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INSIDE:

SHIP.ENERGY SURVEY 2024
EBDNS
ELECTROFUELS

Under the radar

Dr. Charlie McKinlay of Lloyd's Register and **Dana G. Rodriguez** of Environmental Defense Fund look at how Sustainable First Mover Initiatives are building local port-community resilience through electrofuel production for the shipping industry

To avoid exacerbating the climate crisis, the shipping sector must rapidly decarbonise in line with the Paris Agreement's 1.5ºC temperature target and the International Maritime Organization's (IMO) ambition of achieving net-zero greenhouse gas emissions by, or around, 2050.

Ports, as key hubs for transport and energy systems, are critical enablers for maritime decarbonisation efforts. They can foster first mover initiatives – such as green corridors or energy hubs – which aim to play a key role in unlocking investments for the incubation and scale up of electrofuels and clean technologies in a way that is sustainable and inclusive of regional stakeholders.

The maritime energy transition must consider all stakeholders and pay close attention to those most vulnerable to environmental impacts, such as port-side communities. It should build on a region's potential to produce electrofuels (i.e. fuels that have net zero carbon emissions throughout their lifecycle) in a way that is inclusive and sustainable and does not undermine or exploit resources in economically vulnerable regions, like the Global South.

Upcoming policies are expected to generate demand for electrofuels, which will likely result in the expansion of their production in new geographies and the need for further investments in alternative fuels and technologies. Engaging ports that have not been included in shipping first mover initiatives, especially ports in the Global South, as plausible hubs for electrofuel manufacturing can help speed up production and draw in high impact investments. Carefully selecting a production site location can also present an opportunity for wider social, environmental, and economic co-benefits to communities and the environment.

This past November, Environmental Defense Fund and Lloyd's Register Maritime Decarbonisation Hub, in collaboration with Arup, published a report introducing the concept of Sustainable First Mover Initiatives (SFMIs), that are in line with the 1.5ºC Paris trajectory and deliver wider co-benefits. The report showcases the SFMI identification tool designed to identify ports which have high potential to be suitable locations to foster SFMIs, looking at electrofuel production and/or bunkering capability.

The SFMI identification tool functions as an impartial device that can compare ports and their suitability for different roles in the transition using a data-led approach, this can help identify potentially suitable locations which haven't been so far considered.

Placing these ports on the radar as possible electrofuel hubs has the potential to diversify regional economies, contribute to economies of scales and unlock high impact investment. Shipping stakeholders can utilise the SFMI Identification tool to support the planning and development of potential SFMIs, through scenario generation, holistically considering energy, investments, and the environment. This allows for the development of electrofuel and port infrastructure to support wider goals and enable local resilience, without compromising resource security or any other decarbonisation efforts. Sustainable port development and decarbonisation could also help countries with developing

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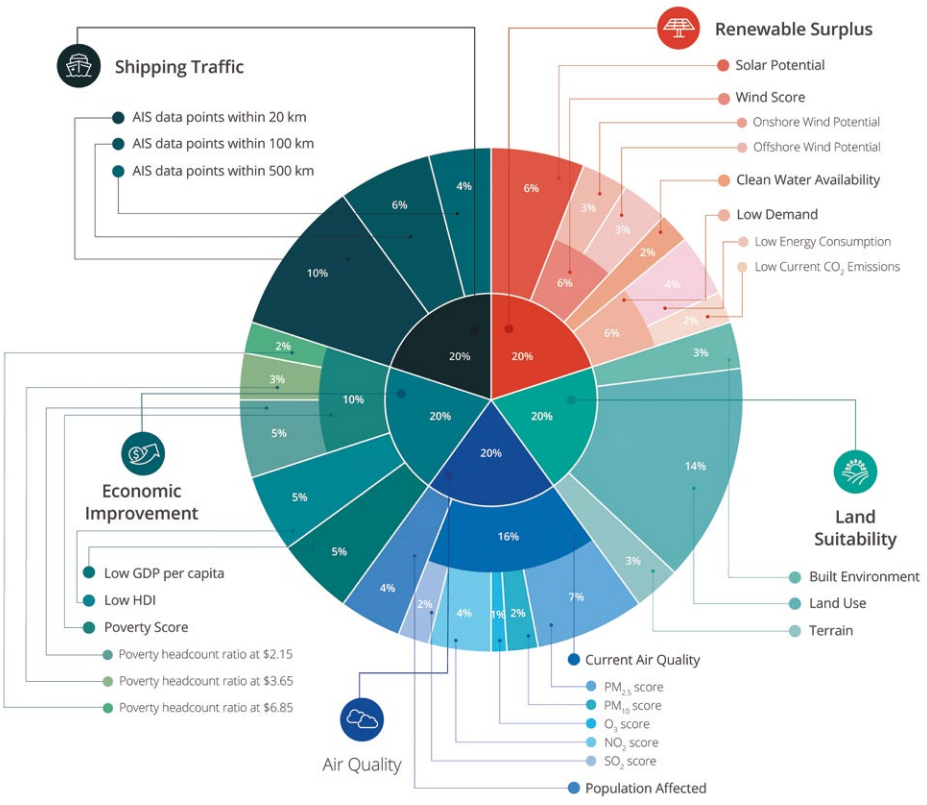

