GLOBAL MARITIME FORUM

INSIGHT BRIEF

Legal and contractual changes to enable operational efficiency

Global Maritime Forum Short Term Actions Taskforce

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Authors

Randall Krantz
Senior Advisor on Shipping Decarbonisation
Global Maritime Forum

Ludovic Laffineur
Project Advisor on Shipping Decarbonisation
Global Maritime Forum

Lena Faber
Project Assistant
Global Maritime Forum

Contributors

Nishatabbas Rehmatulla
UMAS

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What are the legal implications of operational efficiency, and how can the inefficient artefacts of shipping contracts be phased out while driving uptake of specific clauses that encourage the transparency, cooperation, and benefit sharing that allow for more efficient operation of ships?

This paper explores this question as part of a series that examines the undervalued opportunity presented by operational efficiencies to reduce shipping emissions in the short term and pave the way for long-term decarbonisation solutions. The learnings presented here have emerged from a series of meetings and workshops gathering perspectives from experts across the maritime value chain—shipowners, operators, charterers, ports, and NGOs—as part of the Short Term Actions Taskforce. Other papers in the series provide an overview of the issue, and dive deeper into the identified solutions and enablers: the role of data, and the role of pilots.

1. Introduction

Speed optimisation is one of the most effective short-term operational measures to cut down on shipping's greenhouse gas emissions. However, vessels have not historically had the right incentives to optimise their speed—in fact, the opposite is often true. In the days when vessels sailed under wind power and there was no way to track their position from shore, captains were given the incentive to sail as fast as possible, referred to as "utmost despatch", so that cargo could be delivered quickly. There was no way of knowing where a vessel was once out of sight of shore, and from the vessel there was no way of knowing how crowded a port might be. The distances covered and the isolated nature of the open sea created a historic emphasis on legal structures as an important part of the fabric of shipping.

With advances in satellite communications, GPS, vessel tracking using automatic identification system (AIS) data, route and weather optimisation software, and other digital technologies, there is now more than enough data to predict vessel progress and arrival with a great degree of accuracy. While the operational inefficiencies caused by a lack of information are no longer necessary, the contracts that govern the industry have evolved to lock in many of the inefficiencies they were initially designed to eliminate. Over time, shipping contracts have developed sophisticated mechanisms for allocating the financial cost of operational inefficiencies to shipowners or charterers (or buyers or sellers of cargo) through a range of contractual mechanisms: demurrage, laycan, speed warranties, etc. (see Glossary in annex).

This paper will focus on the legal/contractual challenges for speed optimisation but there are other legal/contractual challenges that impact implementation of other energy efficiency operational measures, e.g. hull cleaning, trim draft optimisation, and weather routing. Those will be covered at a later stage.

2. Deep Dive - Just-in-time arrival and virtual arrival

Today, the entire edifice of international maritime trade (including the sale contracts and the letter of credit) is made up of building blocks that comprise contractual norms that drive inefficiency, the core of which is often more than a century old. In order to prioritise operational efficiencies, many of these building blocks must be carefully disassembled, all without collapsing the core contractual architecture upon which contracts are built. To do this, we must first understand why things are the way they are.

One only has to check an AIS tracking platform[1] to see that there are countless ships at anchor close to ports waiting—often for days or weeks—to be loaded or unloaded. Port congestion is a well-known phenomenon and can be seen on the horizon close to ports around the world. There are ways to avoid this but they require reliable and efficient data exchanges between ship and shore as well as enhanced slot allocation policies, thereby optimising voyages and port calls and facilitating the just-in-time (JIT) arrival of a ship.

According to the Just In Time Arrival Guide of the International Maritime Organization's (IMO) Global Industry Alliance, the concept of JIT arrival of ships allows for ships to optimise their speed during the voyage in order to arrive at the Pilot Boarding Place (PBP)[2] when the availability of berth, fairway and nautical services is ensured.[3] Since JIT arrival allows a ship to adjust and optimise its speed during the voyage, it presents an immediate opportunity for ships to reduce emissions and save operating expenditures from fuel.

In recent years, charterers and shipping companies have tried to implement JIT arrivals with the help of the 'virtual arrival system'. In 2009, BP Shipping pioneered virtual arrival (VA) with Maersk Tankers on the tanker Bro Elizabeth. In the voyage charterparty the two parties included a VA clause. When it became evident that the oil terminal could not accommodate the tanker at the originally expected time, the clause enabled the ship to slow down and postpone arrival by 27 hours. Under this arrangement, the vessel was deemed to have arrived 'virtually' at the originally agreed time. This allowed the shipowner to earn demurrage from the charterer for the longer-than-expected use of the ship. A third-party weather routing service verified the updated schedule and route.[4]

While JIT arrival is a general principle, VA is a concept that involves digital information exchange between a ship and shore. If a VA clause is added to the contract, the benefits can be shared by both parties. JIT and VA can easily be confused and are differentiated by the issuance of a Notice of Readiness (NOR). VArequires the NOR to be accepted by the port while the vessel is still en route, while JIT arrival requires a physical NOR at a designated point and implies the owner doesn't get demurrage. VA, therefore, involves an agreement to reduce a vessel's speed during a voyage to meet a required time of arrival when there is a known delay at the discharge port. This concept uses digitalisation to make all parties acutely aware of the optimal arrival time and a legal clause to share the benefits of fuel savings.

