# 2

# MARITIME TRANSPORT SERVICES

In 2021, due to strong market conditions, in terms of value the world shipping fleet increased dramatically, and there was much greater demand for second-hand vessels. During the 12 months to January 2022, however, in a more difficult economic environment, the total fleet of seagoing merchant vessels grew more slowly, by around 3 per cent.

The fleet has also been ageing. Since 2021, the average age of vessels has increased from 20 to 22 years. This is partly because ship owners and operators, uncertain about future fuel and carbon prices, environmental regulations and technological developments, have delayed investment and are keeping older vessels in operation.

Faced with new regulations and fuel types, owners may choose not to recycle existing ships and instead move to new, greener vessels. However, environmental regulations on the production inputs such as steel may raise costs and put a premium on recycling.

During the past year the supply of shipping capacity has been affected by the war in Ukraine, and the COVID-19 pandemic – which have led to chronic port congestion that has removed around 16 per cent of global container ship sailing capacity. These crises have also disrupted shipping schedules leading to ad hoc ship calls and longer dwell times. Shippers have suffered from shortages of vessel space and containers, while carriers have had to consolidate port calls, and ports have been managing logjams. Some of the pressures may, however, be alleviated in 2023–2024.

Faced with these crises, and the prospect of further disruptions, players across the shipping industry are aiming for greater resilience. Vulnerable economies will need to futureproof their ports and their maritime supply chains. Preparing for uncertainty will mean gathering sufficient data and planning different scenarios, while also establishing emergency response protocols to mitigate the impacts.

## A. MODERATE FLEET GROWTH IN 2021

In early 2022, the total fleet of seagoing merchant vessels amounted to 102,899 ships of 100 gross tons and above, equivalent to 2,199,107 thousand dwt of capacity. In the 12 months to January 2022, in dwt terms the global commercial fleet grew by 2.95 per cent (table 2.1), an historically moderate growth rate and the second lowest since 2005 (figure 2.1). Over the same period, supported by robust global gas demand, the fleet of liquified-gas carriers continued to grow strongly, by 8.15 per cent.[1]

At the start of 2022, the average age of the global fleet was 21.9 years in terms of number of ships, and 11.5 years in terms of carrying capacity, and in 2022 on both measures the average age continued to increase. In terms of dw tonnage, the youngest vessels were bulk carriers at 10 years, followed by container ships (11 years) and oil tankers (11.2 years) (table 2.2). Newer ships are generally bigger.

Since 2011, the total fleet has aged by 7 per cent, from 20.4 to 21.9 years – growing older for all ship types except for bulk carriers, which since 2013 on average have been the youngest vessels (figure 2.2). The fleet is ageing partly because shipowners and operators, uncertain about future fuel and carbon prices, regulations and technological developments, have delayed investment and are keeping their older vessels in operation.

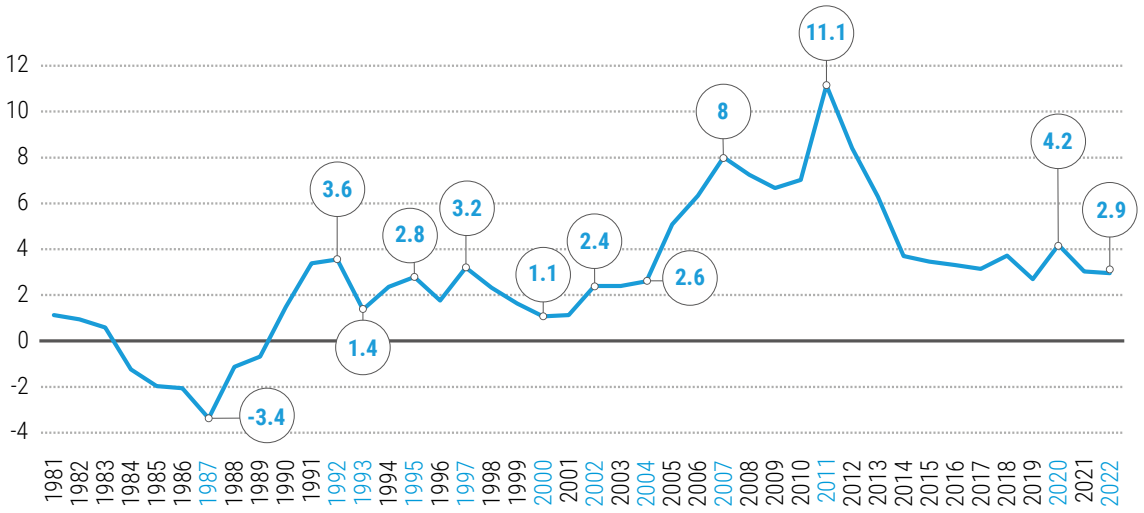
**Table 2.1 World fleet by principal vessel type, 2021–2022**
(thousand dead-weight tons and percentage change)

| Principal types | 2021 | 2022 | Percentage change 2022 over 2021 |
|---|---|---|---|
| Bulk carriers | 913 175 | 946 135 | 3.61% |
| | *42.75%* | *43.02%* | |
| Oil tankers | 619 331 | 629 014 | 1.56% |
| | *28.99%* | *28.60%* | |
| Container ships | 281 825 | 293 398 | 4.11% |
| | *13.19%* | *13.34%* | |
| Other types of ships | 243 949 | 251 742 | 3.19% |
| | *11.42%* | *11.45%* | |
| Offshore supply | 83 805 | 84 281 | 0.57% |
| | *3.92%* | *3.83%* | |
| Liquefied gas carriers | 77 458 | 83 770 | 8.15% |
| | *3.63%* | *3.81%* | |
| Chemical tankers | 49 055 | 49 662 | 1.24% |
| | *2.30%* | *2.26%* | |
| Other/n.a. | 25 443 | 25 690 | 0.97% |
| | *1.19%* | *1.17%* | |
| Ferries and passenger ships | 8 188 | 8 340 | 1.85% |
| | *0.38%* | *0.38%* | |
| General cargo | 77 910 | 78 819 | 1.17% |
| | *3.65%* | *3.58%* | |
| **World total** | **2 136 190** | **2 199 107** | **2.95%** |

*Source:* UNCTAD calculations, based on data from Clarksons Research.

*Notes:* Propelled seagoing merchant vessels of 100 gross tons and above, as of 1 January 2022.
Dead-weight tons for some individual vessels have been estimated.

**Figure 2.1 Annual growth of the world fleet, 1981–2022**
(percentage of dead-weight tonnage)




*Source:* UNCTAD calculations, based on data from Clarksons Research.

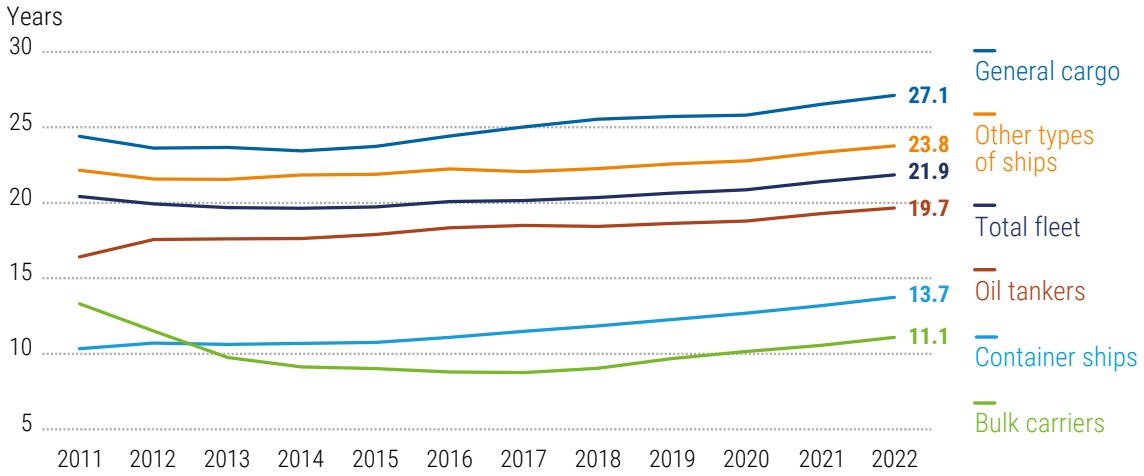
Table 2.2 Age of world merchant fleet, by vessel type and flag of registration, 2022

