

ON TRIPS DOWN the Peruvian Amazon, passengers on the Aqua Nera can soak up the moody riverscape and spot pink dolphins from the top deck. What they may not realize is that the handrails and carpets of the Aqua **Expeditions** (aquaexpeditions.com) ship are helping to protect, in a small way, the delicate ecosystems all around them. The railings and decking are made from Resysta, a wood-substitute material composed of rice husk, salt, and mineral oil, and many of the floor coverings are spun from recycled plastic, to the tune of around one two-liter bottle per square foot.

The innovative ship, which launched in 2021, is emblematic of the efforts cruise lines are making to furnish their ships with environmentally friendly and ethically sourced materials. In doing so, they've made sustainability a tactile experience for guests while nudging the industry toward a greener future.



Hurtigruten's Fridtiof Nansen

"Sustainable interiors have really moved to the top of the conversation," says Thomas Westergaard, a vice president at Hurtigruten (hurtigruten. com). The line's Fridtjof Nansen is one example, with hybrid-electric engines and plenty of hygge in the form of flooring that's Cradle to Cradle Certified, a global standard that indicates materials are sustainable.

The interiors experts at Tillberg Design of Sweden have collaborated with several lines, including Hurtigruten, Norwegian Cruise Lines (ncl.com), and MSC Cruises (msccruises.com). When sketching out new ships, Tillberg designers draw from a "responsible supplier library" that includes curtains fashioned from recycled plastic and wall coverings made from renewables such as wood and wool pulp. Tillberg client Tui $\textbf{Cruises} \ (\textit{meinschiff.com}) \ \textit{now} \ \textit{uses} \ \textit{Global}$ Organic Textile Standard-certified cotton for bed and bath linens in every cabin on Mein Schiff 1 and Mein Schiff 2. On NCL's newly launched Norwegian Prima, decorative tiles cut from recycled glass decorate the Surfside Café & Grill.

Meanwhile, Holland America Line (hollandamerica.com) has spent 18 months working with Danish textile manufacturer Dansk Wilton to develop Origin, an undyed and fully recyclable carpet made from natural wool that debuted in all the staterooms on the Rotterdam in 2022. The companies are now working to upcycle carpets torn out during refits to be reborn as signage and even furniture.

A lounge aboard the Aqua Nera.



GETTING TO ZERO

In late 2020, the pandemicbattered cruise industry set a goal of pursuing net-zero carbon emissions by 2050. Now the challenge is to make that goal-or even the ambitious target of net zero—a reality.

The industry's current focus is on liquefied natural gas, or LNG: a cleaner-burning fossil fuel that reduces particulate emissions by as much as 95 percent as well as overall carbon burn by about a fifth. The just-launched, 2,633-cabin World Europa from MSC (msccruises.com) is now the largest LNG-powered cruise ship. Carnival Cruise Line (carnival.com) and Disney Cruise Line (disneycruise. disney.go.com) have also launched LNG vessels in recent years.

More efficient "shore power" is another way lines are cutting fuel burn. Today, only a small percentage of cruise ports worldwide have infrastructure that allows ships to plug in to the local electrical grid, rather than running their engines while docked. (Seattle and Juneau, Alaska, are two with the tech.) Ships, too, need the right hardware-like that aboard the fuel-cell-equipped Silver Nova, which Silversea (silversea.com) plans to debut in summer 2023.

Other clean-engine technologies are still developing: new luxury brand Explora Journeys (explora journeys.com) has ordered two hydrogen-powered vessels, though the first won't arrive until 2027. Mein Schiff 7, on order for European line Tui Cruises (meinschiff.com), is being built to accommodate methanol fuel, an alternative energy option first floated in the 1990s that's seeing renewed traction. Hurtigruten (hurtigruten.com) has announced plans for a zeroemissions ship to arrive on the Norwegian coast by 2030.

Meanwhile, most lines have reduced or eliminated singleuse plastics aboard. Waste heat recovery systems are allowing ships like those in the Disney Cruise Line fleet to reduce water usage: the clever tech captures condensation from air-conditioning units to be reused to wash down outside decks. - C.M.