

The two ‘greens’

by Przemysław Myszka

The shipping industry has repeatedly been accused of being a laggard, a business that would happily sail on heavy fuel oil till kingdom come, only investing in technologies that are needed to keep its blissfully analogous fleet afloat. We’re talking with Yaskawa Environmental Energy / The Switch’s Asbjørn Halsebakke about those who have nonetheless decided to go against the grain and pay for solutions that, although they come at a premium, promise to deliver greater efficiency, also in the field of eco-performance. We’re also taking a closer look at how such technologies are developed and sold in a mixture of pure commerce, governmental support, technological possibilities, and moral compass.

■ *How has the corona pandemic impacted your company – the way you work, manufacture, deliver, and serve your clients?*

Unfortunately, several orders have been delayed. It’s much more difficult for shipowners to find a yard today. There are no face-to-face meetings with the builders; hence it’s hard to negotiate and virtually impossible to have your own people on the spot to either supervise the contract or build the relationship. After all, nobody wants to travel to a place where COVID continues to take its toll.

We’ve undergone a few changes at our company, too. For example, the majority of our engineers work from home now. The assembly people are still working on the line, but we’ve introduced social distancing to minimize the risk of contracting the pathogen. It has been an altogether different breed of cat for people like me who used to travel a lot, meet clients and discuss solutions at the same table. To be perfectly honest, I miss that. Only when it disappeared, had I realized what a considerable chunk of my professional life that was. We have online conferencing instead, but that’s nowhere near the real thing. In-person troubleshooting has a certain dynamic to it that just cannot be replicated.

At least air pollution and emissions have gone down as more people are stuck indoors. That said, it appears that for the foreseeable future we’ll have to grin and bear it, adjusting to the situation. I think next year won’t bring any breakthrough; the struggle will continue. Once the pandemic is overcome, there will be no return to the pre-corona times. Remote work will definitely be one of the irremovable developments.

■ *There’s an eye-catching phrase on the company’s website, in the section devoted to wind energy, namely that you first challenged the industry and then enabled the technology to be commercially available. Does it also pertain to the maritime business? If yes, then what’s the action sequence – is the industry ripe for change, actively seeking solutions that will make their ships future-proof, or the other way around – entrenched in old thinking?*

Technology is important to our clients – that’s a given. Yet, what’s on the price tag is equally crucial. Think of it as a clash between two ‘greens’ – one being the environment, the other, of course, money. The present reality of shipowners, even those most inclined towards greening their fleets, is that you have to satisfy both. In

other words, run with the hare and hunt with the hounds.

From the seller’s perspective – nobody will buy technology for its own sake, no matter how shiny it is. Shipowners have to grab onto something that will have a tangible effect on their spreadsheets. The way we approach this is to show that our technology, though it might seem like a more expensive upfront investment, has time and again proved to cut bunker consumption. That’s an added margin offer. We’re challenging the industry with this approach – presenting technology that’s cheaper because it’s more expensive. What’s essential – our solutions are industrialized products, not some one-offs that need to be modified each time to fit a particular vessel. Standardization stands for efficient production.

What’s fortunate, the public sector has taken a greater stake in supporting technological advancement of the shipping business, chiefly when it comes to greening it. Thanks to public funding, say from the EU, Norway, or Singapore, developing and investing in new technology is less risky. That’s the right way forward – and I’m not saying this only because we’ve benefited from Norwegian public funds ourselves; in fact, it’s the other way around – we can now clearly see that without this support, we wouldn’t go as far as we actually did. Governmental funds are

needed to push next-gen technologies like batteries or hydrogen fuel cells. The state and publicly-owned companies can also drive the shipping industry in the green direction. By way of example, the energy company Equinor, the former Statoil and StatoilHydro, demands that vessels working for them must be hybrid. A lot can be achieved at the local level as well; in Norway, short-distance ferry connections will have to be served by battery ships.

What's more, before corona, I talked to several shipowners asking them about their evaluation of the government's efforts, whether too much or too little is being done to make shipping eco-friendlier. The answer was that Norway's public authorities could be progressing the green transition at a faster pace. Shipowners are saying the technology is out there for the taking, and they are prepared to use it, only an incentive is needed that will make the financial risk easier to swallow. That or clear regulations that call for cleaner vessels. Banks are another institution that needs to be convinced, as they'll be asking why they should dig deeper into their pockets for a ship that's more expensive than the one previously ordered. The same holds true for yards and designers – they should be our allies in winning over customers with the message that this-and-that technology, although more costly, cuts operational expenses. Luckily for us all, we've got data to substantiate our claims – there's quite a lot of ships sailing with our technology on-board, burning about 15% less fuel. In addition, we've also seen that with our solutions, maintenance goes down for both newbuilds and retrofits. Having fewer generators and using batteries for peaks translates

into a steadier load and less running hours – thus longer intervals before service works. That's money talking.

