Supply chain chaos is causing the biggest increase in ship emissions in more than a decade

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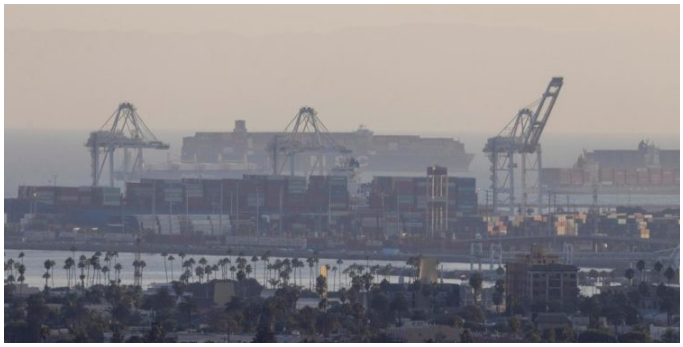

America's post-pandemic shopping spree isn't just breaking the supply chain, it's taking its toll on the environment. Ships chasing record-high container prices are speeding across the ocean to load up as

often as they can, raising emissions at the fastest rate since 2008.

Container ships, like the ones carting goods from the ports of Asia to the US, are speeding up as much as 22% faster in good weather, and consuming more fuel in the process, says Mike Konstantinidis, CEO of METIS Cyberspace Technology, a Greek company that analyzes data on ship movement.

Once a vessel arrives, unprecedented congestion at the overflowing ports are leaving a record number of ships idling in the water, pumping pollution into the neighborhoods surrounding the ports. A study (pdf) published on Nov. 16 by Singapore's Nanyang Technological University estimated that emissions from ships at the port of Los Angeles doubled between July 2020 and 2021, and increased by 123% in Singapore. The most dramatic increases in emissions have come from vessels serving US demand, with container ship emissions at port up 94%, while for bulk carriers, the cargo ships used mainly for coal or grain, they're up 140%.

Port pollution has been found to increase incidences of childhood asthma and cancer, contributing to an estimated 1,300 premature deaths a year in the neighborhoods around the ports of Los Angeles and Long Beach, as LA councilmember Nithya Raman pointed out when the city voted to adopt a resolution calling on ships at the city's ports to be zero-carbon by 2030.

After vessels unload their cargo, they speed back to the ports of China to pick up another load of goods. METIS estimates an overall increase in total annual emissions of 15%, between 2020 and 2021. "If no measures are adopted, emissions from shipping are expected to grow extremely, even up to 250% to 2050," Konstantinidis said.

The supply chain crisis is poised to roll back a decade of progress on reducing shipping's carbon intensity, the measure of how much CO2 is emitted for every nautical mile a ton of cargo travels, as well as increasing overall emissions.

Before the pandemic, slow-steaming lowered emissions

In the economic doldrums after the 2008 recession, shipping companies were making less than $2,000 per container and earning slim profits. To save on fuel costs, ships began slowing down in a practice called slow-steaming. Just by going slower (pdf), with few other engine adjustments, ships can burn less marine fuel oil, lowering their greenhouse gas emissions.

Massive container vessels lumbered across the sea at 12 or 14 nautical miles per hour (knots), rather than 24 or 26 knots. The Pacific crossing could take six weeks or more, considerably slowing deliveries, but shipping companies were happy to save the money and overall carbon intensity dropped 31% between 2008 and 2019. However, due to an increase in the number

of ships and voyages, overall emissions (pdf) still went up from 962 million tons in 2012, to 1.05 billion tons in 2018.

According to Nishatabbas Rehmatulla, a senior researcher at the University College London Energy Institute, slow-steaming can bring down a ship's carbon intensity between 30% and 50%.

But it's also overridable. Even as ships steadily emitted less carbon in the decade before the pandemic, Rehmatulla noticed that new ships' engines were being built larger than they needed to be for slow-steaming. This meant that the ships were "going to be capable of speeding up when the conditions are right," Rehmatulla said. "And currently, those are the conditions we find ourselves in with the supply chain."

As American demand surged in the pandemic and supply chain chaos drove container prices up to record highs of more than $10,000, shipping lines swept aside the environmental benefits of slow-steaming.

What do faster ships mean for the environment?

The shipping industry emits about 3% of the world's greenhouse gasses, more than all but five countries. The current surge in emissions can have long-term consequences for the shipping industry's ability to stay in line with the Paris Agreement's goal of keeping global temperatures below 1.5°C.

So far, the industry has burned through half of the remaining carbon budget it can use to stay within that goal, according to James Mason, a researcher at the University of Manchester's Tyndall Center for Climate Change Research, who specializes in low-carbon shipping. Before this year's supply chain crisis, the industry had 14 years left of emitting at its average rate before it exceeded the 1.5°C target. "If emissions increase in the short-term due to increasing speeds," Mason said, then there's even less time.

The longer the industry delays reducing its emissions, the more drastic the action required to stay below the 1.5°C goal. It can mean scrapping fossil-fuel burning ships sooner than the standard lifespan of about 25 years, or absorbing the costs of expensive zero-carbon fuels before scale brings prices down. But, Mason said, that raises the issue of feasibility—if decarbonization is harder, the industry may be less likely to achieve it.

Profits vs. climate pledges

In October, nine major retailers, including Amazon, IKEA, and Inditex, the company that owns Zara, announced a call to progressively switch to using zero-carbon vessels to ship their goods. The announcement did not include a plan to build zero-emissions ships or the infrastructure to support them, but was seen as an important signal to ship owners that there was demand from the world's largest retailers for zero-emissions ships.

Such retailers have considerable leverage, and responsibility, to demand changes in the shipping industry. A study published on Monday (Nov. 29) by Ship it Zero (pdf), an advocacy organization, estimates that ocean shipping by Walmart produces 11.5 million tons, equivalent to roughly 1% percent of annual shipping emissions in 2018, while Amazon produces about 1.5 million tons of CO2.

But the speeding up of ships amid a shipping gold rush suggests that despite their stated good intentions, companies remain likely to be motivated by profit first—a dynamic that could be throttled by better regulation. But according to a study by the Tyndall Center, the current targets set by the International Maritime Organization (IMO), the UN agency tasked with overseeing shipping's climate goals, "would lead to shipping emitting more than double the emissions compatible with limiting global heating to 1.5 degrees."

Rehmatulla, of the University College London, said that processes to prevent ships from speeding up need to be put in place. "There is no way that ships would have done what they are doing if there was a genuine incentive to not mess up your CO2 intensity." Speed, he said, is "a major variable that really needs to be controlled."

The IMO may be moving in that direction. At a meeting this month, it said it would put in place new regulations for shipping, including limits on speed and time spent anchored at port. The measures would not

take effect until 2023, and will not impact shippings' current emissions surge.

Shipping's record profits from the supply chain chaos could be used to retrofit ships with zero-emission cargo sails, for example, or to scale up the development of hydrogen or ammonia as bunker fuel. Instead, shipping companies are investing in air freight to move goods faster, at an even higher cost to the environment.

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