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Europe's shipyards navigate from sunset industry to green revival

European shipyards are under pressure to cut costs and clean up. A new EU-funded initiative aims to help them do both, with digital tools and better tracking of energy use and materials to improve their environmental footprint and reduce waste.

09 June 2026 - By ANTHONY KING

In September 2026, naval architect Thomas Koch is bringing his firm's virtual shipyard to a maritime trade fair in Hamburg, Germany. The virtual shipyard is a digital replica that tracks shipbuilding progress in real time and can suggest improvements that save money and energy. Such tools are badly needed as European shipbuilding struggles to keep up with rivals.

Many large docks in Europe have shut down over the last three decades. China, Japan and South Korea dominate shipbuilding in volume, benefiting from huge scales and automation to make container ships, tankers and other commercial vessels.

European shipyards now focus mostly on specialised high-value vessels such as cruise ships, coastal ferries, yachts, icebreakers and offshore engineering vessels. Many have carved out niches in particular ship types and are testing new technologies to cut emissions and fuel use.

"Europe can gain an edge in global shipping by adopting new clean technologies," said Koch, the founder of Atlantec Enterprise Solutions, which provides IT for the maritime industry.

Koch and a team of researchers are tackling some of the challenges by combining renewable energy, digital advances and material tracking systems to boost sustainability in a new EU-funded project called ESY.

The researchers look at emissions from ships at sea, but also at shipyards' environmental footprints: how much energy they use, how much steel and other materials they need, and how much waste they produce.

Koch estimates that assisted wind power can cut fuel use by 20 to 30 %, for example, which means lower costs for operators and fewer emissions overall.

“Shipbuilding in Europe has a future and Europe has specific strengths,” he said. Retrofitting ships with new technology has seen a surge in demand.

A sector in slow decline

Labour accounts for as much as 70 % of shipbuilding costs, which makes Europe expensive. Unlike car manufacturing, where identical models are made over and over, shipbuilding usually involves a single bespoke vessel, made without much automation.

Also, small and medium-sized shipyards in Europe operate independently – not benefiting from scale – and often rely on large expensive equipment that must work for decades.

“Shipbuilding is rather old fashioned and still very labour intensive,” said Dimitrios Lyridis, a naval engineer and professor at the National Technical University of Athens (NTUA), who is also part of the ESY team.

For decades, he said, it was seen as a sunset industry in Europe, receiving little government or EU support or funding, especially from the 1970s to the early 2000s.

This may be changing. In March 2026, the European Commission adopted a new Industrial Maritime Strategy to boost Europe’s manufacturing and shipping industries. ESY researchers are working towards the same goal.

“Our main focus is to try to improve competitiveness of the European shipbuilding industry by providing tools to monitor their processes and improve their environmental footprint,” said Panos Evangelou, a naval economist at NTUA.

This means giving shipyards digital tools that show where they waste energy and materials, and which simple changes would cut this waste the most.

The ambition is to construct advanced vessels boosted by green technology in leaner, more sustainable shipyards. The ESY team is launching an EU material passport that tracks materials from production to ship decommissioning.

The passport is a digital logbook for each ship, listing which materials go into it, where they come from and how they are used, so that parts can be repaired, reused or recycled more easily later.

“There’s often lots of waste throughout shipbuilding,” said Lyridis. “By tracking how much waste you have, you can redesign, for example, the way you cut steel in a more efficient manner.” The idea is to use materials more efficiently, save energy, cut costs and introduce better standards.

Greener shipyards in practice

In one demonstration, a steel cutting process was retrofitted at Astilleros de Santander, a Spanish shipyard in the Bay of Biscay that has been operating for over a century. A piece of equipment was modified so that it would use less energy, thereby reducing costs and emissions.

The same setup will also be used to test the material passport and other ESY tools – in a real yard with ships.

The researchers are also developing an environmental performance index for shipyards that helps to measure and reduce their environmental footprint.

The index combines simple figures – electricity, fuel and water use, waste and emissions – into a single score. In this way, shipyards can see if they are getting better over time, or compare different projects or sites.

“By benchmarking what you are doing, you can find alternative ways that are more economical and more energy-efficient,” Lyridis said.

This fits into the general trend of greener industrial processes, with potential competitive advantages.

“Financing for shipping is easier if you have a greener profile and now cargo owners have been requesting that ships be green,” said Lyridis. There are more stringent regulations on emissions and noise, and in how ships and shipyards operate.

The ESY material passport is a first step in delivering a certification for sustainability compliance, noted Professor Marc Bonazountas at Epsilon Group, a maritime technology and consulting firm. This could become crucial in future.

“Ports are now thinking about giving priority to those vessels that are greener and emit less pollution. Dirty, noisy vessels may have less access to harbours in Europe,” said Bonazountas.

Why shipyards still matter

There are strategic reasons for Europe not to neglect shipbuilding.

“The dominant countries that govern the world are those that dominate the seas. For that, you must have shipyards,” Bonazountas said, adding that the USA is now offering subsidies and support to get its shipbuilding back.

Europe, Bonazountas said, must create a unified maritime industrial strategy where shipyards become part of the wider transport value chain. This means not only constructing new vessels, but also providing lifecycle services, retrofitting, digital support, and, in the future, leasing advanced vessels to operators, particularly as nuclear propulsion technologies emerge.

“Europe’s competitiveness will depend on the shipyards it preserves, modernises and empowers,” said Bonazountas.

Lyridis said shipbuilding in Europe had survived despite years of neglect. “Now it has been realised how important it is for Europe to retain a shipping industry.”

For Koch, Lyridis and their colleagues, the next steps are to prove that tools such as the material passport and performance index work in busy shipyards – and to show that making ships greener can also help keep Europe’s shipyards in business.

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More info

- ESY (CORDIS)
- ESY project website
- EU Industrial Maritime Strategy