'Adversity is the mother of progress'

by Ewa Kochańska

Global ports and the cities and regions they serve play a vital role in international trade and the shift to sustainable energy. However, ports also have a history of causing adverse environmental impacts due to emissions and pollution. Last year, the Environmental Defense Fund, in collaboration with the Lloyd's Register Maritime Decarbonisation Hub and in partnership with Arup, introduced the Sustainable First Movers Initiative (SFMI) Identification Tool in their *The Potential of Ports in Developing Sustainable First Mover Initiatives* report. This innovative solution aims to facilitate the maritime industry's transition to cleaner energy sources by helping stakeholders identify ports ready for green investments. The SFMI tool also factors in socio-economic and environmental consequences to ensure inclusive and sustainable outcomes on a worldwide scale.

The maritime industry, responsible for transporting around 90% of international trade, is a critical component of the worldwide supply chain. Shipping also generates roughly 3% of global greenhouse gas emissions (GHG-E); therefore, while taking steps to address its carbon footprint, the sector has been undergoing a fuel transformation.

Similar global transformations in numerous industries have often ignored the needs and circumstances of underdeveloped and developing regions, thus negatively affecting about 77% of the worldwide population. And, perhaps not surprisingly, presently, over 80% of clean energy investments are again made in only developed economies and China. However, if properly managed, the SFMI paper argues, the transition to electrofuels (e-fuels), which is set to reshape the fuel market, could also offer significant opportunities for low- and middle-income countries.

The SFMI Identification Tool can facilitate this 'fair' transition by helping shift the maritime industry away from fossil fuels while addressing broader social, economic, and environmental circumstances. Specifically, the Tool identifies suitable port locations for investments while taking into account factors like e-fuel production, clean energy access, land suitability, decarbonisation efforts, and living standards. The system can also help spot lower-income regions where the deployment of more investment will be financially beneficial and necessary to safeguard the Paris Agreement targets. In some underdeveloped areas, conditions for renewable energy may be even more beneficial than elsewhere because of unexplored renewable energy sources.

'In the middle of difficulty lies opportunity'

The SFMI report mentions voluntary first-mover initiatives like the **Clydebank Declaration** and Clean Energy Ministerial promoting green shipping corridors and energy hubs as positive activities pertaining to reaching global climate goals. That said, these efforts have mainly focused on developed countries, leaving out the Global South and stakeholders such as port communities, which comprise 40% of the world population (living within 100 km of the coast).

Environmental damage and its consequences have disproportionately impacted the poorest regions, exacerbating existing vulnerabilities and

widening socio-economic disparities. These regions often lack the resources and infrastructure to adapt to changing environmental conditions, making them more susceptible to the adverse effects of climate change. Extreme weather events such as hurricanes, droughts, and floods have become more frequent and intense, devastating communities that rely heavily on agriculture, fishing, tourism, and natural resources for their livelihoods.

To ensure that e-fuel production brings fair socio-economic and environmental benefits, "significant" concessional finance (which is a below-market rate financing from major institutions in underdeveloped areas) will be vital in low-income countries as the investments there must increase fivefold by 2030 to achieve net-zero emissions by mid-century. Focusing on the Global South for SFMIs can reinforce equitable benefits, while early engagement with shipping stakeholders, including port communities, can minimise negative impacts and create robust policies addressing inequality.

"SFMIs account for broader impacts on communities and the environment, truly ensuring that the transition is people-centred. This means that communities affected by such initiatives can benefit from their implementation rather than be put at risk," says the report.

'Innovation distinguishes between a leader and a follower'

The idea behind the SMFI Identification Tool is that while ports serve their pivotal role as pillars of economies worldwide, they can also contribute to positive societal outcomes concerning improved air quality, sustainability, and socio-economic conditions.

