



Unlocking Vessel Dismantling Opportunities: *Towards steel Circularity*

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NEW ENERGIES

The energies coalition for transport & logistics

Executive Summary

Commercial Vessel Fleet is getting older than older and will reach an average age of 23 years between 2024 and 2025.

As demonstrated by the order book registered in the first months of 2024, the vessel Dismantling market is rising again after a period of slow down.

Since 2018, the EU Ship Recycling Regulation has been requiring the use of an approved ship recycling facility included in the European List of ship recycling facilities for a sea-going vessels sailing under an EU Member State flag.



39% of the ships world's tonnage is owned by European companies, representing around 25 000 vessels falling under European Dismantling Regulatory Scheme.

49% of these European vessels are over 15 years old, including 11% over 20 years old.

Based on an internal analysis using "Clarksons Research" data¹, the New Energies Coalition has estimated that Vessels Dismantling market should be expand significantly: **The market capacity should be multiplied by 4 in Europe and increased by 2.5 times globally within the next decade** to accommodate the current fleet rotation needs.

In addition, **Europe is expected to become a net importer of scrap metal by 2030** has the global steel demand is projected to increase by more than a third in 2050 (IEA Source) Shipping could be one of the largest providers of metal scrap in European Union if we make sure that dismantling takes place in the European Union influence area.

Steel industries and Vessel dismantling regulatory framework should be more connected to ensure **European low carbon steel sovereignty**.

The objective of the document is to analyze the two markets interdependence by balancing vessels dismantling market growth and the scrap steel needs in Europe.

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1. Introduction

Increasing shipping decarbonisation regulation accelerates the need for ship replacement

Year after year, **the world's shipping fleet is ageing, reaching average 22.2 years by end of 2023².**

Between 2022 and 2023, the average age of the global shipping fleet has increased by 4 months. The average age was under 20 years 12 years ago.

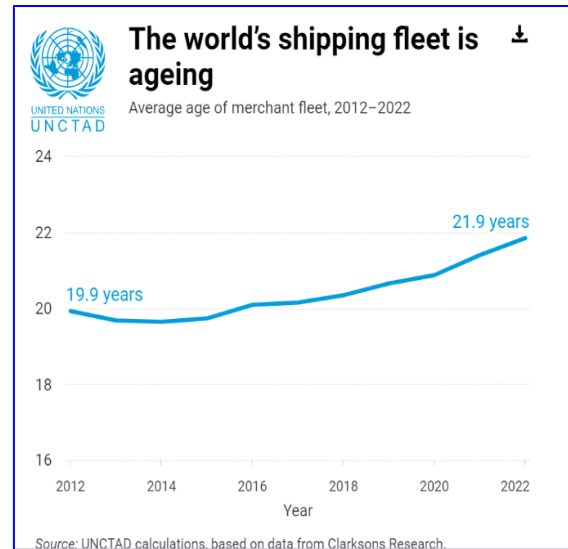
As from next year (2025), each vessel delivered will still be in operations in 2050 with the obligation to reach near zero emission in 2050.

Roughly and based on a lifespan estimated around 30 to 35 years for a merchant vessel, **half of the ships in service will need to be replaced in less than 15 years.**

In average, between 2 000 and 2 500 vessels will need to be recycled each year in the next 10 years.

For containerships, the fleet average age is lower reaching 14,2 years in 2023 compared to 13.7 years in 2022. **45% of the total containerships fleet is over 15 years** which means it will have to be renewed and scrapped by 2040, representing an average of 88 vessels by year just for containerships in the next decade, reaching 277 vessels by year in the 5 following years as from 2034.

The reason of this increase is explained partially by uncertainty on renewable fuels costs and availability, innovation readiness in the market, carbon prices and regulations mechanisms to support this energy transition. **A new generation of greener ships is expected but time of readiness and costs of operations remain too uncertain increasing the average lifespan of the current vessel fleet.**



² – United Nations Conference on Trade and Development

Recent IMO Green House Gases (GHG) emissions Strategy published is fostering the fleet renew needs and scrap availability

With the new IMO GHG strategy published in July 2023 and the last European shipowners' joint-declaration at COP28 to strive to at least – 30% of GHG emission by 2030 and – 80% by 2040, the oldest ships must be replaced with more energy efficient ships that will still be in operation in 2050.

