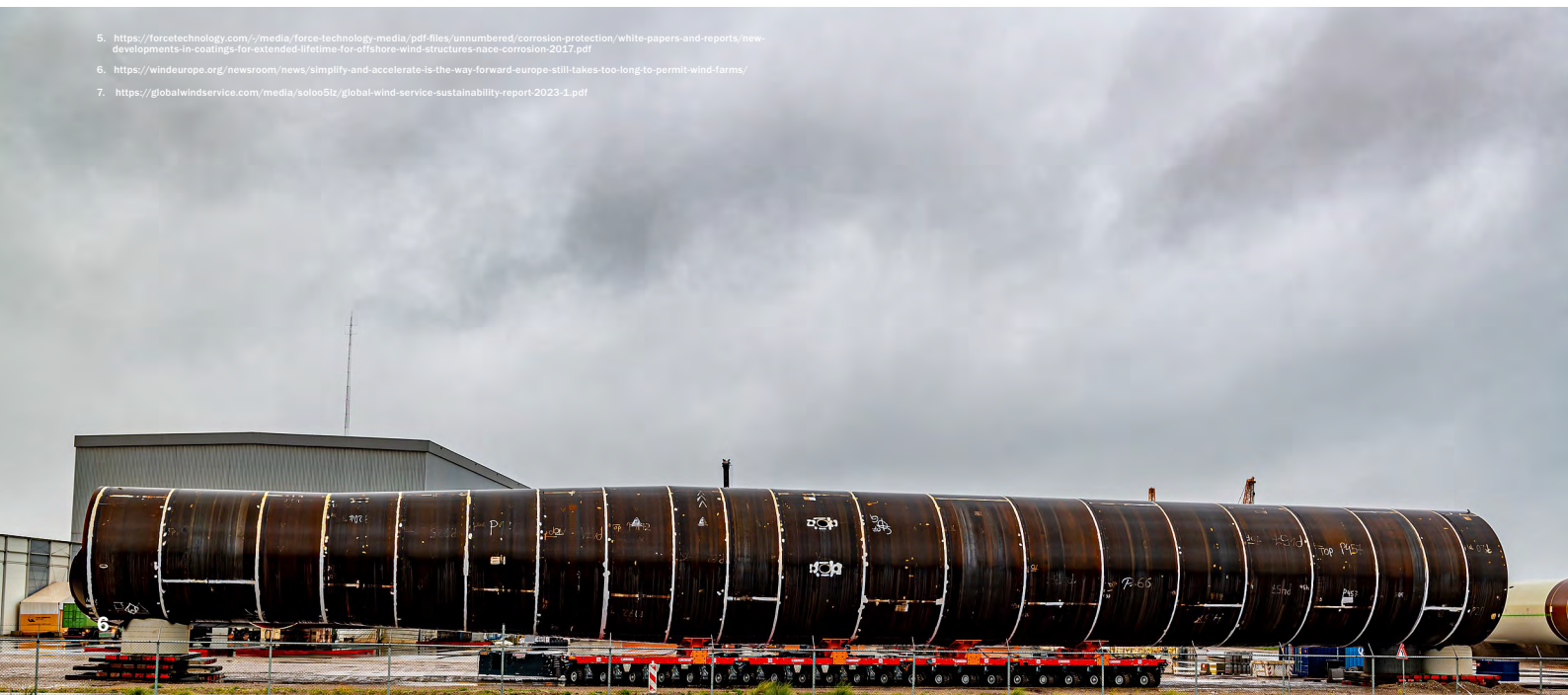


From 2024, the EU's Corporate Sustainability Reporting Directive (CSRD) requires companies to report on ESG metrics. That puts pressure on specifiers to choose low-emission, solvent-free coatings with clear documentation on environmental impact. Coating decisions now influence not just technical outcomes, but a company's sustainability narrative, towards investors, regulators, and the public⁷.

