Untapped potential – for all

by Alexa Ivy

In the vast expanse of the maritime industry, where operational complexities and environmental imperatives collide, the need for optimisation and collaboration has never been greater. It is vital that the sector adapts to the changing world and stops serving ships on a first-come-first-served basis. A recently launched PortXchange white paper, *Untapped Potential of Just-In-Time Port Arrivals*, uncovers the challenges plaguing the industry and unveils a transformative strategy for ports and shipping companies.

In it, research demonstrates that the implementation of just-in-time (JIT) port arrivals has the potential to make a dramatic impact on emissions if adopted by the entire global fleet. An extensive seven-month investigation project that analysed 323 vessels in ten seaports (Los Angeles, Mobile, Miami, New York, Moín, Buenos Aires, Gothenburg, Valencia, Vado Ligure, and Tanger Med) revealed a potential saving of approximately 24,000 tonnes of CO_2 and over six million US dollars in fuel costs, promising a minimum fuel cost saving of $1,000 (based on a bunker price of $815 per metric tonne).

Port call data was acquired from analysis of vessel speed profiles 48 hours before port arrival through PortXchange Synchronizer. Emissions and fuel consumption were calculated for each vessel, employing the TNO model developed by the Netherlands Organisation for Applied Scientific Research, with calculations offering a comparative landscape between actual operations and an optimised JIT scenario.

The quantitative implications outlined in the research are not just statistics; they are a snapshot of the global fleet's potential and a call to action for the maritime industry to move from prospect to actualisation.

The carbon credit equation

In light of including much of shipping in the European Union Emissions Trading System (EU ETS), the carbon cost of carrying goods by sea cannot be seen in isolation from the broader financial implications. The white paper's analysis expands the conversation from CO_2 emissions and fuel consumption to the critical metric of carbon credits, offering a nuanced understanding of the economic impact of JIT implementation within European voyages.

The study concentrated on analysing the potential emission reduction through the implementation of JIT port arrivals for vessels sailing from different EU ports to Valencia, Vado Ligure, and Gothenburg. It identified a significant potential for CO_2 savings of 885t, 359t, and 692t, respectively. With the prevailing carbon credit price at €87.87 during the study, these reductions translate to approximately €170k in potential savings on carbon credits for all vessels.

Maersk, which dominated 37 of the 71 analysed port calls, provides another illustrative example. The company had the potential to curtail its CO_2 emissions by 1,141t and bunker fuel by 358t. Had JIT port arrivals been applied during these port calls, the possible savings could have soared to €99,539 in carbon credits (i.e., for 2026 and beyond when the EU ETS will cover all of the shipping emissions vs 40% of 2024's and 60% of 2025's) and €231,784 in fuel costs, totalling €331,323 – or roughly €8,955 per port call. As such, there's an escalating financial imperative to reduce carbon emissions, offering tangible savings for companies.

In a specific instance, a vessel travelling from Genoa to Valencia received an updated planned time of arrival at the pilot boarding place 27 hours before reaching the port. Despite receiving a speed adjustment based on the new arrival time, the vessel maintained its initial speed, resulting in unnecessary fuel consumption and emissions – equivalent to 15.86t of fuel and 50.11t of CO_2. Had the JIT recommendation been heeded, a saving of approximately $12,925 in fuel costs would have been realised.

