

Mechanical sails? Batteries? Shippers forming 'green corridors' to fast-track cleaner technologies

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Loading docks are seen at the Port of Los Angeles, on Monday, Nov. 21, 2022. A year ago, Los Angeles and Shanghai formed a partnership to create a green shipping corridor that would become a showcase for slashing planet-warming carbon emissions from the shipping industry, which produces about 3% of the world's total. The container shipping route is among the world's busiest. Credit: AP Photo/Damian Dovarganes, File

It's among the world's busiest container shipping routes—a stream of vessels packed with furniture, automobiles, clothing and other goods, traversing the Pacific between Los Angeles and Shanghai.

If plans succeed, this corridor will become a showcase for slashing planet-warming carbon emissions from the [shipping industry](#), which produces nearly 3% of the world's total. That's less than from cars, trucks, rail or aviation but still a lot—and it's rising.

The International Maritime Organization, which regulates commercial shipping, wants to halve its greenhouse gas releases by midcentury and may seek deeper cuts this year. "Shipping must embrace decarbonization," IMO Secretary-General Kitack Lim said in February.

Meeting agency targets will require significant vessel and infrastructure changes. That's inspiring plans for "green shipping corridors" along major routes where new technologies and methods could be fast-tracked and scaled up.

More than 20 of these partnerships have been proposed. They're largely on paper now but are expected to take shape in coming years. The goal: uniting marine fuel producers, vessel owners and operators, cargo owners and ports in a common effort.

Front-runners

Los Angeles and Shanghai formed their partnership last year.

"The vision is that a container will leave a factory on a zero-emissions truck (in China)," said Gene Seroka, executive director of the Port of Los Angeles.



This 2021 photo shows the SC Connector, a freight-hauling vessel owned by the Norwegian company Sea-Cargo, sailing on the North Sea off the southwestern coast of Norway. The ship is equipped with two rotor sails manufactured by Finland-based Norsepower. The 38-yard-high (35-meter-high) rotors spin in the wind and help propel the vessel. It's an example of new technologies helping the shipping industry reduce its greenhouse gas emissions. (Artur Sylwestrzak/Sea-Cargo via AP).

"It will arrive at the port of Shanghai, be loaded onto a ship by a zero-emissions cargo handling equipment unit, and move across the Pacific Ocean on a vessel that emits zero carbon. Once it gets to Los Angeles, the reverse happens," with carbon-free handling and distribution.

Los Angeles entered a second agreement in April with nearby Long Beach and Singapore. Others in the works include the Great Lakes-St. Lawrence River; a Chilean network; and numerous corridors in Asia, North America and Europe.

C40 Cities, a global climate action coalition of mayors, advocates green corridors as "tools that can turn ambition into action, bringing together the entire shipping value chain," said Alisa Kreynes, a deputy director.

But Kreynes sounded a note of caution: "I can't help but wonder how much of it is PR and how much of it is actually going to become practice. It's going to require a cultural shift in thinking about how we get things from point A to point B."

New approaches developed in green corridors could bring fast results, said John Bradshaw, technical director for environment and safety with the World Shipping Council. "I'm very confident that the industry will deliver zero emissions by 2050."

Pressure builds

From tea to tennis shoes, stuff in your pantry and closets likely spent time on a ship.

Roughly 90% of traded goods move on water, some in behemoths longer than four football fields, each holding thousands of containers with consumer products. About 58,000 commercial ships ply the seas.



A truck arrives to pick up a shipping container near vessels at the Port of Los Angeles, on Nov. 30, 2021. A year ago, Los Angeles and Shanghai formed a partnership to create a green shipping corridor that would become a showcase for slashing planet-warming carbon emissions from the shipping industry, which produces about 3% of the world's total. The container shipping route is among the world's busiest. Credit: AP Photo/Damian Dovarganes, File

Their emissions are less noticeable than onshore haulers such as trucks, although noxious fumes from ships draw complaints in port communities.

Maritime trade volumes are expected to triple by 2050, according to the Organization for Economic Cooperation and Development. Studies predict the industry's share of greenhouse gas emissions could reach

15%.

Yet the 2015 Paris climate accord exempts maritime shipping, partly because vessels do business worldwide, while the agreement covers nation-by-nation goals.

"No one wants to take responsibility," said Allyson Browne of Pacific Environment, an advocacy group. "A ship may be flagged in China, but who takes ownership of emissions from that ship when it's transporting goods to the U.S.?"

The IMO responded to mounting pressure with a 2018 plan for a 50% emissions reduction by midcentury from 2008 levels. An update scheduled for July may set more ambitious targets favored by the U.S., Europe and small island nations. Opponents include Brazil, China and India.

The Biden administration wants a zero-emission goal, a State Department official told The Associated Press.

