S&P Global
Market Intelligence

# Ep. 184 - Sustainability at sea: Port performance and emissions

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# Presenters

**Kristen Hallam**

**Turloch Mooney**

# Presentation

**Operator**

You're listening to The Economics & Country Risk Podcast from S&P Global Market Intelligence. In each episode, our experts will provide you with the where, how and when to make decisions that transform your business.

**Kristen Hallam**

We all think of emissions when we're stuck in traffic, cars idling all around us. But how many of us think of ships waiting to get into busy ports? We may be stuck in road traffic for an hour, but ships can be waiting many hours to enter a port. What is the shipping industry doing to manage these wait times and get closer to their emissions targets and save money in the process?

I'm Kristen Hallam, Content Strategist at S&P Global Market Intelligence and your host for this episode of The Economics & Country Risk Podcast. With me to discuss shipping emissions and port performance is Turloch Mooney, a Director at S&P Global Market Intelligence. Welcome to the podcast, Turloch.

**Turloch Mooney**

Thank you, Kristen. Very nice to be here.

# Question and Answer

**Kristen Hallam**

Turloch, what percentage of global CO2 emissions is accounted for by international shipping?

**Turloch Mooney**

So there are different estimates for that. But organizations like, for example, the IMO, the UN, the European Commission puts international shipping at somewhere between 2% and 3% of global CO2 emissions, probably closer to 3%. And that doesn't seem like a huge percentage, but the rapid growth in demand for international shipping means maritime emissions are growing at a faster rate than most other sectors.

In 2021, for instance, we had a year-over-year growth in emissions of nearly 5%. The global port congestion we had that year was, of course, one of the main causes of that steep increase. If everything were to stay the same, given the growth in shipping demand, it could be responsible for as much as 15% or more of global emissions by 2050.

So the IMO targets are a reduction in carbon intensity of international shipping by 40% by 2030 compared with 2008 and a reduction in total annual greenhouse gas emissions of about 50% by 2050, again, compared with 2008 with a high-level target of 70% reduction. So that reduction is to come from a mix of design, operational and economic solutions and optimizing vessel speeds, which depends on better network and port call efficiency is largely an operational solution and would be one of the primary ways vessel operators are looking to improve at the moment.

**Kristen Hallam**

You mentioned port call efficiency there. Can you explain the concepts of port performance and port call optimization?

**Turloch Mooney**

Sure. In the context of emissions management, container port performance is the analysis of port efficiency with the primary goal of improving vessel turnaround times. One of the benefits of that on an individual vessel level is that it creates opportunities to optimize speed on ocean crossings in order to reduce fuel burn and emissions. And on a system-wide level, it supports more efficiency and predictability in the global liner network as a whole and the potential for a system-wide just-in-time vessel arrivals.

So vessel turnaround time would include the time it takes to complete things like vessel arrival and berthing processes, the start of cargo operations, the cargo loading and unloading, the processes around departure from the port and so on. So in port performance, you measure and track the time it takes to complete different parts of the port call process in order to reduce it. You're analyzing time to complete specific tasks, whether that be a quantity of moves or a particular segment of the port call process. You're comparing performance across time periods to track progress. You're comparing performance with industry averages or within certain geographies or with best-in-class operational processes somewhere else in the world. And you're doing that to spot the gaps and identify the opportunities to reduce vessel turnaround times.

Port call optimization then aims to develop and apply solutions based on those insights, reducing inefficiencies through process improvements, new technologies perhaps to make the vessel call as predictable and as timely as possible. A major part of that is collaboration and coordination of work across the many different stakeholders involved in port call processes and sharing the right data and information at the right time.

So the predictability of optimized port calls is an important foundation for efficient global liner scheduling and network operations with the ultimate aim of eventually getting to system-wide just-in-time vessel arrivals, the benefits of which would include substantially lower emissions.

**Kristen Hallam**

So let's connect the dots here. How do port performance and port call optimization relate to emissions management and emissions reduction?

**Turloch Mooney**

So reducing negative environmental impact is one of the biggest drivers of port call optimization. Optimizing port calls and just-in-time arrival of ships would be one of the key levers that the industry has to tackle and control emissions. That reduction comes in large part from opportunities for vessel operators to use time saved in port and more predictable port operations in general to control speeds, to reduce fuel burn and consequently reduce emissions as well.

