Summer 2022

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Contributions from readers are welcome although we cannot be held responsible for any damage or loss which may occur to material provided. Items of interest include letters, reports of rallies, events, cruises, articles and advice on building and running electric boats and on items of equipment. We also welcome manufacturers' reports on new equipment and boats.

Copy Deadlines

Material to be considered for inclusion in Electric Boats interactive should be sent to the editor (preferably by email) by the following dates:

> Spring 31 January Summer 31 July

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Volume 4 Number 1 Summer 2022



Showtime

Boat shows made a very welcome return in 2022 (page 26-27) after a two or three year absence following the world pandemic lockdowns. Global energy and supply chain dislocation has since been compounded by the war in Eastern Europe. Escaping on a boat even if it is only up the Rochdale Canal (page 17-20) seems ever more attractive. And should you wish to stay tuned to the doom and gloom check out the feature on mobile internet (page 33)

The spike in energy prices has led to some newspaper reports that running a car on electricity could cost more than on petrol or diesel. But if your electric boat has some solar panels and if you are in no great hurry this should not be a concern. Anne Cleary and Denis Connolly have been on a four month voyage along the Irish waterways in their solar Eco Showboat (page 24). The Eco Showboat Expedition 2022 is an arts voyage from Limerick to Enniskillen aboard the *Mayfly*, the first solar electric boat to make this journey. More than 20 artists, and as many scientists and local activists have been involved in developing a diverse programme of events for the expedition, aimed at raising awareness of local and global environmental issues. The project has received the Arts Council Open

Call Award for 2021, an SFI Discover Award, the Limerick Arts Strategic Award and is supported by Creative Ireland, Waterways Ireland, Dublin City Council, the Local Authority Waters Programme, Offaly County Council and local authorities and universities right across the country. Hydrogen is increasingly being seen as a solution to energy supply problems and the passing of the Inflation Reduction Act (IRA) by the US Senate may prove to be the one of the most important events in the history of green hydrogen and a turning point for the hydrogen industry beyond American borders. Not only will the Act's generous tax credits of up to \$3kg make the renewable hydrogen produced in the US the cheapest in the world it will also accelerate the development of fuel cell and electrolyser technology on a par with the tremendous improvements in battery technology that have taken place in the last few years (page 30 and 31).

The latest news and features on these technologies could have filled this magazine.

Don Wright

Cover: Scoop 2



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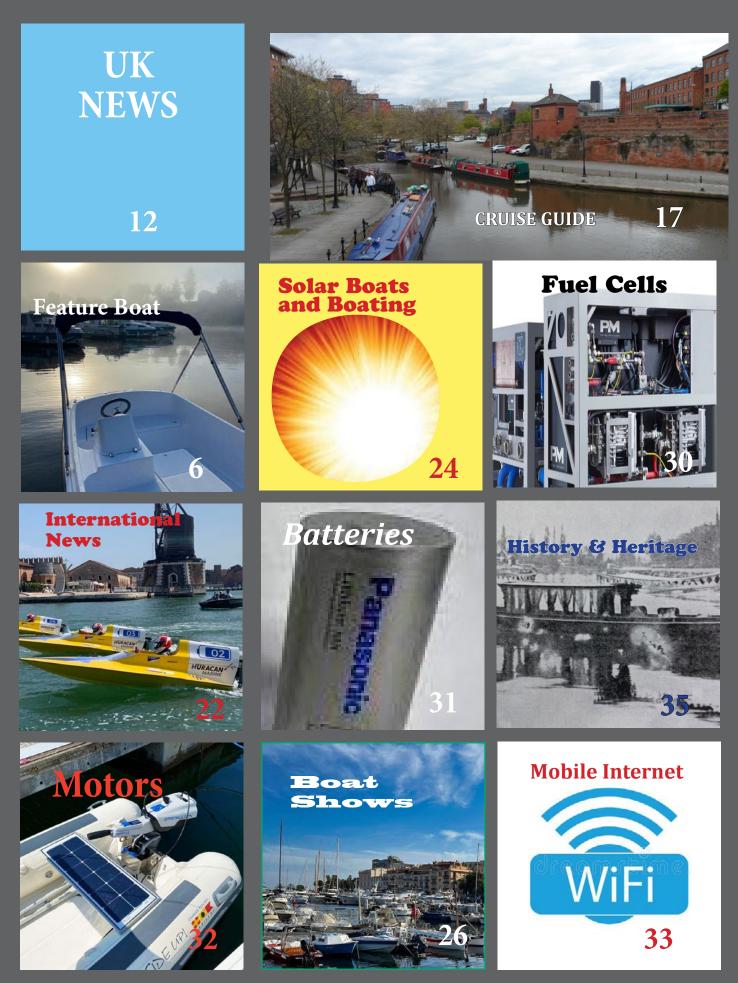
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CONTENTS

Summer 2022









Ruban Bleu boats

After a surge of electric boat orders in 2021, Ruban Bleu, a French boat builder and a European leader of electric boat manufacturing, marked its 30th anniversary in 2022 by launching a new version of the Scoop, the seven seater electric boat which is the flagship product of its boat range.

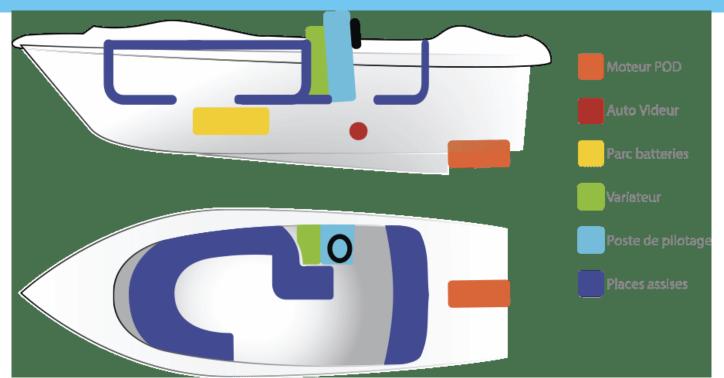
The new Scoop 2 has been completely updated with many improvements and is powered by the Eco One range of electric motors made in France and designed and manufactured by Ruban Bleu. With a Research & Development department and a range of customer services including maintenance, logistics, and spare parts, Ruban Bleu has over 30 years of experience building over 100 boats per year with more more than 2,000 boats sailing in the world.

The company is the only manufacturer of electric POD motors in France and will release another new product in 2022, a propeller compatible with its range of Eco One motors.

Ruban Bleu was also pioneer in the passenger transport sector with the Electric Navette and the company is looking to regain its place in a rapidly growing market by relaunching its passenger transport department with a range of boats seating from from 11 to 30 passengers.







Updated Scoop 2

Ruban Bleu's most popular electric boat the Scoop model has been updated and reimagined to create the Scoop 2 which combines the technology of the Eco One motor, designed and manufactured by Ruban Bleu, with an efficient hull design offering smooth and silent cruising. The cock pit accommodates seven passengers in comfort and they can move around easily thanks to an innovative cockpit layout which has been modified with hinged openings to make it much easier to access the electronic components.

The aft helm position gives good all-round visibility and an increased freeboard ensures safety for all ages. The boat is powered by a 1.6kW motor giving very easy navigation and the aft bench seating has a lifting lockable hatch allowing full access to the motor for ongoing maintenance. The battery box also opens fully for ease of access.

An additional locker has been created beneath the aft deck of the boat to allow storage of safety equipment and other items.

An optional table fits directly into the floor in the forward area with a choice

of table design available together with fitted cushions. There is an option for an aluminium or stainless steel sun awning or fixed canopy with stainless frame and Sunbrella canvas. The fixed canopy also has the option of transparent side screens. Fender eyes are directly integrated into the coamings to facilitate additional fendering.

A trailer for the boat and a boat cover are available as accesssories.