But fewer than half of large shipping companies have pledged to meet international carbon objectives. And there's no consensus about how to accomplish them.

Proposals range from slowing vessels down to charging them for emissions, as the European Union did last year.

"Global shipping is hard to decarbonize ... because of the energy required to cover long distances with heavy cargoes," said Lee Kindberg, head of environment and sustainability for Maersk North America, part of A.P. Moller-Maersk, which has more than 700 vessels. "It's a stretch but we consider it doable."



This 2021 photo shows the SC Connector, a freight-hauling vessel owned by the Norwegian company Sea-Cargo, passing beneath the Karmsund Bridge on the Karmsundet Strait in Haugesund, Norway. The ship is equipped with two rotor sails manufactured by Finland-based Norsepower. The 38-yard-high (35-meter-high) rotors spin in the wind and help propel the vessel. They also can tilt to avoid overhead bridges and power lines. It's an example of new technologies helping the shipping industry reduce its greenhouse gas emissions. Credit: Tor Nilssen/Sea-Cargo via AP

But how?

Mechanical sails. Batteries. Low- or zero-carbon liquid fuels.

They're among propulsion methods touted as replacements for "bunker

fuel" that powers most commercial ships—thick residue from oil refining. It spews greenhouse gases and pollutants that endanger human health: sulfur dioxide, nitrogen oxide, soot.

Finding alternatives will be a priority for green shipping corridors.

For now, liquid natural gas is the runaway choice. Worldwide, it's used by 923 of 1,349 commercial vessels not powered by conventional fuels, according to a study last year by DNV, a Norway-based maritime accreditation society. Vessels with batteries or hybrid systems placed a distant second.

Many environmentalists oppose LNG because it emits methane, another potent greenhouse gas. Defenders say it's the quickest and most cost-effective bunker fuel substitute.

Of 1,046 alternative-energy ships on order, 534 are powered by LNG while 417 are battery-hybrids, DNV reported. Thirty-five others will use methanol, which analysts consider an up-and-coming cleaner alternative.

Moller-Maersk plans to launch 12 cargo vessels next year that will use "green methanol" produced with renewable sources such as plant waste. A biodiesel from used cooking oil fuels some of its ships.



A container ship is docked at the Port of Los Angeles, on Nov. 21, 2022. A year ago, Los Angeles and Shanghai formed a partnership to create a green shipping corridor that would become a showcase for slashing planet-warming carbon emissions from the shipping industry, which produces about 3% of the world's total. The container shipping route is among the world's busiest. Credit: AP Photo/Damian Dovarganes, File

The company is collaborating on research that may lead to ammonia- or hydrogen-powered vessels by the mid-2030s.

"This is the first step toward the turnover of our fleet into something much more climate-friendly," Kindberg said.

Norsepower offers a new twist on an ancient technology: wind.

The Finnish company has developed "rotor sails"—composite cylinders about 33 yards (30 meters) tall that are fitted on ship decks and spin in the breeze. Air pressure differences on opposite sides of the whirring devices help push a [vessel](#) forward.

An independent analysis found rotor sails installed on a Maersk oil tanker in 2018 produced an 8.2% fuel savings in a year. Norsepower CEO Tuomas Riski said others have saved 5% to 25%, depending on wind conditions, ship type and other factors.

Thirteen ships are using the devices or have them on order, Riski said.

"Mechanical sails have an essential role in the decarbonization of shipping," he said. "They can't do it alone, but they can make a great contribution."

Fleetzero contends electric ships are best suited to wean the industry off carbon. The company was founded two years ago in Alabama to build cargo vessels with rechargeable battery packs.

CEO Steven Henderson says it envisions fleets of smaller, nimbler ships than huge container vessels. They would call at ports that have freshly charged batteries to swap for ones running low. Fleetzero's prototype ship is slated to begin delivering cargo later this year.



A docked container ship is seen at the Port of Los Angeles, Friday, April 28, 2023. A year ago, Los Angeles and Shanghai formed a partnership to create a green shipping corridor that would become a showcase for slashing planet-warming carbon emissions from the shipping industry, which produces about 3% of the world's total. The container shipping route is among the world's busiest. Credit: AP Photo/Damian Dovarganes

Who goes first?

Before building or buying low-emission vessels, companies want assurances clean fuels will be available and affordable.

Companies producing the fuels, meanwhile, want enough ships using them to guarantee strong markets.