| Vessel type, country grouping by flag of registration and indicator | | Years | | | | | Average age | |
|---|---|---|---|---|---|---|---|---|
| | | 0–4 | 5–9 | 10–14 | 15–19 | More than 20 | 2021 | 2022 |
| **World** | | | | | | | | |
| Bulk carriers | Percentage of total ships | 17 | 31 | 31 | 10 | 11 | 11 | 11.1 |
| | Percentage of dead-weight tonnage | 21 | 33 | 30 | 10 | 7 | 10 | 10 |
| | Average vessel size (dead-weight tonnage) | 91 530 | 78 801 | 71 422 | 71 234 | 47 812 | NA | NA |
| Container ships | Percentage of total ships | 14 | 18 | 28 | 20 | 19 | 13 | 13.7 |
| | Percentage of dead-weight tonnage | 20 | 27 | 27 | 17 | 9 | 10 | 11 |
| | Average vessel size (dead-weight tonnage) | 73 578 | 79 436 | 50 646 | 43 226 | 24 776 | NA | NA |
| General cargo | Percentage of total ships | 6 | 9 | 17 | 10 | 58 | 27 | 27.1 |
| | Percentage of dead-weight tonnage | 8 | 16 | 25 | 12 | 39 | 20 | 20.2 |
| | Average vessel size (dead-weight tonnage) | 5 361 | 6 723 | 5 824 | 4 497 | 2 661 | NA | NA |
| Oil tankers | Percentage of total ships | 14 | 16 | 21 | 15 | 34 | 19 | 19.7 |
| | Percentage of dead-weight tonnage | 24 | 19 | 30 | 20 | 8 | 11 | 11.2 |
| | Average vessel size (dead-weight tonnage) | 91 996 | 63 518 | 77 031 | 74 477 | 12 425 | NA | NA |
| Other types of ships | Percentage of total ships | 10 | 16 | 18 | 10 | 47 | 23 | 23.8 |
| | Percentage of dead-weight tonnage | 19 | 17 | 23 | 12 | 29 | 16 | 16.2 |
| | Average vessel size (dead-weight tonnage) | 8 658 | 5 091 | 6 170 | 5 967 | 2 987 | NA | NA |
| All ships | Percentage of total ships | 11 | 16 | 20 | 11 | 41 | 21 | 21.9 |
| | Percentage of dead-weight tonnage | 21 | 25 | 28 | 14 | 11 | 11 | 11.5 |
| | Average vessel size (dead-weight tonnage) | 40 585 | 33 020 | 30 308 | 27 097 | 5 824 | NA | NA |
| **Developing economies** | | | | | | | | |
| | Percentage of total ships | 11 | 18 | 20 | 11 | 40 | 21 | 20.9 |
| | Percentage of dead-weight tonnage | 20 | 24 | 25 | 15 | 17 | 12 | 12.6 |
| | Average vessel size (dead-weight tonnage) | 29 751 | 21 526 | 19 862 | 20 572 | 6 709 | NA | NA |
| **Developed economies** | | | | | | | | |
| | Percentage of total ships | 13 | 16 | 21 | 11 | 40 | 21 | 21 |
| | Percentage of dead-weight tonnage | 23 | 27 | 31 | 13 | 7 | 10 | 10.5 |
| | Average vessel size (dead-weight tonnage) | 54 300 | 51 196 | 44 230 | 35 411 | 5 354 | NA | NA |
| **Small Islands Developing States** | | | | | | | | |
| | Percentage of total ships | 14 | 22 | 22 | 11 | 32 | 18 | 18.6 |
| | Percentage of dead-weight tonnage | 27 | 31 | 23 | 11 | 8 | 10 | 9.9 |
| | Average vessel size (dead-weight tonnage) | 63 325 | 44 917 | 33 292 | 33 324 | 8 155 | NA | NA |
| **Least Developed Countries** | | | | | | | | |
| | Percentage of total ships | 14 | 13 | 8 | 6 | 59 | 28 | 27.9 |
| | Percentage of dead-weight tonnage | 9 | 13 | 25 | 22 | 31 | 17 | 17.4 |
| | Average vessel size (dead-weight tonnage) | 6 531 | 9 935 | 31 823 | 37 401 | 5 412 | NA | NA |

*Source:* UNCTAD calculations, based on data from Clarksons Research.

*Notes:* Propelled seagoing vessels of 100 gross tons and above, as of 1 January 2022.
Dead-weight tons for some individual vessels have been estimated.
The average age of a dwt is calculated as the sum of all products of the age and dwt of a ship, divided by the sum of the dwt of all ships.
The LDC and SIDS country groupings are based on the definitions of the Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UNOHRLLS). Developed and developing country groupings are based in the UNCTADstat classification. For more information see all groups' composition at https://unctadstat.unctad.org/EN/Classifications.html.

**Figure 2.2 Average age of merchant fleet, 2011–2022**




*Source:* UNCTAD calculations, based on data from Clarksons Research.

*Note:* Propelled seagoing vessels of 100 gross tons and above, as of 1 January 2022.

The greatest proportional increase in average age was for container ships, from 10.3 to 13.7 years, followed by oil tankers, from 16.4 to 19.7 years, and by general cargo ships from 24.4 to 27.1 years. For bulkers, on the other hand the average age, which in 2017 was 8.8 years, decreased from 13.3 to 11.1 years.

# B. FLEET OWNERS FACE TIGHTER ENVIRONMENTAL REGULATIONS

## 1. Environmental regulations are tightening

Shipowners faced with new environmental regulations and fuel types may choose to recycle existing ships and move to new, greener vessels. However, for shipbuilders, environmental regulations on the shipbuilding process on inputs such as steel may raise costs and put a premium on recycling.

IMO environmental regulations, which cover issues such as air pollution, ballast water treatment and double hulling of tankers, have continued to influence decisions on the design and construction of ships.[2] On 1st January 2023, three new IMO regulations come into force – aiming to reduce maritime carbon emissions and the environmental impact of shipping. These are:

1. **The Energy Efficiency Existing Ship Index (EEXI)** – This is a framework for determining the energy efficiency of vessels over 400 GT. Ship operators will have to assess their ships' energy consumption and $CO_2$ emissions against specific energy efficiency requirements. To ensure compliance, ship owners may need to reduce their vessels' emissions. This is a one-time certification.
2. **The annual operational Carbon Intensity Indicator (CII)** – The CII, which applies to ships of 5,000 GT and above, indicates a vessel's performance and efficiency based on annual fuel consumption, using a rating from A to E. The CII will be assessed annually from 2023, and becoming increasingly stringent towards 2030. For ships that achieve a D rating for three consecutive years, or an E rating in a single year, shipowners need to develop a corrective action plan.
3. **The enhanced Ship Energy Efficiency Management Plan (SEEMP)** – The SEEMP is the mechanism for improving CII ratings. It envisages targets and planning, and the new technologies and practices for optimizing ship performance, along with procedures for self-evaluation, verification and company audits.

Governments are pressing to strengthen IMO regulation. The United States and Norway, for example, have jointly announced a Green Shipping Challenge for COP27 and have called on the IMO to adopt a revised greenhouse gas strategy, setting an interim goal for 2030 and zero emissions no later than 2050.

Shipping is also affected by other national and regional environmental policies. The EU, for example in 2021 presented a 'Fit-for-55' package, which charts the path towards 2050 to decarbonize across various sectors, including shipping, and includes changes to the EU Emissions Trading Scheme (ETS). In shipping, the package covers bunkering infrastructure in ports, with related tax incentives, and aims to promote alternative fuels, establishing fuel standards and lifecycle GHG footprint requirements.

The EU Commission foresees a cap-and-trade system that limits GHG emissions for each ship with a mechanism for trading in a secondary market.[3] Revenues generated from the auctioning of maritime allowances would go into a fund to support investments in energy transition.

Companies would have to buy carbon credits for all voyages starting or ending in the EU, and when at berth in EU ports, whichever flag they fly, or wherever the owner of that ship is. The regulation would apply to all ships above 5,000 GT, though there are discussions for lowering the threshold. Ships that do not comply could be detained or denied entry to ports.[4] This is likely to increase the cost of voyages involving EU ports.[5]

At the beginning of 2018, emissions allowances were being traded on the EU ETS at €8 per ton of $CO_2$ equivalent, but by March 2022 the price had risen to €80 to €90 per ton and is expected to rise further and become increasingly volatile.[6]

## 2. Increased costs ahead and other implications for ship-owners

The CII will provide an internationally verified and recognized ship rating. A bad carbon intensity rating may, in some cases, affect insurance coverage and charterer's liability. Poorly performing companies could become less attractive to cargo owners in charter markets.[7]

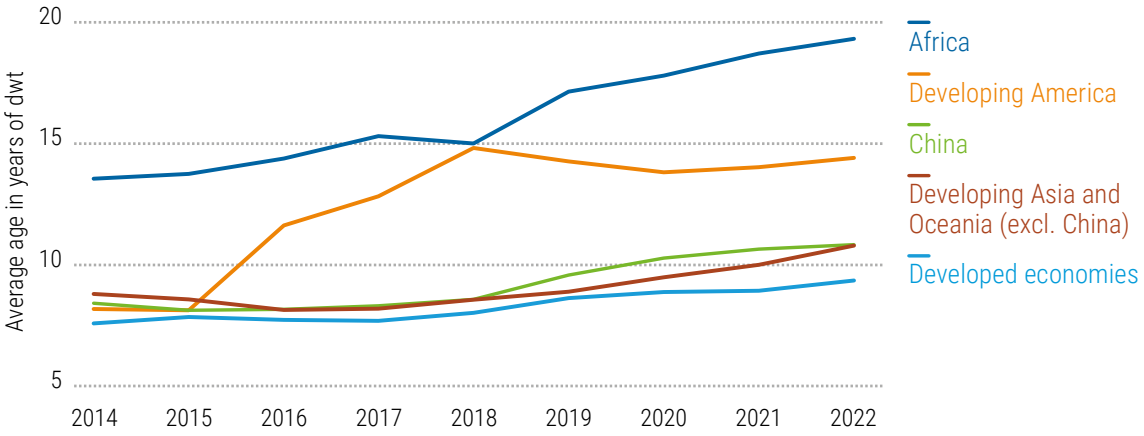
To reduce the carbon intensity and emissions of existing ships they will need to consider alternative, low- or zero-carbon fuels, and ways of optimizing operations, including reducing speeds. They may also need to invest in retrofitting vessels with energy-efficient technology and alternative propulsion techniques.[8]

In addition, companies must comply with new financial regulations such as the EU Sustainable Finance Disclosure Regulation[9] and take into account initiatives such the EU Green Bond principles[10] and the Poseidon principles[11] that address the climate impact of ship finance portfolios. Underperforming companies may struggle to gain access to investors and capital.

In this context, one of the most important considerations is the age of the fleet, which differs from one trading area to another. The region with the oldest bulker, container ship and oil tanker fleets is Africa, followed by developing America for bulk carriers and oil tankers. Developing Asia and Oceania rank joint-third for oil tankers (figure 2.3, figure 2.4 and figure 2.5).