3. Barriers to speed optimisation

Speed optimisation, including the uptake and use of VA clauses to allow vessels to preemptively adjust their speed to arrive just in time and reduce waiting times at port has shown promise for years but has seen little uptake. Conversations with industry leaders have yielded several barriers to speed optimisation from a legal perspective.

a. Utmost despatch

The failure to optimise speed is often driven by pressure from customers and contractual chartering arrangements, through which a cost for one party becomes a profit opportunity for the other. For example, voyage charters incentivise vessels to "Steam Fast Then Wait" (SFTW) or 'utmost despatch', earning demurrage to compensate the shipowner for the consequences of the delay, without regard for the conditions at the port or for other ships sailing to the same destination. The majority of the voyage charterparties contain utmost despatch clauses. Under time charterparties, the charterers are responsible for providing and paying for the fuel, often leading to a disincentive for the owners to optimise the operation so long as they're not in breach of the speed and fuel consumption guarantee. Of course it's not so simplistic, and optimisation will depend on the agreed fuel consumption guarantee. If an owner has overstated the performance to get the charter, they have an incentive to optimise. The behaviour of shipowners will also depend on the state of the market, and there is evidence that shipowners engage in strategic behaviour by quoting warranted speed and fuel consumption in time charter contracts that reflect the development of the market.[5]

b. Misalignment between contracts and split incentives

The maritime supply chain is operating within a web of contracts, which is a major challenge for the broader uptake of efficiency measures on a larger scale. Head contracts for the sale of goods have an influence on charterparty contracts, and the terms set by the terminals cascade into the contracts further down the supply chain. The freight contracts that dictate the shipping of goods are independent of the commodity contracts and have different terms. It has become clear through conversations with stakeholders that amending contracts at multiple levels, or fundamentally shifting contractual architectures, will be necessary to maximise efficiency.

Several of the large charterers involved in this work have tracked instances in a given year in which vessels were able to slow down, and these numbers represent only a small percentage out of hundreds of voyages. Also, because existing contractual clauses are bilateral, any change requires that the whole supply chain be included, not only charterparties. Any new contracting architecture to optimise speed through VA should be aligned with other

contracts, e.g. commodity sale contracts, and include other stakeholders within the supply chain, e.g. ports.

A VA clause with a benefit-sharing option will not be invoked if the commodity contract or the terminal operator specifies a different laycan window. Identifying and delivering on the full potential of speed optimisation will require unprecedented engagement across the whole supply chain beyond charterparties. It was learned from industry input that amending contracts even within the same company faces many challenges, which highlights the obstacles to amend contracts in a multi-party setting.

c. Low uptake of VA and virtual NOR

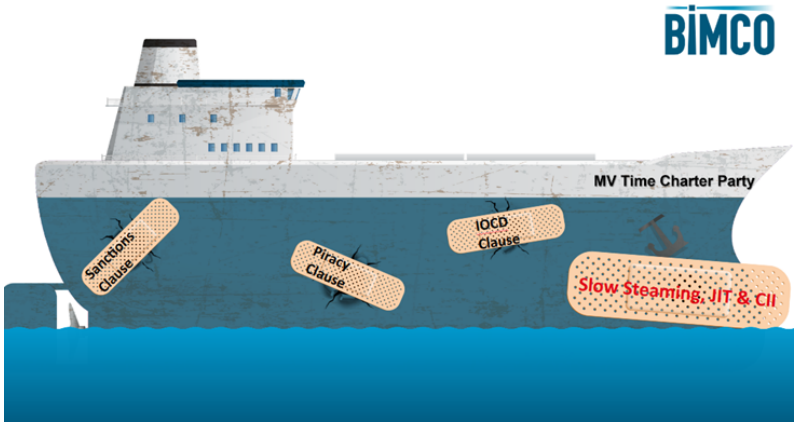
There are several barriers to increasing uptake of VA clauses, the most important being the split incentive, where the costs of energy efficiency are incurred by one party but the benefits accrue to another, and the contractual architecture that is strongly linked to this does not allow for broader uptake. Lack of reliable information and transparency across the value chain on potential costs and fuel (or emissions) savings is one of the reasons that the VA policy is seldom implemented. Research indicates that the major obstacles to port call optimization lie in maritime logistics' organisational and behavioural aspects, not in digitisation technology, so technology is not the main bottleneck for implementing VA.[6] In the cases examined by the Short Term Actions Taskforce, VAclauses have only been used when the receiving party is the same company as the charterer. For uptake of VA between a third-party receiver and a charterer, they would need to have an extra agreement.

