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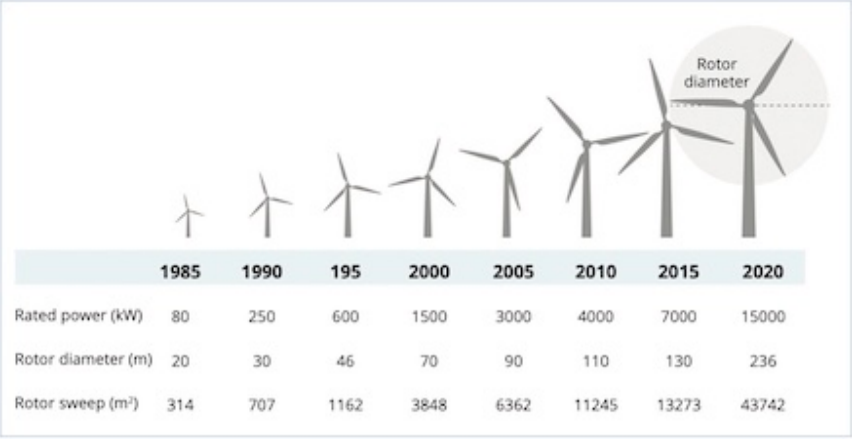
A new report from renewable energy insurance specialist GCube, Vertical limit: when is bigger not better in offshore wind's race to scale? has highlighted the increasing number of failures experienced by the ever larger wind turbines demanded by the offshore wind industry. The report's conclusions are summarised below.



	1985	1990	195	2000	2005	2010	2015	2020
Rated power (kW)	80	250	600	1500	3000	4000	7000	15000
Rotor diameter (m)	20	30	46	70	90	110	130	236
Rotor sweep (m^2)	314	707	1162	3848	6362	11245	13273	43742

Above: The leap from 8 MW to 18 MW turbines has occurred in significantly less time than it took to go from 3 MW to 8 MW. Only five years ago, 8 MW machines were the largest turbines in the industry. But today, manufacturers are moving up to the 18-21 MW threshold, with plans in place for turbines to grow bigger still, reaching the height of a 70-story building (source: GCube)

GCube notes that as the pace of turbine development is accelerating, with the leap from 8 MW to 18 MW machines taking significantly less time than that taken to get from 3 MW to 8 MW, there has been an increasing number of failures as essentially prototypical equipment is rushed onto the market.

Also, in instances where there may not be outright failure – such as a vessel collision – it takes significantly longer to repair the larger machines owing to the limited availability of specialist vessels.

In GCube's view, if these trends persist, there is a very real risk of the withdrawal of insurance capital, rising rates and deductibles, ultimately slowing the clean energy transition.

On the basis of GCube's claims data and experience, coupled with external perspectives provided by some of its colleagues in the offshore wind industry (also included in the report), two messages are clear:

- **The new risks created by the rising scale of wind turbines are undoubtedly a cause for concern for insurers and the future growth of the offshore wind market.** While there is currently no shortage of appetite to underwrite these projects, the pressures the 'race to scale' is creating threaten to expose weaknesses throughout the supply chain that may impact the insurability of offshore wind as an asset class.
- **To bring about the global energy transition, we cannot stand in the way of technological progress.** Larger turbines are the future of offshore wind and to impose a 'vertical limit' on the insurance industry's orders would thwart the ambition that is fundamental to the progress of the industry.

Faced with these potentially contradictory messages, what does a vision for sustainable offshore wind development look like? The GCube report puts forward several key recommendations for manufacturers, developers/contractors and insurers.

Recommendations for wind turbine manufacturers:

- **Streamline product portfolios.** Wind turbine manufacturers could learn a lot from the aviation industry, which has, over time, reduced losses by reducing the size of product portfolios. Some turbine OEMs are offering up to 20 different varieties of machine, all with their various sets of component parts, placing unnecessary pressure on the supply chain to keep up with products and standards. By

streamlining turbine fleets to two or three quality machines that have a strong supply of spares and parts, manufacturers will see a marked reduction in losses.

- **Factor in the price for higher quality products.** Market forces have led turbine manufacturers to build products to an agreed price, instead of building and engineering bulletproof products and applying an appropriate price to them – as has been industry standard in the past. This places extra pressure on engineers and increases competition amongst manufacturers to cut costs, typically on quality and standards. Manufacturers need to ensure they are increasing build qualities and standards and not selling themselves short on the price that comes with this.
- **Embrace and enable third-party monitoring.** The reputation of wind energy was destroyed in the ‘80s and ‘90s by equipment that was not fit for purpose. As a result of this, many turbine manufacturers were not able to get insurance and went out of business. Today, however, manufacturers need to be able to stand behind the efficacy of the equipment they sell. To do this, they need to make better use of, and enable their customers to use, third-party performance monitoring platforms, which can provide deeper insight into a turbine’s energy production, health, mechanical breakdown risk and financial performance. For commercial reasons, manufacturers have historically been reticent to give these platforms access to all of the data streams produced by their turbines. However, it is now time for an era of more open data access. Using advanced monitoring and asset management platforms will also help manufacturers better understand where their liability for failures starts and stops.

Recommendations for developers and contractors:

- **Share risk.** Developers must hold turbine manufacturers accountable for the equipment they produce. Manufacturers charge a lot of money for warranties and can sometimes try and shift the onus onto insurance companies for poor quality products. In the early ‘90s, for example, insurers perpetuated poor manufacturing by accepting losses, ultimately acting as a turbine suppliers’ R&D vehicle. We must learn to share risk between developers, manufacturers and insurers more equitably. Developers are in a powerful position to bring together themselves, the insurance market and manufacturers to help facilitate this.
- **Invest in supply chains.** Vessels are going to be the biggest bottleneck in the development of offshore projects. Most are already booked out to 2030, and there

will be little new tonnage until 2026. Many vessel owners are now refusing O&M work, which is putting huge strain on the ability to keep turbines running. Developers need to seriously consider opening their lending books to supply chain companies to help keep their developments within set timeframes. The supply chain is struggling, we know, but injecting investment into supplier companies will benefit the industry as a whole.

- **Engage and empower your marine warranty surveyor.** Marine warranty surveyors (MWS) play a critical role in ensuring projects are built safely and that accidents are prevented. The MWS exists for the benefit of all key stakeholders in an offshore wind project, which includes its insurers. It is important that marine warranty surveyors are trusted and empowered to do their job in the best interests of all parties. While insurers should use an experienced MWS to gain a clearer understanding of marine construction operation risks, MWS clauses should not be watered down as they have been in the past. The role of the MWS in ensuring safe, timely completion of a project will only grow in importance as projects grow in scale and complexity.

Recommendations for insurers:

- **Set larger deductibles.** Deductibles will play a key role as equipment gets bigger. Supply lead times are now very long, not only because of global issues but also because manufacturers' order books are now full. The offshore wind industry needs to prepare to accept larger deductibles from insurers, as current offshore wind terms are unsustainable for the insurance market in the medium to longer term. The setting of larger deductibles by insurers will demonstrate a greater sharing of risk across the industry and will also help keep premiums to a more realistic level for insureds.
- **Engage closely with industry.** Insurers should engage with their insureds at targeted industry events and conferences to generate closer collaboration. Gaining access to granular data will also allow insurers to develop more favourable terms and conditions, as they will have more confidence in the performance and availability of the equipment.
- **Use experienced lead insurers.** Experienced insurers can help a project when claims happen. They usually understand why something has failed and what to do to mitigate the risk quickly. Experienced insurers will also know where and how to

source spares and hold certain parties accountable for their actions.
