

The Superyacht

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REPORT

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A Smarter Refit



While 'green' thinking has entered the concept, design and new build stage of yacht development, the refit and operational stage is where it could have significant impact. **Bob Wagemakers** of Virtue Yacht Refit Management describes the thinking and opportunities he's encountering on recent sea trials and the major refit of a 100m+ yacht currently underway.

With increased environmental awareness, the superyacht industry seems to be following the technological developments of other sectors, though at a significantly slower pace. Apart from MARPOL, there are very few international regulations that require yachts to be built and operated with a lower environmental impact. It's the owner, manager, captain and crew who decide whether an additional effort is made outside the regulations.

New build options for reducing a yacht's environmental footprint are receiving a lot of press coverage at present, although it must be noted that the only 'environmentally friendly' yacht is the one that was never built. The Arcadia 85 design and the Mochi Craft Long Range 23 are two concepts that would operate for a couple of hours on electrical power – but then switch to the high-fuel-consumption mode called semi-displacement.

Developments in sustainable technologies for new builds are well known, but a plethora of technologies exist which can be implemented on existing vessels during normal operation, maintenance periods or major refits. Although a lot of these changes require an initial capital investment, most of them

have a very reasonable return of investment period, mostly as energy reduction measures. Other changes may require less investment and some do not require any investment at all. Virtue Refit is currently carrying out a major refit on a 100m+ yacht. The crew is well aware of the impact of this large vessel and is willing to work on and invest in improving the environmental performance of the yacht.

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The company will be installing more efficient gensets with low-consumption fuel burner soot filters (replacing the old energy intensive electric heating coil burners), upgrading the power management and control system for increased efficiency, programming the HVAC system to allow the engineers to select predefined 'eco' settings at night or when

the guests are not onboard (this is something that is already implemented on a lot of new builds, but did not necessarily exist, say, 10 years ago). Furthermore, a lot of the interior and exterior lighting is being replaced with LED technology to reduce both power consumption and heat reduction (read: lower AC load).

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By installing a sewage treatment plant compliant with the latest MEPC 159 regulations for operation in environmentally sensitive areas, the impact of the grey- and black-water output will be considerably reduced. Other examples of sustainable measures being implemented that will also reduce operating costs are the replacement of bottled water with UV sterilising and filtering water fountains and optimising and recalibrating the CPP propulsion system combinator curves. Note that the measures implemented in this project are only some of the options that are readily available for any vessel in our industry.

The use of exotic woods, especially teak, has been covered broadly in the yachting press (and see *The Superyacht Report* issue 121). Although alternatives are available and are now being used more regularly, mainly for tender decks and beach clubs, teak remains the norm. Having carried out more than 60 refit projects, we have rarely, if ever, seen teak decking replaced due to a lack of thickness – most often decks are replaced because of poor sealing or installation. Most new builds and refits, however, specify a teak thickness of 20-25mm. My experience is that both in refits and new builds thinner teak planks could be used. This would significantly reduce the amount of teak required, as well as the supply costs.

Important as well is that crew must take care of what they use on the decks. Owners often like the teak decks to look as though they are newly sanded. This requires regular heavy cleaning, which actually has an adverse effect on the teak. Again, this is down to education of the owners (in accepting a weathered teak look) and crew (in using environmentally and teak and caulking-friendly products).

Apart from technological changes, owners, managers, captains and crew could also consider the operational profile of the boat. This ranges from the laundry detergents to the speed at which the captain is requested or likes to >>



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drive the boat. Virtue Refit recently went out on sea trials on an 80m yacht. At its design cruising speed of 16kn the fuel consumption was about 750 litres per hour. However, the captain and owner usually drive the yacht at 19kn, thus entering into the semi-displacement regime. The fuel consumption more than doubled for only an extra few knots of boat speed.

By changing some small aspects in operational mentality, more energy reduction can be achieved than most hull-and-propulsion-design optimisation at the new build stage will ever render. One should ask: 'Is it really necessary to drive the boat this fast, or is it really necessary to have the entire interior chilled to 19°C and have the lights on when there are no guests onboard?' We feel that a lot could be gained from making those employed in the superyacht industry more aware of the impact of their decisions and behaviour. Although a lot of crews are already very educated when it comes to environmental impact, a far broader public could be reached if our industry's professional bodies and managers would cooperate to make operations more sustainable. However, reducing our footprint does not just depend on the crew and owners. Marina operators could also join in.

Although we see more 'Blue Flag' marinas that indicate increasing environmental performance, many are still not equipped to support boats that are willing to reduce their operational impact. Boats which have the arrangements to separate waste for recycling and a crew that is more than willing to do so still find themselves in marinas or shipyards that don't have the necessary reception facilities in place.

Superyacht marinas and shipyards should also improve on sewage water reception facilities that make it straightforward and cost effective to pump out sewage water shoreside, rather than over the side. Particularly in Europe, where a lot of the superyacht operations take place, these types of facilities are still lacking.