Technical specifications Length : 4,99 m Width : 1,92 m Weight in load : 520 kg (with batteries) Homologation CE : 7 passengers. cat. D Construction : Polyester Type : 1.6 kW motor Voltage : 24 V Batteries : 320 Amp. Charger : 24V/45 Amp. Self-regulated Maximum speed : 8 Km/h Range : 7 h

roduit Ruban Bleu 🧲



Propulsion: Eco One POD motor

In 2019, after more than 20 years of sourcing motors from Austria or USA suppliers, Ruban Bleu decided to develop its own models and entered into a joint R&D development with another French company which supplies the motors 80% complete. The motors are then finished by Ruban Bleu adding propellers and other elements.

The resulting ECO One range of POD motors is a new generation of high-performance electric motors. The 24-volt motor was the first to be produced and has been used in Ruban Bleu boats since 2019.

Ruban Bleu has now developed other models of electric motors including a 12V POD for lower power requirement and is now looking to



develop a 4.5kW 48 volt motor, the maximum power allowed for unlicensed boats. Ruban Bleu, has pioneered the development of electric boats for river rental bases and protected waterways and in 2020 the company produced 150 motors, 90% of which went into their own boats, as well as spare and replacement parts for their rental base customers. The company now wants to expand its operation beyond its river base by offering sail boat electric motor conversion packages for port exit and entry propulsion.

But that's not all, the company also hopes to mark its anniversary year by releasing another new product, a propeller compatible with its range of Eco One motors.

Ruban Bleu is working with Institut catholique d'arts etmétiers (ICAM) Nantes, a graduate engineering school in the West France region, to develop a propeller that would primarily reduce energy consumption, but not at the expense of speed.



Eco One POD Motor Technical specifications

Power: 1.6kW Voltage: 24 volts direct current Sealing: Ceramic mechanical seal (no lip seal). Double row ball bearings with shoulders Polyurethane gasket Dual fins Tube diameter 30 Stop ring Anode: Possibility of adding a second anode - for boats equiped with a POD motor the anode is placed directly on the motor





Energy supply and storage

The battery is house in a lockable storage compartment which opens fully for ease of access

Technical specifications

Battery Epoxy painted steel box Width : 421mm Length : 519mm Height : 460mm Capacity : 320 Amps Voltage : 24 Volt Charger 24v 45amp





Control and monitoring





The Scoop control console can be equiped with an LED screen displaying:

- state of battery charge
- remaining power

• power consumption in real time Individual monitors are also available





With 8,500km of waterways France has the longest river network in Europe and Ruban Bleu has been at the forefront in the development of electric boats for river rental bases and protected waterways since 1982. The company offers acomplete range of 100% electric boats, from 5 to 30 seats, and everything else needed to to set up a boating centre. The company is relaunching its passenger transport department to regain its place in a rapidly growing market.











Navette

Length : 8,50 m Width : 3,50 m Weight (with batteries) : 4,2 tons Weight (with passenger) : 6,3 tons Capacity : Up to 30 passengers Construction : Aluminium Type : 2 motors of 5 kW Voltage : 48 V Batteries : 2 x 640 Amp/h Maximum speed : 10 km / h adaptable Range (autonomy) : 10 h

Ace

Length : 3,85 m Width : 1,90 m Weight in load : 270 Kg (with batteries) Capacity CE : 5 passengers Cat. D Construction : Polyester Type : 650 W motor (Available soon in 1 kW) Voltage : 12 Volts Batteries : 320 Amp/h Charger : 12V/40 Amp. Self-regulated Maximum speed : 7 Km/h Range : 7 h

Legend

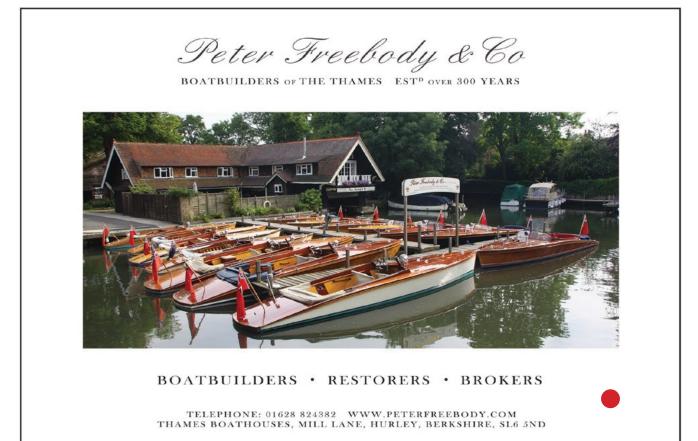
Length : 5,60 m Width : 2,20 m Capacity CE : 9 passengers incl. 1 with reduced mobility. Construction : polyester Type : Pod 2,4 kW (motor adjustable) Voltage : 24 V, 48 V Maximum speed : 10 km/h

Most

Length : 5 ,90 m Width : 2,20 m Weight in load : 900 kg (with batteries) Capacity CE : 11passengers. cat. D Construction : Polyester Type : 1 in-board 2.2 kW motor Voltage : 24 V Batteries : 540 Amp. Charger : 24V/60 Amp. Self-regulated Maximum speed : 10 Km/h Range : 8 h

Sensas

Type : Pod 1.6 kW Length : 4,50 m Width : 2,02 m Weight in load : 485 kg (with batteries) Homologation CE : 6 passengers. cat. D Construction : Polyester Voltage : 24 V Batteries : 320 Amp. Charger : 24V/45 Amp. Self-regulated Maximum speed : 8 Km/h Range : 7 h





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uk news

In Brief

HS2 threats continue

The IWA has been campaigning to protect canals and rivers from the damaging effects of HS2 especially where the tranquillity of the waterways is under threat.

The IWA's HS2 route changes have already reduced waterways crossings, saving the project $f_{.50}$ million, and have secured agreement for a new canal restoration route, a new mooring basin, changes in viaduct designs and improved noise protection. However HS2 and the Integrated Rail Plan (IRP) continue to threaten several waterways and canal restoration projects and the IWA has made submissions to an Inquiry into the IRP. The IWA is also critical of the intention to press ahead with the Western Leg of HS2 2b and the lack of detail on the Northern Powerhouse Rail (NPR) routes which may adversely affect other waterways.

Ashton Attack

Ashton Attack (ASHTAC for short) followed on from Operation Ashton, the campaign to save the Ashton Canal. Approximately 1000 people worked on the Ashton Canal and the Lower Peak Forest Canal over a single weekend in March 1972. The event contributed to the Cheshire Ring being fully re-opened to navigation in 1976. Ten years ago a large scale clean up took place to celebrate the 40th anniversary, with over 100 volunteers travelling from all over the country, including many of the original participants of the 1972 event. The 50th anniversary event was more modest with Covid preventing the planning of a larger scale event, but over two days in March a significant amount of work was still carried out. Over 30 volunteers from the local area and from across the north west area, picked up litter, cleared vegetation and trees and generally tidied up the Ashton canal side in the vicinity of Portland Basin.



Pioneer of Belfast

Following sea trials of The Pioneer of Belfast a 11.5m prototype Artemis Technologies has developed a commercially viable all-electric foiling workboat, which cuts through the water with minimal wake at up to 34 knots and offers a per-charge cruising range of up to 60 nautical miles. Artemis was founded in 2018 by Olympic sailing champion and America's Cup veteran, Dr. Iain Percy. The multi-purpose production version is built around a proprietary eFoiler propulsion system that sees the vessel rise above the waves on twin T-foils at up to 34 knots, and can manage 60 nautical miles cruising at a 25-knots. Bow and stern thrusters also allow for low-speed maneuverability, and the company states that the battery pack can be recharged in less than an hour for quick turnaround times.

Artemis says that operators can look forward to up to 90 percent savings in energy costs compared to combustion-engine workboats. The foiling workboat is constructed using lightweight glass and carbon fiber composites, has a 4-m (13-ft) beam and 2.2-m (7.2-ft) draft, and can accommodate two crew members and six passengers in a flexible seating layout.

The Artemis Technologies' workboat range is currently made up of two models: the 11.5-m multi-purpose workboat and a 12-m (39.3-ft) crew transfer craft which has a top speed of 32 knots and a cruising range of 50 nautical miles at 25 knots. It can carry 12 passengers and two crew. A larger boat for crew transfer operations is also in the works. First deliveries to customers are expected in 2023.

