MARITIME TRAFFIC ACROSS SOUTH AFRICAN PORTS

A Briefing to Guide the Green Shipping Transition in South Africa

This briefing provides insights into maritime traffic, emissions, and trade across South African ports and discusses the implications and opportunities presented by the green shipping transition. South Africa (SA) plays a crucial role in African maritime trade. By addressing inefficiencies, expanding its domestic fleet, and implementing green shipping practices, the country can unlock new growth potential.

The global defossilisation agenda toward green shipping, primarily driven by the International Maritime Organization (IMO), along with changes in regional trade policies, necessitates adaptation by the South African maritime sector to remain competitive and capitalize on green fuel opportunities. Proactively embracing this transition could secure a larger share of the green maritime bunker fuel market, driving economic resilience and long-term prosperity.

This briefing is an executive summary of a broader research study, the *Socio-economic Study on Maritime Defossilisation and Green Shipping in South Africa*, conducted by HEAT GmbH.

Maritime Defossilisation in the Global Context

Shipping transports 80 to 90% of goods traded globally, making it a critical pillar of the global economy (UNCTAD, 2023). Disruptions in global maritime transport have severe knock-on effects with far reaching economic implications. The shipping industry is required to be dynamic to respond to shifting patterns of trade flows arising from geopolitical tensions, and longer-term changes in line with the International Maritime Organisation's defossilisation goals (IMO, 2023). This includes reducing emissions by 34% by 2030 and achieving net-zero emissions by or around 2050. The IMO similarly aims for zero or near-zero greenhouse gas (GHG) emission technologies, fuels, and energy sources to represent at least 5%, striving for 10% of the energy used by international shipping by 2030. A significant component of this transition involves replacing fossil fuel-based bunker fuels with greener alternatives such as e-ammonia and e-methanol, which produce minimal or zero GHG emissions across their production lifecycle (well-to-wake). Achieving these goals requires consensus at a multi-lateral governance level, substantial investment in infrastructure to initiate the transition and concurrent enabling market conditions.

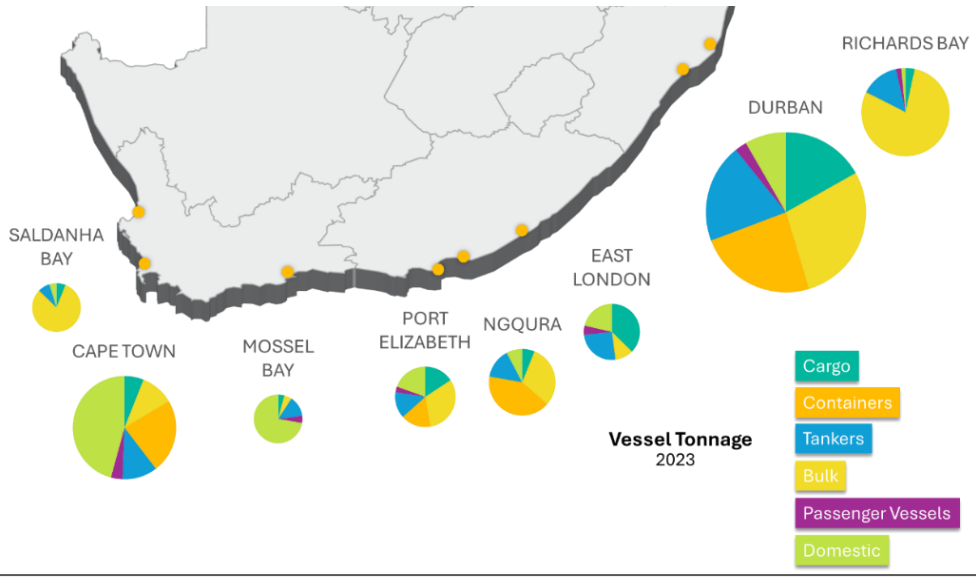

Figure 1. Overview of the vessel tonnage across South Africa's commercial ports. Data: TNPA, 2023