Conversely, when you have very inefficient port call processes with things like chronic delays, excessive time spent waiting for berths, very low levels of berth productivity and so on, you have situations where vessels may need to increase speed to try and maintain schedules, which results in increased fuel consumption and emissions. And then things like service recoveries can involve significantly higher sailing speeds and, consequently, again, much higher fuel consumption and emissions.

**Kristen Hallam**

What is the potential for improvement here? In other words, can we quantify the level of inefficiency in the system today?

**Turloch Mooney**

Yes, sure, there's a lot of room for improvement. There's no question that it's a very big opportunity, and we can quantify it to a certain extent. Global container shipping schedule reliability is currently at around 65% on-time arrivals, and that's based on quite a generous definition of on-time as being arrival 1 full day either side of the published schedule.

During COVID, when we had the global port congestion, schedule reliability was probably as low as 30% or 35%. And you can link a wasted hour in port to a certain number of metric tons of bunker or fuel and associated costs and emissions. And that's something we'll likely see quite a bit more of as the industry increasingly tracks this as it works to meet those emissions reduction targets.

So in our global port performance data set, if we take 2022 as an example, we saw global average 30% of vessels' port time was spent on what we call the arrival process. And that's about 11 hours per port call of that process. 3 hours is the average for the vessel to steam in, so to get from the port limits to the berth, which is, of course, necessary time. It's necessary for the vessel to steam in. But the other 8 hours is purely waiting time, which many would quite brightly see as avoidable waste. That's an average 8 hours for every port call, and it would be much more than that at certain quite inefficient ports globally.

You also have other parts of the process where we can see and track a lot of waste, for example, what we would refer to as the start-up and finish processes can also be a major source of waste. Start-up would be from when the vessel arrives at berth to the start of cargo operations. And global best practice for that is about 20 minutes. But at some terminals, ships can routinely be alongside for 3 or 4 hours before the cargo operations even begin. So no question, it's a very big opportunity for the industry and really a key lever to tackle emissions.

**Kristen Hallam**

These are some serious-sounding delays, hours when it should be about 20 minutes. This sounds like areas that are ripe for improvement, I guess, we could say?

**Turloch Mooney**

Indeed, very much, there's a lot of waste in the processes at the moment really right across the port calls. And scope for improvement even at really very efficient ports globally, there's quite a lot of scope for improvement. So the waste is really caused by a number of factors. You have behavioral and procedural causes. You have static processes in many cases with a very limited focus on measuring and analyzing port performance and proactively working on improvements.

So if we were to continue with the start-up process, for example, as I mentioned, this is the process from when the vessel arrives at the berth to the commencement of the cargo operations, in our port performance data, we can see at certain very efficient ports, places like Salalah in the Middle East, Tanjung Pelepas in Malaysia, this can be done in under 20 minutes. But in many ports, ships can be sitting for several hours before the vessel loading and unloading actually begins.

So to do it well, you need the terminal and the ship to be ready and well-drilled. You need a game plan, great supervision, things like boarding the cranes as soon as possible, knowing where to find the gearboxes, having the required checks from local authorities completed as quickly as possible. And globally, on average, we're losing about 40 minutes per call on this activity, and it's just one part of the overall port call process. And that's, of course, time that could be reinvested into the next leg of the journey and used, for example, to optimize vessel speeds and, therefore, reduce fuel burn and reduce emissions.

And when it comes to waste more generally, a big cause would be the absence of shared information, which I mentioned earlier as a significant issue here. It's really lack of good quality data and an underdeveloped culture for sharing of data and being transparent in operations in order to realize efficiency gains. The good news is these are being improved upon all the time. Data quality is getting much better. Lack of standards for sharing data has been an issue. But now in the case of port call optimization, for example, the standards are actually there. And it's more about applying them and developing the technical foundation and also the culture to work together for improvements.

So the digitization of the industry is really key when we're talking about better efficiency moving towards just-in-time arrival processes and all of the benefits of that. You would also have other causes of waste in the system, some of which are maybe a little harder to address. Poor physical infrastructure can be a problem. So clearly, you need funding to correct that and build better, more modern infrastructure, better technologies, et cetera. Extreme weather events could also be a significant cause of waste in certain regions as well. So a lot of waste and multiple reasons for it.

**Kristen Hallam**

That's quite a list of causes of waste in the system. Given all the things that you've just shared with us, do you think just-in-time port calls will ever become the norm in the industry? Is that something that's really achievable, Turloch?