The available scrap metal fed by the shipping sector will increase by 4 by 2034

The current vessel dismantling market is estimated at 7 million of Light Weight Tonnage (LWT) per year **and will double by 2028 to reach 14 million of Light Weight Tonnage** for the whole vessels market including, RORO, containerships, tankers... **and will be multiplied by four (4) by 2034³** reaching an estimated total of 28 million of LWT (empty ship weight).

The limited European Recycling Market is struggling and is looking for new opportunities.

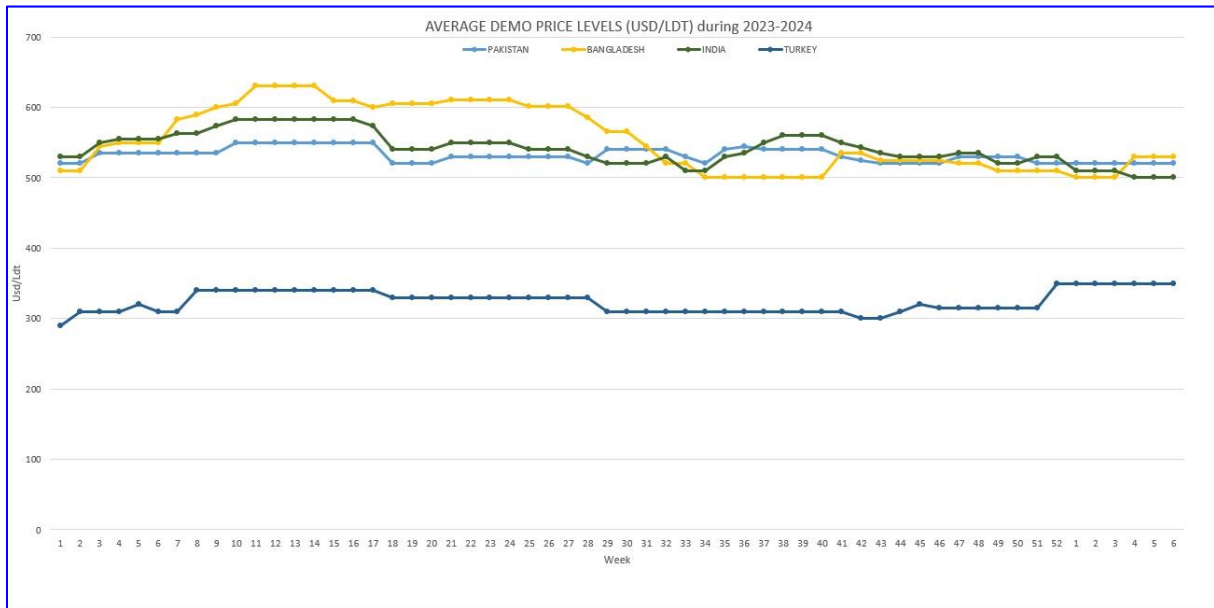
In Europe, Vessel Dismantling market has been regulated for years and is authorized only in scrapping yards (such as some Turkish yards) certified by EU, limiting the market offer and the capacity for absorbing such volumes.

The authorized European yards are representing less than 6% of today's recycling capacities with a total of **less than 60 vessels recycled in 2023, mainly in Turkey**. Based on such data, only 600 vessels could be scrapped in the next 10 years when the need will be almost around the double.

Moreover, scrapped metal is negotiated at a higher value in India and Pakistan, where European vessels are not authorized to be recycled due to social and environmental concerns, around 500 to 580 \$ / ton versus 300 to 380 \$ / ton in Turkey, creating more appetite for vessel scrapping in South Asia than in EU where prices are rather at 100\$/t.

The higher purchasing price per ton of vessel that Asian yards can afford is not linked to a higher scrap market price in Asia, but to their lower social and environmental costs enabling to pay more to catch the business. In fact, the reselling price for scrap in Asia is similar to EU price levels as scrap is an internationally traded commodity.

³ Source: sustainable shipping initiative based on UNCTAD and Hoffman 2020



Illustrative 1: Average demolition price during 2023 –2024. Source: www.go-shipping.net/demolition-market

In addition, steel from vessel scrapping is a valuable commodity as most steel producers around the world are basing their decarbonization journey on steel recycling, looking for more and more steel with the highest quality grades such as vessel steel scrap and creating more appetite for steel scrap around the world.

How could the shipping and steel industry work together?

How circular economy could be developed and promoted between two sectors?