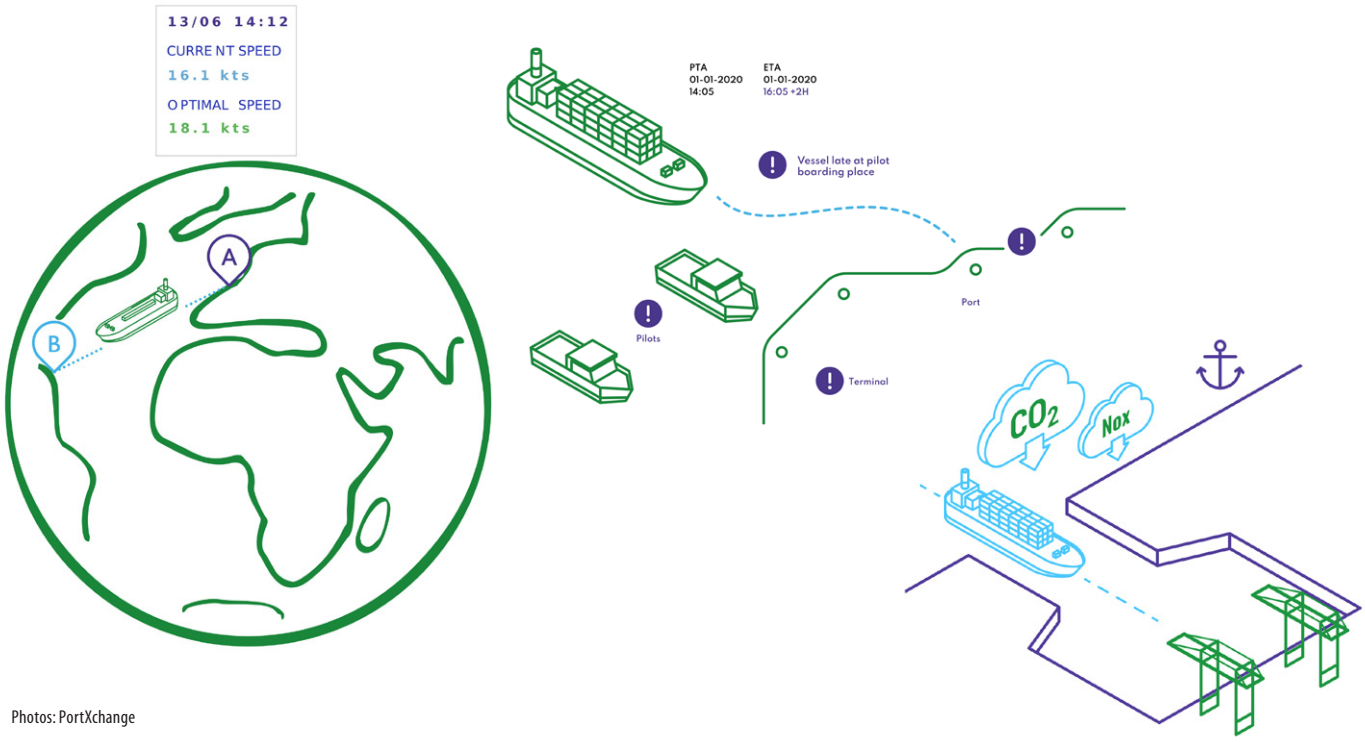
Under the surface

The crux of the PortXchange white paper lies in demonstrating the transformative power of JIT port arrivals and how their PortXchange Synchronizer technology can facilitate this operational shift by redefining the dynamics of vessel management at ports, consequently making substantial contributions to emission reduction.

The researchers' exploration of pressing industry trends makes the synthesis of complex technological solutions and market dynamics into an actionable strategy evident. The executive decision-making focus highlights that JIT port arrivals are not just a theoretical ideal but a practical pathway for C-level executives to master the evolving complexities of global shipping.

The challenges facing the adoption of JIT port arrivals are not brushed aside; instead, they are dissected to underscore the urgency for collaborative action. Operational impediments, such as low visibility into terminal planning, communication gaps among port call participants, and data standardisation issues, are acknowledged as hurdles that demand industry-wide consensus. It is a rallying call for stakeholders to pivot towards data standardisation, eliminate silos, and embrace integrated solutions.

The white paper also doesn't shy away from the complexities of the global supply chain and the persistent congestion plaguing ports. Instead, it positions these challenges as opportunities for a multidimensional



Photos: PortXchange

approach that combines technological advancements with stakeholder cooperation. JIT port arrivals, from a theoretical ideal, become a tangible, actionable strategy through this collaborative perspective.

Port lens: bringing global emission targets into view

The reality is that ports aren't just logistic endpoints but the beating heart of global trade and a barometer of how world trade is fairing. These bustling sea-rail-road intersections are the ideal aggregates of critical data on emissions. Rather than pointing fingers at each other, maritime stakeholders would do well to place ports at the epicentre of emission data gathering to propel environmental change.

Changing the role of ports from 'transitional areas' to 'emission hubs' central to CO_2 reductions means tracking and analysing carbon footprints in and around the port so decision-makers can develop an actionable decarbonisation strategy. The white paper underscores the role of ports in achieving this, demonstrating how PortXchange EmissionInsider acts as a strategic partner on the journey to bring global emission targets into view.

By harnessing the power of data, the maritime industry opens fresh avenues for cutting emissions and discovering new revenue streams, such as green energy solutions and sustainable shipping practices. The digital solution's ability to measure vessel emissions within port boundaries is not just a technical feature; it's a tool for ports to develop actionable decarbonisation strategies. The pain points of ports, from the lack of frequent visibility into vessel emissions to the time-consuming manual creation of inventories, find relief in EmissionInsider. It is not just about reducing emissions; it's about providing ports with the means to swiftly make informed, data-driven decisions as needs change over the coming years.

Although initially perceived as distinct in purpose, PortXchange Synchronizer and EmissionInsider are like two players reinforcing each others' perks. The former aids in ensuring JIT arrivals, while the latter provides a visual representation of the environmental impact of optimised operations. The result is improved efficiency and sustainability – they represent the tangible outcomes of a strategic partnership that goes beyond the functionalities of individual solutions.

The future beckons

The white paper is not just an exposition of findings; it's a call to embrace change. As the maritime industry stands at a crossroads, the roadmap laid out in the document is a guide for transformation. The challenges outlined are not roadblocks but opportunities for innovation. The case studies, like the Genoa to Valencia (single $13k-saving!) voyage, serve as vivid illustrations of the consequences of not heeding JIT recommendations.

In conclusion, PortXchange's latest research is a comprehensive narrative. But it's not the end; it's the beginning of a journey towards a sustainable maritime future and one available to all (not only those with shoulders powerful enough to make a full zero-emission fuel switch). The call to action is clear – embrace sustainability, optimise operations, and steer towards a future where efficiency meets environmental responsibility. The journey is challenging, but the destination is a maritime industry that stands as a beacon for the future.

In this scenario, PortXchange Synchronizer and EmissionInsider are not just aids but guiding lights in the transformative seas of change. The imperative is evident: it's an appeal to embrace change and navigate the waters ahead with resilience and innovation. PortXchange Synchronizer and EmissionInsider aren't just solutions but partners in shaping a new era of maritime excellence. ■