African fleet ownership is limited. Despite efforts over many years to increase African participation in the supply of shipping services, the continent still relies mostly on foreign-owned vessels.[12] Compliance with environmental regulation and competitiveness could make African ownership even more difficult, and along some routes the continent may also face the higher costs associated with the deployment of greener ships.[13] Several countries with well-developed transport infrastructures and the potential to supply alternative energy, such as South Africa, Egypt and Morocco, are already planning for bunkering greener ships.[14]

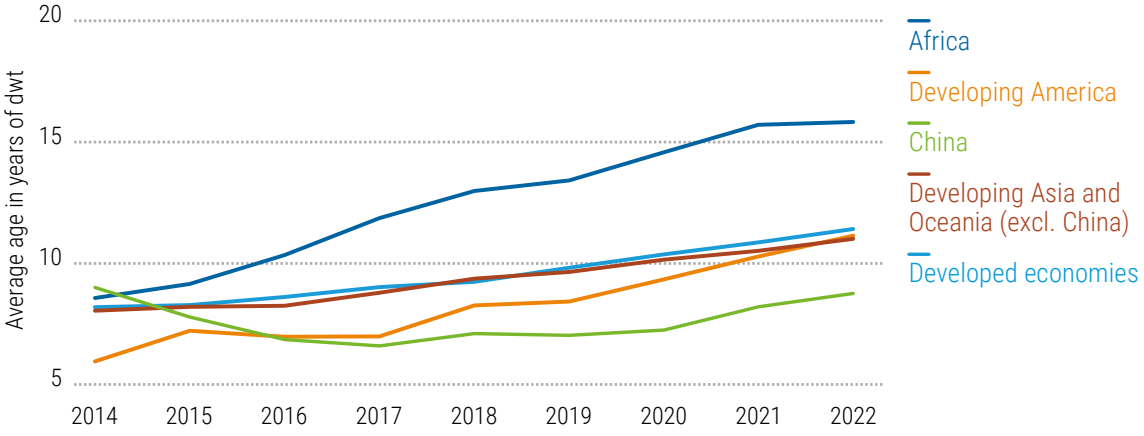
**Figure 2.3 Bulk carrier fleet, average age weighted by carrying capacity by ship type and beneficial ownership, 2014–2022**




*Source:* UNCTAD calculations, based on data from Clarksons Research.

*Notes:* See composition of all country groupings at: https://unctadstat.unctad.org/EN/Classifications.html.
The average age of a dwt is calculated as the sum of all products of the age and dwt of a ship, divided by the sum of the dwt of all ships.

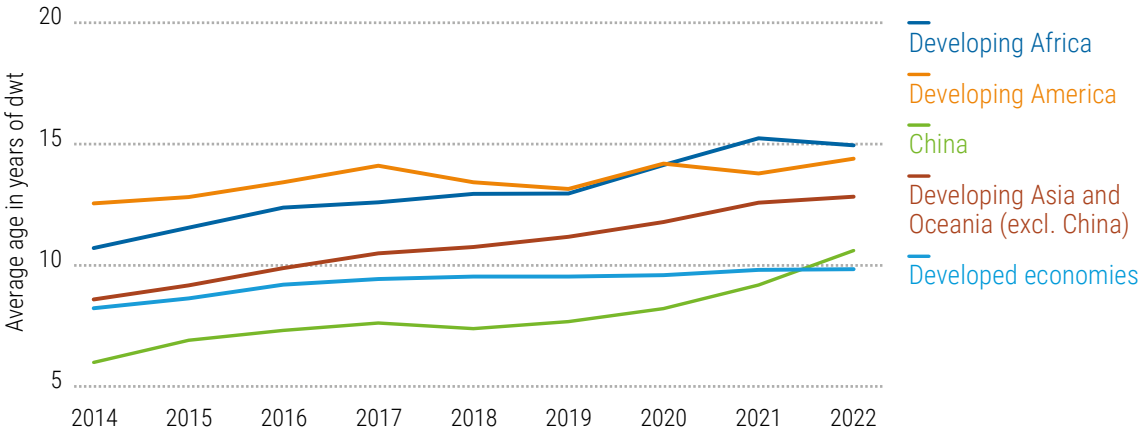
**Figure 2.4 Container ship fleet, average age weighted by carrying capacity by ship type and beneficial ownership, 2014–2022**




*Source:* UNCTAD calculations, based on data from Clarksons Research.

*Note:* See composition of all country groupings at: https://unctadstat.unctad.org/EN/Classifications.html.
The average age of a dwt is calculated as the sum of all products of the age and dwt of a ship, divided by the sum of the dwt of all ships.

**Figure 2.5** Oil tanker fleet average age weighted by carrying capacity by ship type and beneficial ownership, 2014–2022




*Source:* UNCTAD calculations, based on data from Clarksons Research.

*Note:* See composition of all country groupings at: https://unctadstat.unctad.org/EN/Classifications.html. The average age of a dwt is calculated as the sum of all products of the age and dwt of a ship, divided by the sum of the dwt of all ships.

## 3. Older smaller ships and maritime transport networks

Larger ships tend to be newer and thus more modern and energy efficient. However, the modernity of the structure of the vessel or the structure and equipment on board depends not just on age but on type of trade, distance to be sailed, and the owner's willingness to invest. As illustrated in table 2.3, which is based on the thresholds considered in the EEXI and CII regulations, the age differences across ship sizes are highest for tankers and container ships.

In recent years, newbuild ships have tended to be bigger, which further reduces the average age based on tonnage.[15] Faced with uncertainties about future fuel and carbon prices, regulations, and technological developments, many ship owners and operators are delaying investment and keeping vessels for longer. But they are likely to dispose of older ships that are more difficult to upgrade to meet energy-efficiency and carbon-intensity regulations.

To comply with new environmental rules older ships may have to sail more slowly.[16] Smaller container ships tend to be deployed along secondary trading routes or used as feeders in the hub-and-spoke models of liner shipping networks. Here, older and smaller ships sailing slower will further reduce capacity and service reliability.[17]

**Table 2.3** Average age by ship type and size class of 400 GT and above

| | Small ships over 400 GT | | | Medium Ships | | | | | | Large ships | | | Very Large Ships | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 400–499 GT | | | 500–4,999GT | | | 5,000–24,999GT | | | 25,000–59,999GT | | | Above 60,000GT | | |
| | # of ships | % of ship type | AVG age | # of ships | % of ship type | AVG age | # of ships | % of ship type | AVG age | # of ships | % of ship type | AVG age | # of ships | % of ship type | AVG age |
| Bulk carriers | - | - | - | - | - | - | 1 313 | 10% | 14.7 | 5 352 | 42% | 12.3 | 6 049 | 48% | 9.2 |
| Containers | - | - | - | 213 | 4% | 21.9 | 2 100 | 38% | 15.3 | 1 475 | 26% | 13.6 | 1 801 | 32% | 11.1 |
| Oil tankers | 215 | 2% | 34.9 | 4 193 | 36% | 27.6 | 1 432 | 12% | 16.4 | 2 131 | 18% | 11.8 | 2 994 | 26% | 11.2 |

*Source:* UNCTAD calculations, based on data from Clarksons Research.

*Note:* Propelled seagoing vessels of 100 gross tons and above, as of 1 January 2022.

# C. SHIP OWNERSHIP AND REGISTRATION

## 1. The list of top ship-owners and registries is (almost) unchanged

### *Ship ownership*

As of 1 January 2022, the top three ship-owning countries, in terms of both dead-weight tonnage and of commercial value, were, as in previous years, Greece, China, and Japan (table 2.4 and table 2.5). Greece leads in terms of tonnage and China in terms of commercial value.

In the 12 months to 1 January 2022, among the top 25 ship-owning countries, Switzerland recorded the highest increases in tonnage at 17 per cent, followed by China at 13 per cent. Over the 2014–2022 period, the top-12 countries remain unchanged though Greece has pulled further ahead while China had overtaken Japan (figure 2.6).

In 2021, the world shipping fleet increased dramatically in value. Strong market conditions pushed vessel prices upwards, with the greatest increases for container ships.[18] At the same time there has been greater demand for second-hand vessels – fuelled by disruptions to world trade, shortages of new cargo vessels, and the war in Ukraine.[19]

The ranking of fleet ownership and registration is more volatile in terms of commercial value than in tonnage. China registered the highest increase in share, of 1.09 percentage points, followed by Switzerland, Hong Kong China, and the Republic of Korea whose fleets have a higher proportion of container ships.

Table 2.4 Ownership of the world fleet, ranked by commercial value (million US$), 2022, main vessel types

