The Red Sea Under The Microscope: A Deep Dive Into Suez Canal Rerouting And Its Consequences

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Suez Canal

The following report has been written by VesselBot, a technology company with deep logistics market expertise that brings transparency to Scope 3 transportation emissions and enables companies to be confident in accurately and efficiently calculating their carbon footprint and work effectively toward compliance with ESG regulations.

As container ships reroute around the Suez Canal to avoid disruptions caused by Houthi attacks, the world watches closely as one of the key arteries of international trade experiences a shift. At VesselBot, our commitment to transparency in transportation emissions offers more than a view. Standing at the forefront of technology, we monitor vessels' movement in real-time and comprehend the broader implications of such disruptions in global logistics.

Understanding the Disruption

Our technology allowed us to picture the scene and visualize it by creating a real-time snapshot of this monumental shift. The implications are profound, not just for shipping routes and delivery times but also for the global supply chain and our environment. Based on the timeline at the bottom left of the video, we can quickly identify the date the major rerouting started at 15-12-2023.

We carefully examined two different sets of data to identify the specific number of vessels rerouting from the Suez polygon to the Cape of Good Hope after the Red Sea crisis.

Pre-Crisis Traffic:

Initially, 667 vessels were identified traversing the Suez Canal within their respective trade lanes.

Post-Crisis Traffic:

Subsequently, a separate group of vessels navigating near the Cape of Good Hope after the crisis was identified.

Rerouted Vessels:

Notably, a subset of vessels that previously used the Suez Canal neither continued through the Suez nor switched to the Cape of Good Hope, allowing us to safely assume these vessels were likely rerouted via the Cape of Good Hope.

As a result of these analyses, we estimate that a total of 825 vessels have been rerouted through the Cape of Good Hope. To meet the capacity needs within these specific trade lanes and to maintain Schedule reliability, the number of extra vessels assigned by Carriers on the same Lanes was 158, which can also be translated to a notable 23% increase in vessels.

This adjustment in shipping routes indicates a dynamic response within the maritime industry to maintain operational efficiency in the face of unforeseen disruptions.

Deeper analysis of significant factors:

Speed increases

Focusing on the average speed of the vessels before and after the crisis began, we identified that vessels were steaming with an average speed of 13.67 knots. In contrast, after the crisis occurred, rerouting via Cape of Good Hope, vessels were steaming with a speed of 15.87 knots.

Deviations in speed may impact fuel consumption in a non-linear manner and, consequently, emissions from the vessel. In this case, the speed variance between the two observation periods significantly increases fuel consumption and total emissions.

Hence, it is safe to assume that the speed increases effected by Carriers were used to partially “compensate” for the increase in additional distance due to the rerouting. An average speed increase of 16.1% was identified.

Distance increases post-crisis

In addition to the augmentation in the average vessel speed, it is imperative to address the increase in the distances these vessels were required to traverse due to the circumstances arising in the Suez Canal. More specifically, our data indicated that the average percentage of increase in distance was over 40% after rerouting.

Vessel utilization factor increases

Utilization factors are a significant parameter we observed as they can impact the emissions allocated to each cargo shipped. The utilization factor is the loaded container ratio to the total container slots available on a vessel.

Higher utilizations lead to lower emissions assigned to one cargo unit (e.g., TEU). Our analysis reveals that the utilization factor stood at 61% and 63% before and after the crisis, respectively.

VesselBot's mission is to precisely navigate this complex interplay between speed, distance, and cost implications, enabling informed decision-making and strategic optimization in the face of evolving maritime scenarios.