VA does not necessarily only need to work if the charterer is also the receiver, as there are also ports that have mandated VA or are exploring it. The Port of Newcastle has put this theory into practice and commenced to manage coal vessel movements and anchorage under the Vessel Arrival System (VAS), which optimises the ship's speed prior to arrival by issuing a NOR seven days in advance. Any measure that effectively controls congestion and reduces the number of ships waiting at anchor in the queue also reduces the risks to the ships, the port, and the environment. In this case, the involvement of players along the entire chain enabled better connectivity and reduced uncertainty, yielding smoother operations for the terminal and vessels involved.

A vessel's speed and fuel consumption will often be a part of the standard charterparty form, resulting in inflexible speed ranges. If the speed is not defined in the standard charterparty, it will be a part of the vessel's description clause or a more specific performance clause in the rider. Owners frequently undertake that the vessel is capable of a certain performance throughout the charterparty period. Sometimes owners guarantee that the vessel will achieve a certain speed or bunker consumption. Changing the speed (restriction) range in charterparties by even +/- 0.5 knots could significantly improve vessel efficiency.

d. A patchwork of clauses

One additional challenge to changing contracts and clauses is that base contracts have been around for a long time and are not frequently revised. New York Produce Exchange charterparty 1946 (NYPE 46) is probably the most widely-used time charterparty form. Contracts therefore contain clauses designed to address specific challenges that might arise, such as war risks, cyber security, etc., which are then used as add-ons to the contracts. Over the past decade, we have increasingly seen that some of these clauses are not used as add-ons but are rather changing the underlying principles of the contract. In a presentation by BIMCO, this behaviour was compared to patching a ship's holes with plasters, as it often ends up creating much more complex agreements and some clauses can even be contradicting within a charterparty. It was suggested that it is perhaps time to move beyond add-on clauses and look at a new form of contract that takes on the learnings of some of the clauses and better reflects the changing needs of the industry. It might be time for a completely new contractual architecture.



e. Sectoral differences

While in principle there is no great difference contractually between tanker and dry bulk shipping contracts, in the wet bulk sector there is a greater scrutiny on the performance and accuracy of the ship than is seen in dry cargo. The big difference is that the oil industry has established a vetting inspection system that is a grading system of a ship, enabling a potential charterer to compare similar ships and choose the best for the voyage's needs and to maximise efficiency. This extends to oil major voyage charterparties for which the speed the vessel should maintain is often dictated. Despite this oversight, and because commodities are often traded while the vessel is at sea, the destination might change mid-voyage. For wet and bulk time charterparties, the differences are fewer and the basis is essentially the same.

The only known cases where VA clauses have been used are in the wet bulk segment, with no known cases in the dry bulk sector. There are more barriers in the dry bulk market that impede the implementation of on time arrival and virtual notice of readiness (NOR). Charterers that have full control (e.g. owning both cargo and terminals) will likely be the ones to succeed in using VA clauses, as they can more easily overcome the practical obstacles across business units.

Some charterers have started to look at the types of commodity for which VA could work. Tendering a virtual NOR is complicated, especially when it comes to grain, which requires a certain treatment and vessel preparation (e.g. clean cargo holds). It is also important to discuss who controls the loading and unloading (disport). Sometimes it is the receiver, but sometimes it is the port that dictates when the vessel should unload. Further, it is very important to consider how on-time arrival could impact underlying commodity contracts in the bulk segment. Speed changes may interfere with the base commodity contracts dictating the sale, such as GAFTA, ANEC, FOSFA, or NAEGA.[7] As commodity contracts are agreed upon well in advance and signed for a period of around two years, those will need to be revised in a timely manner and renegotiated in order to implement VA clauses. It should also be noted that VA is mainly applicable to spot/voyage charters, which are prevalent in the tanker/wet bulk sector (~90%), whereas the dry bulk sector which has a higher proportion (~60%) of time charters.[8]

Many of the voyage charterparties in the dry bulk sector contain more restrictive clauses on where and when NOR can be tendered compared to the tanker sector, which consequently has an impact on the speed optimisation or incentivises a SFTW approach. Dry bulk charterparties tend to allow tendering of NOR in specific times only. For example, Synacomex charterparty standard terms require owners to tender NOR between 0800-1700 on weekdays and Saturdays between 0800-1200, while Sundays and holidays are excluded. Perhaps one of the reasons for the sectoral differences is the port operation times, as tanker terminals generally operate throughout the day. Similarly, tanker charterparties tend to allow tendering of NOR when a vessel reaches a port boundary, whereas most dry bulk charterparties require the vessel to be 'at-berth' creating even more incentives for SFTW.

4. Enablers

Clauses that try to alleviate split incentives by sharing the benefits and costs more equally, for example through VA (fuel cost savings made from slowing down are split into fuel savings for the charterer and demurrage compensation for the shipowner), have been tested between cargo owners and ship-owners with success, but with very little uptake. One of the lessons from a series of hindcast pilots coordinated by the Short Term Actions Taskforce has been that virtual arrival currently only takes place when the charterer and receiver are the same company, e.g. when a charterer is shipping a commodity to a terminal that they operate. From the experience of companies engaged in the Taskforce, it was noted that, with higher pressure to reduce emissions (for example scope 3 emissions and their reporting, e.g in the case of BP as described in the **Insight Brief on Pilots**), there will be increasing pressure on ports to accept virtual NOR.

