Q&A

PETER ANDERSON, ECLECTIC ENERGY

What is your role within Eclectic Energy, what does Eclectic Energy do and how did it get started?

Eclectic Energy Limited was incorporated in November 1999, with myself (Pete Anderson) as the MD and major shareholder.
The company designs and manufactures water and wind powered electrical generators.

I sailed dinghies from the age of 14, and later owned trailer sailers towing them to the south coast for holidays.
I gained RYA competent crew, day skipper and coastal skipper along the way, which enabled me to charter larger yachts in Greek Islands etc.

I worked as a sales engineer and developing practical solutions for technical problems was an essential part of the job. This 'inventive habit' was carried through to my leisure pursuits.

Anyone who has spent time afloat knows that keeping the batteries charged on a boat when away from the marina berth is a challenge, and I was also looking for ways to keep the onboard electrics running.

At this time PV panels were expensive, so I invested in an Ampair 100 wind/water generator. Representing the state of the art at the time, this unit could be configured for wind generation and then deployed by hoisting it into the rigging using the main halyard.

To configure for water generation the unit had to be lowered and dis-assembled, removing the hub and air blades, pivot poles and tail. The alternator was then installed at the stern by lashing it to push pit.

The water impeller itself was 0.75 meter long and weighed 3.5 kg. One end of a 35-metre x 15mm braided rope was tied to the impeller and the other end to the alternator shaft. To deploy the yacht was slowed down before feeding the impeller and all 35metres of line out over the transom.

Recovery was worse requiring the boat to be stationary. The impeller continued to spin as the rope was hauled in hand over hand, resulting in a soggy tangle on the cockpit floor. t was necessary to untie the impeller and get the yacht underway, before re-streaming the line to untangle it before finally recovering and coiling the line.

Despite these inconveniences, I was struck by the consistent power water generation produced, and thought, 'there must be a better way to do this'.

Four years later in 1999 Eclectic Energy Ltd was founded with the aim of manufacturing 'Duo-Gen', my attempt at producing a more powerful, and user-friendly water /wind generator. The concept had been developed and refined through numerous prototypes until it became marketable.

Eclectic Energy Ltd has just celebrated 26 years in business so we must have got something right!

The 'proof of concept' prototype Duo-Gens had used many proprietary, off the shelf parts, i.e. alternator, air blades etc.

However, it was apparent that to achieve commercial success the company would need to design and manufacture all of the major components from scratch, including alternator, air blades, water impellers, transmissions, tower structures, mount hardware etc.

This was a massive undertaking for a small team with limited resources, and it entailed establishing a supply chain of over 40 specialist sub-contractors to produce the necessary parts and sub-assemblies.

Ultimately, we were successful and the Mk1 Duo-Gen launched in 2002 produced as lot of interest including a Dame award from Mets.

As the D/G concept was novel, we applied for and received a patent.

Also, in manufacturing D/G we had produced a kit of parts which could be re-configured and used to produce other related products.

In 2004 a dedicated wind generator the Eclectic D400 was launched.
Using the same air blades and core alternator parts as D/G, D400 was an immediate success and has gone on to be Eclectics highest volume product. Thousands of D400 units have been sold world-wide not just to cruising sailors, but also for the offshore oil and gas industries, navigation and lidar buoys, plus countless terrestrial applications.

Eclectic products were always produced up to a performance standard rather than down to a price. The major objection to wind generators on boats was noise, so our alternators are designed to minimise noise. Built with powerful magnets and almost a kilo of copper stator winding they rotate slowly for a given electrical output.

The 'slow speed' alternator is the key to making the D400 wind generator quiet and vibration free in operation, as it limits blade tip speed.

This also gives the D400 a high-power coefficient (max0.36), allowing it to produce higher power outputs for a given wind speed when compared to its competitors. It is also robustly engineered, built from high quality materials and components enabling it to operate reliably for years.

Give us an overview of Electrical Power and Power Management on boats

Many boat owners do not understand the physics which underpins their electrical system. Instantaneous electrical power is measured in watts, and wattage is the system voltage x the current in the circuit.

For example, 12v x2amps is 24 watts. 6 volts x 4amps and 24v x1amp are also 24 watts. Power delivered over time is Watt hours and this is the critical and often overlooked measurement.

Batteries store energy in chemical form, i.e. a chemical reaction is driven in one direction when charging and reversed during discharge. These reactions will only proceed at a given rate depending on the battery chemistry, ambient temperature etc.

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This means that however powerful the charging source time remains an important factor in returning the battery to full charge.

It is true that in light winds renewable generators will produce low instantaneous power outputs. To a yachtsman conditioned by high output shore chargers and engine alternators, the renewable output may appear paltry. However, the renewables, will output all day and in the case of wind, all night long, so the cumulative Watt hours returned to the battery stack up.

For example, a 12-volt D400 outputting a modest couple of amps (26 watts) will over 24 hours generate 48-amp hours (or 0.62 Kwh). At the dock It would take around two hours with a high power 25-amp mains charger to replace the same level of charge.

The takeaway from this is that renewables produce useful power over time and should therefore operate continually to derive full benefit.

This explains why low noise is so important to yachtsmen. A noisy wind generator that keeps the off-watch crew awake invariably gets switched off and therefore loses most of its utility.

What are the challenges and rewards of working in this sector?

The renewable sector can be a frustrating place to work. Most practitioners will accept that renewable technologies are not a universal "silver bullet" solution to carbon reduction and future energy needs, but they are a large part of the answer. They are also mature technologies with copious evidence of proven effective power generation.

Unfortunately, the imperative to reduce carbon pollution is challenged by the fossil fuel lobby whenever their political friends gain power and this has a stop start effect on the growth of the industry. There could and should have been a great deal more installed renewable capacity worldwide were it not for this political opposition and disinformation.
Despite the naysayers, installed renewable generation capacity continues to grow, and costs reduce making renewable energy ever more competitive with and in many cases cheaper than fossil fuel alternatives.

In the small wind generator market, the wider availability of high-density battery storage such as lithium Ion as greatly increased the utility of electrical power aboard cruising yachts and also stand-alone power for homes and businesses. In addition, the reduction in the real cost of photovoltaic panels makes such systems increasingly affordable.

The combination of small wind and photovoltaic panels as sources of generation provides a perfect complement with the wind contribution maximised during short dark winter days and at night when sunlight is in short supply.

As a responsible wind turbine manufacturer, we are constantly frustrated by people and organisations who seek to misrepresent the technology.

Unfortunately, it is also true thet the industry attracts less scrupulous companies who make ridiculously inflated marketing claims for the performance of the poor products that they offer.

These rougue operators damage the reputation of the industry as a whole and despite many having been prosecuted in the past these fraudulent products often resurface and are still offered for sale.

My advice to anyone looking to invest in wind energy would be to select a horizontal axis machine from a well established reputable manufacturer.