Charging ahead!

A Bellmarine shaft drive motor

The options for boat owners contemplating electric propulsion are increasing rapidly. We look at some choices and have a sail in a Cornish Shrimper fitted with an electric engine

There's a lot to be said for electric propulsion in sailing yachts. Diesel engines are reliable and can be refilled with a simple can of diesel, but they are smelly, noisy and polluting.

Electric cars are making huge strides, with all the major motor manufacturers racing to produce a viable electric car. But is a conversion to an electric motor a realistic proposition for the sailing yacht yet? That comes down to two things: range and cost.

Diesel engines are relatively cheap, simple to repair and you can buy the fuel anywhere. That means that with enough fuel you can motor all the way across the Channel in a flat calm, refill from cans and motor back, all the while producing enough power to run lights, electronics and heating.

Electric engines are near-silent, don't smell and make for a much neater installation – but the biggest problem is range. For day-sailors and weekenders, that's not a problem – you can simply recharge on shore power or let the boat charge up via solar or wind power ready for the next weekend. For those wanting to go offshore or spend longer on board, you're likely to need a reliable means of recharging. Many boats have diesel generators on board to keep the batteries topped up, but that is an issue on a small sailing boat.

Mastervolt were an early adopter of Lithium-ion batteries for onboard use

Oceanvolt, one of the long-established suppliers, say that for an example 9m (30ft) boat, you can expect a system with 7kWh battery capacity to give you speeds of 3.5-7 knots, with the range decreasing from 35 miles to 6 miles respectively before needing a recharge.

Cornish Crabbers recently sold a Shrimper 21 with electric propulsion (see p44), and have found it a success. Sales manager David Thomas told me: 'It's a great system. For the same weight as a 1GM10 you can get enough power for a day's sailing, and plenty to spare. For the dayboat and weekender market, it works well: the issue comes in the mid to large range, where you don't have a generator and still want to go offshore.

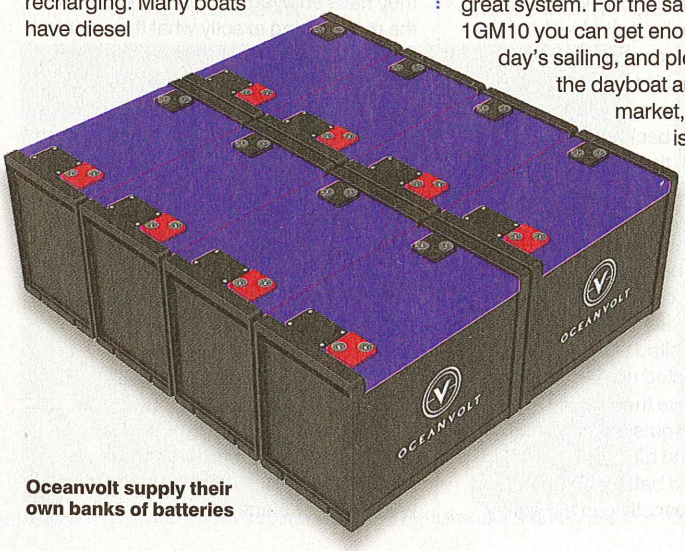
'We did do a Crabber 26 with a hybrid system that was quite a good option, but the problem was that having both an engine and a battery bank was very heavy. We had to take the oven out to fit all the batteries in! Until you get over 45ft or so it's hard to justify the expense or weight of having a generator rather than just a diesel inboard.'

Which batteries?

Battery power users fall into two camps – and which option you choose will depend on the type and displacement of boat and the sort of sailing you want to do. As you'll note from our two case studies, some choose lead-acid or gel batteries (see 'Going electric' on p38) as they are significantly cheaper than lithium ion – athough they are much heavier and can't be discharged as far.

Others (see the Shrimper on p44) choose lithium as they last longer, are much lighter and can be totally discharged without damage. They require a more complex battery management system, which – added to their high cost – pushes the total cost up.

Most motor manufacturers supply their own batteries, too – and packages are often available to help reduce the cost.



Oceanvolt supply their own banks of batteries

A Torqeedo li-ion battery pack

Sails with solar panels sewn in are an emerging technology

Recharging

If you're day-sailing, electric power can be resupplied by shore power. However, if you're planning to head further afield you'll need some onboard charging capacity. Many larger boats use diesel generators for this, which is in effect a hybrid system.

Solar panels are a sensible option, but you're likely to need a large number to give you a decent range. Arcona has recently launched their 380Z which has 1,000W of solar panels sewn into the mainsail, mounted on deck and in the boom, which they say will allow the yacht to motor at 4 knots under solar power alone.

The holy grail of electric propulsion for sailing craft is regeneration, where the propeller continues to spin under sail, acting as a hydrogenerator and replenishing the batteries. Online reviews suggest that this is still in its infancy; but Oceanvolt, for one, have recently started offering it in their electric motor packages, and say that their hydrgenerators start working well above 6 knots.

Hybrid motor packages, where an electric motor and generator are bolted onto a standard diesel engine, are one way of getting around this, giving the best of both worlds, although they are necessarily heavier.

Hanse have recently introduced a combined rudder and motor

Which motor?

A variety of motors are available. These range from shaft drives to outboards and saildrive pods. Other, more creative solutions also exist: Hanse recently announced a partnership with Torqeedo whereby a pod attached to the rudder supplies motive power. These are some of the suppliers available:

OCEANVOLT:
Saildrive and shaft drive are available

TORQEEDO:
Saildrive, shaft drive and outboards

BELLMARINE:
Saildrive and shaft drive

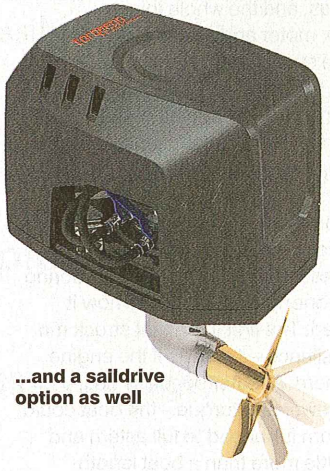
ELECTRIC YACHT:
Shaft drive and saildrive

Bellmarine's SailMaster 20 kW

Torqeedo's 'pod' drive

Electric Yacht's saildrive leg

Torqeedo offer a Deep Blue shaft drive motor...



...and a saildrive option as well