

Marine

News

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Propulsion Technology

Two Kinds of Green



ATB's:
Enduring – and Evolving

Workboat Repair:
Back to the Future

Seafarer Safety:
Shock Mitigation's
Critical Role

The Strong and Silent Type

Mapping and shaping the growth of marine hybrid means many things to different stakeholders. The journey leads us all to the same place.

By Robert Kunkel

If you follow the advancements in automotive design, the term or tag “Hybrid” has come to define the alternative energy movement on our roads and highways. HEV autos have moved past Ford and GM in Detroit and into the hands of contemporary entrepreneurs and inventors the likes of Tesla’s Evan Musk or Dr. Victor Wouk. BMW, Ferrari, Bentley and Rolls Royce have all followed the paths of these geniuses and have developed or are developing electric hybrid propulsion systems. A quick “Google” will report over four million hybrid automobiles running silently along our highways. More will follow despite bureaucratic debates about climate change or the Paris Accord.

Hybrid is a path towards clean and alternative energy and no one can argue any longer whether that path should be taken or not. Alternative power sources reduce emissions, save fuel, and maintenance costs and creates new jobs and opportunities for our

A photograph showing two men standing in a large industrial shipyard. They are positioned next to a long, white metal keel structure. The man on the left is wearing a dark polo shirt and jeans, while the man on the right is wearing a blue polo shirt and shorts. The background shows various industrial equipment and structures of the shipyard.

Derecktor Shipyard General Manager Micah Tucker and Project Manager Joe Goodspeed shaping the Keel for the first Harbor Harvest Hybrid.

HYBRID PROPULSION

next generation. Make no mistake: we are seeing a generational shift to alternative energy and shipping needs to climb on board.

GOING GREEN: FOR THE RIGHT REASONS

That said; there are more important factors that the Hybrid automotive application defines than merely being “Green.” It is moving an industry historically propelled by combustion engines into a new era of emissions compliance and noise reduction and it is not the result of regulation. The simple fact is that shipping needs to follow that lead. Our industry needs to take part in this rebirth and we don’t need governments or bureaucrats to advise us how it should be done. The auto industry has shown us the private citizen base has accepted and supported the movement and it is time to get that profit center offshore and into the U.S. marine industry.

Why embrace Hybrid? Quite simply, hybrid requires battery storage to be successful and energy storage is the key to alternative energy. The advancement in battery technology has been staggering and it will continue not only to increase reliability and capacity but also reduce size, weight and most importantly cost. Look to advancements not only with Tesla but also with, Plan B of Norway, Corvus Energy of Vancouver, British Columbia and Spear Power Systems of Missouri. These lithium battery energy companies are leading the U.S. and International maritime charge.

MOVING AHEAD QUIETLY

Spear Power Systems has collected a decade of experience designing and manufacturing safe and reliable lithium-ion battery systems for defense, marine, oil and gas. Spear’s Trident marine ESS system is giving integrators the ability to utilize the optimal lithium-ion chemistry for their applications while leveraging a standard BMS control interface.

Designed and built specifically for the maritime industry, the Orca ESS product line from Corvus Energy represents a new solution for maritime ESS solutions. Corvus combined its industry research and

development capabilities to build the largest global installed base of ESS solutions – one of industry’s safest, most reliable, and cost-effective maritime ESS product line.

Separately, Plan B Energy Storage of Norway announced their latest innovations with the release of the Harpoon battery product line. Harpoon Power 65 is an evolution of the existing PBES product line incorporating new technology advances. Harpoon Power 65 now provides more than 15,000 cycles at 80% depth of discharge with reduced cost per kWh and with an impressive 35% decrease in weight, volume of the battery and overall system cost.

The development of Hybrid propulsion systems does not stop at storage and battery. The most significant task of producing a successful hybrid project is the application software and hardware controlling charge and discharge and how that software is translated into a complete “Marinized” operating platform. On our projects we selected the BAE Systems “Hybrigen” electric power and propulsion system utilizing Cummins variable speed diesel Gensets. BAE Hybrid has taken the lead with system applications with two U.S. projects on the water and a third on the way.

From our point of view as builders and integrators, the most important issue when analyzing new technologies is trend. We look for trending data and successful installations that show extended operating histories. When we were first introduced to Dave Adamaniak and his team at BAE in Rochester, NY, the question of historical success with their technology was easily answered with over 4,000 systems installed in city buses around the world. All we needed to do was “Marinize” it.