British Marine and Boating award

UK narrowboat builder Ortomarine were awarded the 2022 'Sustainability Award' The nomination highlighted their commitment to building environmentally friendly boats that both significantly reduce the vessel's carbon footprint and create a quieter, cleaner and more natural boating experience.

The nominations were judged by a panel of leading business experts with a wealth of experience in the marine industry and took place at the culmination of the two-day, inaugural British Marine National Conference, subtitled Innovate to Succeed.







Low drag energy saving

UK Cadal Craft has developed a new low drag, patent pending, hull which should cut the energy required to move it by a half compared to current models. It also has better steerage, control and stability. The first hybrid Cadal 60 has now been built and was exhibited at Crick this year. The design is optimised not just for British narrow canals, but also for tidal waters of major rivers, and will be going for type approval under RCD C In common with the old cargo carrying boats, the new hull has long swims at bow, 13ft, and stern 20 ft, to reduce pressure waves. The double chine hull gives an area of reducing beam below the cabin floorboards

Crowdfunded electric runabout

South of England electric boat company Pixii has crowdfunded the development of the inaugral P800 model, a 7.5m runabout with twin electric jet drives totalling 120kW of power and battery system with 150kW of energy storage. At a cruising speed of 20 knots Pixii estimates a range of about 30 Nm.

The area around the company base at Mudeford is quite shallow and jet propulsion was chosen over anything that would project below the hull. The hull is aluminum which has the advantage when building a prototype that it doesn't need a mold and adjustments can be made as the design is tweaked. That's good for the prototypes, but not so great for scaling which is used for ballast and for piping and tankage, saving space on-board. The reducing beam below waterline also reduces the blockage factor, which is the principal contributor to drag on a confined waterway: increasing the area for return flow reduces the return flow speed. The use of a deeper draught throughout the length of the hull, not just at the stern, with a resultant navigable draught similar to current boats, has enabled the prop diameter to be increase, and thus reduce prop rotational speed and therefore the propeller jet. The addition of an apron under the prop will reduce prop wash and tip vortex damage to the canal bottom.

up production because all the seams need to be welded by hand. Pixii found a company in Germany that has simultaneous welding machines and have been doing hulls for military and police boats. Their CNC cutting and automated welding sytem reduces the time taken from weeks to days and is also totally accurate and precise every time.



In Brief

Boater Census

The Canal & River Trust is launching the first ever Boater Census and is asking every boat licence holder to take part and help paint a picture of who boats on the charity's waterways. The Boater Census has been designed with input from boater representatives on the Trust's Council to help understand the different needs of those who live on or who use their boats for leisure on the 2,000 miles of waterways the charity looks after in England & Wales.

The anonymous data will be available to share with other organisations, such as local authorities and health service providers, to help them understand boaters' needs and ensure they are met. The Trust will be sending a unique e-link to the Boater Census to every boat licence holder who has provided an email or mobile phone number.

This will be sent out in phases during August. All answers will be anonymous and cannot be linked to individuals or boats. Boaters are encouraged to complete the census survey by 30 September 2022.

Canal Engineering

The Canal & River Trust has awarded contracts to JN Bentley and Kier to carry out large-scale construction and engineering projects over the next decade across its 2,000 miles of historic waterways, from flights of locks, to reservoirs, 250-year-old tunnels and soaring aqueducts.

The new contracts have a potential total value of approximately £500m and are the Trust's largest ever award of waterway engineering works. Playing a pivotal role in helping the charity protect and preserve the nation's canals, reservoirs and river navigations, the contracts will commence from August 2022, with an initial mobilisation phase.



Introducing the Virtual Club House. A members only place where members can chat about all things electric boating.



At Oundle Marina, where I keep my two boats, a 57' Solar Electric Narrowboat, Shine and the electric canoe, Edwin James, the nights are drawing in and the swallows have calibrated their compasses ready for their journey south. In my opinion it has been a marvellous summer. So no complaints from yours truly.

However, it has been tough on certain canals, boats are getting 'baboon bum' from scraping along the canal.

We've had two rallies so far this year, one from Harleyford Marina on the Thames and the other from the Landamore works in Wroxham. Both were well attended with a selection of boats. I like these get togethers because I find myself meeting people from all walks of life but with a common interest in electric



boating. It was lovely to attend with my wife, Sue (pictured above with me). She is 'becoming' a keen boater, in time she might even like it.

Another fun event was the Thames Traditional Boat Show. We put the word traditional in front of a title, but you could replace it with eclectic. This is a splendid event held just downstream from Henley and I'd recommend it to anybody on a sunny day. Great also to meet some familiar faces from the Electric Boat Association.



I'm at the stage of life now where I've just about realised that things take a lot longer to come to fruition than intended. We have had issues with membership renewals and have decided to change internet provider. Hopefully this will resolve the issues that we have experienced. Apologies for the inconvenience. Likewise, the online shop is taking time to fill up its shelves but please don't give up Moving forward we're very much looking forward to two more events this year, one in the Lake District, late September and hopefully one in Lechlade later in the year (we will have our AGM at this meeting). Please keep an eye out for communications regarding these meeting.

And on a final note, members of the EBA have been pushing hard, once more, to establish a better system of Electric Charging Points on the River Thames. This is long overdue, and I whole-heartedly thank members who are active in this arena for their persistence and forbearance.

Over and out. Tim Knox, EBA Secretary

Logging on to the EBA Virtual Club House

- > electricboatassociation.org
- > go to 'clubhouse' in top menu
- > type your username/password

Not in yet?

Forgotten password? Please click forgot password

Forgot Username? Please email admin@electricboatassociation.org

The Virtual Club House is a private members only area.

Clubs and Associations

As Edward Hawthorne's book (serialised on page 35) reveals boats powered by electric motors were on canals and rivers long before the internal combustion engine took over propulsion and the resurgent interest in electric boats is reflected in the clubs and associations that can be found all over the world.



The UK Electric Boat Association was formed in 1982 and is an international, not-for-profit membership organisation of individuals and businesses promoting electric boating.

The EBA looks to help boat owners with issues such as waterway access, charging points, slipway facilities, licence fees and the Boat Safety Scheme. A Charging Points Forum has been set up in the Virtual Club House to canvas members views and comments on charging infrastructure. The EBA online shop now has a full range of boating apparel



The Electric Boat Association of Greece is a non profit organisation founded in 2016 to promote the development of Electric Boating and to serve the needs of all who have an interest in electric boating. The Association has a regular news blog and a latest report features the award of contracts to Green City to provide the zero-emission propulsion system for the Beluga24 a multi purpose high-speed passenger catamaran ferry with two zeroemission options - battery electric for shortjourneys and hydrogen fuel cell for long journeys.



The Electric Boat Association of Canada is a not for profit Canadian corporation and was formed by a group of boating enthusiasts concerned about the use of fossil fuels for transportation and excited about the possibilities of boats and ships powered by electricity. Their website has a Canada e-boat news feed from Plugboats.com and a latest post features AquaSuperPower's network of electric boat fast chargers: latest expansion to Canada, Italy and Spain coming on the heels of installations with the UK's largest marina operator.





The Frisian Electric & Hybrid Boating Association (SEFF) was founded to promote electric and hybrid boating in the Netherlands Frisian province.

In latest news SEFFF supported a dinghy race during Sneekweek in August. The race was held from the theatre to the Schaapmarktplein for everything that could be inflated to float. More than 100 dinghies and boats which could only be propelled by hand took part and for support and safety, SEEF provided two electrically powered sloops The Electric Boat Association of America was formed in 1992 with the objective of being inter alia: an educational arm and information source for electric powered boating issues, and a representative of electric boaters in matters of environmental protections and regulations; a planning and organizing agency for meetings, exhibitions and competitions. It will be holding the Twenty-second Annual Wye Island Challenge a 24 Mile Electric Boat Marathon on September 30, 2022



The French Electric Boat Association was created in 1994 in Bordeaux by partners from different professional backgrounds - academics, researchers, engineers and industrialists - to develop the image and market of the electric boat in France as well as abroad. Their news section reports that the E-Marine 2022 organised by AquaSuper Power will take place in September in the Gulf of Saint-Tropez and will start from Cogolin, where Aqua SuperPower recently deployed a fast charging station.



