



SUSTAINABILITY IN SHIPPING

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The maritime industry has a crucial part to play in international trade, with over 90% of it being transported by sea. That is good news for the environment; per tonne-kilometre, carbon emissions from shipping are significantly lower than for road or air, making shipping the most environmentally friendly means of international trade. Despite this status, the sector's impact on our climate remains a controversial issue, demonstrating an industry with conflicting views of what defines sustainable shipping. In October, the Mediterranean Shipping Company (MSC) released a statement ruling out exploration of Arctic shipping routes due to environmental concerns. Shortly thereafter, Sovcomflot announced that two of its tankers had successfully crossed the Arctic's Northern Sea Route, a shortcut from current routes, saving time and burning less fuel.

The Arctic has become such a focal point because it is where the tug-of-war between sustainability and profitability is amplified. The region has an almost unique ability to

produce a global environmental snowball effect, as melting Arctic ice is capable of flooding the seas with freshwater, lowering temperatures and salt levels across the world's oceans and producing a resulting ripple effect across global weather patterns. It has a major influence on all sectors, from food production to global sea levels to climate. This degree of impact means that what happens there matters everywhere else, so protecting it is of global importance.

Conversely, it also represents a major opportunity for the maritime sector. Routes across the Northern Sea Route are much shorter than those around the Arctic, which is why Sovcomflot highlighted how efficient their large-capacity tankers' voyages were in terms of time, fuel use and therefore operational cost.

But the reality is that the industry is coming under increasing pressure to prioritise sustainable operations over those that support revenue generation. The recently-issued Global Maritime Issues Monitor 2019 has revealed that "environmental

and climate related issues have jumped to the top of decision-makers' agendas," reflecting the spate of new International Maritime Organization (IMO) environmental regulations that come into force next year under the IMO's World Maritime theme for the year of 2020: 'sustainable shipping for a sustainable planet'.

How can these two seemingly conflicting priorities be merged into a win-win, where taking advantage of the one does not negatively impact the other, and the industry maintains its status as the most sustainable form of trade and transport?

THE NEED FOR CONNECTIVITY

The key to developing solutions for the complex Arctic problem is high-throughput, low-latency connectivity. Currently, there is little to no connectivity in the region. It is poorly served by terrestrial infrastructure, and its position at the top of our Earth leaves it mostly out of reach for geostationary satellites. A number of problems have arisen from this absence.

Firstly, the lack of it makes oversight and governmental monitoring on shipping activity difficult. Local ecosystems are at risk because the ban on commercial fishing has been difficult to enforce. The lack of communication between vessels, headquarters, and even among crews, also puts everyone at a higher risk of accidents, and those accidents not being detected as quickly as is possible.

A 2006 Alaska oil spill, for example, went undetected for five days before an oilfield worker detected it by accident. The eventual damage was a leak of 267,000 gallons spread across Prudhoe Bay, leaving a vast task for clean-up crews working in sub-zero temperatures to dig for oil in the snow and causing considerable damage to the local environment. The lack of effective communications in this region had a devastating effect. It says a great deal about the current state of maritime connectivity that issues like this, that happened more than a decade ago, are still at play.

Though the lack of high-quality connectivity may be the starkest in the Arctic, it is a problem for the whole maritime industry. A Nautilus International survey of 2,000 maritime professionals revealed that 12% of the group permanently have no connection at all at sea, while the remaining 88% spoke of slow and patchy service, meaning the diminished returns in oversight, efficiency, and environmental prudence extend across all global shipping routes.

This is because, where at-sea maritime satellite connectivity is available, it is often delivered to operators as a single channel, requiring ships to carve up data between everything from safety-critical applications to crew social media to emissions monitoring. Important environmental-supporting functions such as speed, fuel and emissions analysis do not get the high-speed connections they need, and the current lack of high-throughput, low-latency services makes real-time monitoring and analytics impossible.