5. <https://forcetechnology.com/-/media/force-technology-media/pdf-files/unnumbered/corrosion-protection/white-papers-and-reports/new-developments-in-coatings-for-extended-lifetime-for-offshore-wind-structures-nace-corrosion-2017.pdf>

6. <https://windeurope.org/newsroom/news/simplify-and-accelerate-is-the-way-forward-europe-still-takes-too-long-to-permit-wind-farms/>

7. <https://globalwindservice.com/media/soleo5tz/global-wind-service-sustainability-report-2023-1.pdf>



CASE

Why coating choices should be a **strategic business decision**

On a major offshore wind project in the Irish Sea, a cost-saving epoxy coating seemed like a smart move until touch-ups at sea drove a **15% annual increase in costs**, ultimately exceeding the price of the original application.

With investors chasing a **5% return on the project (IRR)** and carbon accounting tracked down to the gram, coating decisions suddenly weren't just routine technical decisions; they became strategic concerns in the boardroom⁸.



⁸ Company names in the case have been disclosed but are known to Hanspelt.

Supply chain: Fighting logistic headwinds

As offshore wind scales up, so do the logistics, and rarely in a direction that makes things easier. Foundation specifiers face a growing need to anticipate and adapt to keep projects moving forward.



Transportation

Transporting oversized components requires specialised trailers, meticulous route planning across various modes of transport and infrastructure permits. And no wonder this task has become even more difficult as turbine sizes continue to increase.



Vessels and workforce

The increasing demand for installation vessels and skilled local workers is outpacing supply, driving up costs and putting severe strain on project budgets and slowing down vessel construction and deployment⁹.



Bottlenecks in material

Larger turbines in harsher environments require thicker, high-grade steel to withstand the load and resist corrosion. But rising global demand and limited supply make it hard to secure key materials. Innovative forecasting, alternative materials and designs are becoming essential to avoid disruption¹⁰.

9. <https://windeurope.org/newsroom/news/europes-offshore-wind-expansion-will-depend-on-vessel-availability/>

10. <https://www.steel-technology.com/articles/streamlining-steel-supply-chains-for-efficiency-and-savings>



Hempel's approach

With so many moving parts, from international standards and supply chain volatility to ESG reporting, the pressure on foundation specifiers is mounting.



Durability

Hempel has a long and proven track record to support our focus on product quality and asset durability. Our new coating generation is designed to last for 30 years, preventing degradation and allowing extended maintenance cycles.



Profitability

An upfront investment in premium coatings pays off in the long run as this long-lasting solution means lower maintenance costs for decades to come. At Hempel, we work closely with wind foundation fabricators and applicators, supported by a best-in-class local team with strategically located stock points close to you to avoid delays and ensure on-time coating supply.



Sustainability

We offer VOC-low coating solutions to minimise environmental impact and contribute to the decarbonisation of wind assets. At Hempel, we support customers in transitioning to more sustainable products and provide transparent sustainability data to support ESG reporting and regulatory compliance.

"Selecting the right coating has become a strategic decision that must balance profitability, durability and sustainability"

CUSTOMER CASE

More than 30 years of protected service

Horns Rev 1 in the North Sea was the first offshore wind farm to use the monopile foundation type in 2001. Hempel's solvent-free epoxy technology was used for several of the assets from the very beginning, and the latest inspection shows that **the coating is still in excellent condition after 20 years**, with no indication of degradation of the layer — no cracking, flaking, peeling or any signs of rust.

The expected lifetime of the coating has now been extended from 28 years after the last inspection in 2016 to over 30 years as of 2025. This example of performance demonstrates the excellent corrosion protection for extended durability in the most aggressive environments.

*"...the excellent
corrosion protection
for extended
durability in the
most aggressive
environments."*

What is the core focus of your project?

With project priorities defined, environmental conditions evaluated, and compliance needs mapped out, you're ready to select a coating system that aligns with your goals.