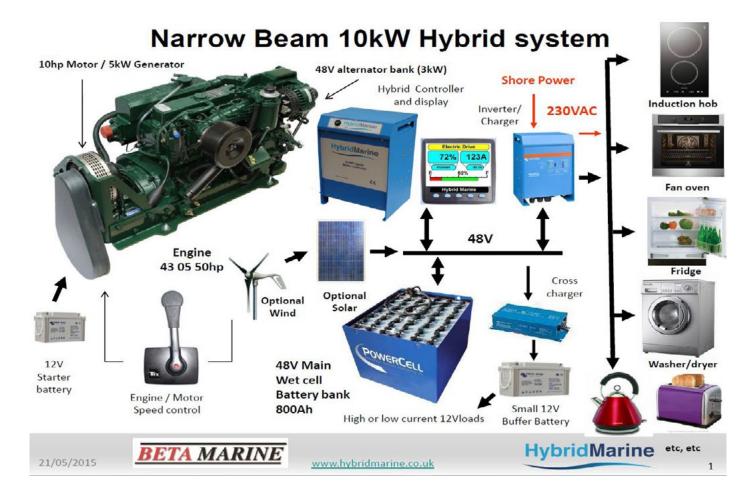
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Cruise Guide Castlefield to Cotton Field

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Cruise Guide

Our summer cruise is barely two miles along the Rochdale Canal but as it climbs out of central Manchester there are 11 locks in this short distance from Castlefield basin to Cotton Field wharf. The canal itself is only 32 miles long but

it has 92 locks as it heads up the Pennines. Construction of the Canal started in 1794 after the passing of the Rochdale Canal Bill. It was designed to link the Bridgewater Canal in Castlefield, Manchester, with the Calder and Hebble Navigation at Sowerby Bridge in West Yorkshire. By 1890 2,000 barges were using the canal carrying 700,000 tons a year. However, competition with the railways saw a sharp decline in trade. The navigation was officially closed by an Act in 1952 and only the section through Manchester's city centre was still operating but by the 1960s much of that remaining section was unusable. A restoration movement in the 1990s saw the canal reopened between Sowerby Bridge and Castlefield.



Castlefield to Cotton Field

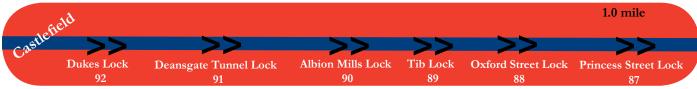
Our cruise starts at lock 92 the Castlefield terminus of the Rochdale canal. When the Rochdale Canal was built it terminated at a basin at Dale Street, Piccadilly, because the Duke of Bridgewater would not agree to the Rochdale linking into the Bridgewater Canal. However when proposals were made to extend the Manchester Bolton and Bury Canal past Rochdale to Sladen and on to Sowerby Bridge, he realised that trans-Pennine traffic would by-pass his canal with a great loss of potential revenue. He changed his mind and allowed the Rochdale Canal Company to construct the link, which consisted of nine locks over a mile and a half. He did, however, insist that his own workers constructed

the final lock linking into his canal at Castlefield, and that he maintained control of this lock, which is still known as the Duke's Lock. When it was first constructed, this section of the canal between Locks 91and 92 ran in a shallow tunnel beneath the Duke of Bridgewater's field at Castlefield. Most of this was later opened out except for a short section below Deansgate. Approaching lock 91 at Deansgate tunnel we pass a disused canal arm opposite the sign advertising the Rochdale Canal art trail. This canal arm is the remains of a tunnel constructed by Brindley that ran from below the Grocers' Warehouse in Castlefield. The water level of this tunnel would have been about 8 feet

Manchester Sorting &

Cruise Location















below the present level. The tunnel link to Castlefield was sealed off when the Rochdale Canal was constructed. After travelling alongside the shops and bars in the railway arches at Deansgate Lock and through locks 90 and 89, just before the Oxford Road tunnel and lock we pass the only art trail exhibit on our short cruise. Moving through Princess Street Lock and Chorlton Street Lock we reach a more modern tunnel created at Piccadilly where an office building was constructed over the canal, which travels between the concrete foundation pillars. Piccadilly Lock is completely underground, with the office buildings above. The towpath on this section of the canal is gated at night between 10pm and 7am We now arrive at Dale Street Lock 84 which was the first of the 'Rochdale Nine' locks linking the Ashton and Bridgewater Canals through the centre

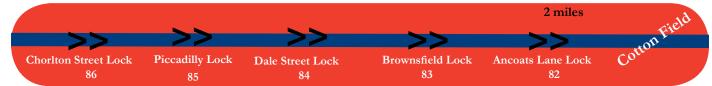


of Manchester. The lock leads into Piccadilly Basin which was the original terminus of the Rochdale Canal before the link to to Castlefield. The Rochdale Canal Company's Dale Street Warehouse is the only stone-built canal warehouse in Manchester. It has four boat arches which allowed boats to unload inside. The canal arm that led to the warehouse is now infilled and used as a car park.

We now pass a row of the only surviving early Manchester cotton mills as we contnue through Ancoats and lock 83 before reaching lock 82 which takes us into Cotton Field Wharf and the end of our cruise







Info

Launching

Craneage and slipway facilities on the UK canals are few and far betweeen. Hesford Marine, Warrington Lane, Lymm, WA13 0SW, has

craneage and slipway facilities on the Bridgewater Canal. Tel: 01925 754639

Licences

Short term licences can be obtained from the Canal and River Trust Boat Licensing Team. There is a 25% discount for electric propulsion. T: 0303 040 4040 Mon to Fri, 8am to 6pm. Email: customer.services@ canalrivertrust.org.uk *mmm.canalrivertrust.org.uk/licensing*

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Canal Terrace Lunchtime and evening meals

Tourist Information

www.visitmanchester.com









Cotton Field Wharf

Cotton Field Wharf is part of the New Islington urban regeneration project that started in 2002 with the main developers Urban Splash. The streets of Ancoats were laid out during the latter part of the 18th Century, with little development taking place other than small houses and shops along Great Ancoats Street and Oldham Road. James Brindley was comissioned to carry out a survey for the Rochdale Canal in 1776 and the knowledge that its construction would make the transport of raw materials and finished goods more convenient, gave industrialists the confidence to build their cotton mills. The first mills were built in Ancoats as early as 1790. From the opening of the Rochdale Canal in 1804 through to 1912, the development of mills continued on a much larger scale. The substantial economic activity generated by such a concentration of mills was halted by the slump in the cotton industry in the 1930's and the prosperity of the mills declined steadily. In 1989 the area bounded by Great Ancoats Street, Oldham Road, Kemp Street, Wadeford Close, Jersey Street and the Rochdale Canal was designated as a conservation area.



Cask

Situated by the canal in New Islington Cask opened in 2018. There are six cask ales and one real cider served by handpump and 20 keg lines. Voted branch Pub of the Year in 2021 by the CAMRA local branch.



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EBi International



Electrification progress

Venice

Kevin Desmond

Electric Boat Association President, reports on the Venice E-Regatta which he helped set up.

Kevin is the founder editor of the EBA magazine and has now published his latest book. Electric Boats and Ships'

The Third Salone Nautice held in Venice this June 2022, has enabled "Electrify Venice" to check out progress on the electrification of its fleet. Progress with the two main waterbus fleets is slow, steady and hybrid.

Alongside the twelve Alilaguna yellow and white hybrids, ACTV voyages in the same hybrid direction, while Veritas are testing six green and white workboats before transitioning the remaining 70-strong fleet. The Police's satisfaction with their first two boats has led to a further twelve currently under construction. Only three airport taxis are hybrid, while the remainder of this sizeable fleet still wait for a nine-hour 50kmh performance offer to equal their existing diesel unit. This is the same for the water-truck companies such as Bossa A Boat . E-Dock's linking to Aqua SuperPoser promises an increase in discreet rapid recharge points around the canals in the coming years.