2. World Fleet Overview

Focus on European Vessels Recycling Market

Shipping Sectors, the current vessels fleet trends

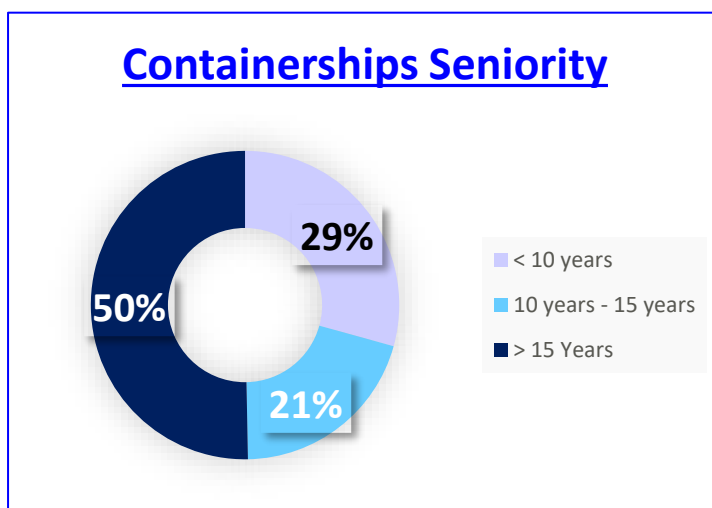
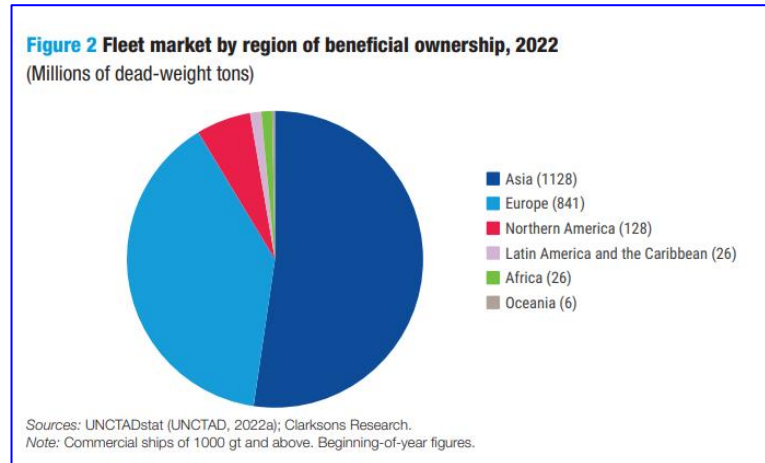
To date, more than 90 000 ships are operated over the world, **including almost 60 000 Merchant vessels out of which 6 000 are containerships.**⁴

In January 2022, half of ships' world tonnage was owned by Asian companies, **followed by European companies with 39% of the dead-weight tons.**

The containership segment represents 13.4% of the total world fleet. (Source UNCTAD)

Between 2017 and 2022, 9 000 merchant vessels have been added to the worldwide fleet (almost +2% by year); built to more than 90% in China, Republic of Korea and Japan, all in Asia.

New vessels will be needed to replace the oldest ones, meaning yards' activities will remain intense in the coming years. In addition, more vessels will be needed to support the world energy transition as **½ of the total future energy produced will be transported by ships, leading to more ships operated on seas in the coming years.** (Source IEA)



50% of the world's containerships fleet is more than 15 years old and will have to be replaced in the next 15 years.

Moreover, 20% are over 20 years.

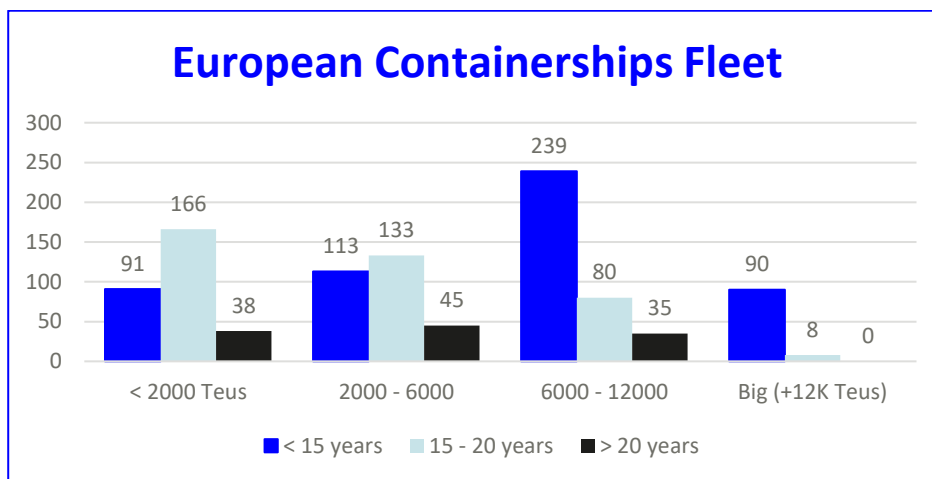
100% of containerships more than 25 years old have less than 8000 Teus (Twenty Equivalent Unites) meaning they are all eligibles for Turkish scrapping yards.