When executed, these clauses have led to significant savings. Embedding benefit-sharing clauses as part of the VA clauses into all contracts is one recommendation. The widespread use of benefit sharing would enable broader uptake, however, such bilateral clauses do not fully solve the issue. In order to facilitate on-time arrival with the least impact on current clauses, ports would need to accept issuing a virtual NOR several days in advance. With support from port authorities, it might not be necessary for the charterer and receiver to be the same company to make VA work in the future; for example, the Port of Rotterdam and Port of Newcastle have successfully trialled and operated VA systems.

The bigger solution will require unprecedented engagement across the whole supply chain beyond charterparties and multilateral contracts. In the long term, there is a need for new business models and a new contractual architecture to support them. (This will be explored in more detail in a future Insight Brief.)

The emergence of green corridors—shipping routes that support zero-emission solutions—may provide the testing grounds for such new contracts, as the legal frameworks for such corridors will need to be built from the ground up. Efficiency measures must be built into the contractual architecture for green corridors, as wasting 20% of the (initially) much more expensive zero-emission fuels will not be in the interest of any party involved. Such changes to the contractual architectures, however, are not short-term actions, but rather fundamental industry changes that will require long-term commitment, dedication, and collective action. Nevertheless, any insights gained from improvements in operational efficiency in the short term will be useful learnings for the broader long-term changes towards decarbonisation.

a. Embedding clauses for speed optimisation

Currently, there is no widely-used industry standard clause for VA that is included by default in the charterparty and widely accepted by all parties. On the contrary, several different clauses exist. For example, BIMCO has published a Virtual Arrival Clause for Voyage Charter Parties[9] and shipping companies have developed their own clauses for JIT arrival implementation that differ from the BIMCO clauses (e.g. SHELLVOY6[10] and BPVOY4[11]). Because there is limited application of JIT and parties do not understand the liabilities it could potentially impose, sales contracts could take longer to agree until the practice is normalised.

Several VA clauses are found in the Annex, and closer examination shows that they have some key differences, especially when it comes to benefit sharing. The BIMCO VA clause states that "extra time shall be compensated by the Charterers to the Owners at USD ___ per day pro rata or as otherwise agreed by the parties which shall take into account the savings in fuel by the Owners and shall be payable by the Charterers to the Owners, prior to completion of final discharge." This means that the clause accounts for time compensation, but not fuel savings.

On the other hand, the BP VA clause states very clearly that "any bunker cost savings arising from Charterers' instructions under this Clause (calculated by the Routeing Company) will be shared equally between Owners and Charterers." By including a clear and concise mention of benefit sharing in the VA clause, both charterer and owner have an incentive to invoke the clause and see the reward it can generate. This type of VA benefit sharing should be included by default in all voyage charter contracts.

b. Other clauses to encourage operational efficiency

The Chancery Lane Project, a global network of lawyers and business leaders, has been working across multiple industries to create contractual clauses to encourage decarbonisation. Following a series of workshops with

industry representatives, shipping industry law firms, and industry experts, several clauses were drafted specifically for the shipping industry and published in 2021.

An "Energy Efficiency in Shipping" clause outlines a contractual duty in charterparties for both parties (charterers and owners) to take all reasonable steps to maximise energy efficiency. Its aim is to put in place contractual mechanisms that incentivise and drive the use of zero-emission fuel and energy efficiency in shipping with corresponding reductions in greenhouse gas (GHG) emissions. The clause explicitly highlights the role of charterparty cooperation to promote the fuel-efficient operation of the vessel, "such as collaborating with respect to weather routing, speed optimisation, and other measures as proposed by the EEOI Guidelines" and "cooperating and liaising with relevant third parties such as port operators, agents and cargo interests in order to maximise fuel efficiency". The clause also highlights the role of reporting and disclosure of Energy Efficiency Operational Indicator (EEOI) information and introduces the concept of a "Fuel Efficiency Fee".

A "Fuel Reporting Clause for Shipping Charterparties" is designed to be inserted as a rider to time and/or voyage charterparties combining 'green' fuel use, reporting and disclosure obligations with a levy for using fuels with a higher carbon content. As shipping companies start to sign up to stringent decarbonization targets and as regulation on decarbonisation increases, this clause may become increasingly useful. Even without requirements for zero-emission fuels, the clause mandates that owners and charterers "maximise the operational efficiency of the Vessel, thereby reducing the EEOI of the vessel, by deploying operational measures including but not limited to: slow steaming, virtual arrival, weather routing, trim/draft optimisation, autopilot adjustments, auxiliary engine optimisation, and hull and propeller maintenance." Perhaps most importantly, the clause requires owners to submit a comprehensive report of fuel consumption and charterers to calculate the vessel's EEOI for that voyage (or an agreed number of voyages).

