

# Pollutant emissions in seaports likely to have spiked during pandemic

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By E&amp;T editorial staff

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## A study from Singapore suggests pollutant emissions from the shipping sector increased significantly at major international seaports during the Covid-19 pandemic.

The findings serve as a stark contrast against findings from the Nasa Earth Observatory that showed that the freeze in industrial processes and human activity arising from the pandemic resulted in lower air pollution.

In Singapore, researchers from Nanyang Technological University (NTU) found emissions were modelled to have more than doubled (123 per cent), during the pandemic period, while they increased twofold in Los Angeles (100 per cent), almost two-thirds (65 per cent) in Long Beach, California, and over a quarter (27 per cent) in Hamburg, Germany.

“Our study presents a review of the ship emission outlook amid the pandemic uncertainty,” said Professor Law Wing Keung from NTU’s School of Civil and Environmental Engineering. “Lockdown measures and other Covid-19 restrictions on human activity have upended the landscape for the shipping sector and significantly affected the operating patterns of maritime and trade, leading to the computed outcome revealing a significant increase in pollutant emissions in the seaports in our study.”

The research builds upon previous studies that signalled that Covid-19 had a substantial impact on the shipping industry. The United Nations Conference on Trade and Development found that Covid-19-related constraints on ships and crew in many ports led to workforce shortages and operational challenges and affected productivity, while global shipping intelligence provider S&P Global Platts remarked that the unprecedented and volatile surge in cargo demand following the first wave of Covid-19 caused further delays at almost every seaport worldwide.

According to the researchers, ship emissions in all four ports increased by an average of 79 per cent because of the prolonged turnaround time in port, with extended ‘hotelling’ time at berth and anchorage areas as longer operational times were needed because of pandemic-related delays.

The research team’s computations of pollutant emissions were from July 2020 to July 2021, which was at the height of the pandemic. The findings were compared to the whole of 2019, which is taken as the baseline year with business-as-usual emissions.

Pollutants studied in the research were carbon dioxide, sulphur oxide, nitrogen oxide, particulate matter, carbon monoxide and methane.

The team calculated the fuel consumption and pollutant emissions of the ships using actual ship movement data sourced through AXSMarine, a global provider of dry, tanker and liner chartering. It provided information of the ships, including their sailing speed, time duration, coordinates, navigational status, as well as ship-specific information such as the name, type of carrier, and deadweight tonnage (DWT), which is a measure of how much weight a ship can carry.

Additional information was also obtained from the various port administration authorities where the study was done, as well as from the intelligence arm of international UK shipping services provider Clarksons, which provided ship specification information such as the ships’ designed maximum speed, engine type, and rated engine power.

The research team also found that container ships and dry bulk carriers marked the sharpest increase of total emissions, seeing an average increment of 94 per cent and 142 per cent respectively, compared to before the Covid-19 pandemic.

“Although they typically spend the least time in ports, dry bulk carriers, which are designed to transport unpackaged bulk cargo such as grains, coal, ore, and cement, experienced the biggest increase in pollutant emissions,” said Liu Jiahui, a PhD student at NTU. “This is because of a combination of Covid-19 precautions at ports and the increased demand for raw materials because of the resumption of industrial activity in the second half of 2020, which resulted in a spike in dry bulk carriers in ports.”

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