NEWTECH

The latest marine innovations from our experts


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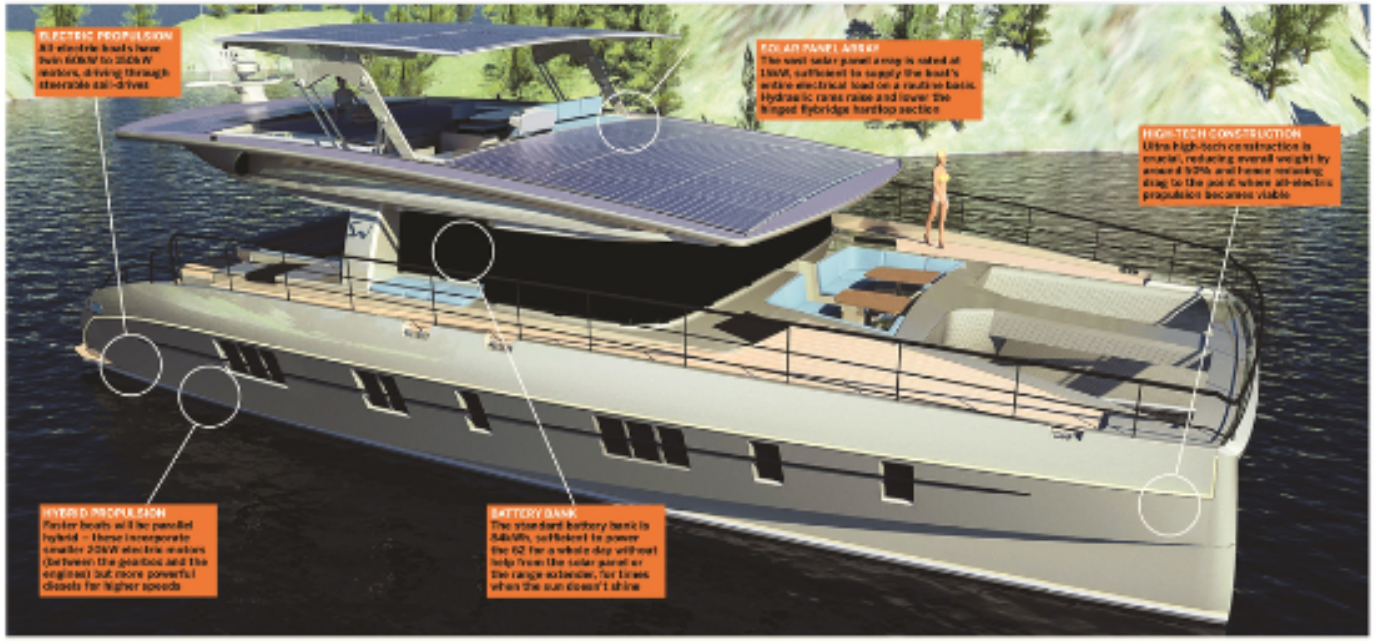


The brightest idea under the sun

Solarwave has fully embraced electric technology and is bringing it to fruition in a 62-footer

Barely a month goes by without a new all-electric car appearing on our roads. Tesla, Nissan, and BMW were among the earlier adopters, and one assumes that batteries have recently become very appealing to Volkswagen. So where are our all-electric motor cruisers?

Surely an almost complete absence of noise and vibration for those on board, and for neighbouring boats, plus zero emissions at the point of use is appealing to us all? There are numerous small craft around, but given that even a couple of the tiny 60kW (100hp) electric motors in a Nissan Leaf would be powerful enough to push the average 60-footer at displacement speeds, why has nobody produced a big, all-electric cruiser?

Well, finally, a pioneering Swiss company has done just that. Solarwave is about to launch its first all-electric 62-footer, the Solarwave 62. Although it carries a diesel generator as a safety back-up (Solarwave quastically refer to this as the 'Range Extender'), the aptly named Solarwave 62's vast 15kW solar panel array is designed to supply the boat's entire electrical load on a day-to-day basis, motors and all.

We often report on innovative new projects in the making, and while they frequently look great on paper, only the bravest of souls would consider buying the first boats off the line because of their unproven nature. This project appears quite different. For the past five years, Solarwave has had a fully operational prototype cruising far and wide (see 30-second briefing). Its a decade in the longest gestation and testing period I've encountered for any new marine project. And nor is the prototype solar boat a mini me that could be squeezed onto a garden pond, it's a 46-footer whose systems doubtless mimic those of the production boats very closely. So there should be few surprises when the boat and its systems are scaled up.