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Shipping in South Africa

South African ports play a pivotal role in African maritime trade, serving as a gateway for regional commerce, particularly for landlocked Southern African Development Community (SADC) countries. Maritime transport is a key contributor to South Africa's economy. Approximately 95% of SA's total import and export volumes is transported by foreign vessels. International exports by ship account for approximately 30% of the country's Gross Domestic Product (GDP) (DFFE, 2022). The Transnet National Ports Authority (TNPA) operates eight commercial ports that handle substantial cargo volumes, with the Port of Durban being the busiest as reflected in vessel tonnage (Figure 1). As the largest container terminal in sub-Saharan Africa, Durban handles approximately 60% of the country's container traffic. Despite its strategic position, South Africa accounts for only 1% of global seaborne trade, highlighting the potential for growth, provided that existing barriers such as a limited domestic fleet and port inefficiencies are addressed. Looking ahead, the government has set ambitious objectives, aiming to position South Africa as a major maritime centre by 2030 (DOT, 2024). As the global maritime sector strives towards defossilisation, SA's maritime sector must adapt to facilitate the transition. Embracing sustainable maritime practices not only aligns with SA's duty as an IMO member state but provides an opportunity to build business around the supply of alternative Power-to-X (PtX) fuels.

Vessel Traffic

In 2023, South Africa recorded a total of 8,970 vessel arrivals across its commercial ports, with Durban receiving the highest number (2,933), followed by Cape Town (1,823) and Richards Bay (1,397) (Figure 2). International (ocean-going) vessels accounted for approximately 82% of arrivals, dominated by bulk carriers (3,158), container ships (1,563), and tankers (1,373), while domestic (coastwise) vessels totalled 1,653 arrivals (Figure 2). Bulk vessel traffic is primarily handled at the ports of Durban, Richards Bay, and Saldanha Bay, while container traffic is concentrated in Durban and Cape Town. Although vessel arrivals have declined since 2016, a 1.6% increase between 2022 and 2023 suggests signs of recovery, particularly post-COVID impacts.

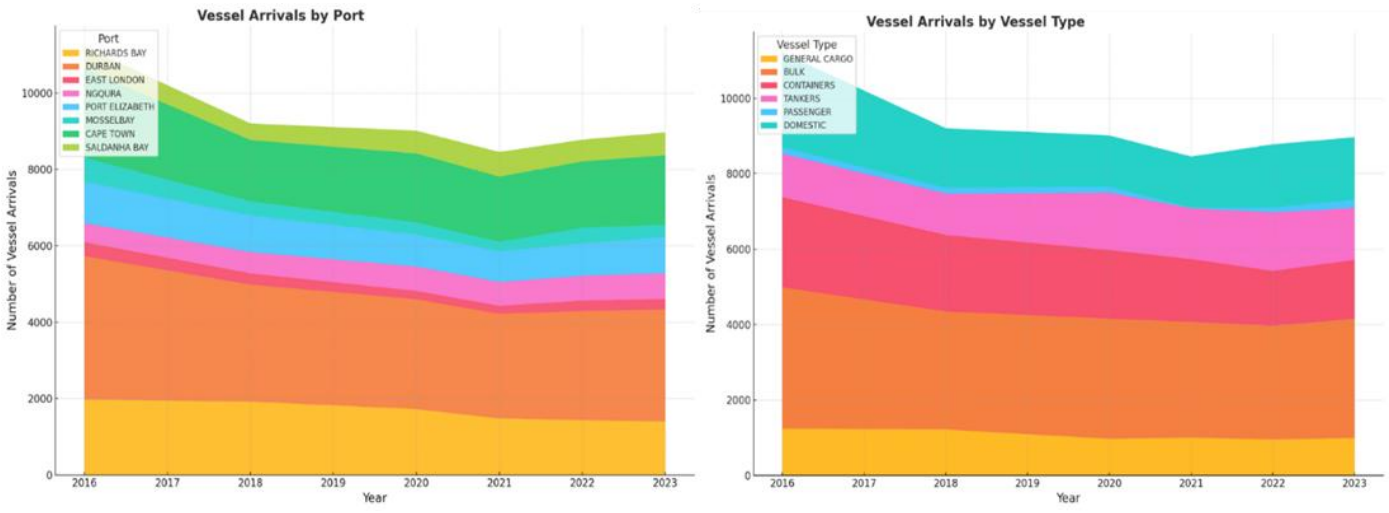

Figure 2. Total vessel arrivals by port (left) and vessel type (right) across South African commercial ports. Missing data interpolated for 2017 and 2019. Data: TNPA, 2023.