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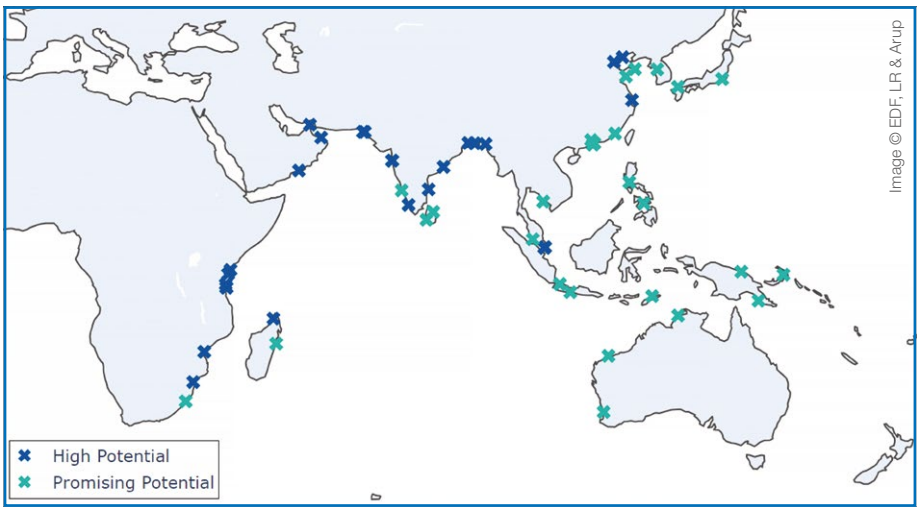
economies achieve their nationally determined contributions (NDCs) through ramping up renewable energy production while benefiting from shipping's energy transition.

The IMO 2023 GHG Strategy requires the shipping industry to rapidly decarbonise in the next three decades starting with a 20-30% emissions reduction by 2030. This includes a clean fuels and technology uptake of up to 10% by 2030, generating a demand for electrofuels. If the necessary industrial infrastructure is put in place, the power map of energy access could change as renewable energy is more widespread than oil and gas reserves. This means that regions with high renewable potential, such as many countries in the Global South, can become key players in electrofuel production.

The SFMI identification tool has been initially applied to the Indo-Pacific region as a case study. This region was chosen in part due to country diversity. The tool assessed 108 ports on their suitability to produce and bunker electrofuel. This included undertaking a layered multicriteria analysis for each port location based on renewable energy potential, available and suitable land, current and crossing shipping traffic, and potential improvements to air quality and economies. The preliminary results demonstrate that several ports show a high potential to develop SFMIs in three different scenarios of both fuel production and bunkering, fuel export, or fuel import and bunkering. Interestingly, the results concluded that the port of Antsohim Bondrona in Madagascar, which ranked 10th highest to be an electrofuel hub (production and bunkering) and 2nd to be an electrofuel exporter.

Madagascar presents a distinctive scenario due to its extensive forest coverage (44% of the island) and unique biodiversity. It is certainly true that some Madagascan ports, such as Toamasina, are not viable candidates for electrofuel production due to a lack of suitable land and high risks of causing adverse environmental impacts, such as direct or indirect land use change (ILUC). However,



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initial results indicate that the Port of Antsohim Bondrona is a strong candidate, partially due to high levels of potential solar and wind, and a large scope for economic improvement.

The Port of Antsohim Bondrona scores highly for land suitability, however it is noteworthy that the current assessment includes land types like pastures, which introduces a potential risk of ILUC. For example, if the infrastructure for electrofuel production is established on pasture or rangeland, there is a likelihood that agricultural activities may need to relocate, possibly to areas with higher ecological value. This shows that a country level analysis isn't nuanced enough to determine actual in-country scenarios, and ports need to be assessed on individual basis. Therefore, while the Port of Antsohim Bondrona shows promise in the initial assessment, it is imperative to emphasise that further investigation, and local stakeholder engagement, is required to ensure that the chosen location does not lead to any negative direct or indirect environmental impacts.

The results for the Port of Antsohim Bondrona are a good example as to how the tool can be used as a starting point to explore ports potential in joining the shipping's energy transition as first movers. Engaging with local stakeholders is crucial to ensure the co-benefits identified match the port's, and therefore the region's, reality, helping obtain better clarity to unlock investment opportunities.

As the shipping sector's climate commitments increase the demand for electrofuel production, the tool can enable stakeholders to make informed decisions that avoid exploiting regional resources or jeopardising port-side communities. By identifying suitable ports, the SFMI tool can elevate ports in Global South regions to foster Sustainable First Mover Initiatives, become hubs for electrofuel production, and function as a vital part of a maritime energy transition that is inclusive and sustainable.

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