One final example is a clause on "Maximising the Laden Ratio of Vessels in Shipping Charterparties", which is a charterparty clause encouraging the parties to consider opportunities and cooperate to maximise the laden ratio of the vessel and minimise repositioning voyages in ballast during the charter period. This clause promotes more efficient (and therefore more cost-effective) use of a vessel, facilitates cooperative dialogue between owners and charterers, and could open up additional employment opportunities for the vessel.

c. Covering the whole supply chain

There is increasing awareness of the important role of ports in the wider supply chain and the action that ports can take to facilitate the reduction of GHG emissions from shipping. This has been recognised through the adoption of IMO resolution MEPC.323(74), in May 2019, which encourages voluntary cooperation between the port and shipping sectors to contribute to reducing GHG emissions from ships. The resolution also invites IMO Member States to facilitate, among others, actions that support the industry's collective efforts to improve the quality and availability of data and develop necessary global digital data standards that would allow reliable and efficient data exchange between ship and shore as well as enhanced slot allocation policies that optimise voyages and port calls and facilitate JIT arrival of ships.

The Global Industry Alliance of the IMO has come up with some recommendations on what needs to be done contractually focussing on the contractual barriers related to ships that operate under a voyage charter. They recommend adapting charterparties to allow the vessel to arrive at the requested time of arrival at the pilot boarding place (RTA PBP) whilst tendering her NOR at the time that she would have arrived had she proceeded on voyage at full speed using due despatch (virtual arrival) and physically arrived at the PBP. They also recommend splitting the fuel savings between the terminal (in addition to the shipowner and charterer) so that all three parties receive an equal share of the fuel saved through JIT arrival. This would require a crosscheck and adjustment of the entire contractual chain.

Virtual arrangements such as those developed by the Port of Newcastle would very much help. The Port of Rotterdam performed a desktop trial in JIT ship operations which yielded positive results, showing emissions can be cut considerably. These results show the significant fuel and emission savings that can be achieved through JIT, even when a relatively advanced port is called by relatively efficiently-operated ships.

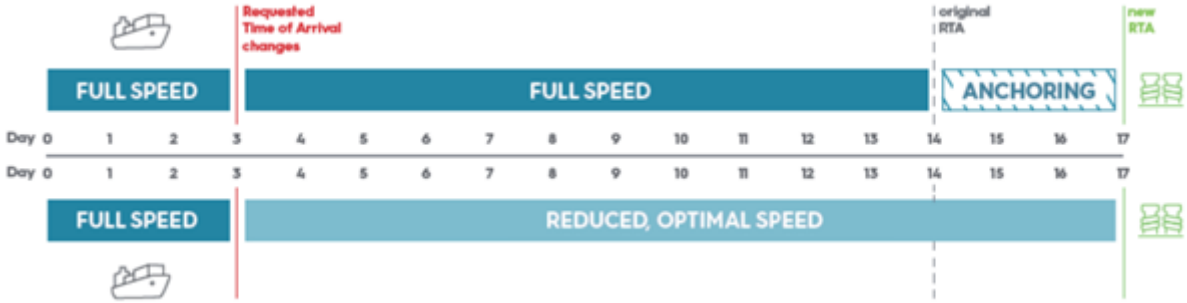


Figure 1: Today's operation vs. JIT Arrival[12]

d. Use of weather routeing

Many ship operators may choose to speed up during the early stages of a voyage in order to produce a buffer time in anticipation of unexpected bad weather in the later stages of the voyage, or simply to ensure a safe passage by avoiding a storm. Selecting ship routes that take weather conditions into account, referred to as weather routing, is conducive to not only improving shipping efficiency and reducing accompanying risks, but also allows more precision in predicting the ship's estimated time of arrival (ETA) at the destination port. This leads to greater reliability in planning port operations, ship maintenance and repairs, and reduces demurrage expenses.[13]

Weather routing services now provide much more information than merely making the ship avoid bad weather, and frequently include routing, bunker and speed optimisation, all of which can reduce costs. Weather routing should result in a reduction of travel time or avoiding rough weather conditions, which may or may not benefit the shipowner. Reduced travel time and smoother sailing both leading to lower fuel consumption, which benefits the charterer.[14] Since these benefits may not be balanced, there is an opportunity for benefit sharing between charterer and owner. As a result, it is advisable that weather routing should be used both in time charters and voyage charters under all circumstances, and that a benefit sharing clause be used to ensure that both parties have incentives to optimise the voyage.

e. Additional drivers to speed optimisation for further exploration

By applying a new level of data accuracy, it should also possible to reduce the inefficiencies within time-charter contracts through the use of a 'continuous' performance guarantee rather than the conventional fixed/static performance guarantee. A new technology using radar to measure more accurate speed through water on a continuous basis has been developed,[15] which will lead to more trust and transparency between both parties. This is very important (and helpful) as it gives the charterer much more data to optimise performance instead of just a single threshold to see over/under performance, enabling significant cost efficiencies to vessels. This will in turn incentivise charterers to charter-in those vessels, and incentives owners to upgrade vessels as they will be paid for actually accurately-measured performance.