**Turloch Mooney**

Yes, it's certainly seen as a very tough initiative for the industry to achieve, but equally something that would have a very big impact on the sustainability side and general image of container shipping globally as well in terms of better customer service and that kind of thing. So as we've been discussing, we need to see big improvements in the operational transparency between the different stakeholders in the port call ecosystem, if you want to call it that. This enables better resource planning, process coordination, and therefore, you can reduce idle time and cut out that waste.

And the digitization of the industry is probably the most important requirement for this. Port operations are very complex. They produce very large amounts of data. Digitization is needed really to ensure these data are recorded and utilized effectively. It improves access to critical information, which in turn drives better collaboration, better synchronization of efforts. Decision-making is better, which improves overall efficiency and gives you the capability to address problems better in a dynamic way and this kind of thing.

One important foundation of digitization is the development of standards, and we are certainly seeing a lot of work in this area currently by organizations such as the Digital Container Shipping Association, for example. But there also needs to

be a mindset change that supports collaboration. Sharing of information, there can still be reluctance, of course, to do that; more transparency between the participants in the various processes.

So you need good quality data. You need to be able to accurately measure what's going on in a globally standardized way and then the capability to compare performance to spot those problem areas and the opportunities for improvement and then track that progress and make it a continuous improvement process. So the industry definitely has some way to go to get there, but the building blocks are being put in place. And although it's undeniably really quite different, certainly very achievable.

**Kristen Hallam**

That was an important point you made about having a change mindset, a growth mindset. And I feel like we could probably have a whole separate podcast episode about digitization. I have some questions I'd love to ask you about that, but we should probably stay on target talking about emissions.

So we've discussed the benefits for reducing industry emissions, not least of which just improve sustainability. But what are some of the other benefits of tracking port performance to optimize port calls and moving towards just-in-time shipping?

**Turloch Mooney**

Yes, definitely looking at digitization in more depth, there are so many aspects to that. It would be a very interesting podcast, for sure. But to address your other question and stay on track, yes, the more predictable operations, when you have more available and actionable and timely information also, of course, means increased safety. So you have higher levels of predictability which improves levels of safety, which is always a concern in the shipping industry and something the industry is always very strongly focused on. So that would certainly be another important benefit.

And then we touched on this a little bit, I think better customer experience for, say, the end users of shipping services is another big benefit, like cargo owners, traders, consumers as well. When you have better schedule integrity, more predictable and timely arrival of vessels and the shipments they're carrying, that's very good for supply chains. It reduces the potential for supply chain disruption.

Shipping liner services are actually set up like bus services or train services. They run on weekly frequencies through fixed rotations of ports. But right now, as we discussed a little bit earlier, the system isn't really delivering the predictability and reliability that this model is supposed to deliver. This is something governments and consumers as well became very aware of over the past few years after the pandemic triggered the global port congestion and then the heavy disruption that we saw to supply chains.

So there's a very direct relationship between port delays and congestion and delays in supply chains and, conversely, a clear link between efficient gateway ports and terminals and efficient supply chains. So the supply chain benefits and the reduced risks for the global trading economy are also very evident from this.

**Kristen Hallam**

I think we have all had our share of supply chain disruptions over the past couple of years. Speaking for myself, I'm all for reducing those, especially as we approach the holiday season here. It's a busy one.

**Turloch Mooney**

Absolutely.

**Kristen Hallam**

So Turloch, what would you say are the top takeaways for our listeners today?

**Turloch Mooney**

Top takeaways: reducing maritime emissions, clearly an important part of global emissions reduction, especially when you consider the rapid growth of the sector and the potential for delays and congestion, especially what we saw over the past couple of years. Making global liner operations more efficient, particularly port calls, making everything more timely and predictable is one of the very important levers to do that.

To achieve it, we need to see more focus on performance, including measuring, tracking, benchmarking port call processes to identify those efficiency gaps and the opportunities for improvement and then develop the technical and the process solutions to make efficiency improvements on a global scale.

And then digitization, industry digitization is really central in all of this for things like collation and sharing of data and information at the right time for better decision-making, better collaboration, better coordination of efforts between the different stakeholders. Definitely very challenging to get to things like system-wide just-in-time vessel arrivals, but the building blocks are being put in place. That's the good news and certainly very achievable.

**Kristen Hallam**

Thank you so much, Turloch, for illuminating these topics for us. And thanks to you, our listeners, for joining us. Let us know what topics you want to cover by interacting with us on the S&P Global Market Intelligence social media handles. And join us next week when our Purchasing Managers' Index team will share fresh data and insights from their surveys.

**Turloch Mooney**

Thank you very much, Kristen.

**Operator**

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