Hempel's product development has always been driven by customer insight, translating real-world challenges into targeted solutions. The following two high-performance solutions reflect this approach to solving a need: one is tailored to deliver on sustainability, the other for productivity, depending on what matters most to your project.

**IF SUSTAINABILITY IS YOUR PRIMARY FOCUS
CHOOSE THIS PRODUCT**

Sustainability



Hempadur Multi-Strength (35840)

Ideal for projects with strict environmental goals. Hempadur Multi-Strength allows for excellent application characteristics without the use of solvents, reducing VOC emissions and environmental damage.

MAIN FEATURES

100% VOLUME SOLIDS

PROVEN TRACK RECORD

GLOBAL AVAILABILITY

CERTIFICATIONS APPLY WITHIN APPROVED SYSTEMS

SLOWER DRYING TIME

- + LOW VOC EMISSION
- + GLASS FLAKE VERSION
- + LONG-TERM CORROSION PROTECTION
- + HIGH SOLIDS CONTENT

REDUCE UP TO
↓ **93%***
VOC EMISSION

REDUCE UP TO
↓ **26%***
CO₂ EMISSION

**IF PRODUCTIVITY IS YOUR PRIMARY FOCUS
CHOOSE THIS PRODUCT**

Productivity



Hempaprime Strength 530 (45500)

Ideal for tight schedules and fast turnaround. Hempaprime Strength 530 is a heavy-duty, self-priming epoxy that cures to an abrasion and corrosion-resistant finish.