One possibility that emerged from conversations among stakeholders was to expand the allowable speed range in charterparty contracts to allow for slower speeds when possible. If the typical speed ranges were to be expanded by +/- 1 knot, this would allow routeing companies to have a broader range of speed options available for optimisation. In order for such a clause to be used, it would be dependent on having better data, including continuous monitoring of speed and fuel consumption. The role of data in enabling speed optimisation is explored more in an **Insight Brief on data and standards**. This type of contractual change could be enacted independently of the above enablers.

Many opportunities for optimisation build on trust between charterparties and long-term relationships from repeat business and locked in through charterparties. There are, however, opportunities for contractual changes in the spot market. Charterers could explore the use of emissions targets embedded in the chartering process, from pre-fixture through conclusion of the voyage, thereby adding an emissions element to the current chartering process.

For spot cargoes, this would mean that charterers set an emissions target prior to entering the market, and owners are asked to include expected emissions with their offers. Once a ship is fixed, then emissions data from a performing vessel need to be collected and validated, and any major deviation from the target documented. This additional level of emissions transparency would put emissions into the decision-making process alongside costs.

5. Conclusion and further areas of exploration

While this paper touches upon many issues with regards to legal changes to maximise operational efficiency in shipping, there are many more opportunities to be explored. Generally, in order to start improving the contractual landscape, it could be helpful to connect the right partners for a stock-taking exercise of the current contracts within bulk segments across the whole supply chain, connecting banks, insurers, shipowners, charterers, cargo owners, terminals, ports, etc.

Firstly, it would be important to get a better understanding of how to get more from existing clauses within the current contractual architecture, such as optimisation clauses, warranted speed clauses, VA clauses and others. What are the measures or commitments that could incentivise a broader uptake of these or even mandate performance-enhancing programmes by the shipowners? Secondly, it is important to look at other possibilities to improve the legal architecture, such as different contractual arrangements for benefit sharing. Thirdly, there is a need to get a deeper understanding of how commodity contracts and trading desks influence charterparty contracts and how the terms set by terminals cascade into contracts further down the supply chain.

One element not visited in this paper is the potential of green corridors, which must be recognised as a test bed for new clauses and contracts that prioritise operational (and technical) efficiency. As green corridors require new contracts in the first place, they can provide the bridge from outdated practices to contracts that are fit for the future of shipping and therefore enable important operational efficiency measures. Also, as many current barriers to operational efficiency emerge from spot trading, green corridors can help overcome these barriers by introducing more predictability and time charters where they previously did not exist in bulk sectors.

While these are all areas for further exploration, owners, charterers, and terminal operators should, in the meantime, commit to acting on the win-win opportunities that are available now. To start with, there already exist many clauses that are either not used in contracts or don't get significant uptake. This must change and companies should explore the possibility of adopting existing clauses that can help improve operational efficiencies. For example, companies can take the following actions to

- Use VA clauses with benefit sharing mechanisms as the default setting in all standard form charterparties, and commit to actively seek opportunities to invoke these clauses.
- Implement agreements to enable virtual notice of readiness (NOR) and engage with ports and terminals to activate these.
- Change speed and performance optimisation clauses to allow for more efficient operation, including broadening the contractual speed range to allow for more efficient speeds where allowable.
- Embed emissions targets in the chartering process, from pre-fixture throughout the conclusion of the voyage.

Uptake of these clauses and actions will help advance operational efficiency, but as noted, many are patches on an inefficient system based on outdated contracts. Therefore, in parallel to increasing uptake of efficiency clauses, there is a longer term need for a whole new contractual architecture, introducing industry-wide changes such as the idea of "air traffic control" for shipping. These ideas for broader and more structural changes to the contractual architecture require active engagement from companies and regulators, and will be the subject of a future paper.

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Annex 1: Glossary

Charterparty: Contract by which the owner of a ship lets it to others for use in transporting a cargo. The shipowner continues to control the navigation and management of the vessel, but its carrying capacity is engaged by the charterer.

Demurrage: A charge payable to the owner of a chartered ship on failure to load or discharge the ship within the time agreed. It refers to the time that a shipowner has lost because the charterer could not complete required cargo operations within an agreed time frame.

Just-in-time (JIT) arrival: Allows for ships to optimise their speed during the voyage in order to arrive at the Pilot Boarding Place (PBP) when the availability of berth, fairway and nautical services is ensured. It smooths out the energy-inefficient moving parts of a voyage.

Laycan window: A period designated by the terminal which defines the earliest day a vessel may tender a Notice of Readiness (NOR) and the last day after which the terminal is not required to accept a NOR.

Notice of Readiness (NOR): A document issued by the captain of a ship to showcase readiness for loading or unloading goods from/into his ship. This is traditionally issued upon arrival at port.

Pilot Boarding Place (PBP): A location offshore where a pilot, usually employed by the local port or maritime administration, may board a vessel in preparation to piloting it through local waters.

Service speed: The average speed maintained by a ship under normal load and weather conditions, which is a factor of vessel design and engine power.

Slow steaming: Deliberately operating a vessel at an average speed that is below its service speed to cut down fuel consumption and carbon emissions.