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Shipping Emissions

In 2023, total vessel arrivals and departures generated approximately 10 million tonnes (Mt) of CO_2 equivalent, with international vessels contributing about 97% of these emissions and domestic vessels accounting for the remaining 3% (~302 000 tonnes CO_{2eq}) (Figure 3). Bulk carriers, cargo ships, and container ships are the largest emission sources. Among South Africa's ports, ships in Durban's ports produced the highest emissions (~3.5 Mt), followed by ships in the port of Cape Town (~1.4 Mt), Saldanha Bay (1.3 Mt), and Richards Bay (~1 Mt). South Africa's shipping emissions represent approximately 1% of global seaborne trade emissions (DOT, 2017). Based on estimates from the national greenhouse gas inventory, domestic water-borne navigation contributed 356 kt CO_{2eq} in 2017, while international bunkers accounted for 6,634 kt CO_{2eq}, with an additional 1,674 kt from international waterborne transport (Stevens, 2021). These estimates align with the figures of the current analysis, though vary based on underlying data and assumptions. Nonetheless, estimating maritime emissions at a port-level is essential to provide a baseline for shaping policies to improve monitoring and support defossilisation efforts.

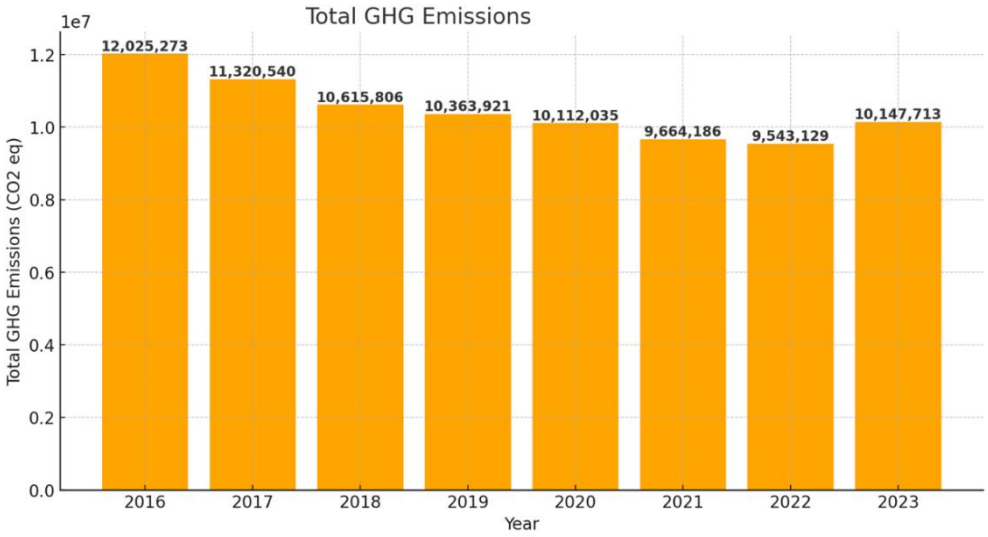


Figure 3. Total green house gas (GHG) emissions in CO_{2eq} for vessel arrivals and departures across commercial ports and vessel categories. Data: Own.

Freight Dynamics

Maritime defossilisation is crucial not only for reducing emissions associated with the transport of goods but also for addressing the carbon intensity of traded products. Emerging climate-energy trade regulations, such as the European Union's (EU) Carbon Border Adjustment Mechanism (CBAM) and the Fuel EU regulation, are likely to impose stricter requirements on traded goods and carbon emissions, potentially impacting trade routes and the export of goods from SA.