Though the maritime industry is starting to embrace digitalisation, as evidenced by the successful introduction of environmental and cost efficiencies from digital technology in shore-based logistic networks, this progress has not been carried over to vessels' systems. This difference in progress is consistent with the difference between the quality of offshore and onshore connectivity. Compared to other industries, the maritime industry has historically been slower to implement technology changes than others, but faster connectivity at sea will also bring about rapid acceleration of the integration of other technologies.

SUSTAINABLE IS THE NEW PROFITABLE

This will help merge the industry's two seemingly contradictory needs of revenue generation and environmental regulatory compliance. Improved sustainability through better satellite connectivity goes hand-in-hand with increased profitability. Preventing unchecked oil spills obviously ticks both boxes as an obvious, publically-visible benefit. Less known is that improved communication channels and emissions monitoring can streamline shipping routes and minimise fuel consumption. Faster data gathering and analysis can provide companies with a competitive edge, as it can help them care for equipment more effectively and use fuel more efficiently. Down the road, artificial intelligence and machine learning can take data processing to another level.

Another part of the associated economic benefit comes from easier compliance with increasingly stringent regulations, avoiding the kind of fines that will come into force next year under the IMO's new mandates. On land, satellite communications can complement strained terrestrial networks, ensuring universal connectivity to organisations and agencies to continue protecting local populations, supporting scientific and research efforts and helping authorities be informed of and protect their local environment.

THE CONNECTION OF THE FUTURE

The environmental and business opportunities at play have not gone unnoticed by the satellite communications sector. Geostationary (GEO) satellite services are still the most popular connectivity-provider in the industry. But their position high above the equator makes significant sacrifices in terms of latency, and provides a weak connection to those areas at the edge of their coverage, such as the Arctic. Moreover, low-Earth orbiting (LEO) constellations are traditionally lacking in power – of use only for safety-critical services without the kind of applications that would help maritime operations be both safe, sustainable and cost-effective.

Additionally, many existing maritime connectivity suppliers usually constrict users to long-term, inflexible contracts, discouraging widespread use. This is why there is currently a push towards systems of many high-power, low-Earth orbit satellites such as those from OneWeb, as the goldilocks solution to this trade-off. We will be supplying the Arctic with near-constant coverage, as soon as next year, with polar-orbiting satellites capable of filling the service gaps left by lofty GEO equivalents, and less powerful, smaller LEO constellations. The low-latency connection provided by our satellites will allow for the real-time vessel tracking and emission monitoring so vital

for the sustainability and profitability of the shipping sector in the Arctic, and the rest of the world.

Such a connection also allows for user terminal health and usage data to be submitted to distribution partners so that problems can be dealt with as they arise, without the need for the maritime user to contribute their own resource for maintenance. This opens real-time connectivity up to smaller players, rather than just the large merchant shipping multinationals, and ensures sustainable operations are made widespread throughout the industry.

These improvements will benefit the maritime industry globally, but will be most visible, and urgent, in the Arctic. The remoteness of the Arctic poses many challenges for all kinds of industries, but with the help of ubiquitous, high-speed connectivity, sustainable maritime operations does not need to be one. We are currently seeing that most-coveted of industry convergences, where the concerns of a particular industry are being recognised and addressed by another capable of providing the solution. Connectivity will bring about three kinds of protection: that of the Arctic's delicate ecosystem, the maritime sector's revenue streams, and the industry's reputation as the world's most sustainable mode of trade and transport.

ABOUT THE AUTHOR

Carole Plessy is Head of Maritime product development for OneWeb, and has more than 20 years of experience working across R&D and complex project management and product integration. Carole has two MScs: in Engineering and Electrotechnology (University of Toulon) and in Aeronautics and Telecommunications (Ecole Nationale de L'Aviation Civile).

ABOUT THE ORGANIZATION

OneWeb's mission is to enable Internet access for everyone, everywhere. OneWeb is building a communications network with a constellation of Low Earth Orbit satellites that will provide connectivity to people around the world. Its high speed, low latency, network will offer game-changing Mobility solutions to industries that rely on global connectivity, such as Aviation, Maritime, Automotive, Trains and more.

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