SOLAR POWER Cleaning up, a little at a time

The idea of solar power on ships is not a new thing, but the enthusiasm building up around marine solar solutions is.

> This is due partly to developments in solar and battery technologies, and partly to growing demand for a wider range of clean and sustainable marine power solutions at all levels.

> Eco Marine Power (EMP) out of Japan is banking on meeting that demand using a combination of revamped and innovative technologies, with flexible solar panels on rigid sails, and a refined version of tried and true lead-acid batteries.

> They are currently underway with an evaluation project on a high-speed ferry in Greece, the Blue Star Delos. The project includes the world's first marine solar power system using flexible lightweight marine grade panels integrated with real time performance monitoring of the solar power array. Fuel oil consumption will also be logged and emissions data calculated.

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"The ferry project is the key test for EMP right now," says chief technology officer Greg Atkinson. "Delos is just finishing the trial period. After that we believe the time will be right to move toward commercial systems. Photovoltaic technology is seeing significant advances, and costs are coming down."

Valve-controlled lead acid batteries have been chosen for the Delos project. "The batteries are 90 per cent recyclable," Atkinson says. "They are safe, and no dedicated cooling is needed. The solution is simple and robust. Requirements for a full lithium system make weight similar for the two battery types, and safety requirements for marine lithium are stricter."

"Contrary to what most people think, valve-regulated lead acid technology has continued to advance while all the attention around batteries has gone to lithium," he says. "Now they have a life span comparable to lithium ion batteries."

For their next move, EMP is looking at car carriers, largely due to their ample deck space. "Cruise ships are also looking more interesting. There is a lot of space available on the upper decks, and flexible panels can be installed on awnings. And passengers are more and more interested in greener cruising."

Atkinson makes another highly relevant point for the passenger segment: "Solar-battery solutions are also very good sources of emergency power. Even if you lose all other power, you can still run some systems until help arrives."

Sailing with the sun

EMP's most interesting project right now? "I think the most intriguing would be the Energy-Sail. It combines solar for auxiliary use, and sails

EnergySail® by Eco Marine Power

Right: Aquarius solar array on Delos

for propulsion, which makes it interesting for more ships." As deck space for solar is not readily available on all ship types, EMP is developing free-standing sails with flexible and semi-flexible solar panels mounted on the sail.

The main inspiration for EMP's patent-pending EnergySail was the JAMDA rigid sail from the 1980s, built by the Teramoto Iron Works in Japan. Now the same company will manufacture solar panel mounting frames for one of EMP's projects.

But is the industry embracing solar power on board, or does EMP still meet sceptics? "Some shipowners are looking for megawatts, and that is not feasible with solar." Right now, he says, solar's most practical use is for lighting and other housekeeping functions.

"But when you use solar, you don't burn fossil fuel. That's good for your image, it's good for the environment, and that is good for the people living around ports," Atkinson points out, noting that 60,000 premature deaths are attributed to shipping emissions each year.

"Regulations are starting to work in our favour. Sulphur caps and emission control areas will all lead owners to look for alternative solutions." A ship might have two generators, he argues, but not have to run both, using solar to keep generator use down. They can also reduce reliance on shore power, which is not always available, and not necessarily sustainable or very affordable when it is.



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Bringing down barriers

What does Greg Atkinson believe is the ultimate potential for marine solar, and what barriers need to be removed for it to reach its full potential? "The conservative nature of the shipping industry in general is a key barrier. Even something as commonplace as Wi-Fi is not standard on ships yet."

On the plus side, Atkinson sees demand playing a bigger role in solar implementation. "It's not just supply side any more. Owners and operators are thinking more about how they use power on board." For example, lighting spaces with no people is still commonplace, but it wastes power, which means wasted money and unnecessary emissions, neither of which work in the owner's favour.

"There is a lot of potential on the demand side. It is in the best interests of the industry to get cleaner. But for this we need progressive owners, even though installing solar power to cut fuel consumption is a relatively minor expense."

Pressure to comply with green logistics chain requirements is another increasingly important factor, and many requirements affecting shipowners will come from outside of shipping. "Authorities will be certifying entire supply chains, not just looking at sea or land transport separately. Fuel efficiency then becomes important from the source to the destination, and all emissions become critical," Atkinson concludes, giving EMP the perfect takeaway for their contribution to the greener future of shipping: Every little bit helps.