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GREEN SHIPPING CORRIDORS

OPENING THE DOOR TO ZERO-EMISSION FUELS AND TECHNOLOGIES

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Gavin Allwright of the International Windship Association calls for an 'energy-centric' approach to green shipping corridors

During the last 18 months we have seen the development of green shipping corridors as solution for kick-starting decarbonisation in the sector being greeted positively by governments, ports and shipping concerns around the world, which is a significant step forward.

But is the use of navigation routes a new thing? Peering into antiquity, the South Pacific islanders navigated for millennia using their knowledge of the winds, ocean swells, currents and the refraction of waves caused by islands. They produced stick maps or 'reilleb' maps that are not to scale as most modern navigators would expect but instead incorporate all of this knowledge into them.

Ancient navigators in the Indian Ocean understood the monsoon cycles very well and set their sails accordingly. In the 15th century the famous Chinese Admiral Zheng He had a legion of cartographers to collate huge amounts of ocean and weather data; and navigators from the Vikings onwards learned to cross the Atlantic from Europe to the Americas by understanding where the winds and currents would take us.

Now we have a new iteration of these 'corridors', known collectively in the shipping world as 'green corridors', which have gained significant impetus since their unveiling at COP26 in October 2021 with the Clydebank Declaration's headline ambition statement: 'The signatories of the Declaration are to support the establishment of green shipping corridors – zero-emission maritime routes between 2 (or more) ports.'

What's not to like about green corridors? Kick-starting low- and zero-emissions shipping activities is surely a win-win situation and there has been a significant engagement with establishing these bilateral and multilateral corridors and investment planned at both ends to deliver the extensive and expensive infrastructure that is required to produce, refine, transport and bunker those alternative fuels.

However, much of the attention thus far has focused on one side of the corridors' mission – fuels – and downplayed the role of technologies. The Clydebank Declaration, backed by 24 nations, from the United States to Palau, stated: 'In supporting the establishment of green corridors, signatories recognise that fully decarbonised fuels *or propulsion technologies* [my italics] should have the capability to not add additional GHGs to the global system through their lifecycle, including production, transport or consumption.'

While the low-emissions fuels are important, we must not overlook the technologies such as wind propulsion – which harnesses an abundant, free-to-all, zero-emissions energy that mariners of old used for thousands of years.

From the International Windship Association (IWSA) perspective, we fully appreciate the need to develop land based infrastructure quickly. However, we focus on the fact that while wind-assist systems can be deployed on most vessels using any of these new corridors that follow exist-

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ing trade routes, it is through harnessing the natural green 'wind corridors' at sea, especially the 'trade winds' and other prevailing wind systems, that we can deliver decarbonisation at a far quicker pace.

What would the adoption of a more energy-centric approach look like and what would the impacts be? Well, this question throws up quite a few key issues around technology neutrality, routing, flexibility and resilience, multi-nodality, facilitating fuels and lowering costs.

In tackling the first part of the question, we first have to understand the different ships and technologies available when we talk about wind propulsion. These are the ships that would be plying these 'green+wind' corridors. As mentioned earlier, wind-assist and primary wind vessels will be increasingly available. Currently we have 24 large commercial wind installed vessels and five more wind-ready which combined are over 1.4 million DWT of shipping, with an additional 20+ installations this year and in 2024-2025 a number of new-build primary wind vessels will join that fleet. These can operate on all existing proposed green corridor routes and deliver moderate savings if these vessels are operated as motor vessels. But the magic starts to happen when these ships are able to weather route for wind and optimise their voyages accordingly. If we take that to the ultimate conclusion, then we can drastically reduce fuel use by harnessing the well-known trade wind patterns,

The classic North Atlantic circle is a well known example, where ships would travel from North European ports heading south to Portugal, then plugging into the trade winds to the Caribbean and Southern part of the United States further moving up the Eastern seaboard of the States to the Maritimes in Canada and then heading East on the winds back to Northern Europe. Similar wind cycles are in near constant movement in the Pacific and in the Southern hemisphere along with multiple other routes worldwide. If we look back again to history, the 'modern' sailing period saw two important breakthroughs: global weather routing maps that detailed winds and currents in a systematic way in the 1850s, championed by US Navy Lt. Matthew Fontaine Maury; and modern shipping weather forecasting in the 1860s developed by Vice-Admiral Robert FitzRoy RN. These played a vital role in keeping wind ships competitive right into the 20th century, especially on the long trades.

However, the deployment of cheap and abundant fossil fuels eroded this and then finally broke down the use of these 'wind corridors', as more direct routes were selected and the infrastructure was built up around those choices to cater to this heavily subsidised fossil fuel network.