South Africa's trade and freight landscape varies across its ports, with Durban handling approximately 1 trillion ZAR in import trade in 2023. In terms of export value, Durban remains the largest port (307 billion ZAR), followed by Richards Bay (214 billion ZAR), Saldanha Bay (132 billion ZAR) and the Port of Cape Town (127 billion ZAR) (Figure 4). In 2023, the country recorded ZAR 1.96 trillion in export value compared with ZAR 1.97 trillion in imports, indicating a slight trade deficit. Key exports include gold (15.4%), platinum (13%), and coal briquettes (8.7%), while refined petroleum (15.2%), cars (4.1%) and crude petroleum (3.8%) were among

the top imports. Asia remains South Africa's largest trade partner, followed by Europe, North America, and Africa (Figure 4). Regionally, Durban, Richards Bay, and Saldanha Bay facilitate most trade with Asia, while significant trade volumes to Europe are distributed across all major ports. This highlights the strategic importance of South Africa's port infrastructure in supporting global and regional trade flows.

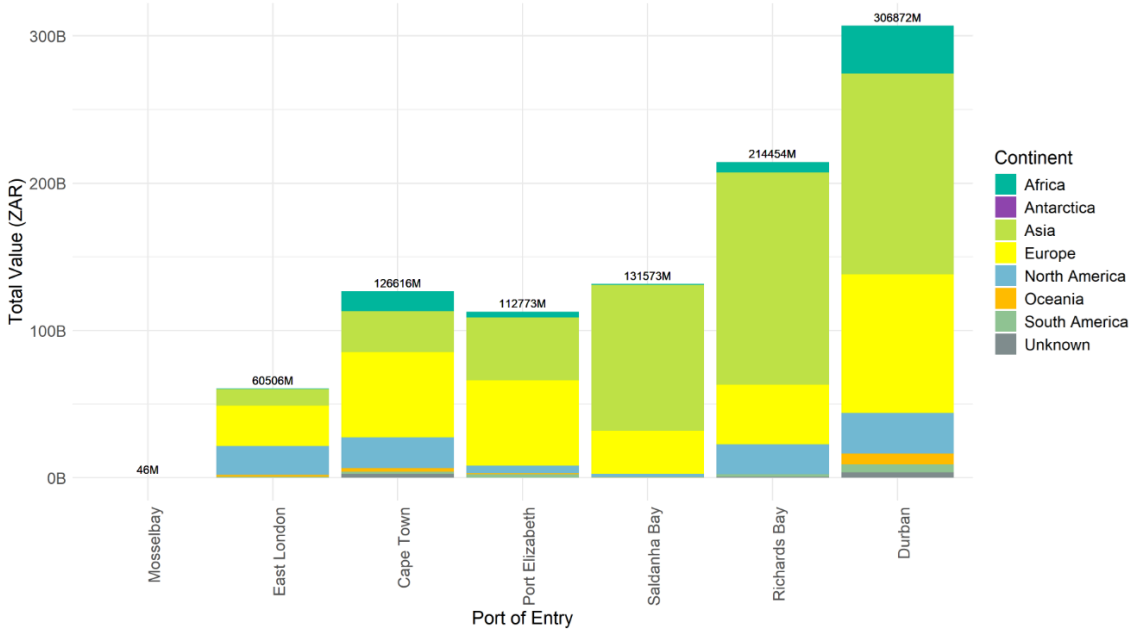


Figure 4. Total export value by port and trading partner for the year 2023. Data: OEC, 2024.