⁴ <https://www.atlas-mag.net/en/category/tags/focus/the-world-merchant-fleet>

Focus on European Flag

The European ship owners possess around 39% of the world fleet for commercial ships above 1 000 Gross Tonnage, representing more than 25 000 vessels.

11% of the European containership fleet is more than 20 years old **and 49% more than 15 years old**, leading to scrapping vessel under European Flag will increase in the next decade and likely creating yard congestion in the European dismantling yards.



In Europe, there are only 118 European flagged containerships to be replaced in the next 10 years, but 387 during the 5 following years, representing **an average of 34 vessels to be scrapped per year in the next 15 years for the containerships segment alone**.

In addition, 45% of these vessels have a Lightweight above 23 000 tons meaning not aligned with most of the current Turkish yard's capacity (max 42 meter of larger); Some yards are able to manage 2 slots adjoining (+/- 100 m) but are still in limited number.

The European vessel scrapping market needs also increased yard capacity to welcome larger vessels and which calls for investment. It should be noted that scrapping by beaching is not authorized.



3. The Vessel Scrapping Market

The Scrapping Market and Associated Regulations

The vessel dismantling market is mainly expressed in Lightship or Lightweight tonnage (LWT) measuring the actual weight of the ship with no fuel, no cargo, water on board.

For a containership with a 6 000 Teus (Twenty Equivalent Units) capacity, the average LWT is between 23 000 to 25 000 LWT (representing a vessel with a larger of 40–42 m and a longer of 270 – 280 m)

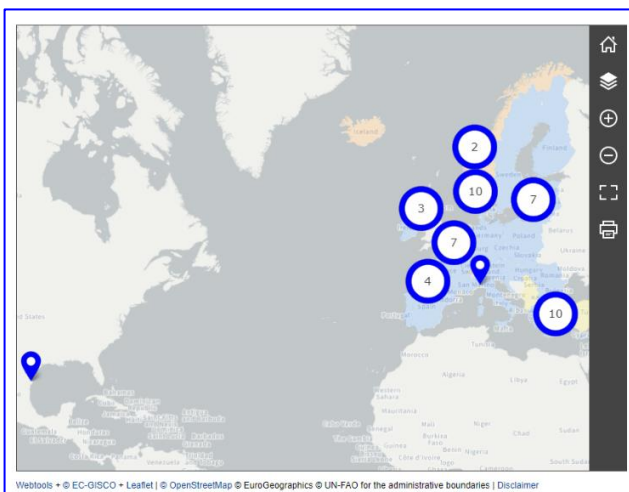
Where are the ship dismantling yards?

To date, India is representing 31% of the scrapping/ recycling capacity of the world and Europe less than 8% of the total recycling market.

Largest ship breaking yards are based in India, Bangladesh and Pakistan, with a total of 90% of the total market based on gross tons in 2022. For the first time in 2022, India displaced Bangladesh as the leading ship-dismantler in 2022.

For the first time, Turkey took the third slot by number (4th by LDT) in 2022 with a total of 48 vessels scrapped.

Focus on Regulations.



The European Ship Recycling Regulation aimed to reduce the environmental and social impacts of the recycling ships by authorizing only shipyards for dismantling that respect EU social and environmental criteria for dismantling European Flagged vessels. The European authorized shipyard list (last one adopted the 6th of December 2023 in its 12th edition) **contains 45 ship-recycling facilities, including 38 yards in Europe (EU, Norway and UK), 9 yards in Turkey and 1 yard in the USA**, removing 3 facilities from the previous version as they are no longer in the ship recycling business.

