



Is global shipping missing the boat?

Words: Diane Gilpin, Founder & CEO Smart Green Shipping

We know wind power is great. After a stuttering start back in the 1990s, appreciation of the potential of wind power as a low GHG power source started to spread. Initial anxieties around its capacity to make a meaningful contribution to a renewable powered grid slowly fell away. True, deniers maintained determined opposition to onshore wind citing eyesores, bird murder and intermittency, amongst their objections. A note about false equivalents here; do we consider the negative visual and nature impacts of existing coal-power stations? Do we bear in mind the deaths to seabirds from maritime oil spills when we jog along in our fossil powered lives?



Economics that wind-assist technologies can work on an estimated 40,000 suitable ships, in a global fleet of 60,000, and we know that wind power has the potential to mitigate a whole host of commercial risks for the maritime sector in an energy constrained future.

But, for now at least, the maritime industry is lining up to support offshore wind by providing OSVs to the rapidly growing sector. One of the sector's leading ThinkTanks driving the narrative in the global shipping sector is the Getting to Zero (GtZ) Coalition, an initiative that 'brings together decision-makers from across the shipping value chain with key stakeholders from the energy sector as well as from governments and IGOs.' GtZ sees domestic vessels like ferries, tugs and OSVs as having an important early role in the effort to reduce shipping's carbon emission. They posit: 'cutting domestic vessel emissions by just 15 percent could reduce the entire shipping industry's greenhouse gas footprint by three percent by 2030.' That may not sound like much, but the coalition continues, 'early steps, even small ones, are essential to get the process of decarbonization started.'

Yes, you read that right, the maritime sector has yet to start the process of decarbonisation.

Starting the decarbonisation of shipping via domestic vessels is considered a good strategy because routes are relatively short and vessels relatively small and so lend themselves to battery-electric, hydrogen fuel cell and hybrid systems.

Family-owned Norwegian ship design house, Ulstein, has designed a 100% renewable, hydrogen fuel cell powered offshore construction vessel by combining existing technologies in new ways. UK based BAR Technologies and Chartwell Marine have joined forces to develop the 'greenest most innovative' crew transfer vessels that will deliver 'significant' GHG savings. There are zero or lower emissions OSV solutions available but none are yet operational. This is progress but it's by no means fast or deep enough to satisfy the required GHG reductions that the physics of climate science demands.

The global maritime sector's hopes for transition to zero emissions rest largely on the use of primary renewable energy, wind and solar, being converted into zero emissions fuels. This is an essential strategy, but one that comes with a multi trillion-dollar price tag, alongside multiple adjacent challenges, for example, which zero emission fuel will win the race for global uptake or how to best manage conversion to more expensive, less energy dense fuels; all of which engenders a long delay to global uptake. Again, this is all too slow to start bending shipping's emission curve downwards at the rate required.

Huge advances in digital analysis solutions enable us to predict, with high degrees of accuracy, the amount of wind power that can be expected from any turbine in any position. These digital systems are so reliable that the insurance industry will insure against the wind not blowing as predicted.

And so, we see clean green power emerging in a way we could scarcely imagine just a few years ago. A single offshore turbine powering 130,000 homes, more than a million jobs created worldwide, and in excess of 750GW installed already with another 470GW forecast by 2025; the industry is a global energy provider.

The maritime industry is waking up to the

opportunity of offshore wind. But rather than seeing the way wind is blowing and revolutionising clean power for the national grid as a potential clean, green power option for shipping, the maritime industry continues to place most of its focus, on the provision of offshore service vessels (OSVs).

A more forward thinking, joined-up sector might be responsive to the idea that offshore wind is a clean power source that, whilst initially requiring collaborative, creative efforts to develop and scale solutions, is an immensely valuable energy source for a zero-emission shipping fleet. We know from a study conducted for the UK's Department for Transport by Frontier

When offshore wind is curtailed to manage grid supply/demand and that capacity is used to make hydrogen, it is an efficient use of energy. Building offshore wind or solar specifically to make alternative fuels for shipping is not the most efficient use of resources. Converting primary renewables and transporting them from production to bunkering sites at ports is a highly inefficient way of using offshore wind power; Indeed, only 10% of the energy is available to power the ship.

So, what is holding the maritime sector back from using offshore wind to provide direct thrust to shipping assets? The offshore wind sector has clearly demonstrated that this power source can be harnessed in gargantuan quantities by using 21st century digital and advanced manufacturing capabilities. But mention wind power in shipping circles today and push-backs include getting stuck in the doldrums and small boys shinning up masts in foul and dangerous conditions.