Significantly, decarbonising shipping presents a substantial investment opportunity, estimated at over one trillion US dollars under appropriate regulations and commercial conditions. It would be hard to deny that societal change has a long history of being driven by opportunities to make money. For example, the Industrial Revolution broke new ground in manufacturing and transportation, leading to the creation of industries such as textiles and railroads. Still, it was primarily driven by opportunities to increase productivity and subsequently – profits. More recently, companies such as Airbnb or Uber transformed

Fig. 1. The SFMI Identification Tool uses five criteria with underlying indicators

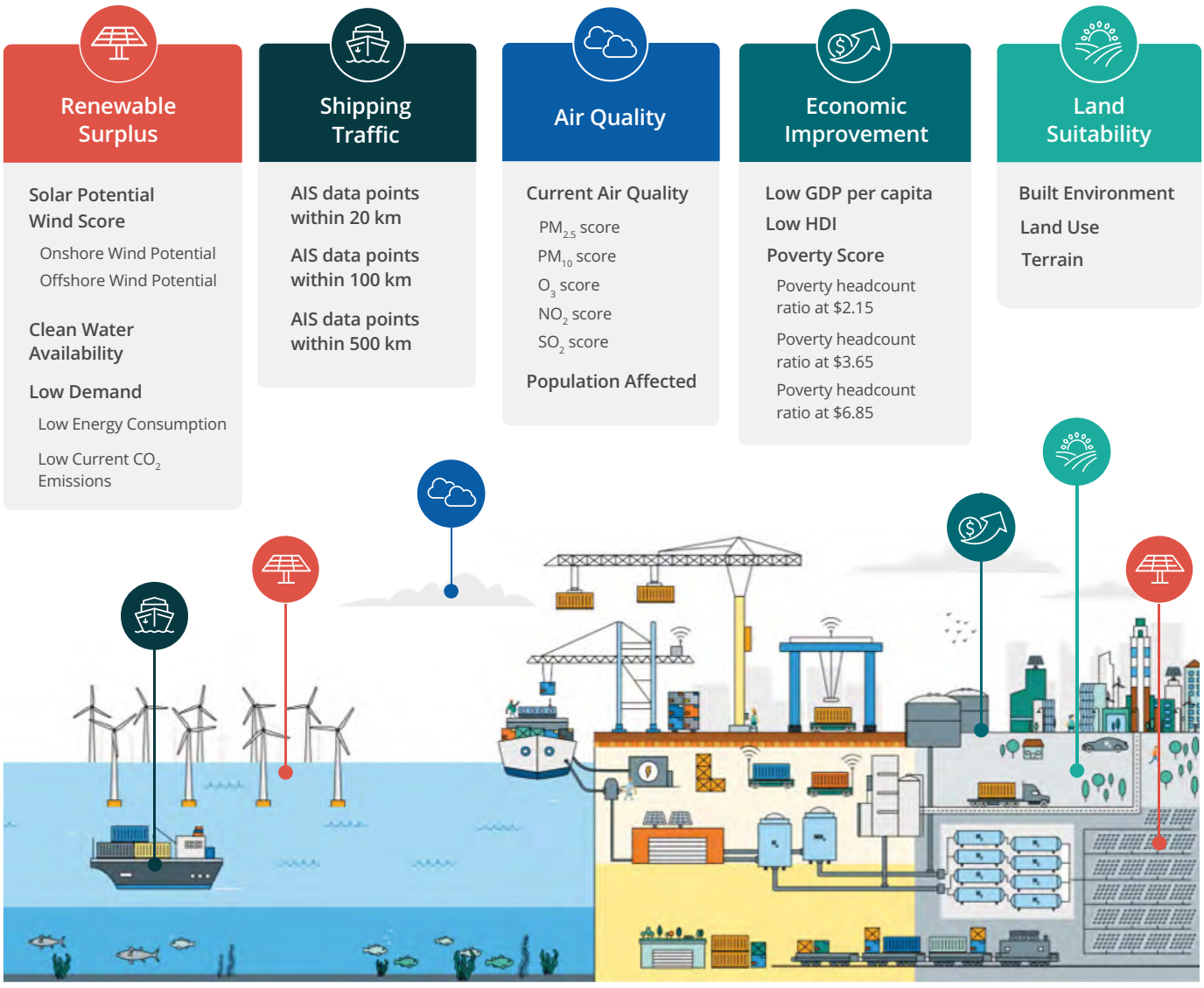
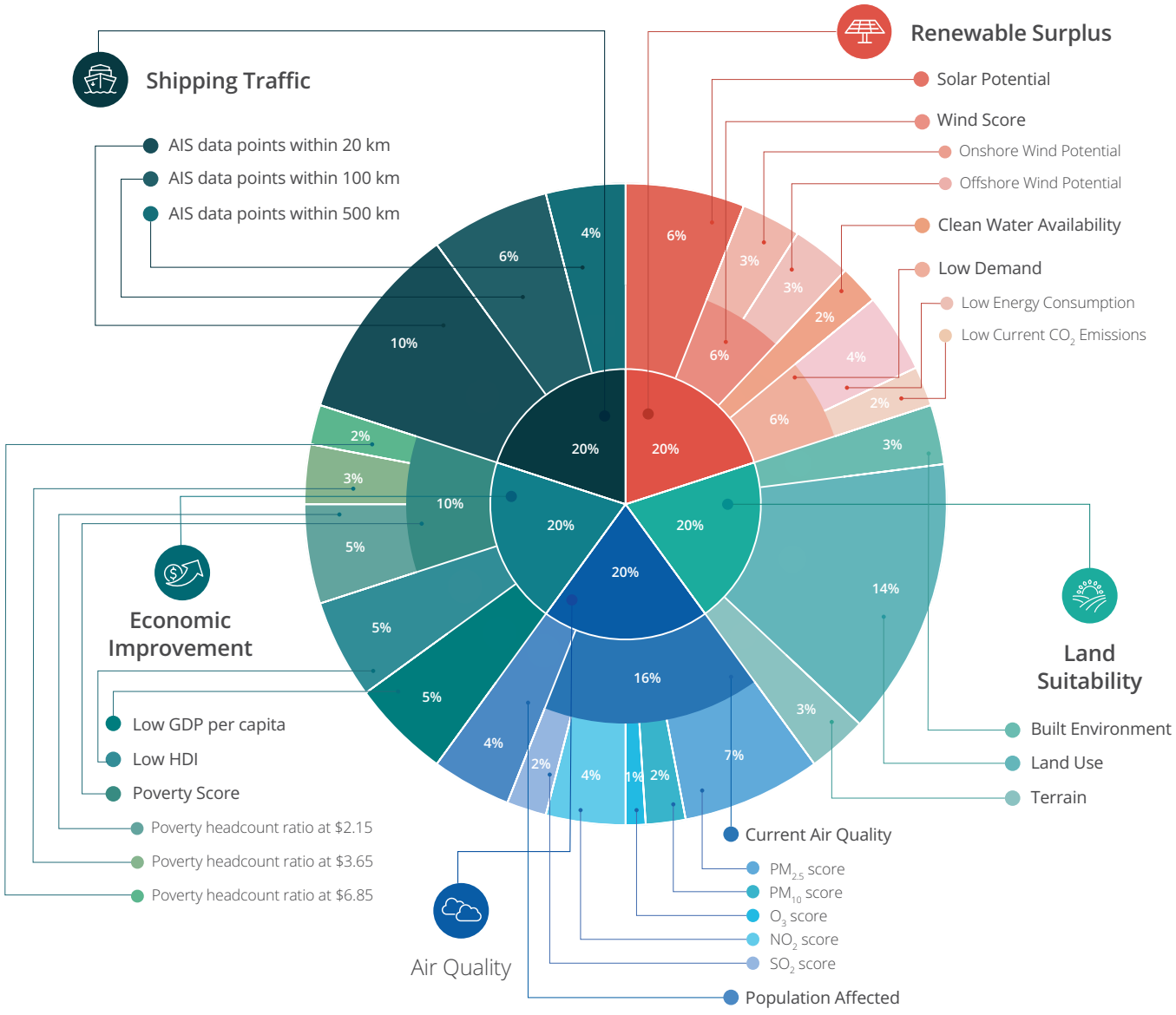