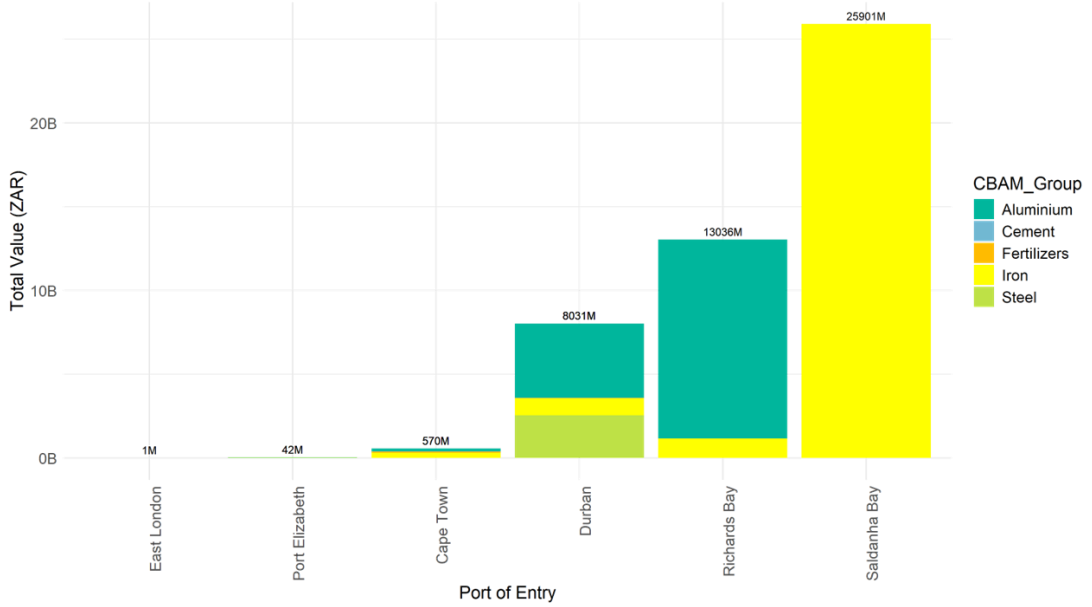
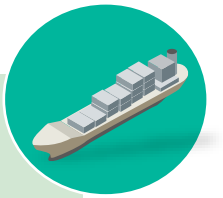


Figure 5. Total export value by port and CBAM aggregated groups (HS-4 CN category) for the year 2023. Data: OEC, 2024.

Regional Policy Implications

Regional policy regimes shape the global maritime trade landscape. Within the context of maritime defossilisation, four key regional trade agreements, namely, the African Continental Free Trade Area (AfCFTA), and EU policies including FuelEU, the EU Emissions Trading System (ETS), and the Carbon Border Adjustment Mechanism (CBAM) were reviewed. While the AfCFTA agreement, in its current form, does not directly include defossilisation instruments, it serves as an entry point to develop multi-lateral agreements to boost inter-continental trade and foster green value chain development. Over the past decade, the total share of export value to African countries has varied between 5 and 9%, with a total value of 58 billion ZAR in 2023. Moreover, in the context of European policy, the FuelEU Maritime, the ETS, and the CBAM, though operating through different mechanisms, will require all trade partners to accommodate the green transition to remain resilient against the implications of carbon-induced measures. It should also be noted that CBAM does not cover specific sectors, but rather selected goods which are prone to carbon leakage (European Commission, 2021).

SA's exports to the EU have surged from 51 billion ZAR in 2011 to 307 billion ZAR in 2023, with approximately 50 billion ZAR of exports—primarily cement, aluminium, fertilisers, and iron and steel— or 16% of total export trade to the EU subject to CBAM regulations (Figure 5). Ports like Saldanha Bay handle 25 billion ZAR in iron exports, and Richards Bay 13 billion ZAR in aluminium exports (Figure 5), thereby holding the largest potential to adapt and introduce emissions monitoring. Potential scope expansion of CBAM may further include additional products and emissions scopes associated with the production of goods. Therefore, to remain competitive, South African maritime authorities, operators, and exporters must proactively adapt to evolving regulations and integrate sustainable practices into trade and shipping operations.



Recommendations

I. **Government Collaboration:** Continue strengthening government collaboration across departments and authorities to develop a national action plan that ensures a coordinated approach to the green maritime transition, regulatory compliance, and sustainable trade development.

II. **Digitalization and Data:** Develop appropriate data infrastructure to monitor maritime traffic, emissions, and related indicators at the port level ensuring compliance with IMO requirements (MSW) and enabling an informed implementation and monitoring of defossilisation efforts.

