

New superyacht a quiet revolution in green technology

- Story Highlights
- IT pioneer Bill Joy has designed a new energy-efficient superyacht
- The vessel "Ethereal" took Joy and his Dutch builders five years to perfect
- The sail provides raw energy, powering propellers that in turn feed a generator

By David Marsh

LONDON, England -- Bill Joy is one of the most gifted and successful computer programmers of his generation.

As co-founder of Sun Microsystems he helped create Java script, the programming language now used in computers worldwide.

As you might expect with such a resume, his design brief for his new superyacht was not short on ambition or innovation. Joy set himself the task of creating the most energy efficient yacht possible.

He and his wife Shannon have ploughed all their spare time in to the project -- "We worked 48 hours a week for five years, on top of our normal jobs," he said -- and the results are impressive.

Heading out of the marina at Barcelona alongside Joy and his wife Shannon on their vessel "Ethereal", we experienced a surreal moment.

We turned off both main engines. Yet, with the sails still furled, and in complete silence, we continued to glide along at 9.5 knots, with 1,500rpm showing on the bright digital displays. Standing at the helm, there was no noise. Not even the burble of a generator.

"We've switched Ethereal to battery power," explained Andy, the skipper. "And I bet you didn't spot when it happened." He was right -- there had been no perceptible transition. Now, with her versatile hybrid propulsion system proudly demonstrating one of its myriad modes, Ethereal's Ron Holland-designed hull was being propelled using the two electric motors with power coming from its 400 kilowatt-hour (kwh) lithium-ion phosphate battery bank.

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All of Ethereal's hotel services -- air-conditioning, lights, pumps and galley -- were also using the same power source. Hence the eerie silence.

That may sound ingenious, and an enjoyably peaceful way to travel under power. In truth, it's a minuscule fraction of what the owners and the Dutch builders Royal Huisman have achieved with this boat.

Joy set out to build the yacht using existing technology where appropriate, but also exploring new technologies where he thought the current ones fell short, in the realms of lighting and thermal efficiency in particular. His goals were not modest.

"Almost any system people use today, you can save half by intelligent design. Three-quarters is harder," he informed me.

Along the way, he created the world's most technologically advanced large hybrid sailing yacht.

So just how efficient is Ethereal? On a good day, under sail, the same electric motors that had been silently pushing us along can be used in reverse, as generators.

Think of Ethereal as a mobile aquatic wind farm. Her 1,606 sq. meters of upwind sail indirectly provides the raw energy, spinning the controllable pitch propellers in reverse as they drag through the water at up to 17 knots, directly turning the generators.

After the inevitable efficiency losses at the propeller and during the electrical conversion (minus 5kw for the cooling pumps), these generators in theory should feed around 16kw each back into the lithium-ion battery bank. That's roughly half of Ethereal's typical energy requirements.

Even on a bad day, tied up alongside or at anchor, so much effort has been put into reducing Ethereal's energy consumption that Ian, the chief engineer, has found that their small 55kw emergency generator is able to handle this boat's energy requirements at times. Put into perspective, anybody belting around in their tiny 29 foot, single 370 diesel sportscruiser, is consuming roughly twice the energy and polluting the atmosphere twice as much as Ethereal does on a 'bad' day.

"You get the quiet for free when you make it efficient," Joy said.

With only the lightest breeze to push us along, we were never going to achieve the 15 or 16 knots that Andy and the ten-strong crew experienced on their passage from Palma to Barcelona. But with designer Ron Holland on board checking the sail trim, and crew member Marcus trimming the sails using Ethereal's huge captive reel winches -- all effortlessly push-button operated from the helm -- we soon settled into an easy 12 knots boat speed in no more than 12 knots apparent.

Not surprisingly, with no waves to speak of and 190 foot of boat underneath us, there was little sensation of speed at first. That is, until I took the helm. As luck would have it, we experienced a sudden huge wind shift of around 30 degrees, so a rapid course correction was required. With light winds, a hydraulic steering system, plus the inertia that 472 tonnes distributed along 190 foot confers, I'd been expecting zero sensitivity and no sense of connection with the water whatsoever.

Instead, Ethereal sprang to life. Amazingly, Ron Holland has produced a 190 foot boat that responds very sweetly to surprisingly small inputs from the huge wheels. Sure, she doesn't feel like a racing sailboat, and turning through that 30 degrees then back again soon after involved a lot of wheel spinning. But thanks perhaps to the feedback system incorporated into the steering, there's a real sense of connection with the water.

This yacht, I suspect, is going to be a lot of fun to sail.

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"Ethereal" is one of the most technologically advanced superyachts in the world. All pictures courtesy of Super Yacht World

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The work of Dutch firm Royal Huisman, the build was overseen by the owner, IT pioneer Bill Joy.

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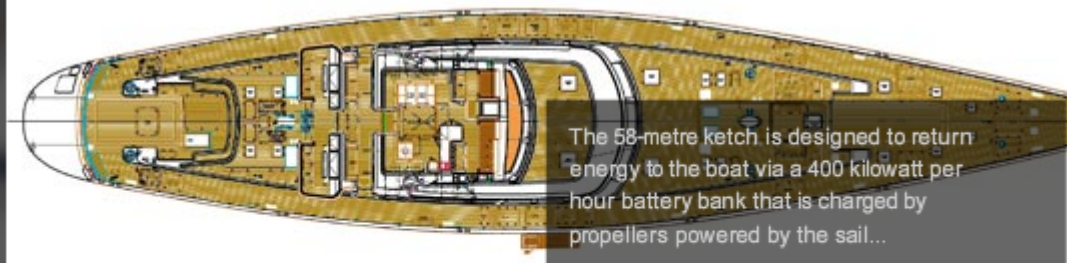
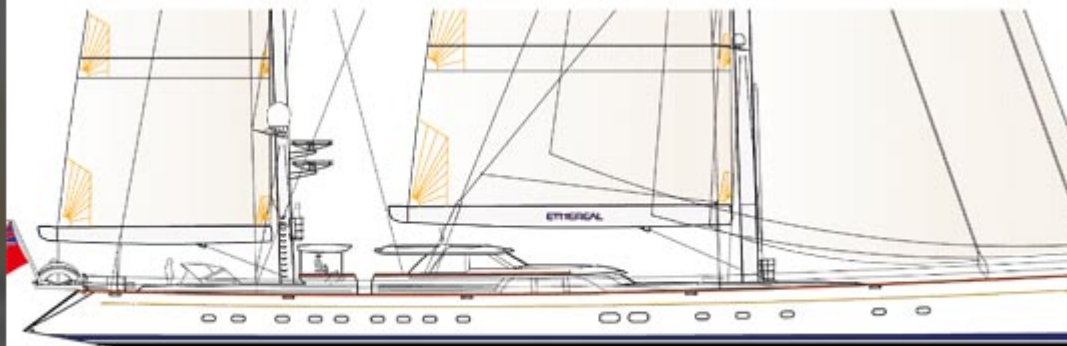
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The 58-metre ketch is designed to return energy to the boat via a 400 kilowatt per hour battery bank that is charged by propellers powered by the sail...

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Joy's boat combines fuel-efficiency with luxury.

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The mahogany interior is the work of the owners alongside designer Pieter Beeldsnijder "We prefer Zen to ornate," said Joy.

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