Fig. 2. Criteria weightings for Scenario A: ports exploring both fuel production and bunkering



very traditional sectors – hospitality and mobility – by capitalising on the sharing economy concept. These companies have created new income streams while reshaping societal norms.

The global shift towards sustainability presents a massive market potential. As consumers and investors become increasingly discerning about environmental issues, they are more likely to support businesses that align with their values. Companies with solid sustainability reputations can tap into this growing consumer base, leading to increased sales and market share, and attract socially responsible investors and partners, providing access to additional capital and resources. Additionally, sustainable practices can lead to cost savings in the long run.

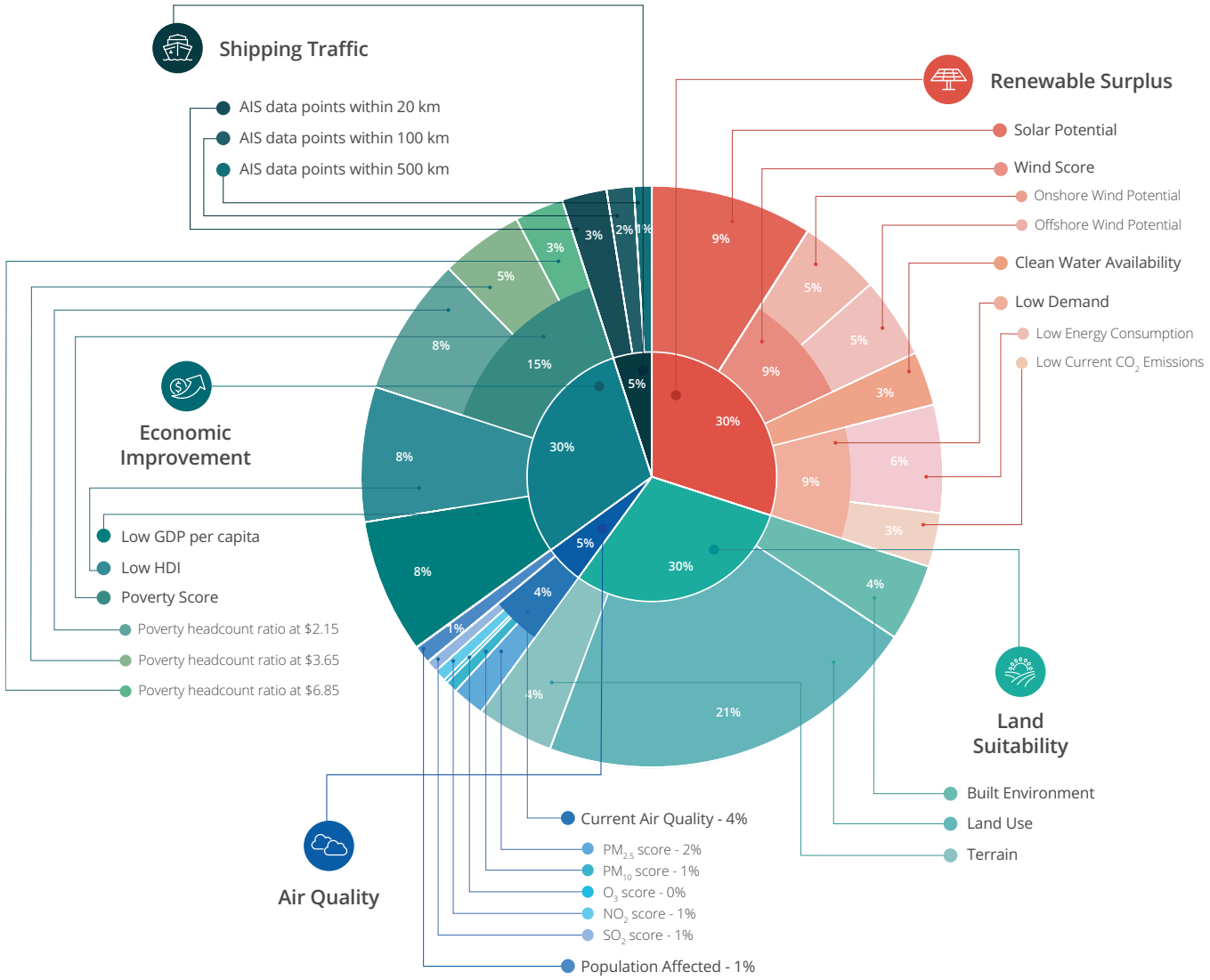
While initial investments in environmentally friendly technologies or processes are expensive, they often result in reduced resource consumption, lower energy bills, and decreased waste disposal costs. Over time, these savings can significantly boost a company's profitability. Furthermore, early adopters can benefit from tax breaks, subsidies, and preferential treatment in government contracts, while failure to comply with these regulations can result in fines and reputational damage.

In line with past revolutions, the push for environmental accountability fosters innovation. Companies that invest in research & development related to e-fuels will likely discover new technologies and processes that can lead to competitive advantages.