Steam fast then wait (SFTW): When vessels sail at their normal service speed without regard for the conditions at the port or for other ships sailing to the same destination.

Time charter equivalent (TCE): A measure used to calculate the average daily revenue performance of a vessel, defined as the gross freight income minus voyage costs (fuel, port, and canal charges) divided by the round-trip voyage duration in days. This is relevant to the subject of speed optimisation because the aim of the chartering desks is to maximise a ship's time charter equivalent without regard to emissions.

Utmost Despatch: This means that the vessel must either proceed "forthwith" at the date of the charter or "within a reasonable time".

Virtual Arrival: A process that involves an agreement to reduce a vessel's speed during a voyage to meet a required time of arrival when there is a known delay at the discharge port. This concept uses digitalisation to make all parties acutely aware of the optimal arrival time and share the benefits and requires the NOR to be accepted by the port en route.

Warranted Speed: A vessel's speed and fuel consumption often will be a part of the standard charterparty form. Otherwise it will be a part of the vessel's description clause or a more specific performance clause in the rider. Frequently owners undertake that the vessel is capable of a certain performance throughout the charterparty period. Sometimes owners guarantee that the vessel will achieve a certain speed or bunker consumption.

Annex 2: Example Clauses for Operational Efficiency

Virtual Arrival BP Clause

Subject always to the Vessel's minimum safe speed, Charterers may instruct Owners to proceed at a speed ("the Set Speed") such that the Vessel will reach the discharge port at a particular date and time. Appointed and paid directly by Charterers, a weather service company ("the Routeing Company") will calculate the Set Speed, and Owners will proceed at that speed, subject to Charterers at any stage ordering any further change(s) in speed. If, due only to Charterers' instructions under this Clause, the Vessel proceeds below the Charter Speed; any extra passage time will be dealt with under this Clause and not otherwise. Any ordered increase from the Set Speed up to and including the Charter Speed shall not result in any additional bunker payment, under Clause [X] or otherwise.

Upon completion of the voyage, any extra passage time will be calculated by the a mutually agreeable Routeing Company, based on that company's weather information, wave and speed projections and any other relevant data which it may have or reasonably require (such to include the Vessel's actual speed and consumption data) which Owners will provide. Such calculation shall be final and binding save only in cases of obvious arithmetical error, and any extra passage time shall count as laytime or demurrage.

Upon completion of the voyage, Owners will send to Charterers and the Routeing Company their related bunker consumption records. Any bunker cost savings arising from Charterers' instructions under this Clause (calculated by the Routeing Company) will be shared equally between Owners and Charterers. Charterers' share to be (in their

option) deducted from demurrage or separately reimbursed by Owners. All carbon credits gained under this Clause shall be recorded by Charterers.

BIMCO Just in Time Arrival Clause for Voyage Charter Parties 2021

(a) The Owners and Charterers shall use their best endeavours to obtain and share information regarding the Vessel's arrival time, this shall include, but not be limited to, information from, or required by, any relevant third party. Any port specific requirements shall be met.

(b) Notwithstanding any other clause in this Charter Party, the Charterers shall be entitled to request the Owners in writing to adjust the Vessel's speed to meet a specified time of arrival, or closest thereto, at a particular destination. Such request shall always be subject to the Owners' consent which shall not be unreasonably withheld and, in the case of an approach voyage, also subject to agreeing an amended cancelling date. The Charterers shall not be entitled to request an adjustment of speed outside the normal safe operational limits of the Vessel.

(c) Extra time used on a sea voyage as a direct consequence of the Vessel adjusting speed pursuant to the Charterers' request shall be the difference between:

(i) the "estimated time of arrival" as provided by the Vessel prior to the Charterers' request to adjust the Vessel's speed to meet a specific time of arrival, or closest thereto, at a particular destination; and

(ii) the "actual time of arrival" at that particular destination, or closest thereto.

Such extra time shall be compensated by the Charterers to the Owners at USD ___ per day pro rata or as otherwise agreed by the parties which shall take into account the savings in fuel by the Owners and shall be payable by the Charterers to the Owners, prior to completion of final discharge.

(d) Where the Vessel proceeds at a speed adjusted in accordance with subclause (b), this shall constitute compliance with, and there shall be no breach of, any obligation as to despatch and shall not constitute a deviation.

(e) The Charterers shall ensure that the terms of the bills of lading, waybills or other documents evidencing contracts of carriage issued by or on behalf of the Owners provide that compliance by Owners with this Clause

does not constitute a breach of the contract of carriage. The Charterers shall indemnify the Owners against all consequences and liabilities that may arise from bills of lading, waybills or other documents evidencing contracts of carriage being issued as presented to the extent that the terms of such bills of lading, waybills or other documents evidencing contracts of carriage impose or result in the imposition of more onerous liabilities upon the Owners than those assumed by the Owners under this Clause.