Despite a decade of heroic effort from the International Windship Association and its 150+ strong membership developing, researching, evidencing and verifying a multitude of ingenious, practical, accessible designs; despite robust lobbying of governments and the International Maritime Organisation; despite the fact that, in the climate emergency, emissions are continuing to rise from the global maritime sector there remains a deep resistance to even considering wind-assisted solutions in the battle to drive down emissions. In the wider conversation about shipping decarbonisation, wind often gets lumped into an 'energy efficiency' category.

This is odd since deploying wind-assist devices reduces the use of fuel by providing additional power to the ship. Does it matter how the tech is defined? Yes, it does. Investors explicitly don't want to invest in 'energy-efficiency'.

The prevailing conversation around shipping emissions reduction with organisations like GtZ, the International Chamber of Shipping and other big influencers focuses almost wholly on the transition to alternative fuels. Wind is clearly not a 'fuel' and gets dismissed from that agenda.

What is missing are real world wind-assist technology demonstrators and efforts to overcome this are ongoing.

In 2018/19 Smart Green Shipping (SGS) led an InnovateUK supported collaborative feasibility analysis quantifying the benefits of retrofitting its FastRigTM wingsails onto a panamax ship importing biomass into the

UK for Drax power, using renewables to move renewables. Fuel and GHG emissions savings were verified, in computational fluid dynamic modelling, virtual world, at the University of Southampton, as saving at least 20% fuel/emissions per annum on the Ultrabulk Tiger operating on her usual route at normal operating speeds. FastRigs are designed to be retractable, intelligent, operated by AI responding to wind speed and direction to optimise power harvested, they are recyclable and modular so can be swiftly upgraded as the technology develops. We know from the rapid technology development in offshore wind to be ready for that.

Between 2018 and 2020 SGS developed an App called TradeWind with European Space Agency support that quantified the value of the wind on any ship on any route to give the market knowledge and confidence ahead of commitment.

Working alongside the Malin Group, SGS has been collaborating with INAL, a UK-based, extruded aluminium manufacturer to make the wings' modules, we've developed a 'plug and play' system to reduce asset downtime for quick and simple installation.

Malin observe that none of the manufacture, assembly or installation involved in this project is a departure from their deep prior experience as marine engineers to the oil and gas industry. This is good news since the SGS/Malin collaboration has entered into a formal agreement with a shipowner to install a test FastRig onto one of its vessels; which will enable the partners to showcase the robustness of the technology, and demonstrate that it requires no special crew training. We will develop FastRig control systems, trial the hydraulics and gather data to evidence fuel saving and GHG emission reduction in the real world, onboard an operational vessel.

Several enlightened ship owners have expressed interest in entering commercial arrangements with us for our 'sail-as-a-service' customer proposition. This allows shipowners to benefit from FastRigs, risk-free. The wingsails are leased to owners, with, as standard, all operation, maintenance and tech upgrades included; owners are also afforded insurance against the wind not blowing, such is the confidence in our TradeWind app's outputs.

The 3 years £6m demonstration project is, at the time of writing, 75% funded by a blend of Scottish Enterprise grants and industry support. The balancing £1.6m that needs to be secured from the private sector has yet to be found. Despite 150



Diane Gilpin

conversations with private investors, all of whom have loved the project, they can't invest because they 'don't invest in hardware or energy efficiency' or, most commonly, the technology is 'too early' for their investment criteria.

As we head into the critical COP26 conference and the urgent need to reduce short term emissions is underlined, we must bridge the funding gap between promising renewables projects and the rhetoric that proclaims tech will save us.

The Malin Group and SGS are showcasing their FastRig solution throughout the Malin Spotlight Series, hosted as part of COP26 just metres from the official blue and green zones. We'll be discussing Offshore Wind on November 4th and 5th at the 'Scotland and The World: Planning for A Future Powered by Offshore Renewables' event brought to you by Mainstream Renewable Power and the GWEC and we'll be focussing on 'An Industry for Tomorrow's World – After COP26 For Shipping' on November 11th initiated by Bureau Veritas. Do sign up in person or virtually to join the conversation at these or any other of the great events planned at Malin's Rotunda.

COP26 is our last chance to get global consensus, to together understand that offshore wind is a success story for energy transition. Offshore wind has a clear role to play in the maritime sector, powering the ships of the future. With this role established, we can look to develop that future together.

To see an animation of the SGS Malin FastRigs in action check out this link: FastRigs_01 on Vimeo

🌐 www.malingroup.com/cop26