The history of the routes from the Far East through to Europe is a case in point. Steamships couldn't compete with sailing ships if they were required to round the Cape of Africa, and it was not until a subsidised Suez Canal route was available (after the British effectively took control of it in the 1880s) that steamships really became viable outside of the heavily subsidised mail steamship lines. A similar situation existed in the Americas: indeed, the *Flying Cloud*, a motorless clipper, set the world's sailing record for the fastest passage between New York and San Francisco via the Cape, of just over 89 days – a record that stood for over 130 years, from 1854 to 1989. The opening of the Panama Canal in 1914 helped put pay to much of that trade and large sailing vessels continued to decline up until the Second World War.

These historical precedents clearly indicate that when we have abundant, cheap fuel and heavily subsidised infrastructure and shipping lines then wind becomes less attractive. But that trend is now reversing, as wind is becoming the cheap energy source. With a primary wind propelled ship, these winds can be harnessed to the fullest once again, and we can foresee the onboard harvesting of excess wind energy to generate alternative, zero-emissions fuel for use when navigating areas of limited wind.

So, what would be the impacts of integrating wind into the heart of 'green corridor' development? The answer to this part of the question is multi-fold. At the lower end is the promotion of wind-assist systems at scale as part of the current corridor development. This would have a two-fold effect. Firstly, it would reduce the amount of fuel required by these vessels by 5%-20% immediately and thus reduce the burden on the landside infrastructure and supply, enabling limited fuel supplies to be available for more ships to bunker sooner and at a lower overall cost. On the flip side, the impetus of hundreds of additional installations of wind systems would help to lower costs dramatically, with a learning curve of approximately 10%, meaning that for every doubling of installations costs reduce by 10%, thus by ship 1,000 we would see costs reduced by 50% in comparison with 2022.

> 'A free energy source brings with it unique opportunities, such as the re-opening of currently commercially unviable routes or the development of new ones servicing backwater ports'

This would also maintain the technology-neutral approach that shipping needs to maintain going forward. Not promoting one fuel or type of propulsion above any other is a key aspect for the market diffusion of systems and this innovation and supply diffusion is very important to the success of the Clydebank approach, especially at a political level. While I am no expert in diffusion theory, on the surface the development of corridors will certainly encourage the uptake of alternative fuels, lower costs and provide security of supply for these new commoditised low emissions fuels. However, given that there are a multitude of alternative fuels and technologies under consideration that are all vying for position at the moment, will we see the infrastructure for *all* of these provided in *each* corridor? This will be costly and could lead to stranded assets. Alternatively, we could see more nationally driven selective investments and the exclusion of certain fuels on certain routes which will ultimately be very challenging.

There is also the concern that has been expressed among a number of developing countries that rather than encouraging diffusion, corridors may lead to structural lock-in and exclusion. These are important considerations, and the exclusion issue is a critical one for smaller ports often at the end of supply chains or on the periphery in LDC/SIDs that could be side-lined over the coming decade as the large ports and established corridors hoover up the investment for alternative fuel infrastructure development, cementing exist-

ing inequalities etc. First mover advantage and the control of the bunkering system by the developed world and large energy companies is also a serious concern. This fear of being excluded may also be a driver for the number of green corridors being proposed.

Nonetheless, if the development of these modern green corridors is made with these issues front and centre – and with an broad energy-centric approach and a strong focus on a 'Just and Equitable' transition, then they can continue to be a positive force.

Incorporating free wind energy into the heart of this movement can further accelerate this diffusion as costs are kept in check and the transition remains accessible to all stakeholders. There are however some other intriguing parts of the equation that need to be explored further. A free energy source brings with it unique opportunities, such as the re-opening of currently commercially unviable routes or the development of new ones servicing backwater ports and generating positive cycles of sustainable development in those regions. It also brings with it the opportunities to extend the range of vessels enabling them to bunker less and decrease turn-around times in port and also unlock shipping to a degree from volatile fuel markets, generating more resilience, more certainty and de-risking further investments in the sector especially in lesser developed regions.

I have already highlighted the spectre of commercially stranded assets, but there is also a risk from the regulatory perspective. Climate change is upon us, and radical action on climate issues will be needed in the coming years if we are to avoid tipping points and the worst effects of that. Currently the industry is focused on carbon emissions or direct GHG emissions, but there are additional indirect climate impacting emissions from Black Carbon to VOCs and even underwater noise. Consequently, it is important to consider how corridors will adapt to deal with these challenges – and wind propulsion delivers across the board on these and lessens impacts near Marine Protected Areas (MPAs) too.

It could be argued that the decoupling of wind corridors from shipping operations during the first great energy transition from sail to coal in the 19th and early 20th centuries has been at the root of our current travails. Shipping is the only global transport industry that transitioned from zero-emissions to heavy fossil fuel dependency and is now making the return voyage. By re-engaging, we will be able to navigate a swift and deep mitigation of our sectors emissions over the next decade, though more analysis and piloting is needed. Fast forward to 2021, COP26 was held in one of the crucibles of late 19th century ship building, on the banks of the Clyde in Glasgow. What better place could have been chosen to deliver a new (old) vision of 'green corridors', one that we hope will soon widen to become a Win-Win-Wind situation for all.

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