Emissions increase

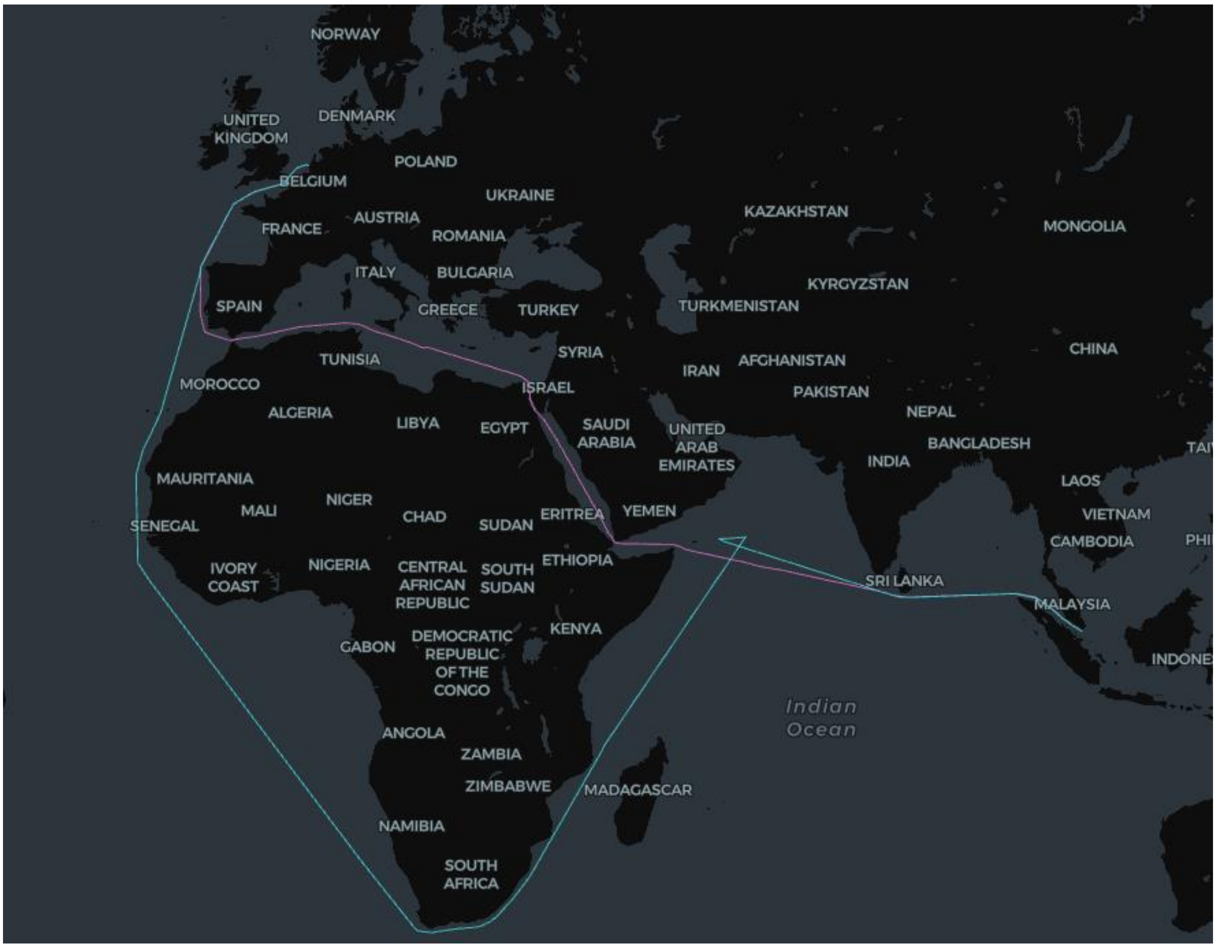
The paramount consequence of the Red Sea incident lies in a substantial escalation of emissions. In light of the imperative to minimize the environmental impact, the Red Sea incident underscores a significant surge in emissions.

To delve into numbers, before the crisis, the emission levels were recorded at 8,959,335 tons of CO_2; following the incident, they rose to 15,324,375, revealing a staggering 71% increase in emissions post-crisis.

This environmental impact underscores the need for strategic actions to mitigate emissions, emphasizing technology's critical role in measuring, addressing, and reducing them.

Distinctive Characteristics and Implications for Global Trade

To provide a more comprehensive view of the Red Sea crisis, we wanted to present an example of a vessel voyage before and after the crisis, the respective changes in operational patterns that occurred, and the impact this has on the environment, as shown below.



In this example, the vessel voyage departed from the Port of Singapore Port and ended at the Port of Rotterdam. Before the Red Sea crisis, the vessel sailed via the Suez Canal (see the pink line on the map). Due to the Red Sea incident, the vessel's trajectory was redefined, as seen by AIS data, leading to the adoption of an alternative route that significantly extended the journey between the specified locations to traverse the southern tip of Africa, proximate to the Cape of Good Hope (see the blue line).

Commencing from the Singapore Port and concluding at the Rotterdam Port, both vessels share identical starting and ending points. However, due to the Red Sea incident, the vessel's trajectory was redefined, leading to the adoption of an alternative route that significantly extended the journey between the specified locations.

Traditionally, the vessel would navigate through the Suez Canal (see the pink line). Still, the alternative route circumvents the canal, opting to traverse the southern tip of Africa, proximate to the Cape of Good Hope (see the blue line).

Rerouting The Seas: A Comparative Study Of Two Distinct Point-to-point Routes Before And After The Crisis

Via Good Hope

Total duration: 33 days, 5 hours

Average speed: 17.6 knots

Total distance: 24346.89 km

WtW emissions intensity: 61.13 g/TEU * km

WtW cargo emissions: 951.70 kg (for cargo 1 TEU)

Load factor: 0.92

Via Suez Canal

Total duration: 20 days, 12 hours

Average speed: 17.3 knots

Total distance: 15408.58 km

WtW emissions intensity: 46.18 g/TEU * km

WtW cargo emissions: 718.95 kg (for cargo 1 TEU)

Load factor: 0.86

The above findings clearly show that despite speed being a significant factor that drives emissions variances, in this specific case, we can attribute the increase in emissions to distance and the TEU utilization factor.

As clearly illustrated in this example, despite the notable increase in the utilization factor (from 86% to 92%), the increase in the distance plays a more important role, resulting in a surge of 32% in total emissions.

The above insights also indicate that all these variables play a significant role in the emissions footprint measurement, which is exacerbated by the complex logistics network that Shippers operate at. As a result, one always needs to consider all voyage operational patterns and factor them into any calculation to measure the emissions of their logistics operations accurately.

Conclusion

In these challenging times, having a comprehensive understanding of shipping patterns is crucial. VesselBot's pioneering technology empowers companies to navigate these disruptions with confidence. Our high-accuracy, primary and modeled data cover all transportation modes, from vessels and airplanes to trains and trucks.