To date, 32 recycling yards in non-OECD countries including 27 in India and Bahrain have applied for EU approval. The UAE has also introduced new ship recycling regulations that will enter into force in March 2024.

The European Regulation contains the requirement of the Hong Kong Convention but includes also additional safety and environmental requirements. **The Hong Kong convention** applies to non-European flag ships of 500 GT or more engaged in international trade and **will enter into force in June 2025**. It applies to ships flagged in contracting states (to date 23 contracting States including Liberia, Pakistan and Bangladesh), which will be required to carry an Inventory of Hazardous Materials (IHM) and will only be allowed to be recycled at authorized facilities.

In addition, there is also the **Basel Convention and the Basel Ban Amendment** controlling the movement of hazardous wastes across international borders, including ship for recycling and requires consent from the export, import and transit state. The Basel Ban Amendment goes further and prohibits export of from OECD states to non-OECD members. One of the major differentiations between all these regulations is about beaching ban and the need of impermeable infrastructure for ship recycling. The new UAE Ship Recycling Regulation (UAE SRR) explicitly prohibits ship beaching.

Turkey is the only market where a significant number of yards are complying by European Union regulation, with market share of 7% but with limited growth capacity due to shore limitation (physical constraint). To date the market is mainly designed to welcome vessels with a max of 6 000 TEU vessels size i.e., with a maximum width of 40 to 42 meters. To be noted, the capacity could be multiplied by 2 in some yards.

In total, we consider that Turkey will be able to increase its capacity to approx. 1.5 million LTD representing a max of 65 vessels of 6 000 Teus / years.

It is important to note that China is no longer accepting foreign flagged ships to be scrapped in its shipyards.

Why the trends will be an acceleration of the vessels dismantling demand in the next decade?

In addition, containerships orderbook is still strong at 30% of the global fleet size with no more than 3,2 m TEUs worth of newbuilding (source Alphaliner) for a total of 478 vessels to be delivered in 2024. This should result in increased recycling demand in Europe and Asia.

The International Maritime Organization's (IMO's) regulation on EEXI and CII will challenge older tonnage with low energy efficiency rate, and place vessels owners between ROI to upgrade their vessel versus scrap of the oldest ones. About 20% to 25% of vessel units will fall into the CII's D and E grades (lowest ones) leading to scrapping demand growth from 2025 and onwards, creating more congestion on recycling yards.

Scalability of recycling yards is at risk but ensuring fair and efficient vessel scrapping market is one of the biggest challenges for the next 10 years.

What is possible to date ?

To date more than 95% of a ship could be recycled.

Over the last ten years, 7 780 ships were recycled with a deadweight capacity of 285 million tons. In 2023, 100 containerships were scrapped, while the double is expected for 2024.

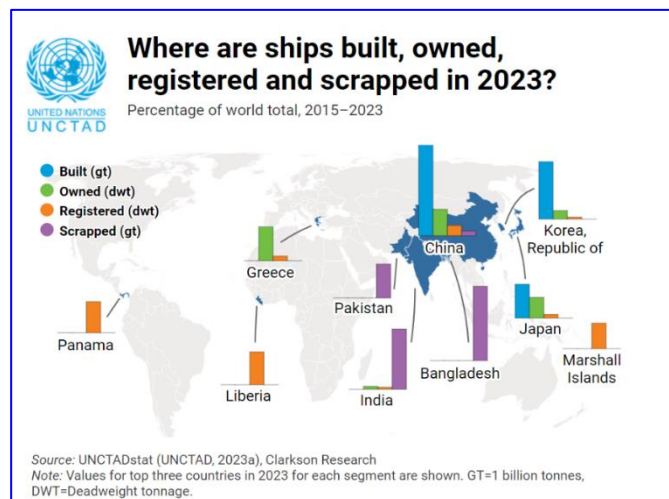
On the basis of these figures, it will take 20 years to dismantle just 16,000 ships, whereas it will be necessary to replace more than 50% of the total world fleet, i.e. between 40,000 and 45,000 ships – more than twice as many!... This would mean **increasing current capacity by at least 2.5 times**. The pivot date will be 2028 where ship recycling demand will quadruple.

Larger scrapping yards are also required to welcome larger vessels with a nominal capacity above 6 000 TEUs and 10 000 TEUs.