| | Country or Territory of Ownership | Container Ships | Bulk Carriers | Oil Tankers | Offshore vessels | Ferries & Passenger Ships | Gas Carriers | General Cargo Ships | Chemical Tankers | Other/NA | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | China | 45 104 | 56 487 | 14 948 | 11 457 | 5 219 | 4 630 | 9 026 | 3 857 | 4 098 | 154 827 |
| 2 | Greece | 30 051 | 55 797 | 35 608 | 228 | 2 280 | 22 432 | 297 | 932 | 533 | 148 157 |
| 3 | Japan | 34 010 | 51 558 | 10 105 | 5 145 | 3 264 | 18 420 | 3 670 | 5 270 | 13 036 | 144 477 |
| 4 | United States | 5 230 | 5 385 | 5 056 | 14 119 | 50 999 | 1 553 | 1 626 | 963 | 1 035 | 85 966 |
| 5 | Germany | 52 934 | 8 072 | 1 800 | 666 | 10 100 | 1 572 | 5 211 | 762 | 533 | 81 649 |
| 6 | Singapore | 21 249 | 19 553 | 12 942 | 4 274 | 12 | 4 844 | 1 393 | 5 406 | 809 | 70 481 |
| 7 | United Kingdom | 17 232 | 5 717 | 4 095 | 14 218 | 5 507 | 7 212 | 1 016 | 1 552 | 3 788 | 60 336 |
| 8 | Hong Kong, China | 29 066 | 15 475 | 7 160 | 124 | 2 075 | 1 619 | 1 305 | 266 | 1 613 | 58 704 |
| 9 | Norway | 4 297 | 5 573 | 5 436 | 20 251 | 3 423 | 8 224 | 1 397 | 2 488 | 5 235 | 56 325 |
| 10 | Republic of Korea | 13 801 | 11 854 | 6 994 | 403 | 524 | 6 029 | 701 | 1 587 | 4 035 | 45 929 |
| 11 | Switzerland | 25 913 | 917 | 535 | 2 896 | 10 546 | 196 | 227 | 168 | 5 | 41 404 |
| 12 | Denmark | 26 742 | 1 858 | 3 439 | 1 675 | 1 169 | 2 170 | 903 | 825 | 152 | 38 932 |
| 13 | Taiwan Province of China | 22 435 | 10 703 | 1 410 | 128 | 71 | 351 | 550 | 223 | 112 | 35 983 |
| 14 | Bermuda | 4 727 | 6 842 | 6 637 | 3 062 | | 8 311 | | 107 | 98 | 29 784 |
| 15 | Netherlands | 854 | 989 | 416 | 11 221 | 452 | 623 | 4 705 | 2 058 | 2 616 | 23 935 |
| 16 | France | 13 906 | 438 | 91 | 5 151 | 1 879 | 388 | 206 | 117 | 131 | 22 307 |
| 17 | Italy | 21 | 1 077 | 1 949 | 5 042 | 10 097 | 205 | 2 310 | 393 | 1 131 | 22 225 |
| 18 | Brazil | 1 370 | 253 | 830 | 13 843 | 61 | 108 | 38 | 74 | 2 | 16 580 |
| 19 | Monaco | 3 837 | 3 064 | 6 688 | | 26 | 1 630 | | 25 | 47 | 15 317 |
| 20 | Türkiye | 2 675 | 5 319 | 1 502 | 705 | 323 | 342 | 2 623 | 1 173 | 45 | 14 706 |
| 21 | Indonesia | 3 154 | 1 920 | 2 500 | 1 201 | 2 062 | 965 | 1 637 | 449 | 66 | 13 953 |
| 22 | Russian Federation | 395 | 410 | 3 467 | 1 542 | 156 | 1 834 | 2 647 | 629 | 1 821 | 12 901 |
| 23 | United Arab Emirates | 1 652 | 3 253 | 3 123 | 2 392 | 37 | 857 | 169 | 632 | 235 | 12 350 |
| 24 | Belgium | 853 | 2 180 | 3 559 | 334 | | 983 | 873 | 208 | 2 021 | 11 011 |
| 25 | Malaysia | 528 | 236 | 355 | 6 266 | 32 | 2 183 | 263 | 126 | 170 | 10 158 |
| | Others | 14 572 | 22 592 | 21 229 | 24 729 | 13 727 | 14 821 | 11 135 | 4 435 | 2 633 | 129 874 |
| | **World total** | **376 606** | **297 523** | **161 873** | **151 071** | **124 041** | **112 504** | **53 929** | **34 724** | **46 000** | **1 358 270** |

*Source:* UNCTAD calculations, based on data from Clarksons Research, as of 1 January 2022 (estimated current value).

*Note:* Value is estimated for all commercial ships of 1,000 gross tons and above.

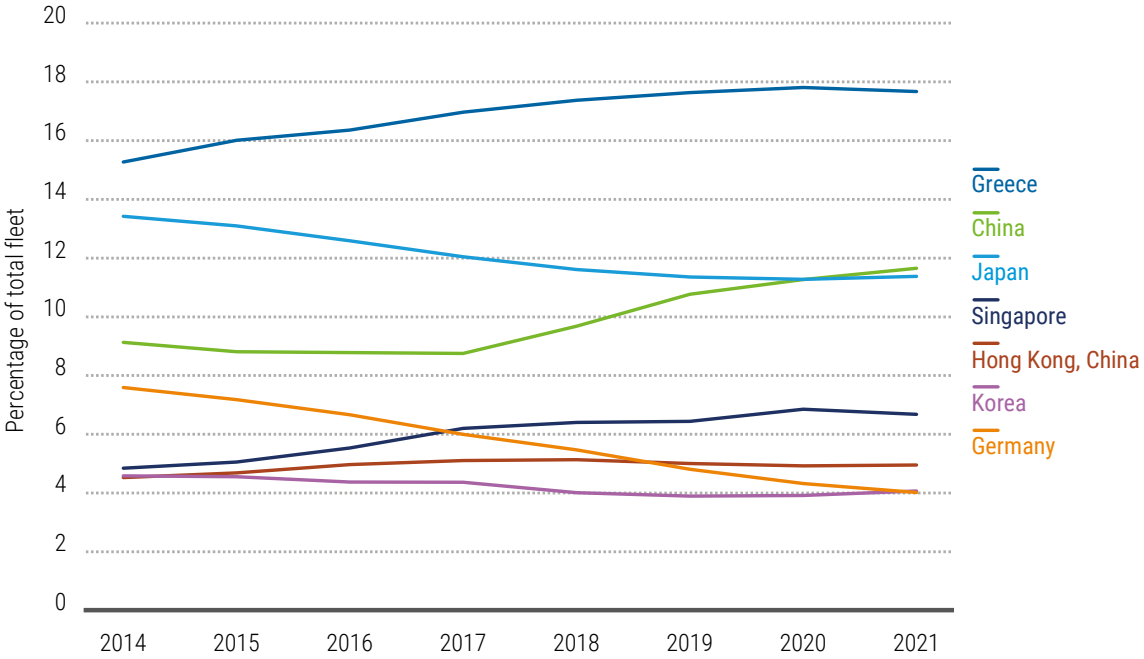
Table 2.5 Ownership of the world fleet, ranked by carrying capacity in dead-weight tons, 2022, national- and foreign-flagged fleet

| | Country or territory of ownership | Number of vessels | | | Deadweight tonnage | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | National flag | Foreign flag | Total | National flag | Foreign flag | Total | Foreign flag as a % of total | Total as a % of world |
| 1 | Greece | 620 | 4 246 | 4 870 | 55 715 512 | 328 703 344 | 384 430 215 | 85.51 | 17.63 |
| 2 | China | 5 357 | 2 599 | 8 007 | 113 035 546 | 163 977 083 | 277 843 335 | 59.19 | 12.74 |
| 3 | Japan | 933 | 3 070 | 4 007 | 35 970 817 | 200 656 470 | 236 638 365 | 84.8 | 10.85 |
| 4 | Singapore | 1 371 | 1 400 | 2 799 | 67 869 137 | 68 312 248 | 136 243 709 | 50.16 | 6.25 |
| 5 | Hong Kong, China | 861 | 948 | 1 822 | 72 061 117 | 39 473 538 | 111 587 729 | 35.39 | 5.12 |
| 6 | Republic of Korea | 804 | 867 | 1 680 | 14 767 539 | 77 501 218 | 92 302 014 | 84 | 4.23 |
| 7 | Germany | 185 | 2 036 | 2 221 | 6 976 526 | 72 616 389 | 79 592 915 | 91.23 | 3.65 |
| 8 | Bermuda | 2 | 505 | 507 | 26 137 | 63 381 136 | 63 407 273 | 99.96 | 2.91 |
| 9 | Norway including Svalbard and Jan Mayen Islands excluding Bouvet Island | 982 | 1 002 | 1 987 | 18 980 244 | 40 945 002 | 59 931 039 | 68.33 | 2.75 |
| 10 | United Kingdom of Great Britain and Northern Ireland including Channel Islands and Isle of Man | 363 | 1 014 | 1 380 | 9 376 891 | 49 222 876 | 58 746 865 | 84 | 2.69 |
| 11 | United States of America including Puerto Rico | 774 | 1 001 | 1 783 | 10 193 014 | 44 123 048 | 55 113 272 | 81.23 | 2.53 |
| 12 | China, Taiwan Province of | 150 | 856 | 1 014 | 6 590 724 | 48 326 874 | 54 974 072 | 88 | 2.52 |
| 13 | Denmark | 414 | 430 | 844 | 20 484 167 | 20 152 955 | 40 637 122 | 49.59 | 1.86 |
| 14 | Monaco | 0 | 393 | 393 | 0 | 38 011 632 | 38 011 632 | 100 | 1.74 |
| 15 | Switzerland | 17 | 480 | 497 | 911 905 | 29 975 783 | 30 887 688 | 97.05 | 1.42 |
| 16 | Türkiye | 406 | 1 175 | 1 583 | 5 768 553 | 24 653 060 | 30 433 830 | 81.04 | 1.4 |
| 17 | Belgium | 99 | 244 | 343 | 9 141 427 | 20 304 520 | 29 445 947 | 68.96 | 1.35 |
| 18 | Indonesia | 2 283 | 121 | 2 411 | 24 763 544 | 4 050 071 | 29 065 796 | 14.06 | 1.33 |
| 19 | United Arab Emirates | 124 | 954 | 1 087 | 631 741 | 26 597 771 | 27 363 741 | 97.68 | 1.26 |
| 20 | India | 874 | 197 | 1 076 | 16 165 552 | 9 302 885 | 25 979 620 | 36.53 | 1.19 |
| 21 | Russian Federation | 1 516 | 309 | 1 833 | 9 250 551 | 15 044 248 | 24 317 936 | 61.92 | 1.12 |
| 22 | Iran (Islamic Republic of) | 244 | 10 | 255 | 18 608 833 | 830 667 | 19 441 051 | 4.27 | 0.89 |
| 23 | Netherlands | 665 | 524 | 1 189 | 5 392 304 | 12 519 434 | 17 911 737 | 69.9 | 0.82 |
| 24 | Saudi Arabia | 160 | 108 | 269 | 13 619 108 | 3 738 256 | 17 358 885 | 21.54 | 0.8 |
| 25 | France, Metropolitan | 173 | 252 | 425 | 4 356 779 | 10 978 404 | 15 335 183 | 71.59 | 0.7 |
| 26 | Italy | 453 | 177 | 630 | 9 040 908 | 6 237 878 | 15 278 786 | 40.83 | 0.7 |
| 27 | Viet Nam | 959 | 167 | 1 133 | 11 358 301 | 3 562 368 | 14 934 404 | 23.88 | 0.69 |
| 28 | Brazil | 295 | 84 | 384 | 4 672 784 | 9 077 925 | 13 773 954 | 66.02 | 0.63 |
| 29 | Cyprus | 124 | 227 | 353 | 4 435 287 | 9 272 007 | 13 758 739 | 67.64 | 0.63 |
| 30 | Canada | 207 | 174 | 383 | 2 491 394 | 7 342 722 | 9 835 479 | 74.67 | 0.45 |
| 31 | Oman | 4 | 64 | 69 | 5 558 | 9 326 443 | 9 332 147 | 99.94 | 0.43 |
| 32 | Malaysia | 453 | 163 | 629 | 6 597 645 | 2 344 395 | 8 985 167 | 26.22 | 0.41 |
| 33 | Nigeria | 203 | 73 | 282 | 3 521 990 | 3 976 535 | 7 520 054 | 53.03 | 0.34 |
| 34 | Qatar | 53 | 74 | 127 | 733 693 | 6 475 247 | 7 208 940 | 89.82 | 0.33 |
| 35 | Kuwait | 44 | 7 | 51 | 4 805 336 | 446 848 | 5 252 184 | 8.51 | 0.24 |
| | **Subtotal, top 35 shipowners** | **22 172** | **25 951** | **48 323** | **588 320 562** | **1 471 461 279** | **2 062 880 823** | **71.44** | **94.63** |
| | *Rest of the world unknown* | *3 173* | *2 558* | *6 714* | *33 495 841* | *56 785 576* | *117 177 484* | *48.46* | *5.37* |
| | **World** | **25 345** | **28 509** | **55 037** | **621 816 403** | **1 528 246 855** | **2 180 058 307** | **71.08** | **100** |