Chancery Lane Fuel Efficiency Clause

1.1 Each party agrees to take all reasonable measures to maximise the Fuel Efficiency of the Vessel during the term of this Charterparty. [The Parties shall [jointly] Offset the Residual Emissions associated with this Charterparty and encourage each other in the achievement of their respective Net Zero Targets. The Parties shall [share the costs equally]/[agree their respective shares of the associated costs in writing within [[●] days] of the date of this Charterparty]/[share the costs as follows: [insert cost sharing provisions as agreed between the Parties]].]

1.2 The measures taken by the Parties under clause 1.1 shall be agreed before the commencement of this Charterparty [and set out at Schedule [●]] and shall include but not be limited to:

1.2.1 using all reasonable efforts to ensure the Vessel slow steams when travelling pursuant to this Charterparty;

1.2.2 cooperating [with each other and the other Party's relevant representatives and contractors] to promote the fuel efficient operation of the Vessel, such as collaborating with respect to weather routing, speed optimisation, and other measures as proposed by the EEOI Guidelines; and

1.2.3 cooperating and liaising with relevant third parties such as port operators, agents and cargo interests in order to maximise Fuel Efficiency.

[Drafting note: Users of this clause could consider whether it would be appropriate to require further general collaboration and knowledge sharing between the parties and other stakeholders to publicise their Net Zero Targets and promote their climate leadership/ collaboration in the shipping sector.]

1.3 For the purposes of this clause [1], Fuel Efficiency shall be measured by reference to the energy efficiency operational indicator as set out in the EEOI Guidelines (EEOI).

1.4 Upon request, the [Parties] shall disclose to one another all information required to calculate the EEOI for the requested period. This information is to be disclosed within seven (7) [days] of completion of the relevant voyage or within seven (7) [days] of the relevant information becoming available (whichever is the earlier).

1.5 If a [Party] is in breach of clauses [1.1] or [1.4], the other [Party] may within [two (2)] [days] of becoming aware of the breach serve a notice identifying the breach and requiring rectification of it. If the breach is not rectified:

(i) in the case of breach of clause [1.1] within [fourteen (14)] [days], and

(ii) in the case of a breach of clause [1.4] within [two (2)] [days],

the [Party] in breach agrees to pay liquidated damages in accordance with clause [2] below.

1.6 At no time should this clause [1] be construed as requiring the [Parties] to take any measures which [may compromise]/[conflict with any legal obligation relating to]:

(i) the safety of the Vessel or its crew;

(ii) assistance of vessels in distress; or

(iii) attempts to save life or property at sea.

1.7 The [Parties] shall ensure that clauses [1] and [2] (with minimal amendments to ensure that the objectives of those provisions are preserved) or equivalent clauses that are no less onerous than clauses [1] and [2] are included in all sub-charterparties concerning obligations under this Charterparty in a manner that binds any relevant third parties engaged to meet or facilitate the meeting of those obligations.

Endnotes

1 Marine Traffic live map view of ships at anchor off Singapore

2 A pilot boarding place is a location offshore where a pilot, usually employed by the local port or maritime administration, may board a vessel in preparation to piloting it through local waters.

3 GEF-UNDP-IMO GloMEEP Project and members of the GI. (2020). Just In Time Arrival Guide – Barriers and Potential Solutions

4 Poulsen, R. T., & Sampson, H. (2019). 'Swinging on the anchor': The difficulties in achieving greenhouse gas abatement in shipping via virtual arrival. Transportation Research Part D: Transport and Environment, 73, 230–244. Online access version available here.

5 Veenstra, A. W., & Van Dalen, J. (2011). Ship Speed and Fuel Consumption Quotation in Ocean Shipping Time Charter Contracts. Journal of Transport Economics and Policy (JTEP), 45(1), 41–61.

6 Pruyn, J., & van Hassel, E. (2022). Editorial: Frontiers in Maritime Transport Chains: Digital and Organizational Innovations in Maritime Transport and Port Operations. Frontiers in Future Transportation, 3.

7 GAFTA = Grain and Feed Trade Association; ANEC = European Association for the Coordination of Consumer Representation in Standardisation; FOSFA = Federation of Oils, Seeds and Fats Associations; NAEGA = North American Export Grain Association

8 Rehmatulla, N. (2014). Market failures and barriers affecting energy efficient operations in shipping [Doctoral, UCL (University College London)]. In Doctoral thesis, UCL (University College London).

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10 Steamship Mutual. (2010, September 8). SHELLVOY 6: The New Provisions and their Substantive Impact on Shipowners.

11 BP Shipping Limited. (1998). BPVOY4. Voyage charterparty.

12 GEF-UNDP-IMO GloMEEP Project and members of the GI. (2020). Just In Time Arrival Guide – Barriers and Potential Solutions.

13 Gershanik, V. (2011). Weather routing optimisation—Challenges and rewards. Proceedings of IMarEST - Part A - Journal of Marine Engineering and Technology, 10, 29–40.

14 Rehmatulla, N. (2014). Market failures and barriers affecting energy efficient operations in shipping [Doctoral, UCL (University College London)]. In Doctoral thesis, UCL (University College London).

15 Miros Mocean. (n.d.). Miros Mocean unlocks real-time vessel performance observations for BW dry cargo.