Dismantling Shipyards capacity should be increased but also new business models should be defined, facilitating the recyclability of the ships and more cooperation between shipping sector and steel industry.

To ensure that the European steel industry can access those high-quality scrap volumes, it is of utmost importance to reinforce the ships' dismantling capacities within their geographical range. As Asia is already net scrap importer, it is very unlikely that scrap production in Asia linked to ship dismantling would flow back to EU.

Additionally, local scrap production is the best way to develop a recycling market, EU still being a significant actor in shipbuilding.



4.

The role of ferrous scrap in the Steel Sector Transition

Role of ferrous scrap in decarbonizing the Steel Sector

Steelmaking is responsible for approx. 7–8 percent of CO₂ emission globally. The steel industry’s decarbonization journey relies on steel recycling capacity, on scrap steel quality and availability. **The amount of scrap steel currently available is only enough to meet a quarter of the global demand.**

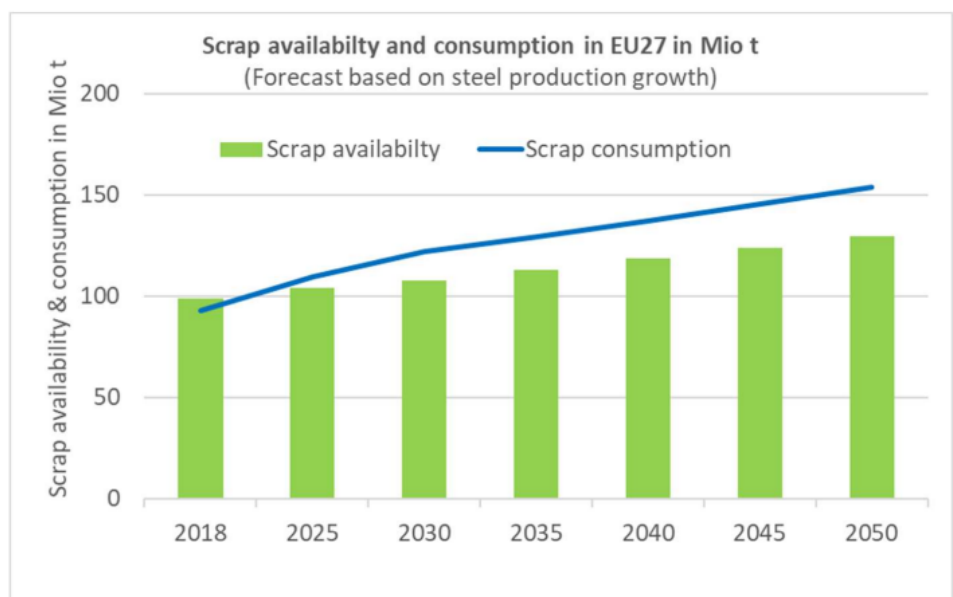
Ferrous scrap plays a fundamental role to meet the EU’s ambitious climate and circularity targets, impacting not only the European steel industry’s transition but also the overall cleantech value chain development.

Indeed, pushed by the ETS and RepowerEU, steel industry in EU is forced to transition from its classical blast furnaces route (which is primarily using coal to provide the energy required to melt the iron ore) to a greener production route where iron ore reduction is done through hydrogen and steel melted in furnaces thanks to low-carbon electricity. This new route enables increasing the recycled content rate from the current 10% to a range varying from 40–50% up to 100% depending on the grades.

For every ton of carbon steel scrap recycled, a saving of 1.5 tons of CO₂ is achieved. Moreover, it contains other critical raw materials such as manganese, vanadium, tungsten, yttrium, niobium, titanium, and so on, which can be recycled as well and are essential for high tech products and cleantech innovations.

By consequence, the demand for ferrous scraps and especially high-quality scraps (with low residuals) will drastically increase starting from the early 2030s.

But ferrous scrap is already considered a scarce, hence strategic, resource, and over 40 countries already apply trade restrictions. Europe who was traditionally a net metallic scrap exporter (since blast furnaces using virgin iron ore was the main production route) is expected to become a net importer within the coming years.



Turkey is also by far the Top ferrous scrap importing country when European Union is one of the Top ferrous scrap exporter region. But the trends will change, and cards will be redistributed.

According to projections of scrap availability and consumption patterns in the future – based on the needs of the transformation the **European steel industry will undergo by 2030–2050 – , there will not be sufficient scrap available to cover the EU low-carbon steel production needs.**

Shipbuilding could be one of the largest providers of metallic scrap in EU in the future if we make sur that dismantling takes place in the EU influence area.