Today, we are following Norway’s lead with this technology. Ampere was the first all electric groundbreaking ferry project for Noried, in collaboration with Siemens in 2014. The vessel operates on a 5.7 kilometer crossing between the villages of Lavik and Oppedal, making 34 trips a day with two 450kw electric motors. The ingenious part of the project was the charging system that incorporated battery storage at each terminal due to a challenging

HYBRID PROPULSION

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shore side hydroelectric grid. The project claimed a reduction of one million liters of diesel fuel, 2,680 tons of carbon dioxide and 37 tons of nitrogen oxide each year.

The glass ceiling of Hybrid size and power was also shattered by Swiss battery manufacturer LeClanche. Working with the Danish shipbuilder Soby Shipyard

LTD, they collectively installed 4.2 Megawatts of power in what is claimed as the world's largest electric ferry, scheduled for delivery in June. Corvus has also installed storage on this large a platform.

CLOSER TO HOME

U.S. centric projects have targeted the smaller research vessel, harbor Tug and passenger ferry markets. The first of our Hybrid vessels was delivered to the Norwalk Maritime Aquarium as a 65' catamaran research vessel carrying 65 students each trip into Long Island Sound in 2015. The second vessel, using a similar research design for the City University of New York and again built at Derektor Shipyard in New York, completed trials and was commissioned this month.

More recently, our project with Harbor Harvest and Harbor Connect of Norwalk, CT moves Hybrid into new markets of moving cargoes of agriculture and artisan food products along Long Island Sound

CUNY 1 Siemens and Furuno navigation suite



HYBRID PROPULSION

between New York and Connecticut ports. This hybrid will be the third generation project completed by the BAE, Derecktor and the Amtech team. Moreover, the project has been submitted to the Federal Department of Transportation's Maritime Administration Marine Highway program and we expect our official project designation within the coming weeks.

Separately, the new Connecticut State Port Authority is the project's public sponsor and it has been widely supported by Congressman Jim Himes and State Senator Bob Duff. Connecticut area merchants, local farms on both sides of the Sound and the shellfish community are all eagerly waiting the project's arrival. The first catamaran, incorporating many of the upgrades and modifications made available to the CUNY 1 hybrid will be available spring of 2018. The keel was laid at Derecktor Shipyard this month.

This Harbor Harvest Hybrid Catamaran will carry 12,000 pounds of pallet cargo, much of which is refrigerated on board. The vessel will be berthed at the Cops Island Oyster facility in East Norwalk and recognize the Port of Norwalk, Connecticut as one of the nation's first environmentally sustainable secondary ports. The growth potential of the Marine Highway project is enormous. Follow on vessels serving the mid Hudson valley along the Hudson River and coastal areas reaching into Rhode Island and Maine are under consideration. No less than five trade routes within Long Island Sound have been identified to continue the series.

HAND-IN-HAND: MARINE HIGHWAYS, HYBRID, AND SHORESIDE INFRASTRUCTURE

The growth potential of hybrid and shortsea shipping –hand-in-hand – raises another subject that should also be vigorously debated within the U.S. Maritime industry; namely, the loss of our working waterfront. Harbor Connect moved towards the Hybrid Catamaran design to gentrify coastal cargo movements, develop new markets for our local farmers and work towards an environmentally sustainable transportation system; a system that can rise above the “not in my backyard” noise. To develop these projects

we need to support our working waterfronts.

We have seen a Bridgeport, Connecticut shipyard – a developed shipyard site we actively pursued with the city to continue building Hybrids – fall to real estate development that includes restaurants and apartment complexes. We are now investigating the reconstruction of the Manrissa/NRG real estate to develop gentrified working waterfront properties that continue the New England tradition of commercial fishing, shipbuilding and repair. Offshore wind, Solar and hybrid alternative energy will require the working waterfront to not only exist, but also to grow. And support these local industries. Amtech and Harbor Harvest both intend to be part of that growth.



Robert Kunkel, President of Alternative Marine Technologies, previously served as the Federal Chairman of the Short Sea Shipping Cooperative Program under the Maritime Administration and the US-DOT from 2003 until 2008. A past Vice President of the Connecticut Maritime Association, he is a contributing writer for MarineNews. A graduate of the Massachusetts Maritime Academy, Kunkel sailed as a licensed engineer and continued his career in ship construction at NASSCO and Hyundai Heavy Industries, among others. He is a senior member of the Special Committee on Ship Operation with ABS and an elected member of the NCB.