During the parade of the 28 e-boats, part of the 41 on show, while cruising through the Grand Canal, the Swedish E-Shore boat patriotically broadcast music by Abba !, while once out in the bay, several boats accelerated through the waves, unofficially launching the sport of e-offshore. The cherry on the cake, the E-Regatta, in only its second year, saw nine boats, with both female and male crews steering through the buoys while their e-ballerina proved far more choreographic and fun. The four yellow Huracan outboard skiffs racing around the seaplane base took the century-old-sport of outboard circuit racing into the future, with a local teenage girl, Michela Tozzo the winner. This GT-Electra fleet, personally and courageously sponsored by Italian powerboat champion Giampaolo Montavoci of the Italian Powerboat Federation, has already been invited to race in Serbia. During the Conference, the Venice Region in the north of Italy and Puglia in the southern heel announced a collaboration in the hydrogenisation and electrification of their ports, based on the Amsterdam and Oslo models. For "Venice Agenda 2028", six years are left to make the conversion of all motorised vessels in the Serenissima, recently declared by the Mayor Luigi Brugnaro as 'The World Centre of Sustainability.

General Motors pontoon

USA

General Motors has taken a 25 percent ownership stake in US based Pure Watercraft which included both an investment and a technical partnership combining Pure Electric's electric boat technology and GM's battery expertise. Pure Watercraft's 7.5m pontoon boat will have capacity for up to ten people, and is powered by single or twin Pure Outboard motors and a a GM-built car-spec battery back that can be up to 66kWh in capacity. The pontoon is offered with either a single or twin electric outboard driving a 16in propellor. Each motor offers the equivalent to 50hp, resulting in a top speed of 15mph for the single motor and 23mph for the dual resulting in a range of 36 miles for the single outboard pontoon, and 32 miles for the dual.



EBi International



Space X speed boat

The first delivery of the *Arc One* an electric wakesport boat with a 500hp (\approx 370kW) electric motor and 220kWh battery capacity developed by former SpaceX engineers is expected in late summer 2022. The boat completed tests in March 2022 and according to Arc Boats it's now the most powerful electric watercraft commercially available with a top speed of 40mph. The 24ft boat can carry upt to 12 people and has a runtime of 3-5 hours

The *Arc One* has a bigger motor and battery bank than originally planned, with the battery capacity of 220kWh 10% larger which is about three times the capacity of a Tesla ModelY. Arc Boats designs and builds its boats in-house, including its battery packs, powertrain systems, thermal control systems, and software

Torqeedo autonomous

Germany

USA



Torqeedo has been awarded a contract to supply a complete electric drive train for a groundbreaking autonomous boat in the German city of Kiel. The electric vessel, *Wavelah*, will serve as a research platform for the Clean Autonomous Public Transport Network (CAPTN) initiative in Kiel. The program aims to create thei infrastructure for an integrated inner-city mobility network based on multiple modes of transport on water and land. *Wavelah* will be built by the Gebrüder Friedrich shipyard in Kiel and is scheduled to be delivered by the end of 2022. Torqeedo was selected to provide the fully integrated electric propulsion system. The package includes dual 50 kW Deep Blue steerable thrusters and six Deep Blue lithium-ion batteries with a total capacity of 240 kWh. Four Power 24-3500 batteries supply the 24V onboard grid. The system is completed by a 22kW fast charger, DC/DC converter and DC/AC converter.

Drone delivery

Menorca

The yachting industry is using drones to deliver food without the need to send crew ashore. Drone to Yacht has expanded its drone delivery service to Menorca in collaboration with the Miramar Restaurant in Cala Blanca. The drone has a range of around two kilometres from land. Customers on boats can make their selections, place orders with the restaurant through an app or the Drone to Yacht website, and then wait for their meals to fly in. The delivery drone has a winch system with a camera and hook that descends 20 meters. Orders are placed in a cloth



bag with a maximum of four kilos for food and drink.

The Miramar allowed Drone to Yacht to establish a base on their property which allows the drone to reach the cove or vessel anchoring areas in about 60 to 90 seconds at 60 kmph. The drone pilot clears the area, warning people of the passage, so it can leave through the area of the channel for boats. Then it flies a programmed path until it reaches the boat, where the drone pilot takes control of the winch and lowers the bag to the customer. The camera then sends the video to one of the monitors at the base to show when the order is received before the drone returns. Originally launched in November 2021 in Ibiza, the system was devised by Galician company Aerocámaras. The technology is not currently authorised in cities, which is why the company is looking expand further around the Spanish coast, before moving out to charter hotspots in Italy and the Caribbean.

Electric Boats interactive Summer 2022 23

Solar Boats and Boating

Anne Cleary and Denis Connolly of the School of Looking went on a four month voyage from Limerick to Enniskillen in *Mayfly* their solar powered boat raising awareness of climate change and biodiversity at each tour location.



Solar Eco Showboat tour







Mayfly weighs about 900 kg, and is 20 foot long by 6 1/2 foot wide. She was originally a Prelude sailing boat, and was partially converted to an electric cruiser before Anne and Denis completed the transformation with a Torquedo Cruise 2.0 FP drive, 4 Victron 12V 100Ah AGM Super Cycle batteries, Victron MPPT solar charge controller and 6 flexible 175 watt Renogy solar panels installed on the biminis. They usually travel at about 6-7 Km/hour, consuming between 800 and 1000 watts. and Mayfly charges as they go along. On a good bright day they can be taking in around 600/700watts an hour from solar and on a dull day maybe 300 watts. Even in very rainy dark conditions they usually get a 150 watts in the daytime. Most days they cover between 20 and 30 km a day. The wind turbine rarely produces any meaningful power but in concept adds to the overall theme of the tour . They carry a Goal Zero Yeti 3Kw portable power station, used for boiling the kettle, computers, phones etc. which can also be solar charged but can shore charge if required. They have a projector and PA system for the Eco Sunday events and the Yeti provides all the power needed for the presentations









Solar Boats and Boating



Solar river canoe

A solar powered canoe travels back and forth along the 67km stretch of the Capahuari and Pastaza rivers in the Amazon basin providing a transport system connecting the nine isolated settlements that live along their banks. The *Tapiatpia* is named after a mythical electric eel in the area and the solar canoe is an ideal solution to the networkof interconnected navigable rivers. The communities previously relied entirely on gasoline canoes, known as pequepeques, but they are expensive to run and only owned by a few families per village.

The *Tapiatpia* costs passengers just \$1 each per stop, whereas pequepeques cost \$5-10 in gasoline for the same journey. Gasoline costs five times more here than

in the capital Quito because there are no roads and it needs to be flown in. With a roof of 32 solar panels mounted on a traditional canoe design of 16 x 2-metre fibreglass, *Tapiaptia* carries 18 passengers.



Coastguard Solar rescue





The crew the Swiss solar ship MS Porrima, previously named the *PlanetSolar* and then the RaceforWater, had to be rescued off the coast Mandwa, India after a fire broke out in the battery compartment. The Indian Coast Guard (ICG) battled strong winds and rough seas after a Mayday request was received. Their fast response vessel struggled through the bad weather and reported heavy flooding along with the fire. The ICG then launched a helicopter to rescue all five crew. MS Porrima was on its passage from the UAE, and had arrived off Mandwa, Mumbai, for shelter to undertake repairs before continuing its further passage to the Maldives. The boat had some technical issues near Mandwa and the crew had tried to anchor but the anchor had not held in the bad weather.

Solar Tech Solar concentrator

Solar panels work best when sunlight hits them directly. To capture as much energy as possible, many solar arrays actively rotate towards the sun as it moves across the sky. This makes them more efficient, but also more expensive and complicated to build and maintain compared with a stationary system.

Stanford University, engineering researcher Nina Vaidya has designed a device that can efficiently gather and concentrate light that falls on it, regardless of the angle and frequency of that light. It's a completely passive system and doesn't need energy to track the source or have any movingparts.