The positioning of scrapping yards will be key in the future years to keep the scrap in Europe and to support the decarbonization of the steel sector and ensure Europe steel sovereignty. This ferrous scrap will help to develop the green steel market.

Shipping and Steel sectors need to collaborate to create a more efficient and improved recycling market and ensure European sovereignty in green steel market.

Why vessel dismantling market, Steel Industry and Europe Sovereignty are interconnected?

Steel is the primary shipbuilding material, making over **75%** of a vessel by weight.

Due to its massive process transformation, the EU steel industry is well placed to become one of largest sources of low-carbon steel supply for many industries, including shipbuilding.

In this green steel market, shipping is closing the circle by endorsing a double role:

- buyer of green steel for vessels, containers fleet and port infrastructures
- supplier of steel scrap from ship recycled.

Shipping is not yet on track to meet the international climate goals. And Steel requires strong underlying conditions such as capacity to retain scrap within its production area to succeed. An enhanced collaboration is essential to accelerate the transition especially in Europe, where the vessel dismantling market will suffer from a lack of capacity and where steel scrap will be needed in the coming years.

According to a recent UMAS⁵ report, nearly 800Mt of CO₂ (accumulative for the next 25 years) can be reduced by their shipping sector progressively switching to green steel with lower emission processes, equivalent to one year of shipping's GHG emissions.

⁵ <https://www.u-mas.co.uk/new-analysis-shows-shipping-can-lower-emissions-through-progressive-adoption-of-green-steel/>

Using green steel for new buildings is just starting with new initiatives such as the Japanese Shipping company Kline and JFE Steel Corporation cooperation for the new Ultramax bulker.

Further connecting the steel industry and shipping sector could lay the ground for a future circular economy able to transform scrapped vessel into new vessel or new port area.

Shipping needs more scrapping facilities, and the European steel sector needs more scrap to accelerate their climate transition. By encouraging cooperation between both sectors as from now, the vessel scrapping market could be more connected to the steel industry, considering the full value chain in the development of the future scrapping yards and facilities, and creating new business models.

European scrapping possibilities should be developed in the coming years, but definitively underpinned by the steel market's decarbonization journey. Europe should ensure that new regulation around dismantling yards should be linked with scrap steel recycling market.

Metal could be recycled indefinitely, and this is why Europe should ensure to have its steel back to its own industries.

New business models will appear by creating more connections between industries and transport.

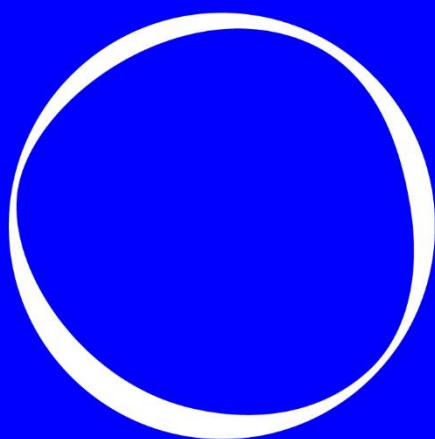
The steel industry and shipping will be more than ever connected, developing hand in hand a possible circular economy around vessel recycling market.

As green or "low-carbon" steel production develops mainly in EU, we have to ensure that the end of life also takes place in an EU influence area to make sure this steel recycling market could be deployed.

Abbreviations

Abbreviations

DWT	DeadWeight Tonnage= The total weight of the cargo, fuel, and supplies in metric tons.
CII	Carbon Intensity Index
EU	European Union
EEXI	Energy Efficiency Existing Index
GHG	Green House Gases
IMO	International Maritime Organization
LWT	LightWeight Tonnage = only steel and equipment weight without crew, fuels, water, ballast, cargo...
OECD	Organisation for Economic Cooperation and Development
RORO	Roll on/Roll off is a method of transport (as a ferry or train or plane) that vehicles roll onto at the beginning and roll off of at the destination.
TEU	Twenty Equivalent Unit Twenty-foot equivalent Unit is a general unit of cargo capacity, often used for containerships.
UAE SRR	The UAE SRR imposes stricter requirements than the EU Ship Recycling Regulation (EU SRR) by prohibiting not only the beaching but also the landing method.
USD	Unites Stats Dollar



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