Beside its longevity, the most impressive aspect of the testing is that far from investigating the best case scenario, Solarwave made it difficult for itself. So the 46 test-bed not only has high load items on board such as air con, a washing machine and a 3,000 litre/day watermaker, it also has all-electric cooking instead of gas. The tender's outboard is electric, not petrol. The Solarwave 46 even carries an electric motorbike, and how many 60-footers carry a motorbike of any type?

MY TAKE Having driven an electric car for a number of months, range anxiety is always the main concern. That's why a solar-powered catamaran with an almost infinite range and very little drag makes so much sense. Hugo

INCREASING THE EFFICIENCY

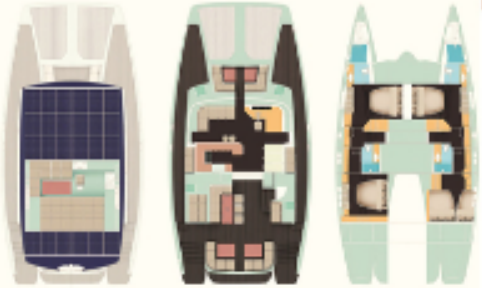
The first two 62s off the line, which cost around €2m, are both powered by a pair of 60kW motors. With these, Solarwave estimates a top speed greater than 10 knots and a cruising speed around 6-8 knots. To decrease drag and increase manoeuvrability, steerable sail drives (www.hydrostaruf/pmprop.html) are fitted instead of shafts. These units have been utilised in commercial craft for years, and are beefy enough to cope with the (currently) largest twin 150kW electric motor option.

The other way Solarwave has maximised the 62's efficiency is to reduce weight using high-tech construction. Claims of 'high-tech' are frequently no more than annoying hyperbole, but Solarwave's construction – an epoxy resin infused carbon composite structure with honeycomb cored furniture throughout – truly is high tech. It explains why the 62 weighs 18 tonnes (light), compared with the Lagoon 630's 35 tonnes. The boat obviously relies on an indeterminate measure of sun, although given the prototype's operational record, that does not seem difficult to achieve. If the sun did disappear completely, with the recommended 84 kWh battery bank, Solarwave est makes the 62 would be able to cruise at 7 knots for about ten hours, before the battery bank was depleted enough to require the 'range extender'. Slow just a little to 5 knots and that time extends significantly.

Solarwave understands that some owners will want more speed. So it also has a parallel hybrid version that incorporates 20kW electric motors (www.letrika.mahle.com/en/) between the gearbox and the diesel engines, which is straightforward tried and tested technology in the Greenline mould. Because the 62 is so light, it's not easy to accurately predict the higher speeds, and Solarwave was refreshingly cautious in wanting to wait until the first 62s hit the water before I committed itself. Lagoon's 630 did 16 knots with twin 300hp Volvos, so certainly mid-20s seems possible with the same power, but whether the 62 could hit the magic 30 remains to be seen.

There are further advantages to solar powered, all-electric propulsion than zero emissions and the lack of noise and vibration. Combining a slender catamaran with infinitely variable electric motors means that the boat won't have a natural 'groove' as some boats do, instead owners will be able cruise at precisely their speed of choice, from zero to flat out. Notwithstanding provisioning and the necessary amount of sun to 'fuel' the solar panels, with the watermaker on board the 62 effectively becomes autonomous with a potentially unlimited range. At zero fuel cost! For intrepid long distance cruisers, that has to be hugely appealing. MBT

Contact www.solarwave-yachts.com/engl.ahc www.letrika.mahle.com/en/; www.hydrostar.nl/pmprop.html



The layout of the Solarwave 62 shows the carbonised flybridge and the four spacious double ensuite cabins

Flybridge hardtop folds
Flush to cover seats and sun
station when not in use

30 SECOND BRIEFING: SOLARWAVE 46 TEST-BED

- The Solarwave 46 is a fully functioning prototype solar-powered boat, built specifically as a test bed for Solarwave AG's ideas. It has been fully operational since January 2010.
- In the last five years it has cruised around the Mediterranean, criss-crossed Europe's rivers, and sailed the Black Sea and the Aegean, apparently encountering winds up to F9, sunny and cloudy skies alike, as well as snow and ice. To date, it has been used for more than 140 weeks.
- Everything on board is all-electric: air-conditioning, fridges and freezers, washing machine, watermaker, and all the cooking appliances.
- The solar panel array powered all of those electrical loads on a day-to-day basis. Although a back-up generator had to be carried for safety reasons, Solarwave reports that it only ran for about 50 hours over five years, primarily to maintain its reliability.
- During the same period, the electric motors ran for 2,500 hours. Neither the solar panels, the batteries or the electric motors required any maintenance.