The device, which the researchers are calling AGILE (Axially Graded Index Lens) looks like an upside-down pyramid with the point removed. Light enters the square, tile layered, top from any number of angles and is funneled down to create a brighter spot at the output. In their prototypes, the researchers were able to capture over 90% of the light that hit the surface and create spots at the output that were three times brighter than the incoming light. Installed on top of solar cells, they could make solar arrays more efficient and capture not only direct sunlight, but also diffuse light that has been scattered by the Earth's atmosphere, weather, and seasons.

Solar power at night

Researchers at the School of Photovoltaic and Renewable Energy Engineering at UNSW Sydney have successfully tested a device capable of converting infrared heat into electrical power. The team used a powergeneration device called a 'thermoradiative diode', which is similar to the technology in night-vision goggles. The amount of energy produced by the test is very small and new materials will need to be found to progess the research, but the proof of concept is regarded as significant.

Boat Shows







The UK's biggest inland waterways festival, The Crick Boat Show, held on the Jubilee Bank Holiday weekend at the beginning of June, had over 200 exhibitors and 23,000 people attending, including visitors from Australia, New Zealand, Canada and the USA as well as a number of European countries. EBA business members Finesse Boats and Mothership Marine were exhibitors at the show. Finess was showcasing *Time of Life* its new fully electric wide beam featuring a 30kw motor, 50kwh lithium battery, fold down rear deck, air conditioning with climate control, and ultra modern two-tone kitchen with a full range of electric appliances. *Time of Life* was voted the show's Favourite Widebeam. Mothership Marine had its 57ft solar electric semi cruiser *Falcon* on display with 2kW integrated solar, double glazed ports and door, 15kW electric motor, bow thruster, 28kW/h battery bank and 5kW generator.

Cannes Yachting Festival







Silent-Yachts is at this year's Cannes Yachting Festival held in Cannes' Vieux Port one of the oldest harbours on the French Riviera. The company is debuting both the Silent Tender and a kite wing for the Silent 60. The Silent Tender is 4m in length and built of carbon fibre. It can be lifted out of the water, stored on the hydraulic stern platform of the Silent 60, and recharged with solar energy produced by the yacht. There two different electric drive trains available: an electric jet drive or a conventional 30kW electric outboard. Both systems offer a claimed top speed of above 20 knots. The new Silent Tender is the first in a range and a larger tender is already being planned.

According to Silent Yachts the light, compact kitewing generates up to 10 times more power per square metre than a conventional sail. It is launched from a fold-away mast structure on the foredeck, and offers additional propulsion, being able to pull the 30-ton yacht at a claimed speed of 4-5k knots.

Boat Shows



Green Tech Boat Show

The Green Tech Show designed to shine a spotlight on the marine industry's green products and technologies returned to MDL's Queen Anne's Battery, Plymouth, for the second time, in June of this year. Pixii boats exhibited their allelectric 7.5 metre Pixii SP800 with an estimated top speed of 40 knots and a towing eye for waterskiing or wakeboarding. RS Electric Boats had its fully electric RIB, the Pulse, on display. Built using sustainable materials wherever possible, the ecofriendly Pulse 63's interior deck, floor, console, engine box and hatchesare





all made from recycled carbon fibre, with a recycled PET core. The Pulse has a 40kW electric drive with a bank of lithium-ion batteries that provide a range of 100 nautical miles at 5 knots The show also featured the the Classic 7 cruiser from JR Yachts and Silent Yachting that can be configured with either a 4kW or 8kW motor offering top speeds of between 6- 10 knots. Vetus had a major exhibit featuring their increasing e-drive propulsion options.

After last year's attendance at the Green Tech Boat Show Aqua superPower installed electric boat chargers at five of MDL's marinas. This year Aqua showcased its dockside charging infrastructure created at Plymouth Sound through the MeLL project which is funded by the Department for Transport and delivered in partnership with InnovateUK.

Aqua is the technology partner for the project, which is led by fellow Green Tech Boat Show exhibitor, the University of Plymouth in partnership with Plymouth City Council. Plymouth is set to install a network of AquaSuperPower's fast chargers, delivering between 25kw o 150kw of power, for its expanding fleet of electric maritime vessels, including the UK's first marine electric passenger ferry and an electric water taxi.

Thames Trad Boat Show

Tim Knox the EBA Secretary spent an enjoyable few hours wandering around the Thames Trad Boat Show on a Sunday afternoon in July, meeting up with some of the EBA members and seeeing their fabulous traditional boats. He visited the electric boat section taking photos and seeing Jenny Landamore who was exhibiting the Mayfly 16 and the Mayfly 21. He was also pleased to see Bray Marine offering a dayboat with an electric e-propulsion outboard.





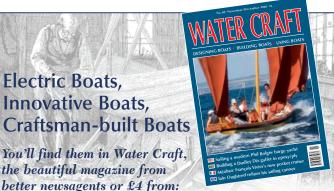
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Electric narrowboating: domestic use

As previously I should emphasise that these are my personal views on the present state of the technologies relevant to the design of an electric narrowboat, based on my involvement in the design and construction of all-electric narrowboat Ampère over the period 2011-15 and its subsequent use, now totalling about 4,500 miles of cruising.

When designing the domestic installation you want to achieve the best overall efficiency while keeping the maximum instantaneous load within the limits of your supply. Sometimes, as with induction hobs, overall efficiency comes at the expense of high instantaneous loads. Fortunately, it is easy to calculate the maximum instantaneous load. Simply list all the mains voltage appliances you will use onboard and add up their power ratings (in kW), making an allowance for the fact that everything will never be on together (there are published guidelines). Compare the

Malcolm and Barbara Bridge were already experienced narrowboaters when they took delivery of their all electric boat at the Crick Boat Show in 2015 where Ampere was voted one of the show's favourite boats on display. Since then Ampere has travelled extensively and in the final part of a series on electric narrowboating Malcolm gives his personal assessment of the relevant technologies.

total to what your inverter can provide. If it is greater go back and work out how to reduce the load. Consider a combi-microwave instead of separate units. The inbuilt restrictions will limit the maximum power you can use with minimal loss of functionality. A mains vacuum cleaner is a high power user; a rechargeable one takes only a minimal charging current. Low wattage kettles, hair dryers and immersion heaters are readily available. They take longer to work but keep the instantaneous load down. Using DC appliances will also reduce the inverter load but many cost more than their mains equivalents and aren't as efficient. Look also at putting a couple of high power appliances onto a non-maintained circuit (only live when the generator is running or the boat has a mains connection). As to overall power usage you need

to estimate how much power each item will actually draw each day. For example, if a 2.2 kW kettle takes 3 minutes to boil and is used 8 times per day it will use $2.2 \ge 3/60 \le 8 =$ 0.88 kWh per day. It's harder to assess thermostatically-controlled appliances such as ovens and hotplates because you simply have to guess at the proportion of time they will actually draw power, 25% probably being a good starting point.

When you have finished, if you aren't an electrical engineer, find one and go and talk to them. Then, if necessary, go through the process again.

Finally, join the Electric Boat Association (www.eboat.org.uk). It's only a small organisation but it's the best there is at the moment, affords useful contacts, and will get more useful as its membership increases.

Fuel Cells



Torqeedo fuel cell

Torgeedo has announced a collaboration with Proton Motor to integrate hydrogen fuel cell charging into Torqeedo's electric boat propulsion systems. The two Bavarian based companies will work together on a marine hydrogen hybrid building kit that integrates Torqeedo's existing Deep Blue battery-electric drive systems with Proton Motor's advancedfuel cell technology. The project has received funding from the Bavarian federal government for 2021 through 2024. The system will be designed to provide propulsion power ranges from 50 to 200 kW and fuel cell power of 30 to 120 kW and will have flexible options for hydrogen storage. A prototype system will be tested and validated at Torqeedo's engineering centre near Munich. The companies expect to undertake collaborative marketing and industrialization of the system following the successful conclusion of the development project. Proton Motor has been devloping and manufacturing emission-free hydrogen fuel cells for 25 years with a focus on stationary applications such as emergency power for critical infrastructures, and mobile solutions such as back-to-base applications. In addition, the company offers customised or standard CO2-neutral hybrid systems for the automotive, maritime and rail sectors, as well as battery-electric uninterruptible power supplies.