*Source:* UNCTAD calculations, based on data from Clarksons Research.

*Notes:* *Propelled* seagoing vessels of 1,000 gross tons and above, as of 1 January 2022.
For the purposes of this table, ships registered under national flag are any ship where the registration and ownership are in the same country or territory of ownership. Ships in second registries of Brazil, China, Denmark, France and Norway are considered to be under the national flag if they are owned in their respective country. Ships registered in Isle of Man are considered as being registered under national flag if they are owned anywhere in a greater territory of United Kingdom including the Isle of Man and the Channel Islands. Likewise, for the purpose of determining national flag, Madeira and mainland Portugal are considered as one unit.
The totals for a country or territory of ownership includes vessels for which the flag is unknown. Thus, the sum of national and foreign flags does equal the total. Foreign flag as a percentage of total is calculated as share of vessels with known flag.
For a complete listing of nationally owned fleets, see http://stats.unctad.org/fleetownership.

**Figure 2.6** Beneficial ownership of the global fleet, percentage share, top 7 ship-owing countries, 2014–2021, deadweight tonnage



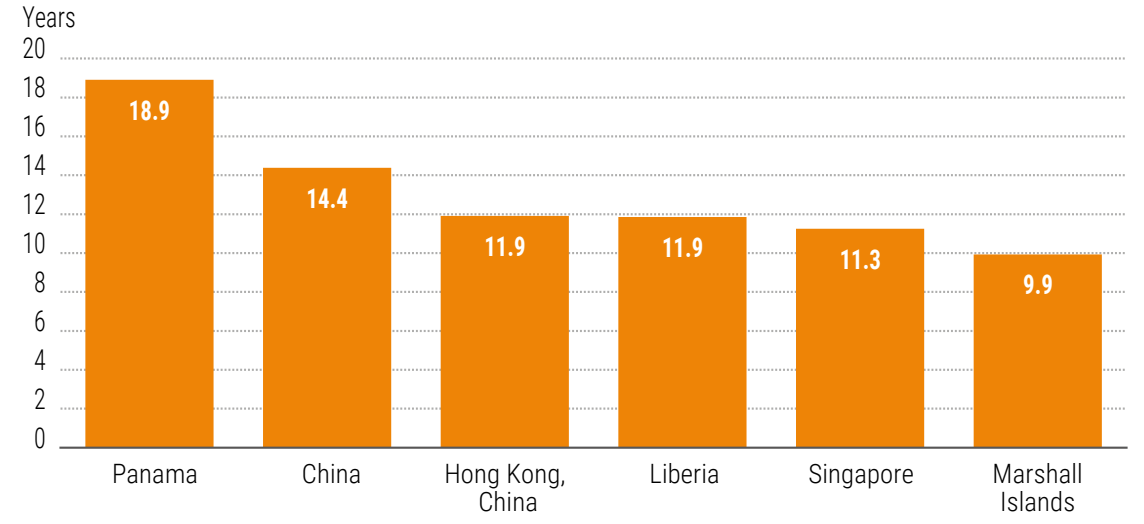

*Source:* UNCTAD calculations, based on data from Clarksons Research.

## *Vessel registration flags*

As of 1 January 2022, in terms of dead-weight tonnage and commercial value, the top three flags of registration were those of Panama, Liberia and the Marshall Islands (table 2.6 and table 2.7). Among the top registries, Viet Nam recorded the highest increases in dead-weight tonnage. The Liberian flag registered the highest increase in the share of fleet value, of 2.2 percentage points, whereas as the Bahamas flag had the largest decrease, 1.5 percentage points. Iran, Israel and Madeira recorded the highest increase in percentage of global fleet value between 2019 and 2022.[20]

Among the top six registries, the highest average age of total fleet was for ships registered in Panama, followed by China. The lowest was for the Marshall Islands, followed by Singapore (figure 2.7). Differences in age reflect differences in registries policies, pricing structure and specialization in different ship types.

**Figure 2.7** Average fleet age in the top six registries, by deadweight tonnage, as of 1 January 2022




*Source:* UNCTAD calculations, based on data from Clarksons Research.

Table 2.6 Leading flags of registration by dead-weight tonnage, 2022

| | Flag of registration | Number of vessels | Share of world vessel total (percentage) | Dead-weight tonnage (thousands dead-weight tons) | Share of total world dead-weight tonnage (percentage) | Cumulated share of dead-weight tonnage (percentage) | Average vessel size (dead-weight tonnage) | Growth in dead-weight tonnage 2021 to 2022 |
|---|---|---|---|---|---|---|---|---|
| 1 | Panama | 8 025 | 7.8 | 350 401 | 15.9 | 15.9 | 43 664 | 1.7 |
| 2 | Liberia | 4 311 | 4.2 | 335 114 | 15.2 | 31.2 | 77 735 | 11.9 |
| 3 | Marshall Islands | 4 042 | 3.9 | 289 781 | 13.2 | 44.3 | 71 693 | 5.7 |
| 4 | Hong Kong, China | 2 661 | 2.6 | 207 816 | 9.5 | 53.8 | 78 097 | 1.4 |
| 5 | Singapore | 3 227 | 3.1 | 131 369 | 6.0 | 59.8 | 40 709 | -3.6 |
| 6 | China | 7 309 | 7.1 | 114 952 | 5.2 | 65.0 | 15 727 | 6.0 |
| 7 | Malta | 2 047 | 2.0 | 114 910 | 5.2 | 70.2 | 56 136 | -0.9 |
| 8 | Bahamas | 1 307 | 1.3 | 72 998 | 3.3 | 73.5 | 55 851 | -1.8 |
| 9 | Greece | 1 234 | 1.2 | 61 817 | 2.8 | 76.4 | 50 095 | -4.3 |
| 10 | Japan | 5 590 | 5.4 | 40 263 | 1.8 | 78.2 | 7 203 | 2.4 |
| 11 | Cyprus | 1 030 | 1.0 | 33 461 | 1.5 | 79.7 | 32 487 | -1.7 |
| 12 | Indonesia | 11 015 | 10.7 | 29 332 | 1.3 | 81.0 | 2 663 | 1.1 |
| 13 | Danish Int'l Register | 612 | 0.6 | 26 061 | 1.2 | 82.2 | 42 583 | 5.6 |
| 14 | Madeira | 672 | 0.7 | 25 863 | 1.2 | 83.4 | 38 486 | 13.7 |
| 15 | Norwegian Int'l Register | 695 | 0.7 | 21 300 | 1.0 | 84.4 | 30 648 | -3.1 |
| 16 | Isle of Man | 291 | 0.3 | 20 661 | 0.9 | 85.3 | 71 002 | -6.1 |
| 17 | Iran (Islamic Republic of) | 942 | 0.9 | 20 195 | 0.9 | 86.2 | 21 439 | -2.6 |
| 18 | India | 1 810 | 1.8 | 16 934 | 0.8 | 87.0 | 9 356 | -1.1 |
| 19 | Republic of Korea | 2 063 | 2.0 | 15 635 | 0.7 | 87.7 | 7 579 | -0.6 |
| 20 | Saudi Arabia | 413 | 0.4 | 13 887 | 0.6 | 88.3 | 33 625 | 1.6 |
| 21 | United States of America including Puerto Rico | 3 636 | 3.5 | 12 526 | 0.6 | 88.9 | 3 445 | -0.1 |
| 22 | Viet Nam | 1 975 | 1.9 | 12 331 | 0.6 | 89.5 | 6 244 | 19.4 |
| 23 | United Kingdom excl. Channel Islands and Isle of Man | 881 | 0.9 | 11 292 | 0.5 | 90.0 | 12 817 | -3.8 |
| 24 | Russian Federation | 2 917 | 2.8 | 11 039 | 0.5 | 90.5 | 3 784 | 1.1 |
| 25 | Italy | 1 266 | 1.2 | 9 969 | 0.5 | 90.9 | 7 875 | -11.4 |
| 26 | Belgium | 199 | 0.2 | 9 791 | 0.4 | 91.4 | 49 200 | 1.6 |
| 27 | Malaysia | 1 790 | 1.7 | 9 269 | 0.4 | 91.8 | 5 178 | -9.6 |
| 28 | Bermuda | 135 | 0.1 | 7 888 | 0.4 | 92.2 | 58 430 | -2.0 |
| 29 | Germany | 591 | 0.6 | 7 096 | 0.3 | 92.5 | 12 007 | -9.8 |
| 30 | China, Taiwan Province of | 450 | 0.4 | 6 755 | 0.3 | 92.8 | 15 011 | -5.4 |
| 31 | Netherlands | 1 175 | 1.1 | 6 661 | 0.3 | 93.1 | 5 669 | -2.2 |
| 32 | Türkiye | 1 237 | 1.2 | 6 257 | 0.3 | 93.4 | 5 059 | -2.3 |
| 33 | Antigua and Barbuda | 638 | 0.6 | 6 219 | 0.3 | 93.7 | 9 747 | -2.8 |
| 34 | Philippines | 1 853 | 1.8 | 6 201 | 0.3 | 93.9 | 3 346 | -1.3 |
| 35 | Cayman Islands | 139 | 0.1 | 6 070 | 0.3 | 94.2 | 43 671 | -11.8 |
| | **Top 35** | **78 178** | **76** | **2 072 117** | **94.2** | **94.2** | **37 001** | **5.5** |
| | **World total** | **102 899** | **100** | **2 199 107** | **100** | **100** | **21 372** | **2.9** |

*Source:* UNCTAD calculations, based on data from Clarksons Research.