Next, does new equal to reliable? It must. The most terrifying sound in the open sea is no sound at all – when everything turns black, and the vessel goes adrift. Marine technology is heavy-duty stuff and lives depend on it. Proper design, testing pushed to the limits, and redundancy is what we do to never jeopardize those who rely on our machinery and electrical systems. Things might go wrong, but there needs to be a built-in solution that gets it right again. Risk management is key.

Then again, there's a group who believes in nothing else than diesel engines, thinking of initiatives such as Tesla as abominations. Conversely, there are people, myself included, that are guided by an environmental compass and who really take pride in coming back home and saying to their loved ones: today, I made a difference.

■ ***How do you come up with products & solutions, including relatively new technologies for the shipping business like DC systems?***

Product development in the marine industry doesn't take place in some secretive laboratories – it requires close collaboration with both those who buy the product as well as the end-users. While we may come up with what eventually will turn out to be a new and innovative solution, rather than storming the market headfirst with it, it's better to set up a feedback meeting to scan the actual response. The business world is littered with “amazing” ideas nobody really needed. Avoiding silo thinking is crucial, as well. Take, for instance, our permanent magnet



generators, a technology originally developed for the wind energy sector and then transplanted to the shipping business. On the surface, these are two different industries, yet there are solutions that can connect the dots, so to speak. It's also about simplification. Permanent magnet machines have, e.g., fewer parts that require tending to. It's also *they* which create the magnetic field, not a separate device as it is the case with other technologies.

DC systems are another very promising avenue to explore. We're working on a quite big vessel, two times three megawatts of propulsion power, that doesn't have an AC main switch, as everything has been designed around a DC system. If I had to choose one prominent feature, it'd say DC systems are future-ready. The shipping business is poised to undergo a significant



Photos: Yaskawa Environmental Energy / The Switch

transition towards alternative fuels – and it's anybody's guess how ships will be designed or operated in five-to-15 years. That said, DC systems are constructed in such a way that makes it easy to scale them up. Imagine that you're ordering a vessel that will operate for the next two or even three decades. The only certain thing against this time frame is that the engines will have to be replaced or modified in order to run on new bunker. Our DC-Hub solution has the capacity to add new energy sources, be they fuel cells, batteries, ammonia engines, or even a hybrid solution. A DC system can combine them all and feed propulsion, tunnel thrusters, ballast pumps, the ship's cargo handling equipment, etc. It's possible to do the same with an AC solution, however, not in the same way. Converters will be needed; hence energy will be lost along the feed loop. Again, simplification leads to better performance. "Is the efficiency higher?" is a question heard a lot across our company's corridors, followed by passionate calls for "I need higher efficiency!" Yet, a DC system is no silver bullet, nor will it save the world environment-wise single-handedly. It's by far *the* solution for battery-run ferries or vessels that will undergo major changes in their lifetime, the latter requiring a hub that will juggle the power between different sources & demands. Still, there are ship types for which a more traditional solution is a better fit. Overall, the market for power systems is a mixed one. When it comes to drives, almost all our deliveries are at least partly DC already today. For machines, it continues to be tilted in favour of traditional solutions, mostly because of the customers' conservative approach in this regard.

To end that thread, I believe our Electronic Bus Link (EBL) has what it takes to be a game-changer. Essentially, we're using it to connect different DC systems, as it might be quite tricky to do that while keeping the whole set up efficient. The idea is to have multiple smaller units sitting alongside a vessel but working as one. The speed at which the entire system works is of paramount importance here. Instead of using breakers, which take 50-70 milliseconds to close/open, the EBL can detect and disconnect in ten – but this time microseconds.

As such, we can 'cut' a cable in a manner that won't affect others.

■ ***What's your take on how the shipping and technology industries will continue to collide in the future?***

The pace of development is, at times, breath-taking. I've been working in electrical engineering for more than 30 years, and I have never imagined that batteries will secure such a prominent position within the shipping business. And we're talking about their current standing! Was there potential in batteries ten years ago? Certainly. To propel vessels on their own? Science fiction. But here we are today. The greening of the global tonnage will be a permanent theme of the times to come. Some will do it step-by-step, say opt for a hybrid solution; others will go for a deep dive, experimenting with hydrogen for instance. The technology is out there, so many things are already doable. At the same time, the numerous R&D departments, ours included, aren't giving up their pursuit of higher eco-efficiency. That includes finding the Holy Grail, namely a solution that will replace diesel but without the need to entirely scrap engines running on it, too. Taken altogether, it isn't only a matter of what's technically possible and economically feasible but also right in the ethical sense of the word. ■