Chase Zero is a prototype hydrogenpowered foiling chase boat being tested by Emirates Team NewZealand and the first boat to be launched in the next cycle of the Americas Cup competition. The New Zealand team is a pioneer of cutting edge technology and sees the boat as a shift towards a cleaner more sustainable future for powerboating *Chase Zero* has been tested for a total 36 hours of motoring, covering over 1,042km on the water, with the only emissions of its operations being pure water. The top speed to date has been clocked at 50.3 knots which met the design expectations. The team calculate that the range on four full 8.4kg tanks of hydrogen gas is 330km at a cruising speed of 28-30kn.



using its first purpose-built hydrofoil sailboat in sea trials. The trials took place off the coast of Essex and made approximately six litres of green hydrogen over a two-hour test run. The yacht out-performed expectations and could have made over ten times more hydrogen which is produced by a turbine



Hydrogen Cartridge Toyota and its

subsidiary Woven Planet have developed a working prototype of a portable hydrogen cartridge serving as a lightweight store of energy. The high-pressure hydrogen round canister is 400mm long and 180 mm in diameter and weighs around 5 kg making them easily manipulated and carried by a single person. The capacity works out to around 660 Wh/kg which while it's not a lot of power, is better than lithium-ion batteries, which are around 260 Wh/kg.



underneath the catamaran driving a generator charging

Batteries



Battery investment

Panasonic has announced that it will invest \$700 million to expand its battery factory in Wakayama prefecture, Japan, bringing in new manufacturing equipment the 4680 battery cells developed by Tesla. When completed, the factory will be capable of producing about 10 gigawatt-hours per year of the new batteries, enough to power about 150,000 electric vehicles, which is about 20% of Panasonics total battery manufacturing capacity from its facilities in Japan, the US, and other countries. The 4680 battery costs 10% to 20% less to manufacture and has around 15% higher energy density than the lithium-ion batteries that Tesla has been using to date. The extra energy density means a Tesla Model S would have a range of 750 kilometers, versus 650 kilometers today. Panasonic says the first batteries should be produced early next year. Panasonic was Tesla's main partner for a long time, but CATL and LG Energy Solutions have also started supplying batteries to Tesla, reducing Panasonic's market share but the Japanese company expects to win back some of its business with Tesla by being the primary supplier of 4680 battery cells

Aqua expands fast charging

AquaSuperPower is expanding its charging infrastructure with its first installation along the shores of Lago Maggiore at Marinadi Verbella in the Ticino Natural Park in northern Italy. Lago Maggiore, also known as Lake Verbano, is an Alpine lake that straddles the border of Italy and the Swiss canton of Ticino. It is the second-largest lake in Italy and the largest in southern Switzerland. Marinadi Verbella is the largest marina in the Italian lakes committed to leading on sustainability and helping to protect the lake's shores, environment and cultural heritage. Lago Maggiore is AquaSuperPower's



first major European inland lake installation. The electric boat fast chargers have AC and DC 25kW-150kW power and can be used for everything from recreational electric and hybrid boats to electric jet-skis, super yacht tenders, commercial vessels and passenger ferries. Aqua will own, operate, and maintain the network with their own cloudbased system and users have an app with maps of charger options and navigational aids to charger locations.

Battery Tech High performance Low cost

Alsym Energy has announced that it is partnering with a leading Indian automaker to develop Alsym's battery technology which promises to provide the performance of lithium-ion batteries at a fraction of the cost and without the inherent risk of fire. Alysm's batteries are also less sensitive to raw material shortages and price volatility due to their use of low-cost materials with robust supply chains. To accelerate the development of these battery systems Alsym is looking to supply a minimum of 3 gigawatt hours per year of battery systems to the automaker and is also in talks with companies in the marine shipping and electric two-wheeler markets to develop similar partnerships.

High Power Liquid cooled

Batteries for electric vehicles are often 400 to 800V and the new Sealence battery is 400V, with a maximum power output of 250kW and an energy storage capacity of 83kWh - comparable to a Tesla Model 3, Polestar 2 or BMW i4 eDrive40. Unlike those EV packs, which have a low height to fit in the chassis of four-wheeled vehicles, the electric boat battery has more carton-like dimensions: 982mm x931mm x 633mm. Safety is paramount for all batteries especially at sea. Selence's new electric boat battery incorporates eDriveLAB's cooling system with the lithium cells immersed in a liquid solution that envelopes them completely. This maintains optimum temperature for the individual cells and means that if one were to be damaged and catch fire, it would not spread to the adjacent cells. The battery management system uses intelligent proprietary algorithms to oordinate multi-battery systems and ensure easy modularity and excellent redundancy ie. duplication of critical components or functions of a system to ensure reliability. The battery has received certification from worldwide registrar DNV GL as well as RINA (Registro Italiano Navale).

Motors



Deep Blue in Berlin

Oranje Nassau, a 20m, 55-passenger sightseeing boat and water taxi operating on Berlin's urban waterways has replaced its diesel engine with a fully integrated all electric propulsion system by Torqeedo and is now powered by a Torqeedo Deep Blue 50i electric drive and three DeepBlue batteries with 120 kWh capacity. The Deep Blue 50i is rated at continuous power of 55kW and peak power of 66kW using 360V.

The system enables the Oranje Nassau



Rim Drive Technology



to operate for a full 8 hours and recharge overnight at the dock with a shore power connection. The German capital has eleven

navigable waterways totaling 200 km in length, including the Spree and Havel rivers and the famous Landwehr Canal.

Like many other global cities, Berlin has invested heavily in electromobility in recent years. Until now, however, the boat traffic on the Spree River, the city's oldest traffic route, has lagged behind other transportation modes in going electric.

André Siebach, managing director of Berliner Wassertaxi, is already making plans to convert the other two tour boats in his fleet with the same Torqeedo propulsion system.

Rim Drive Technology is the only company to offer rim-driven electric outboard motors and is developing a 15 kW (\approx 25 HP) model to expand its current product line of seven motor sizes with power outputs ranging from 0.5kw to 30 kw. Each of them is available in six configurations, including a fixed pod-style electric engine that can be mounted under the hull and a steerable bearing pod that rotates 200°. A rim drive has no center hub or drive shaft, but instead the propeller blades are attached to the round outer rim. The system reduces turbulence and increases thrust as well as avoiding prop wrap.

ePropulsion

ePropulsion, the Chinese marine electric propulsion systems and services company, has announced record sales revenue growth in 2021 and forecasts a strong outlook for 2022. Sales revenue increased 200% year-over-year in 2021, with more than 15,000 units sold across the globe. The company estimates a further 100% growth rate in 2022 as more boat owners look to switch to more sustainable boating and convert to electric propulsion systems as commercial use and OEM applications grow. Europe and North America continue to be the two largest growing markets for ePropulsion moving into 2022, with the United

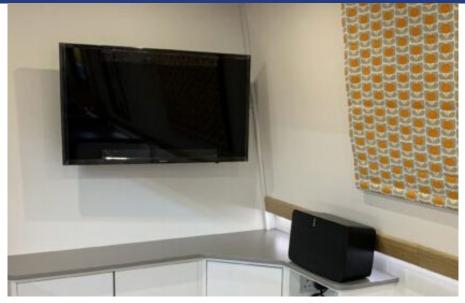


Kingdom, United States and Germany the leading countries, and the leisuremarine sector accounting for the majority of sales.

The Solbian ePropusion dinghy features the ePropulsion Spirit 1.0 Plus outboard motor and has custom-made seat featuring a 39Wp Solbianflex SP panel. The seat also has a waterproof box housing a custommade MPPT charge controller which charges the EPropulsion Spirit1.0 Plus' 52V Lithium-Ion battery even while the motor is in operation. The panel is connected using the original waterproof EPropulsion connector, and the technical details have been approved by the manufacturer. Not only is the motor lightweight and practically silent, in combination with the solar seat it also recharges itself while at anchor.