MAIN FEATURES

90% VOLUME SOLIDS

PROVEN TRACK RECORD

GLOBAL AVAILABILITY

FULL PACKAGE CERTIFICATION

FAST DRYING

- + LOW CARBON FOOTPRINT
- + VERSATILE
- + EXCELLENT COATING SAG RESISTANCE
- + WIDE APPLICATION WINDOW

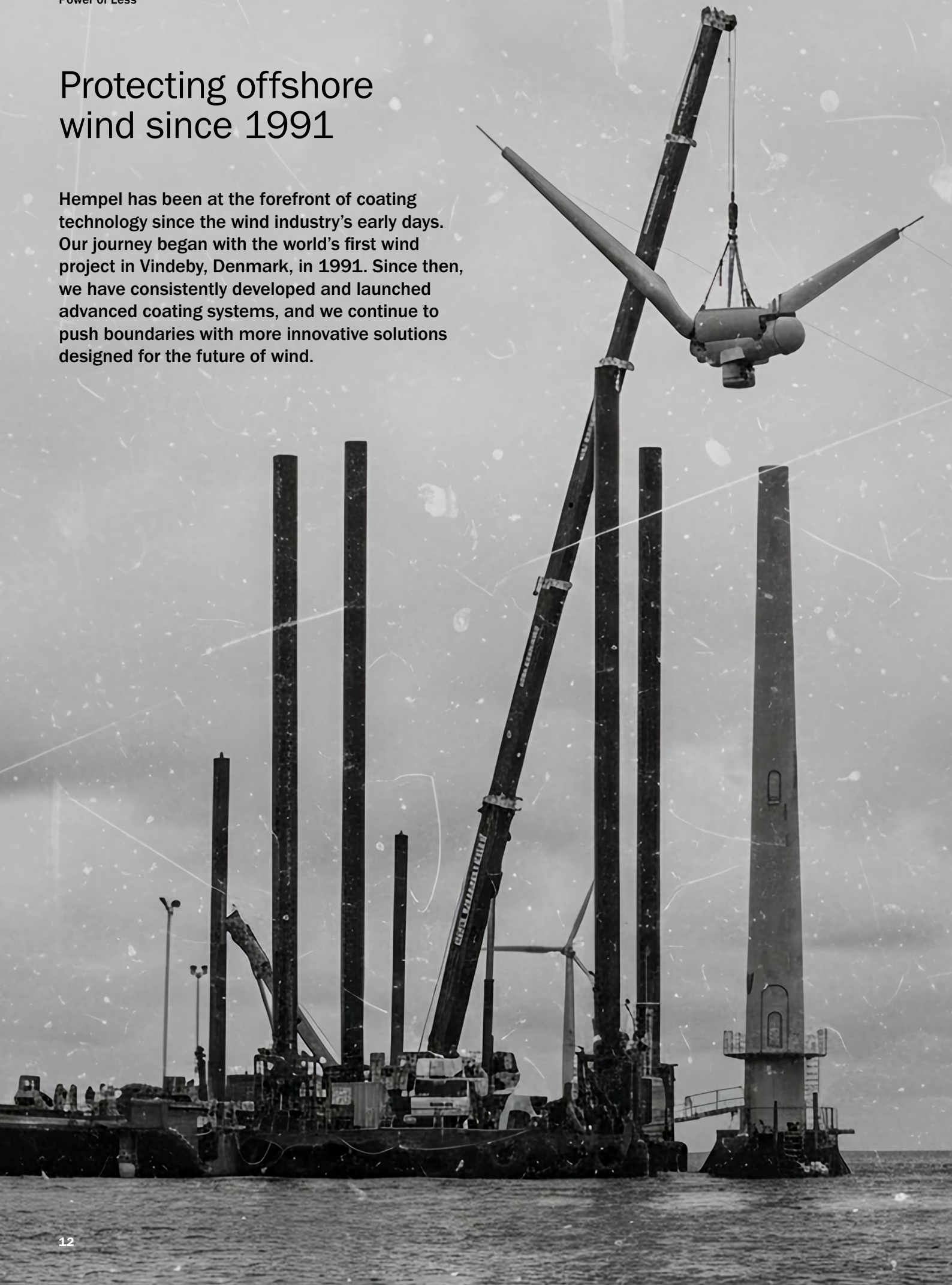
REDUCE UP TO
↓ **53%***
VOC EMISSION

REDUCE UP TO
↓ **41%***
CO₂ EMISSION

*Compared with a standard solution of 79% Volume Solids

Protecting offshore wind since 1991

Hempel has been at the forefront of coating technology since the wind industry's early days. Our journey began with the world's first wind project in Vindeby, Denmark, in 1991. Since then, we have consistently developed and launched advanced coating systems, and we continue to push boundaries with more innovative solutions designed for the future of wind.



Power of **Less**: our commitment to the wind industry

At Hempel, we develop high-performance coatings for wind turbines aligned with our Power of Less philosophy, which means less maintenance, less waste and less environmental impact. This approach fuels greater efficiency and sustainability in the wind industry.



Power of **Less**

CONCLUSION

Strategic coating decisions **start with Hempel**

At Hempel, we enjoy adding new layers to your knowledge. Just like a high-performing coating system, we want to build your strength and help you navigate complexities with confidence.

Ready to sharpen your strategy with expert input?
Get in touch with us and let's build the future of wind together.

Jamie Hortelano

Your dedicated foundation coating expert is here to help move your project forward

[Get in contact >](#)



About Hempel

As a world-leading supplier of trusted coating solutions, Hempel is a global company with strong values, working with customers in the decorative, marine, infrastructure and energy industries. Hempel factories, R&D centres and stock points are established in every region.

Across the globe, Hempel's paints and coatings can be found in almost every country of the world. They protect and beautify buildings, infrastructure and other assets, and play an essential role in our customers' businesses. They help minimise maintenance costs, improve aesthetics and increase energy efficiency.

At Hempel, our purpose is to shape a brighter future with sustainable coating solutions. We firmly believe that we will succeed as a business only if we place sustainability at our heart. Not only is it the right thing to do, it will strengthen our competitive position, make ourselves more resilient and reduce our risk.

Hempel was founded in Copenhagen, Denmark in 1915. It is majority owned by the Hempel Foundation, which ensures a solid economic base for the Hempel Group and supports cultural, social, humanitarian and scientific purposes around the world.

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