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# Study: Just-in-Time Arrival Could Improve Fuel Efficiency 10-25 Percent

Total bunker savings would be greatest for container ships (iStock)

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A new study from the UCL Bartlett Energy Institute and UMAS has hard numbers for the energy savings that shipping could achieve through just-in-time arrival, the ever-elusive practice of optimizing voyage speed to match berth availability. The potential fuel savings are substantial, comparable to installing wind-assisted propulsion or an air lubrication system - but without any capital expense.

Ships spend up to six percent of their operating lives at anchor while waiting to berth, running their auxiliary engines the whole time and generating emissions - and the percentage is on the rise. There are business reasons for this inefficiency: there are contractual incentives for "sail fast and wait" operating practices in many charter parties, and at some seaports, terminals operate on a first-come/first-served basis. In these cases, it may pay financial dividends to speed up, arrive early, then wait longer.

By slowing down mid-voyage and arriving on time to proceed straight to berth, "just-in-time" vessels increase efficiency through slow steaming and through the avoidance of auxiliary engine runtime at anchor. The savings, according to the UCL/UMAS study, can be significant: about 10 percent for bulkers and boxships, 16 percent for oil tankers and an astonishing 25 percent for chemical tankers.

Changing the incentive structure to favor just-in-time arrival will take cooperation among multiple parties, including charterers, who might normally be more focused on their commercial and operational needs than on the emissions of the vessel. The study's authors suggested that the IMO could push just-in-time efficiencies forward by including in-port emissions in the CII regulation. If the

CII is limited only to the underway voyage, waiting times would remain an unaddressed part of shipping's carbon output.

"Our analysis highlights that the no-value-add emissions associated with port waiting times are a current and growing issue across the shipping sector," said UMAS consultant Dr. Haydn Francis. "By targeting these idle periods, the IMO can help unlock significant emissions reductions while also driving broader improvements in voyage optimization and overall operational efficiency."

The potential industry-wide savings are greatest for container ships, amounting to nearly six million tonnes of CO2 per year. Oil and chemical tankers (taken together) would contribute another six million tonnes. In financial terms, this would equate to global bunker fuel savings worth billions of dollars.