*Notes:* Propelled seagoing merchant vessels of 100 gross tons and above, as of 1 January 2022. For a complete listing of countries, see http://stats.unctad.org/fleet.
Dead-weight tons for some individual vessels have been estimated.

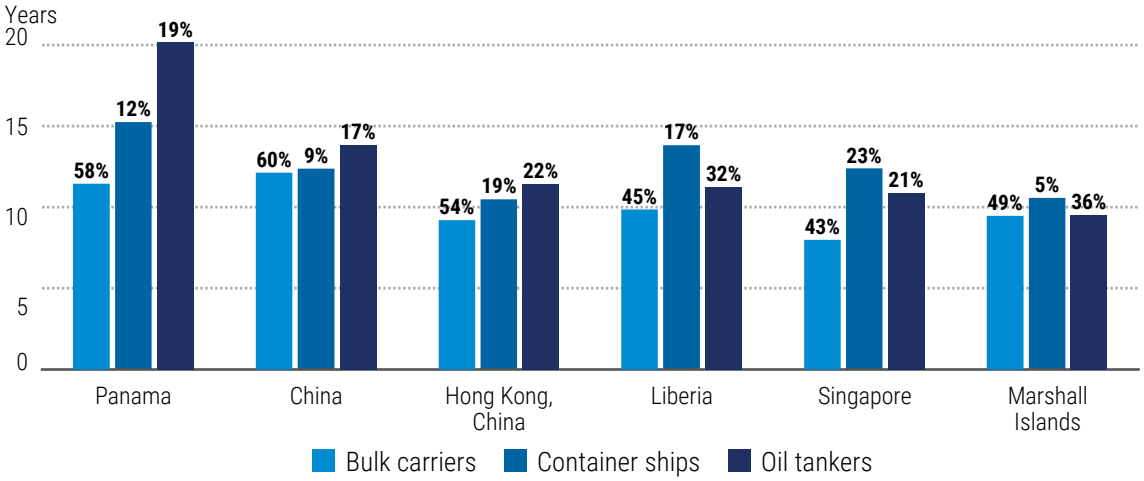
Table 2.7 Leading flags of registration, ranked by value of total tonnage, 2022 (million US dollars) and principal vessel types

| | Flag of Registration | Container ships | Bulk carriers | Oil tankers | Offshore vessels | Ferries and passenger ships | Gas carriers | General cargo ships | Chemical Tankers | Other/NA | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Panama | 47 425 | 62 889 | 13 858 | 14 205 | 11 033 | 11 589 | 5 153 | 5 178 | 10 215 | 181 546 |
| 2 | Liberia | 71 702 | 44 053 | 25 441 | 10 163 | 415 | 7 092 | 1 639 | 3 766 | 2 175 | 166 446 |
| 3 | Marshall Islands | 20 459 | 48 411 | 29 977 | 12 368 | 1 315 | 17 173 | 780 | 4 561 | 2 480 | 137 524 |
| 4 | Hong Kong, China | 53 034 | 33 170 | 10 979 | 263 | 42 | 6 620 | 2 101 | 1 658 | 168 | 108 035 |
| 5 | Singapore | 41 489 | 17 641 | 10 492 | 6 647 | | 9 990 | 1 074 | 3 708 | 1 818 | 92 860 |
| 6 | Malta | 32 893 | 12 374 | 10 097 | 3 718 | 16 904 | 10 389 | 2 216 | 1 705 | 1 670 | 91 967 |
| 7 | Bahamas | 1 927 | 7 218 | 6 522 | 26 189 | 29 324 | 12 333 | 104 | 36 | 3 724 | 87 378 |
| 8 | China | 14 819 | 27 417 | 8 774 | 8 050 | 4 315 | 816 | 5 188 | 1 794 | 3 887 | 75 061 |
| 9 | Madeira Int'l Register | 18 201 | 3 057 | 903 | 16 | 306 | 93 | 1 507 | 446 | 183 | 24 711 |
| 10 | Danish Int'l Register | 17 323 | 417 | 2 769 | 665 | 876 | 911 | 616 | 576 | 126 | 24 279 |
| 11 | Italy | 492 | 458 | 926 | 496 | 16 167 | 172 | 2 296 | 299 | 1 102 | 22 408 |
| 12 | Japan | 3 732 | 4 487 | 2 645 | 436 | 3 121 | 2 313 | 1 813 | 127 | 3 692 | 22 366 |
| 13 | Greece | 476 | 3 849 | 8 741 | 72 | 1 294 | 6 994 | 63 | 95 | 25 | 21 609 |
| 14 | Cyprus | 6 717 | 5 965 | 768 | 1 587 | 2 136 | 1 552 | 1 394 | 374 | 943 | 21 437 |
| 15 | Norwegian Int'l Register | | 2 562 | 3 163 | 4 963 | 1 403 | 2 997 | 653 | 1 884 | 1 735 | 19 360 |
| 16 | Bermuda | 587 | | 305 | 471 | 7 307 | 6 782 | | 151 | | 15 604 |
| 17 | United Kingdom | 5 341 | 1 006 | 81 | 2 091 | 4 244 | 461 | 636 | 429 | 283 | 14 573 |
| 18 | Indonesia | 2 413 | 2 007 | 2 010 | 2 127 | 2 048 | 1 028 | 1 634 | 488 | 68 | 13 824 |
| 19 | United States | 3 983 | 69 | 1 162 | 3 040 | 1 755 | | 1 084 | 42 | 1 266 | 12 401 |
| 20 | Netherlands | 467 | 157 | 178 | 1 065 | 3 899 | 499 | 4 669 | 262 | 1 121 | 12 316 |
| 21 | Isle of Man Int'l Register | 471 | 3 287 | 1 267 | 3 612 | 230 | 2 677 | 269 | 179 | 48 | 12 039 |
| 22 | Republic of Korea | 4 392 | 1 288 | 368 | 172 | 298 | 635 | 532 | 1 183 | 1 497 | 10 366 |
| 23 | Russian Federation | 156 | 120 | 1 348 | 1 749 | 153 | 243 | 2 670 | 630 | 1 832 | 8 901 |
| 24 | Germany | 7 145 | 16 | 92 | 454 | 332 | 27 | 181 | 20 | 128 | 8 394 |
| 25 | Malaysia | 556 | 228 | 664 | 4 707 | 23 | 1 640 | 75 | 107 | 216 | 8 215 |
| | **Subtotal top 25** | **356 200** | **282 145** | **143 531** | **109 327** | **108 941** | **105 027** | **38 348** | **29 698** | **40 402** | **1 213 619** |
| | ***Other*** | ***20 406*** | ***15 377*** | ***18 342*** | ***41 744*** | ***15 100*** | ***7 477*** | ***15 581*** | ***5 026*** | ***5 598*** | ***144 652*** |
| | **World total** | **376 606** | **297 523** | **161 873** | **151 071** | **124 041** | **112 504** | **53 929** | **34 724** | **46 000** | **1 358 270** |

*Source:* UNCTAD calculations, based on data from Clarksons Research, as of 1 January 2022 (estimated current value).
*Note:* Value is estimated for all commercial ships of 1,000 gross tons and above.

In January 2022, among these registries, Panama, at 18.9 years, has the highest average age across most ship types except bulk carriers, which represented 58 per cent of its registered fleet.[21] For the China flag, almost 60 per cent of the fleet are bulkers, and among these six registries, the China flag has the highest average age for bulkers, at 12.1 years (figure 2.8).

**Figure 2.8** Average of the bulk carrier, container ship and oil tanker fleets in the top 6 flag of registration by dwt and percentage of each ship type in the total fleet, as of 1 January 2022




*Source:* UNCTAD calculations, based on data from Clarksons Research.