Yachting is about pleasure and enjoyment for the owner and guests. We should all be working to ensure the pleasures of yachting are sustainable, without necessarily having an enormous impact on cost. Let's focus on win-win solutions for a better environment.

Image: istock.com

RESPONSE FROM CAPTAIN TORK BUCKLEY

I certainly agree with Bob that we are slow in moving superyachting towards the 'green yacht'. There are a number of reasons for this. Like Bob, I think describing a superyacht as 'green' or as 'environmentally friendly' may be oxymoronic. 'Green' as an expression describing a yacht (or anything else that doesn't have that colour) is not only fuzzy in its technical definition, but also incorrect. 'Environmentally friendly', on the other hand, may be applied to some yachts provided that we correctly define the phrase. We can lower the environmental impact of superyachts. Doing that is certainly 'friendly' to the environment. However, as Bob said, it's not as 'friendly' as having no yacht and therefore no impact. To some extent, we need to take the terms in the last paragraph out of the hands of the marketing department and put them into the minds of the design and technical departments.

The biggest problem with building a low-impact yacht is that it's extremely hard to sell a new yacht in the current market at all. The unpalatable truth is that low impact does cost extra: efficiency paybacks are in the main part insignificant for the yacht in average usage.

In terms of systems, for example, it is perfectly possible to have a sewage-treatment system whose emissions are only drinkable water. This is in excess of IMO requirements; however, such systems also cost quite a lot more and take up more space. Prior to the financial crisis, there were a few yacht owners sufficiently passionate about the intention to lower yachts' environmental impact – Bill Joy is one obvious example – that they were willing to spend extra money for the 'feel-good factor' alone. The truth is today it's hard enough to get clients to pay the real cost of building a standard impact yacht at a profit, let alone shell out 10 to

20 per cent more to take care of the planet. We may not like that fact, but it is an unfortunate reality.

Ironically, in the current lean times, a commercially operated ship owner may well pay extra for increased efficiency, perhaps even more so than before 2008, as long as it offers a bottom-line payback in a relatively short amount of time. But these vessels operate 24 hours a day, all year round; few but

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the busiest yachts are used enough to offer a good payback against the cost of newly installed systems or equipment. However, Bob again correctly points out that there are efficiencies that can be made in terms of operation and habit using existing machinery. Those savings are money in the bank for the owner of an environmentally sensitively operated superyacht.

There are some concerns, not least the fact that lowering the loads on the yacht may actually push the gensets into light loading and perhaps operating less fuel-efficiently and with greater harmful emissions than when they were properly loaded. That is not to say that we should not attempt to reduce fuel burn, but we must look at the overall picture, not just at reduced fuel consumption and ensure that we reduce (or at worst maintain original levels of) CO₂, CO, NO_x, SO_x and particulates emissions. >>

There are some truly incredible technological developments coming at us that will allow us to live with a massively lowered impact upon our planet. Simply Google Justin Hall-Tipping, CEO of Nanoholdings, and listen to his short TED, or long THiNK presentations on the subject; these are genuinely awe inspiring. In the near term, though, until such technologies escape the laboratory into everyday life, it is still possible to seek a different way of yachting. Although, sadly, many of these holistic design approaches are not retrofitable, once the enthusiasm and budget have returned, the possibilities are immense.

The reutilisation of wastewater for wash-down, toilet flushing and more is a fine and technologically simple example of how to reduce energy requirements. Along with those ubiquitous LED lights you simply can fit significantly smaller gensets; this in turn reduces emissions significantly. Longer term, superyacht systems design engineers must aim to create the 'superyacht as a spacecraft', where (as much as possible of) everything is supplied from within and recycled with nothing escaping into the environment, a philosophy that applies as much to energy as it does to SOx, NOx or sewage.

I will be very pleased when the financial health of the industry and realistic prices return. In an environmental context it will mean a resurgence of superyacht owners who are genuinely committed to leading the way to self-contained, low-impact yachts and where answering those needs will allow our industry to afford environmental innovation. It's also very important that we don't beat ourselves up concerning the impact of superyachting on the planet. While the fuel consumption of a 100m-plus yacht as a 'vehicle' is startlingly greater than it would be for a Smart car, the emissions of the entire superyacht fleet compared to those of coal-fired power stations or motor cars is but a drop in the ocean of emissions.

Nevertheless, beyond needing the willingness to pay the right price to buy a superyacht, as suppliers and operators, we must foster an image of superyachting in which the ownership of large, vastly expensive toys is seen as not only socially acceptable but actively socially beneficial; there is no doubt that lowering the environmental impact as much as possible will strongly contribute to that process.

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OFFICES: EVERETT, WASHINGTON USA
HAARLEM, THE NETHERLANDS

EMAIL: sales@pcmii.com
WEBSITE: www.pacificcoastmarine.com
PHONE: +1.425.743.9550