SMART OWNERSHIP

# How sustainable solutions protect long-term yacht value

WRITTEN BY: AWWAL IDRIS, ENVIRONMENTAL EXPERT

WATER REVOLUTION FOUNDATION

Energy audits on yachts built in the 2000s regularly find generation efficiency of 20 to 30 per cent. In most cases the machinery is in good order. It is sized for a duty the yacht rarely performs.

The common case is a yacht at anchor in August. Guests aboard, air conditioning at full load, one generator carrying about a quarter of its rating for nine hours. Nothing smaller is available to run.

## Why the plant is oversized

Diesel engines have a specific fuel consumption curve. It is flattest between about 70 and 85 per cent of rated load and rises steeply below 40 per cent. Below 30 per cent, combustion is incomplete and unburned fuel and lubricating oil collect in the exhaust. This is wet stacking. It costs fuel first, then injectors, piston rings, turbochargers and exhaust cleaning. Marine genset manufacturers generally specify 60 to 75 per cent loading.

The oversizing is designed in. Systems are sized for full speed, full guest complement, peak seawater temperature and the hotel load of the hottest night of the year. Redundancy is added on top, then class margin, then allowance for late changes during the build. Each margin is reasonable on its own. Together they produce a plant that spends most of its working life below its efficient load band.

A condition survey will not show this. It shows in the fuel bill, in maintenance intervals, and at the point of sale.

## Where the regulation applies

The EU Emissions Trading System extension to shipping applies to vessels of 5,000 GT and above. FuelEU Maritime uses the same threshold. Yachts that carry no more than twelve guests are not passenger ships under SOLAS, and very few private yachts reach 5,000 GT.

Direct exposure at present is limited to a small number of large commercial vessels. The threshold is under revision. In 2026 the European Commission proposed bringing selected vessel categories between 400 GT and 5,000 GT into scope from 2031, with negotiation running into 2027.

Other requirements already apply. Since 1 May 2025 the Mediterranean has been a sulphur emission control area, with a 0.10 per cent limit on fuel sulphur. Marine protected areas and speed restrictions continue to expand. Marinas are installing shore power, and some now require its use. Each of these narrows where an inefficient yacht can operate and at what cost.

## The holding period problem

Efficiency savings run for the service life of the yacht. Most owners resell within a few years. Depreciation runs at roughly 6 to 8 per cent a year after the initial drop, and refit specialists generally treat a project costing more than about 30 per cent of pre-refit market value as a reason to sell instead. On those numbers, an owner funding a deep efficiency refit passes most of the benefit to the next owner.

This is why the work is often deferred. It also sets the condition under which it makes financial sense. The saving has to be transferable. That requires the next owner to see it, verify it and price it. Fuel savings recorded only in the current owner's accounts do not transfer. Savings measured against a baseline, logged across seasons and reported in a form a buyer's technical advisor recognises, do.

This is the practical case for third-party assessment. The Yacht Environmental Transparency Index, developed by Water Revolution Foundation, applies life cycle assessment across eighteen impact categories, benchmarks the yacht against a standard operational profile, and divides the result by gross tonnage so vessels can be compared within a class. Without a shared functional unit, no one outside the owner's team can check an efficiency claim. With one, the yacht has a defined position relative to comparable vessels, and that position survives a change of ownership.

Timing is important for the same reason. Efficiency work done inside a scheduled class survey or a repower window costs considerably less than the same work done on its own, because the yard time and strip-out are already committed. An owner planning to sell in three years is usually better off sequencing upgrades into the next survey.

## What life cycle assessment adds

Over a service life of thirty years or more, the use phase dominates a yacht's environmental footprint. Two things follow from that.

The first is that operating hours determine payback. A yacht running 1,200 hours a season and a yacht running 300 hours a season can have the same specification and produce very different results from the same refit. Four years on one, fifteen on the other, in fuel and in carbon. A payback estimate without an operating profile behind it is not reliable. A useful audit starts by logging a season of actual operation.

The second is burden shifting. Composite lightweighting lowers fuel burn in service and raises embodied impact in production, with no established recycling route at end of life. Whether it comes out ahead depends on operating hours. Battery storage reduces generator running time, and the pack has its own production footprint and a cycle life shorter than the hull's, so replacement belongs in the calculation. Biocidal antifouling reduces drag: light slime costs roughly 10 to 20 per cent in fuel and heavy calcareous growth considerably more. The biocide carries a marine ecotoxicity burden that a carbon-only assessment does not capture. Silicone foul-release coatings substitute a different set of impacts and depend on a cleaning regime the crew has to keep up.

Eighteen impact categories exist because a single number hides these trades. The commercial consequence is straightforward. A refit that improves one indicator and worsens three will not hold up when a buyer's advisor assesses it properly. Running the analysis before the work is how an owner avoids paying for a downgrade.

## Ranking the measures

Measures are best ordered by cost per tonne of CO2 equivalent avoided rather than by headline percentage saving. The order is broadly consistent across the fleet.

First, hull coating condition and cleaning regime, system settings, chilled water setpoints, load management and crew operating practice. These deliver 5 to 10 per cent for very little capital, and they produce the baseline data needed to justify anything larger.

Second, air conditioning, usually the largest hotel load on an older yacht. Variable-speed compressors, setpoint reset against actual seawater temperature, corrected ducting and zone control have reduced HVAC consumption by up to two thirds on legacy vessels. Comfort improves at the same time.

Third, propulsion, at the natural repower window. Logged data almost always shows a yacht cruising well below design speed. Engines matched to actual use burn less per mile, operate in their efficient band, and reduce noise, vibration and soot. Range increases without any change to tank capacity.

Fourth, hybrid systems and energy storage. These are conditional. They pay where the load profile varies: long periods at anchor, wide swings between hotel and transit load, frequent low-load running. On a yacht with a steady, high hotel load, a correctly sized conventional plant will often outperform a hybrid retrofit on both cost and impact. The deep refits that reach 25 to 35 per cent, and the rebuilds approaching 50 per cent, come from getting this sequence right rather than from any single technology.

## What the demonstration projects change

In July 2026 Vitters launched Zero, a 69-metre ketch developed through Foundation Zero to operate without fossil fuels. She uses sail, hybrid photovoltaic-thermal panels, a 250 kW hydro-generation system and an onboard microgrid, with around two weeks of autonomy on renewable energy alone. Development took six years. The system data and key designs are being published openly.

Very few owners need that specification. The effect of a project like Zero is on what buyers and their advisors expect to find. Once a system has been demonstrated at 69 metres, its absence becomes a question at survey.

## The approach

A staged transition works better than a single large project. A multi-refit roadmap tied to survey cycles spreads the cost, keeps technology options open, and avoids committing to one fuel or system while regulation and supply are still settling.

Every yacht changes hands eventually. The next buyer's technical team will ask what it costs to run and where it is allowed to go. Both answers are determined years earlier, at refit.