

# Emissions from ships up 123% during pandemic in S'pore: Study

One reason could be longer turnaround times due to Covid-19-related delays, says NTU don

Clara Chong

Pollutant emissions from the shipping sector have more than doubled during the pandemic in Singapore, with increases also seen in other major international seaports.

In Singapore, shipping emissions have increased by 123 per cent during the Covid-19 pandemic, according to analyses from modelling. Emissions doubled in Los Angeles, increased by almost two-thirds (65 per cent) in Long Beach, California, and rose by over a quarter (27 per cent) in Hamburg, Germany.

On average, emissions in all four

ports have increased by 79 per cent.

These findings were announced by researchers from Nanyang Technological University (NTU) on Tuesday. The emissions were calculated using mathematical and analytical models invented by the NTU researchers.

The researchers compared ship pollutant emissions from July 2020 to July this year during the pandemic with the whole of 2019.

The findings contradict the idea that the freeze in industrial processes and human activity arising from the pandemic resulted in generally lower air pollution.

One reason could be the prolonged turnaround times due to



Professor Adrian Law from Nanyang Technological University's School of Civil and Environmental Engineering, who led the study, and Ms Liu Jiahui, a PhD student from the school, who was the study's first author. The study calculated emissions using mathematical and analytical models invented by the NTU team. PHOTO: NTU

pandemic-related delays in operations, resulting in extended "hotelling" time at the berth and anchorage areas, said Professor Adrian Law from NTU's School of Civil and Environmental Engineering, who led the study.

Hotelling of ships refers to the phase when ships are berthed at terminals and anchorage areas but continue to emit exhaust gases while they await cargo load-

ing or discharge or their next voyage.

"Lockdown measures and other Covid-19 restrictions have significantly affected the operating patterns of maritime trade, leading to the computed... significant increase in pollutant emissions in the seaports in our study," Prof Law said.

Container ships and dry bulk carriers accounted for the sharpest in-

crease of all total emissions, with an average increase of 94 per cent for container ships and 142 per cent for dry bulk carriers.

Dry bulk carriers are merchant ships designed to transport unpackaged bulk cargo such as grain, coal, ore and cement.

Ms Liu Jiahui, a PhD student from NTU's School of Civil and Environmental Engineering, who was the first author of the study,

said: "Though dry bulk carriers typically spend less time at ports, they experienced the biggest increase in pollutant emissions due to heightened precautions at ports and the increased demand for raw materials in the second half of 2020 as industrial activity resumed."

This research could be applied to other sectors, such as aviation, but changes will need to be done so that the model is tailored to the specific industry.

If port congestion due to Covid-19 is resolved, there would be a high likelihood of over 50 per cent that emissions from August this year to August 2022 would decrease by 34 per cent at all four seaports, said Prof Law.

If port congestion continues next year, Singapore would likely see a further emission increase of about 6 per cent. This translates to a cumulative increase of 137 per cent compared with 2019 levels. The ports of Hamburg, Long Beach and Los Angeles would also likely experience an increase in emissions from 2020 numbers, albeit marginally.

Prof Law said he hopes the adoption of cleaner energy options such as electric power will be accelerated, as it will help to substantially reduce ship emissions.

The earlier adoption of green energy, and updated technology at shore to cut down on the time a ship takes to come and go, will improve the situation in the long run, Prof Law said.

Ms Liu added: "The Covid-19 pandemic has accelerated the development and uptake of digitalisation in the shipping industry, which could also help to accelerate automation of port clearance processes to reduce port turnaround time in the future."