Given the significant stakes involved, ensuring that the transition to e-fuels includes developing and underdeveloped nations is crucial. These countries have suffered the highest economic and human costs of ecological irresponsibility of their wealthier neighbours, yet they have reaped minimal benefits from the opportunities presented by environmental innovation.

In searching for a proper definition of "just and equitable," the report found that the present efforts to achieve a fair and balanced transition in the shipping industry focus on three main factors: addressing

Fig. 3. Criteria weightings for Scenario B: ports mainly exploring fuel exports



historical climate disparities, mitigating the disproportionately high GHG-E of wealthier nations, and alleviating the significant climate change costs endured by small island states and less developed countries. Additionally, the report underscores the importance of acknowledging the direct effects of the shipping sector on communities residing near ports, especially in the world's less affluent regions.

As the use of e-fuels becomes more widespread globally, there have been delays in adoption due to differences in financial resources. Neglecting this issue could worsen the situation in underdeveloped regions, leading to extra costs and negative consequences for businesses and local communities. Therefore, it's vital to include local port communities, particularly in economically disadvantaged regions across the globe, while transitioning to e-fuels, understanding that they indeed are an integral part of this shift. Achieving such an inclusive transition will require collaborative efforts from all players in the industry: governments, ship owners, fuel providers, ports and their communities.

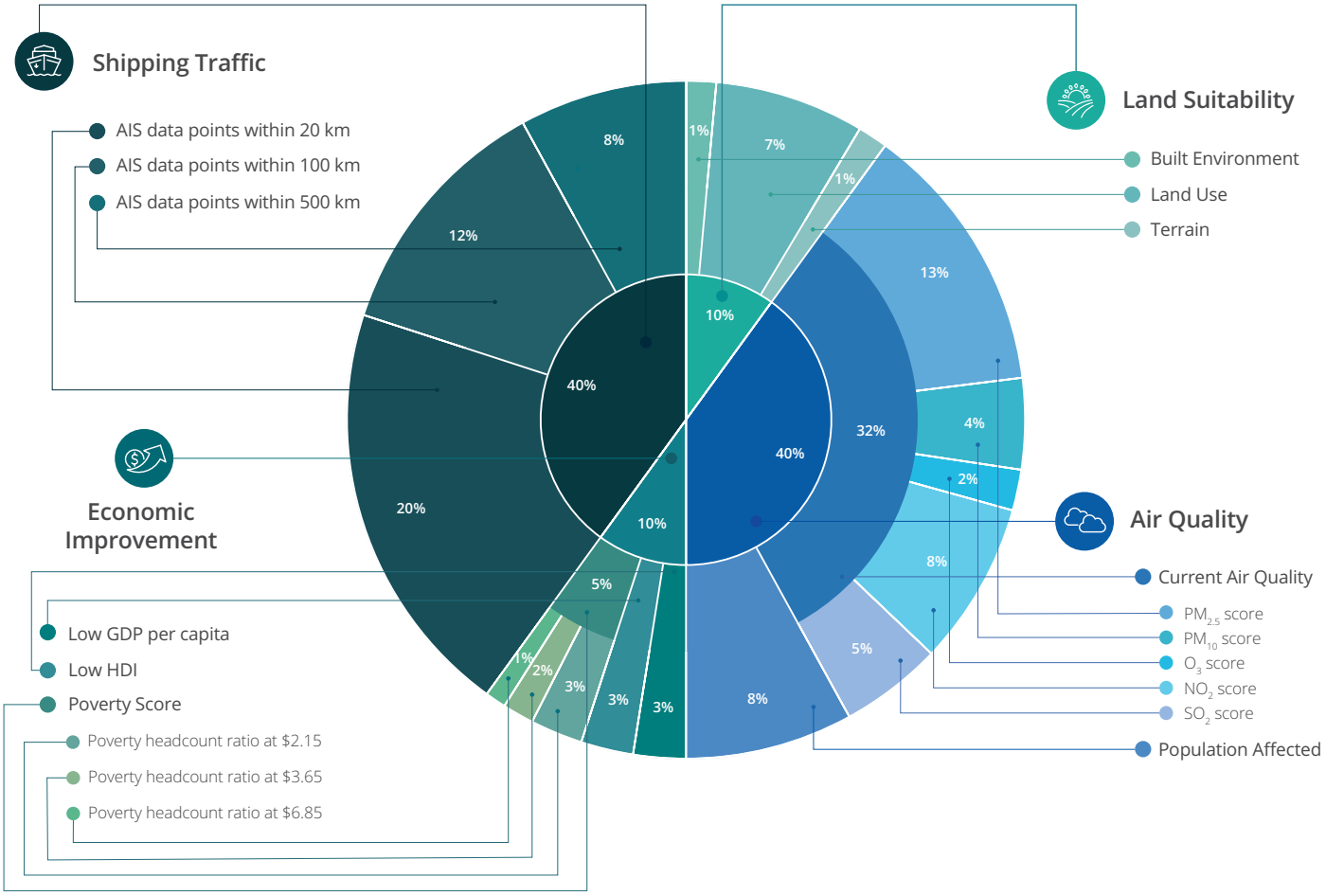
'An investment in knowledge pays the best interest'