## 2. War in Ukraine disrupts supplies and renews interest in local and regional fleets

Because of the war in Ukraine some customers have suspended cargo bookings, and international shipping companies have adjusted their schedules and rerouted shipments – increasing shipping distances, transit times and costs.[22] In addition, associated risks have significantly increased the cost of insurance: before the beginning of the war in Ukraine, premiums to enter the broader Black Sea were 0.025 per cent of the ship's value, but by August 2022 they had risen to as much as 5 per cent.[23] [24]

The war in Ukraine has also added complexity to container shipping logistics. Cargos destined for the Russian Federation often require transhipment through Northern European ports – adding to congestion and resulting in container shortages. For shipping companies, insurers and other maritime operators, economic and other restrictive measures can be confusing. Restrictions on finance, trade, shipping and immigration, change frequently and are not always synchronized across regimes. In the United Kingdom in March 2022, for instance, difficulties in verifying the origin and ownership of vessels increased port congestion.[25]

Economic and other restrictive measures relate to Russian-owned or -flagged vessels calling or refuelling at ports (European Union and United States); to marine insurers providing cover from Russian cargoes (European Union); and to nationals broking, chartering or selling vessels to persons connected with the Russian Federation (United Kingdom). In addition, the United States has imposed export controls on technologies and equipment used in maritime transport and on the Russian Maritime Register of Shipping and the United Shipbuilding Corporation.[26]

Concerned about economic and other restrictive measures, many shipping companies have halted bookings to and from Russia, as have other companies across the maritime supply chain, including engine and other marine equipment manufacturers, maintenance companies, classification societies and insurers.[27]

In addition, the war in Ukraine has affected crewing. Seafarers from Ukraine and the Russian Federation represent around 15 per cent of the global maritime workforce.[28] Ukraine port closures have made crew changes in the region more difficult. Many seafarers unable to return home have faced extended tours of duty. In addition, crew payments have been made more difficult by economic and other restrictive measures on banks.[29]

The disruption and high freight rates resulting from the war in Ukraine, the COVID-19 pandemic, and port congestion have prompted official responses. Several governments have initiated national discussions, announced plans, or passed legislation to help sustain service frequency and quality at competitive rates for all traders (box 2.1). These initiatives also need to address the broader maritime ecosystem including workforce skills and port efficiency, and competition surveillance and the options for public-private collaboration.

## Box 2.1 Policy debates and initiatives on regional fleets

Overdependence for shipping and associated services on foreign-owned, foreign seafarers or foreign flags can be a source of vulnerability. To build resilience, some countries are aiming to enhance the contributions of local or regional operators.

- **Western Australia** – In March 2022, the government of Western Australia established a task force to strengthen the State's supply chains and reduce freight rates. This could include developing a coastal fleet of tankers, general cargo ships and ro-ro ships, as well as relaxing the cabotage regime to enhance links between Western and Eastern Australia and with international customers. There could also be measures to upgrade the skills of the maritime workforce and support the local shipbuilding industry. But some stakeholders have expressed reservations about government involvement in the commercial management of shipping lines and the high costs of operating under the Australian flag.
- **Bangladesh** – The 2019 Flag Vessels Protection Act provided for 50 per cent of cargos to be carried by local vessels, which would have VAT exemption and berthing priority at local ports. The aim was to promote investment by local entrepreneurs, increase transport supply capacity and relieve bottlenecks in trading operations in key export routes. In 2020, the national fleet grew in dwt, by 18 per cent, and in 2021 by 19 per cent. The growth in container ships was particularly significant, though other stakeholders believed that while the measures had been effective for bigger shippers, they had made processes more burdensome for smaller traders.
- **Viet Nam** – In 2022, aiming to reduce transport delays and freight rates the Ministry of Industry and Trade proposed several measures aimed at easing supply chain issues along intra- Asian routes and reducing the burden on traders. These included tax incentives to attract foreign investment in new ships and to encourage private-sector investment in key infrastructure upgrades, as well as measures to encourage fleet renewal and the development of a coastal fleet management programme. More container ships are needed to meet higher demand. The Viet Nam Logistics Association has estimated investment needs of $1.5 billion to acquire new ships and to rent and purchase containers.
- **East Africa** – Kenya, through Mombasa, and Tanzania, through Dar es Salaam, have ports that compete as entry points to East Africa. Both States have passed policy frameworks and taken initiatives to develop infrastructure and shipbuilding capabilities as well as national shipping lines, and attract investment in multimodal connections. They also hope to harness the potential of the oceans economy and regional trading opportunities. However, national shipping lines have not been successful and in 2022 announced the need to dispose of vessels. Some stakeholders believed this was due to a lack of capacity to compete with international lines. International lines have subsequently announced plans for direct services from key ports, including Mombasa and Dar es Salaam, to Asia, while also providing services for local freight, clearing, warehousing and last-mile delivery.

*Sources:* Curtis (2022); Government of Western Australia (2022); Shipping Australia Limited (2022); Illius et al. (2021); UNCTADstat; Maritime Gateway (2021); Nguyen (2022); Maritime Executive (2022): the East African (2015), Kitimo et al (2022), Container News (2022) and VOA (2022).

# D. HIGH LEVELS OF SHIPBUILDING AND LESS RECYCLING

## 1. Shipbuilding and new orders

In 2020, due to the COVID-19 pandemic, shipbuilding contracted. In 2021, deliveries increased by 5.2 per cent, reaching 60,779,648 GT, but were still lower than in the 2014–2017 period and in 2019.

Maritime ship supply continues to be dominated by three countries – China, the Republic of Korea, and Japan – which in 2022 together had 94 per cent of the market. Over the past year, shipbuilding increased in China by 15.5 per cent and in the Republic of Korea by 8.3 per cent, but in Japan declined by 16.4 per cent.

In 2021, as in 2020, most of the tonnage delivered was of bulk carriers, oil tankers, container ships and gas carriers (table 2.8). Newbuilt tonnage increased most in offshore vessels by 142 per cent, in general cargo ships by 74 per cent, and in gas carriers by 54 per cent. In contrast, there were declines for bulk carriers, of 21 per cent, oil tankers of 12 per cent and chemical tankers of 4 per cent.

In the past year, orders for container ships surged by 129 per cent to a record high. In 2021, the liquefied gas carriers orderbook continued its upward trend, increasing by 26 per cent, while the tankers orderbook continued its downward trend, contracting by 13.5 per cent. For bulkers, the orderbook had its first increase for three years, of 4 per cent (figure 2.9). For tankers the 2021 ordering level was the lowest for 25 years, and for bulkers it was close to an 18-year low – as a result of weaker market conditions and higher newbuild prices.[30]

In 2021, contracting was largely for medium-size ships (12,000–16,999 TEU) but over the past year has involved both larger and smaller vessels. This corresponds to the surge in orders for container ships as well as for ships below 3,000 TEU due to expected feedering developments in Asian intra-regional trade.[31]

For 2023, Clarksons projects fleet growth of 1.7 per cent in terms of dwt, maintaining overall moderate growth observed this past year. Despite new supply coming live in 2023, tonnage availability will be constrained by the new environmental regulations which will often require lower speeds.

Owners are still uncertain about the most cost-efficient alternative fuels and the best ways of reducing greenhouse emissions so, despite greater demand, are holding off buying new ships and are maintaining existing fleets, especially in the wet and dry sectors.[32]

The uptake of alternative fuels is advancing slowly. In recent years investment has surged in the transitional (fossil) fuel LNG.[33] In the year from August 2022, the proportion of the fleet that was LNG-capable increased from 2.0 to 2.4 per cent, though in terms of the dead-weight tonnage on order from 21 to 31 per cent.[34]

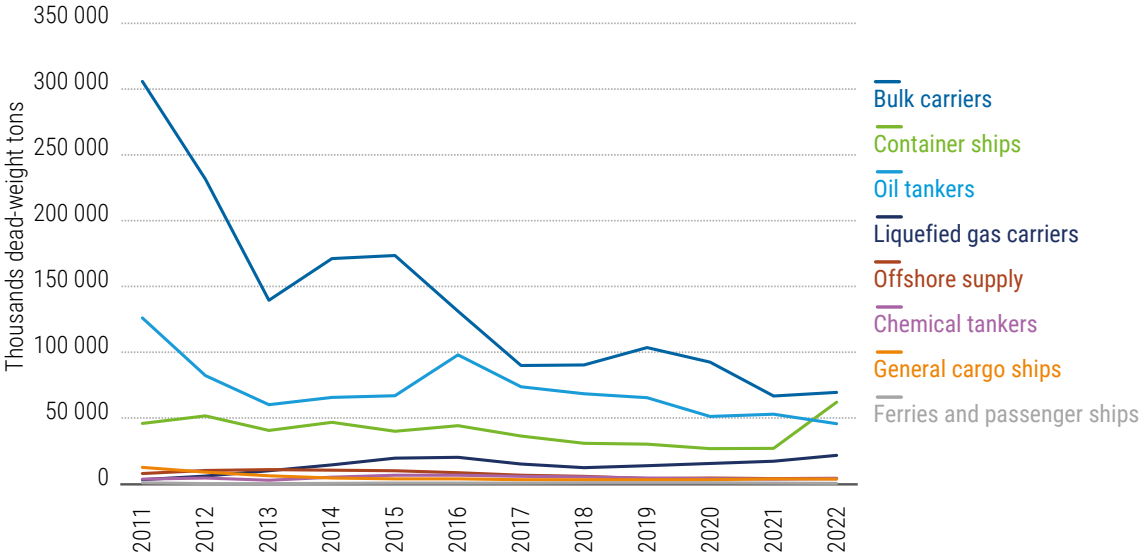
**Table 2.8 Deliveries of newbuilds by major vessel type and country of construction, 2021**
(thousand gross tons)

| | China | Republic of Korea | Japan | Philippines | Rest of the world | Total | Percentage |
|---|---|---|---|---|---|---|---|
| Bulk Carriers | 13 764 | 960 | 5 730 | 624 | 73 | **21 151** | 35% |
| Oil Tankers | 4 791 | 6 376 | 2 064 | | 358 | **13 589** | 22% |
| Container ships | 4 170 | 4 675 | 1 954 | | 131 | **10 929** | 18% |
| Gas Carriers | 918 | 7 052 | 159 | | 10 | **8 138** | 13% |
| Ferries and passenger ships | 390 | 50 | 83 | 20 | 1 567 | **2 110** | 3% |
| General cargo ships | 1 017 | 56 | 223 | | 256 | **1 552** | 3% |
| Offshore vessels | 641 | 402 | 9 | | 317 | **1 370** | 2% |
| Chemical tankers | 662 | 109 | 226 | | 50 | **1 047** | 2% |
| Other | 510 | 6 | 278 | | 97 | **892** | 1% |
| **Total** | **26 863** | **19 687** | **10 726** | **643** | **2 859** | **60 780** | |
| *Percentage* | *44%* | *32%* | *18%* | *1%* | *5%* | ***100%*** | |

*Source:* UNCTAD calculations, based on data from Clarksons Research.