III. **Unlock Green Infrastructure Investments:** Strive for a holistic maritime policy aligned with the country's energy transition goals, providing a strong signal to private and public infrastructure developers to accommodate green bunker fuel demand in the near future.

IV. **Multilateral Agreements:** Leverage the AfCFTA to develop agreements that promote intercontinental trade and green value chain development with African partners.

V. **Trade Diversification:** Explore opportunities to expand exports by tapping into green trade value chains and product markets, unlocking green premium potential while fostering sustainable growth and a just transition.

VI. **Capacity Building:** Invest in training and skills development to equip the maritime workforce with expertise in alternative fuels, sustainable operations, and emissions monitoring. Collaboration between government, industry, and academia will be key to ensuring a skilled workforce for the green shipping transition.

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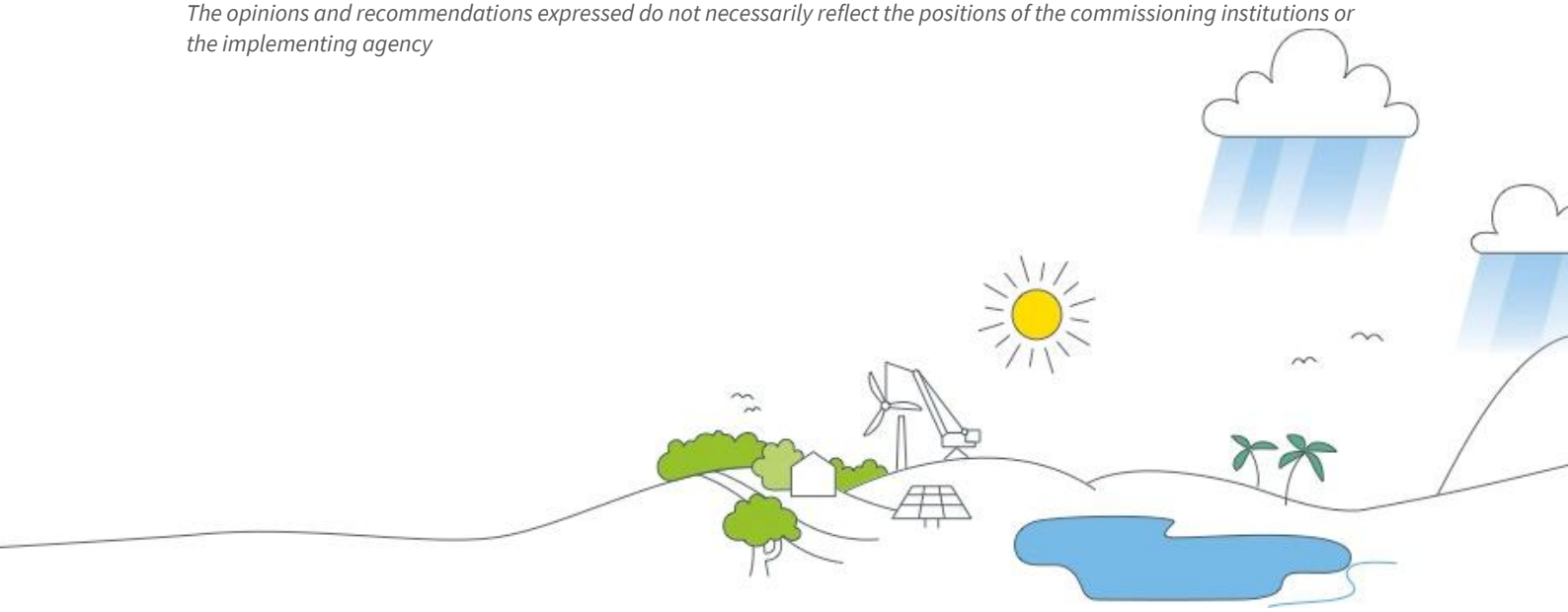
The opinions and recommendations expressed do not necessarily reflect the positions of the commissioning institutions or the implementing agency



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