The SFMI Identification Tool was case-studied in the Indo-Pacific area, which was selected for its pivotal shipping routes and a unique mixture of Global South and Global North nations.

A multicriteria analysis was used to enable a thorough and balanced evaluation, which considered a variety of factors of different importance. The report underscored that it is offering a preliminary evaluation of ports, and a more detailed analysis will come in the next stages of their work. This case study focused specifically on the production and use of renewable e-fuels with zero-carbon emissions (e.g., e-hydrogen, e-ammonia, and e-methanol).

The SFMI Identification Tool uses five criteria: the potential to deliver a surplus of renewable energy near ports; shipping traffic at the port and in the surrounding sea area; land suitability near the port; potential improvement in air quality; and potential improvement to local economies. Each port is assigned a weighted score and, based on that, a category: either 'high potential' for ports in the top 25% or 'promising potential' for ports in the next 25%.

Fig. 4. Criteria weightings for Scenario C: ports mainly exploring fuel imports and bunkering



Source for all figs.: The Potential of Ports in Developing Sustainable First Mover Initiatives

Also, to ensure fair scoring, three scenarios were used. In Scenario A, the focus is on ports which are good candidates for developing SFMIs and investments related to exploring fuel production and bunkering. Scenario B emphasizes ports that are in the best position for SFMIs and investments in fuel production and export. The third scenario, C, focuses on ports which are best suited to develop SFMIs and unlock investments in fuel imports and bunkering.

Interestingly, some ports show high scores in specific criteria and very low in others – yet they classify as high or promising as the scores balance each other out. For example, the ultimately 'high potential' Port of Singapore scores low in land suitability and relative economic advancement but high scores in shipping traffic and air quality improvement even this out.

Scenario B-ports, while offering e-fuel production, do not provide strong local shipping demand, so their focus stays on fuel exports. In Scenario C, ports are capable of providing e-fuel storage and bunkering; however, the fuel is not produced locally but imported.

The SFMI Identification Tool has the capability to illustrate to stakeholders the numerous advantages of involving a diverse pool of collaborators and ports. This perspective can identify ports that might otherwise be overlooked for such initiatives. Additionally, according to the report, "shipping's decarbonisation does not happen in isolation," and many potential outcomes must be examined. The SFMI Identification Tool can assist financial institutions and governments in identifying optimal investment areas and also help achieve climate objectives while protecting the environment and uplifting communities that have been forgotten in the green transition.

'The secret of getting ahead is getting started'

Environmental sustainability represents a lucrative business opportunity in today's world. As consumers, governments, and investors prioritise sustainability, companies that embrace it can gain a competitive edge, reduce costs, and access new markets. History has repeatedly demonstrated that societal change occurs when opportunities to make money align with the greater good, making sustainability a compelling proposition for businesses.

The shipping sector's fuel transition will change the fuel market fundamentally, but it's vital to include underdeveloped and developing economies in this transformation for ethical, environmental, and financial reasons. SFMIs, aligned with the 1.5°C Paris Agreement target, aim to provide environmental, social, and economic benefits (particularly in Global South regions, but that doesn't mean other corners of the globe cannot take advantage of the methodology).

The SFMI Identification Tool, while identifying lower-income areas where the deployment of investment is beneficial and necessary to achieve net-zero emissions by 2050, guides stakeholders in assessing a port's potential and supports regional planning and development. □