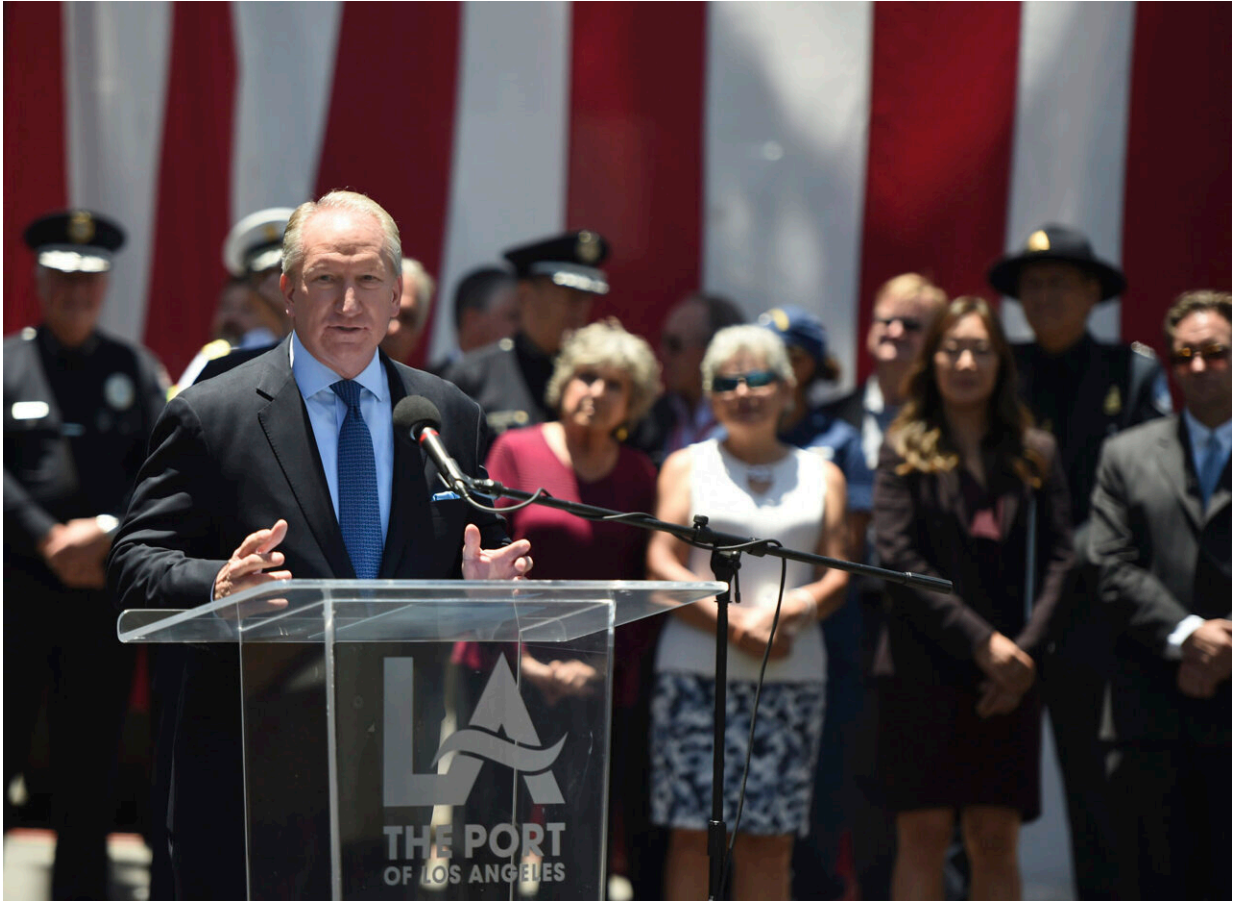
And both need port infrastructure that accommodates new-generation ships, such as electrical hookups and clean fuel dispensing mechanisms.

But ports await demand to justify such expensive upgrades. Switching onshore cargo handling equipment and trucks to zero-emission models will cost the Los Angeles port \$20 billion, officials say.

"Once you put a (green) corridor on the map," said Jason Anderson, senior program director for the nonprofit ClimateWorks Foundation, "at least they're heading in the same direction."

Success will require government regulation and corridor funding, along with support from shipping industry customers, said Jing Sun, a University of Michigan marine engineering professor.

"Shipping is the most cost-effective way of moving things around," Sun said.



Gene Seroka, Executive Director of the Port of Los Angeles speaks during a celebration of The Port of Los Angeles becoming the first port in the Western Hemisphere to process 10 million container units in a 12-month period, on June 10, 2021. A year ago, Los Angeles and Shanghai formed a partnership to create a green shipping corridor that would become a showcase for slashing planet-warming carbon emissions from the shipping industry, which produces about 3% of the world's total. The container shipping route is among the world's busiest. Credit: Brittany Murray/The Orange County Register via AP, File

An organization called Cargo Owners for Zero Emission Vessels pledges to use only zero-emission shipping companies by 2040. Among 19 signatories are Amazon, Michelin and Target.

"When big corporate buyers come together and say we need this to happen, the rest of the chain has confidence to make needed investments," said Ingrid Irigoyen, an assistant director of the nonprofit Aspen Institute, which helped assemble the group.

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