Mobile Internet





We always planned to stay connected to the internet on board Old Nick and we are very pleased with our setup. It's so good that we can stream TV to our heart's content and are consuming, on average, 150GB of data per month - thank goodness for unlimited data plans! The challenge of staying connected whilst also visiting often very rural parts of the canal network is mobile signal strength. It goes without saying that the weaker the signal, the slower your connection and no signal equals no TV. Disaster! The secret to giving yourself the best possible chance of dragging in weak mobile signals is a good, high gain antenna. This, above all else, is the key and the two antennas that Ortomarine fitted to Old Nick have proved excellent, so far - Dual 4G (LTE) Antennas on either side of hatch. There is no point having a good antenna, though, if it is inside what is effectively a Faraday Cage, of which a narrowboat is a near perfect example. Conversely, there is no point in having an external antenna if it's going to corrode and break within a season or two, or be knocked off by a lowhanging branch.

Our antennas have a gain of 4.7dBi – which is to say they amplify the signals by a factor of 3, plus they are rated to IP69, so can be jetwashed or submerged with no ill effect and they are impact rated to IK09, able to

Paul Sumpner from narrowboat Old Nick takes a look at emobile internet for the inland waterways

withstand a 5KG object dropped from 200mm. We have no plans to test any of these claims!

As you can see from the picture the two antennas sit either side of the hatch – not taking up any precious solar panel space – and are connected to one of Digital Yachts latest 4G Xtream products.

Although these units are sold to the commercial shipping market, as I helped design and develop them, one found its way onto *Old Nick*! We have fitted two SIM cards; one for Vodafone and one for EE, which gives us "two bites of the cherry" in terms of finding the best coverage and speed. So far, "touch wood", we have yet to be without a 4G internet connection, even in areas where other boats normally struggle. Inside *Old Nick*, most devices are connected via Wi-Fi to the 4G Xtream router, which



supports both a 2.4GHz and 5GHz wireless network. Modern phones and tablets will be able to connect to the 5GHz network, which provides the fastest data speeds, whilst older legacy devices will only work on the 2.4GHz network, which will be slower but should have slightly longer range around the boat. For speed critical connections, like the smart TV for streaming video, Ortomarine installed wired Ethernet sockets at key locations around he boat. Even with a fast 5GHz wireless network, you will be amazed at how much faster the wired connection will be, and we typically see 1.5x to 2x speed improvements on the wired connections.

Having a good internet connection on a narrowboat is a challenge and even with the best possible setup, there will be times when the connection will be excruciatingly slow or completely nonexistent. We are lucky that I design and develop these systems and we are not suggesting that everyone rushes out and buys a Digital Yacht system (although that would be nice!) but hopefully this article will give you some pointers as to how to give yourself the best possible chance of staying connected.

For anyone, who is interested in fitting a similar setup, we would recommend that you contact Ortomarine who have a range of antenna and mobile router solutions for narrowboats.

Books



The Plugboats Primer an e-Book about e-Boats

The basics you need to know to get started with electric boats and boating

V1.0 August 1, 2022

By Jeff Butler Editor/Publisher Plugboats.com

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Jeff Butler, the Editor/Publisher of Plugboats, the international journal of electric boats and boating has written an e-book 'The Plugboats Primer' in response to the hundreds of questions he gets on the Plugboats website from people wanting to know more about electric boats – but without lot of technical jargon. Jeff spent many years writing award winning advertising copy for hundreds of clients and is very experienced in presenting technical details in an accessible way to the reader.

In the Primer there is both basic and in depth information on everything you need to know to 'go electric' and with the very latest information about electric boats and boating. It is comprehensive without being loaded with jargon, and includes easily understood explanations and illustrations of electric motors, batteries, and the concepts behind analyzing range and power.

It starts with 5 reasons you might want an electric boat and 5 questions you might ask about electric boats and ends with the interactive Plugboats Cost Calculator spreadsheet that can be used to compare the operating costs of an electric boat motor with a fossil fuel motor of comparable size.

In between there are 80 plus pages of information to help you understand electric propulsion and how it is the wave of the future.

Jett has aimed to make the Plugboats Primer comprehensive, finding the right balance so that it is informative and valuable for as many people as possible – those who know very little (or nothing) about electric boats and those who know a lot...and everybody in between.

The introductory price is \$5 US. That includes free updates, so as the world and technologies of electric boating change so will the Primer, and purchasers will be notified when the next edition is available for free download - and there will be lots of updates as new products like improved battereis, hydrogen fuel cells, charging stations and more come on the market.

There is no advertising in the Plugboats Primer and Jeff has spent many hours proofing and researching to get everything as correct as he can.

Version 1.0 which will be revised as soon as any comments are received and corrections addressed.

History and Heritage

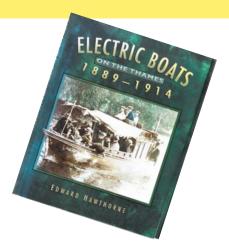
Edward Hawthorne was a mechanical engineer by training and a past chairman of the Electric Boat Association User's Group. His superb and fascinating book is no longer in print and his family have kindly permitted EBi to serialise extracts

Thames Valley Launch Company

William Rowland Edwards set up the Thames Valley Launch Company (TVL) at Riverside Works, Weybridge in 1895. He had previously been the manager of the General Electric Power and Traction Co's launch department and when it was turned into a separate company, the Immisch Electric Launch Company, Edwards decided to set up his own company. In 1896 Lawrence Carr joined Edwards to set up and run the Thames Valley Launch Co depot at Maidenhead on Boulter's Lock Island and during the next three years the hire business was expanded to include nearly forty electric launches ranging in size from 18 to 45ft in length. The boat building side of the business also prospered including delivering six launches in the winter of 1896 and a small boat for the Chester Boat Co to run on the River Dee. In 1899 TVL delivered two boats to Colombo in Sri Lanka, each licensed to carry fifty passengers. The boats had a 4hp motor fitted in the stern and the batteries were located under the seats which ran all around the boat. The battery capacity was sufficient for the boat to run for sixteen hours.

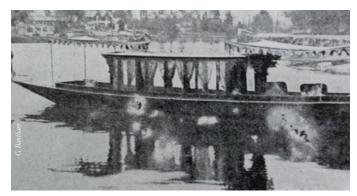
In 1899 Edwards also took over the Upper Thames Electric Launch Co at Henley which gave him another works

to compliment the three existing depots at Maidenhead, Pangbourne and Shillingford Bridge. At all of these places launches could be hired, boats repaired and private craft moored and housed over winter. By 1900 TVL had charging stations at Hurley and, by arrangement with the Oxford Electric Lighting Co, at Oxford. Two new stations were set up at Windsor and Reading in 1902. There were a number of other charging stations owned by other businesses such as Immisch so it was possible to finding a charging station roughly every ten miles between Kingston and Oxford. TVL's borochure gave a unique picture of the range of boats that were being built. At that time there were 29 electric launches in the hire fleet. Of the saloon launches three were of 45ft length, two of which seated 25 passengers and one 35 passengers, eight launches of 30 to 40ft seating 12 passengers. The rest of the electric launches were open boats fitted with awnings, varying in length from 22 to 36ft and carrying from 6 to 12 passengers. The TVL launches were built to a high standard in teak or mahogany carvel construction with a counter stern. The early launches were fitted with the Beevor-Edwards control switch which was designed

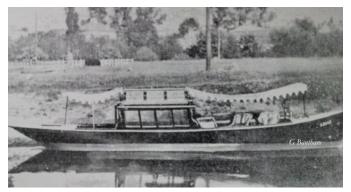


to give only half and full speed by switching the batteries in parallel or series. In 1902 Edwards and Beevor introduced a new control device comprising a single lever located through the floor of the boat. As the lever was pushed forward and through a series of step contacts the boat moved ahead at variable speeds. Pulling the lever back the boat moved astern at the same variable speeds. With a sideway movent the control lever could also be used to steer the boat.

By the turn of the nineteenth century Maidenhead had become a major centre for hire boats with at least seven hirers of electric boats. But despite the appearance of good prospects the electric boating business was going into decline. Edwards was unable to reorganise quickly enough to meet the rapidly changing scene and the Thames Valley Launch Company was wound up in 1904. Lawrence Carr kept the Boulter's Lock boat yard going under the name of his own business, the Ray Motor Company



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