



2019 OCEAN AWARDS

The Innovation Award

This year, the judges felt that there was no obvious winner for this award. However, they highlighted the work of two projects that, while using existing technologies and therefore not sufficiently innovative to be winners, had huge potential to be beneficial to the marine environment. As such they have been given joint recognition in the form of Highly Commended

Dr Anne Kapuscinski

Director, Coastal Science and Policy Program and professor, environmental studies at the University of California, Santa Cruz, for aquaculture microalgae feed

Whether they are wild or farmed, carnivorous fish require other fish to feed on. But with aquaculture being the world's fastest-growing food sector, the need for feed – sustainable sources of protein that do not adversely upset the food web of marine ecosystems – is becoming ever more pressing. “In 2014, for the first time, 50 per cent of seafood consumed by humans came from aquaculture,” says Dr Anne Kapuscinski (pictured right and above). “It is growing explosively. But a lot of the processes in aquaculture are unsustainable.”

As director of the Coastal Science and Policy Program and professor of environmental studies at UCSC, she and her team investigate the development of microalgae-based feeds that support fish growth and omega-3 content without damaging healthy aquatic ecosystems.

It makes no ecological sense to feed farmed fish meals that have been “extracted from other small fish that are captured in the ocean, because in the wild they serve as food for bigger fish like tuna and salmon. They’re being caught in the oceans and ground up into meal and oil, which are then sold on global markets as a commodity. That represents about 25 per cent of the world’s total capture of wild fish. Most of that goes into animal feed, and aquaculture uses up about 90 per cent of that. This is just not sustainable. And by about 2040, demand will outstrip supply.” It also, she says, “hurts marine biodiversity because these fish are a very key part of the marine food



web. So our mission is to produce fish-free feeds [also known as F3] for aquaculture that have no fish ingredients in them.”

The solution, she believes, is microalgae, microscopic unicellular marine plants “at the base of the [ocean’s] food web, which are very efficient at photosynthesis and the planet’s main producer of omega-3 fatty acids”.

The fish in her lab are showing better growth performance on a diet of the fish-free feed her team has developed than those fed a conventional diet. Such microalgae do not even need to be cultivated in the sea: they can, for example, be grown in wastewater from the brewing industry which is rich in nitrogen and phosphorous. This saves breweries from having to find ways to safely dispose of waste because clean-water legislation

tries to minimise the release of nitrogen and phosphorous into waterways where it can cause algae blooms. This way, she says, it is “upcycled and turned into a valuable resource” in which the microalgae clean the water by removing the nutrients from it. In short, a win-win.

“If we are going to get more and more of our food from the oceans,” Kapuscinski says, “we have to do it in a sustainable way.”

Silent Yachts

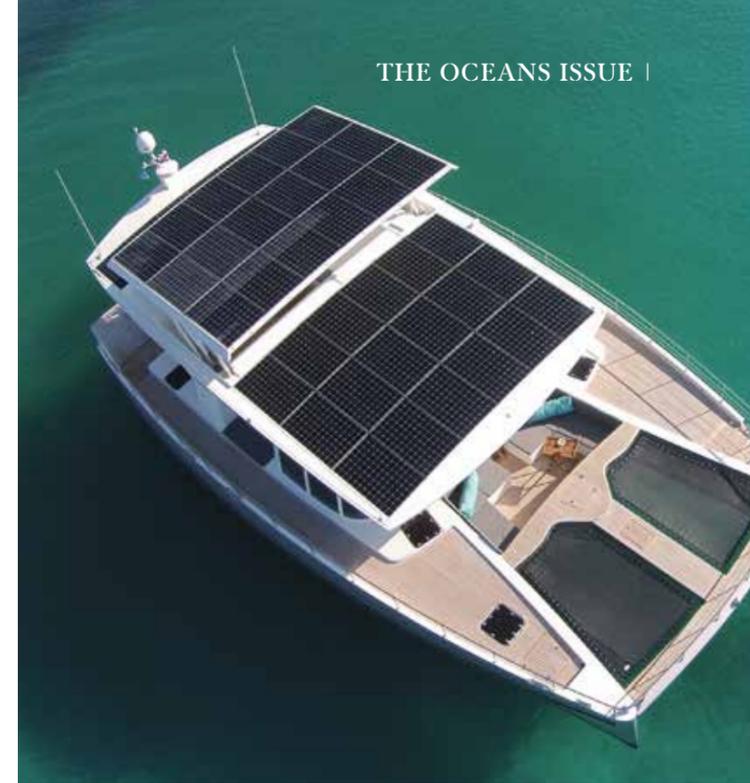
Silent 64

In January 2018, after almost 15 years’ research, Klagenfurt-based Silent Yachts delivered Silent 64 a 19.4-metre solar-hybrid ocean-going catamaran, to its owner. It was a huge step towards developing a completely emission-free yacht, for even sailing yachts tend to rely to some extent on diesel or gasoline engines and onboard generators.

Not this one, which last year completed a 38-day, 5,567-nautical-mile voyage from Cartagena in Spain across the Atlantic to West Palm Beach in Florida, evidence that solar-powered vessels are now capable of covering considerable distances. With a configuration that can be adapted to accommodate up to six cabins (there is also a larger 24-metre model, Silent 80), a garage for toys and sufficiently sophisticated satellite communication systems for it to remain online 24/7 even in the middle of the ocean, it proves that eco-credentials are no barrier to luxury and stands to shake up the way superyachts are powered, much like electric cars are disrupting the automotive industry.

Founded by husband-and-wife solar pioneers Michael Köhler, the company’s CEO and technical director, and Heike, an experienced skipper (they claim they have spent more than 5,000 days on their yachts, sailing more than 75,000 nautical miles) who takes responsibility for the interior layout and ergonomics, Silent Yachts produces three types of solar-powered yacht.

As Michael explains: “Solar panels on the roof supply the energy, which is stored in batteries.” This is sufficient for all the amenities: refrigeration, freezers, all household appliances including the air-conditioning and an onboard plant producing up to 3,000 litres of drinking water a day. “The drivetrain, the electric motors that power the boat [also] get their energy out of the batteries, which are recharged by the sun on the solar panels. Most of the time on average holiday usage this boat should be self-sufficient without using any fuel,” enabling it to sail silently and emission-free for weeks at a time. In fact, without the need to refuel or take on water, its range is much greater than a conventionally powered boat of its size.



Silent Yachts has pioneered a vessel that provides all of yachting’s luxury with none of the emissions. No fuel is necessary for a holiday on the water, thanks to batteries that store the sun’s energy