*Notes:* Propelled seagoing merchant vessels of 100 gross tons and above.
For more data on other shipbuilding countries, see http://stats.unctad.org/shipbuilding.

**Figure 2.9 World tonnage on order, selected ship types, 2011–2022**
(dead-weight tons)




*Source:* UNCTAD calculations, based on data from Clarksons Research.

*Notes:* Propelled seagoing merchant vessels of 100 gross tons and above; beginning-of-year figures.

However, the war in Ukraine and the current energy crisis are creating price pressures, raising doubts about the role of LNG in the energy transition, and concerns about LNG infrastructure. And, taking into account the regulations for emissions control, the outlook appears volatile.

Although LNG is the preferred alternative fuel, there are increasing orders for ships that are also methanol- and ammonia-ready.[35] Short-sea segments and ferries are also looking to electrification. To keep their options open, owners are turning to dual-fuel vessels. As of March 2022, almost 40 per cent of the orderbook was of vessels capable of running on alternative fuels.[36] In June 2022, the main four economies ordering alternative fuel-capable ships were the Republic of Korea at 70 per cent of their orders, China at 26 per cent, Europe at 58 per cent, and Japan at 17 per cent.[37]

Alternative fuels currently cost two to five times more than conventional fuels, so are not yet commercially viable. Arising from the Clydebank Declaration, there have been a number of public-private initiatives to address these issues, involving ports, carriers and maritime supply chain stakeholders. The aim is to scale up the supply of alternative fuels by strengthening low-carbon energy supply infrastructure in ports and producing decarbonized fleets and establishing "green corridors" (see chapter 7).

These initiatives could redefine the competitive landscape for low-carbon shipping. They will be testing grounds for alternative energy and technology, and partnerships for infrastructure, as well as for policies and regulation in diverse value chains. But they have mostly engaged actors in the Northern hemisphere, and since only a small proportion of ports are alternative-energy-ready, there is the prospect of a two-tier port system. This highlights the need for mobilizing finance and collaboration to replicate best practices.

The energy transition should involve more assistance to developing countries. UNCTAD is seeking to address these issues for three African countries, with a project to make ports smart and sustainable and able to use alternative energy and new technology.[38] The project encompasses port assessments, as well as assistance in strategy development and capacity building, promoting cooperation among countries and exchanging experiences.

## 2. Ship recycling

In 2021, more than half the world's recycling by tonnage was in Bangladesh which, with Pakistan, India and Türkiye, accounted for 96 per cent of ship recycling (table 2.9).

In the 12 months to January 2022, recycling volumes declined by 11 per cent, from 17,207,838 to 15,328,713 GT. Although this decline was mostly due to strong markets that encouraged owners to retain vessels, there were also other factors such as limits on imports of vessels (Bangladesh and Pakistan) on letters of credit to protect foreign reserves (Bangladesh),[39] as well as COVID restrictions.

Table 2.9 Reported tonnage sold for ship recycling by major vessel type and recycling country, 2021
(thousands of gross tons)

| Vessel type | Bangladesh | Pakistan | India | Türkiye | China | Rest of the world | World total | Percentage |
|---|---|---|---|---|---|---|---|---|
| Oil tankers | 4 565 | 2 200 | 1 044 | 318 | 42 | 45 | **8 213** | 53.6 |
| Bulk carriers | 2 011 | 477 | 133 | 112 | 60 | 22 | **2 815** | 18.4 |
| Offshore vessels | 160 | 116 | 470 | 274 | 37 | 125 | **1 182** | 7.7 |
| Liquefied gas carriers | 703 | | 35 | 7 | | 7 | **751** | 4.9 |
| Ferries and passenger ships | 101 | 178 | 316 | 148 | 1 | 6 | **748** | 4.9 |
| Chemical tankers | 150 | 13 | 430 | 9 | | 3 | **604** | 3.9 |
| General cargo ships | 113 | 62 | 41 | 82 | | 190 | **489** | 3.2 |
| Container ships | 42 | | 101 | | | 27 | **170** | 1.1 |
| Other | 182 | | 80 | 86 | | 8 | **356** | 2.3 |
| **Total** | **8 025** | **3 045** | **2 649** | **1 036** | **140** | **433** | **15 329** | **100.0** |
| *Percentage* | *52.4* | *19.9* | *17.3* | *6.8* | *0.9* | *2.8* | ***100.0*** | |

*Source:* UNCTAD calculations, based on data from Clarksons Research.

*Notes:* Propelled seagoing vessels of 100 gross tons and above. Estimates for all countries available at http://stats.unctad.org/shiprecycling.

In 2021, recycling increased most for chemical tankers, by 143 per cent, and for oil tankers, by 331 per cent which accounted for more than half of the recycled volumes. Owners of other vessel types were more likely to hang on to their existing tonnage in view of potential profitability. As a result, recycling declined by volume for container ships by 92 per cent and for bulk carriers by 70 per cent.

# E. PORT AND LOGISTICS SERVICES

## 1. More container port activity

In 2021, according to Drewry Maritime Research, world container port traffic increased by 6.8 per cent, taking total volumes to 857 million TEUs (table 2.10). Asia continued to play a leading role, with the region's ports accounting for 62.5 per cent of world container port throughput (figure 2.10). Nine of the world's top 10 ports by throughput were in Asia, led by Shanghai, Singapore and Ningbo-Zhoushan (figure 2.11).

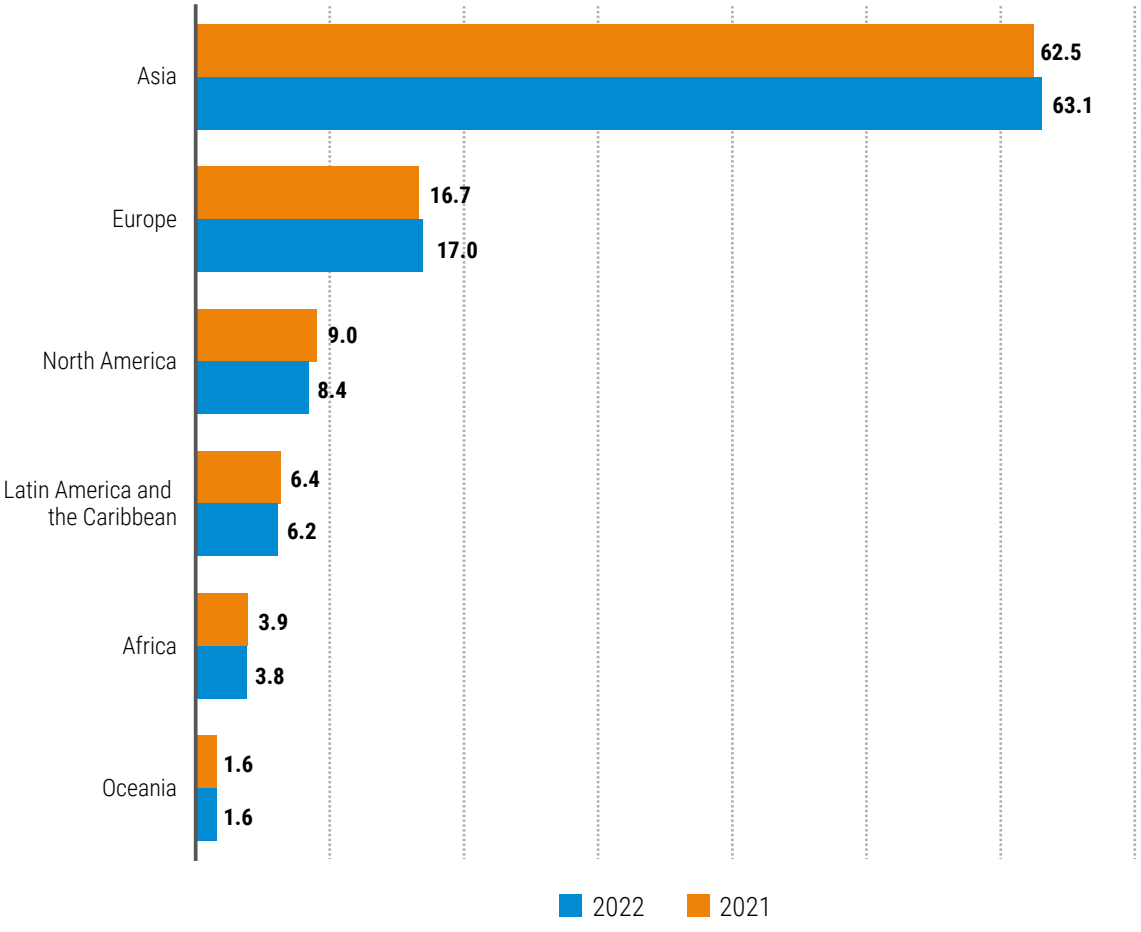
Throughput also expanded rapidly at ports in North America, by 14.4 per cent. Europe increased container port throughput by 5 per cent. In Rotterdam, volumes increased by 7.7 per cent, but in Antwerp volume growth was flat as terminals struggled with disrupted schedules. In Africa, ports had firm growth at 9.5 per cent, while in Australia and New Zealand growth was similarly robust at 7.7 per cent. In Latin America and the Caribbean, cargo handling by container ports increased by 10.5 per cent (box 2.2).

**Table 2.10 World container port throughput by region, 2020–2021**
(millions of 20-foot equivalent units and annual percentage change)

| | 20-foot equivalent units | | Annual percentage change 2020–2021 |
|---|---|---|---|
| | 2020 | 2021 | |
| Asia | 506 | 535 | 6% |
| Europe | 136 | 143 | 5% |
| North America | 67 | 77 | 14% |
| Latin America and the Caribbean | 49 | 55 | 11% |
| Africa | 30 | 33 | 10% |
| Oceania | 13 | 14 | 8% |
| **World total** | **802** | **857** | **7%** |

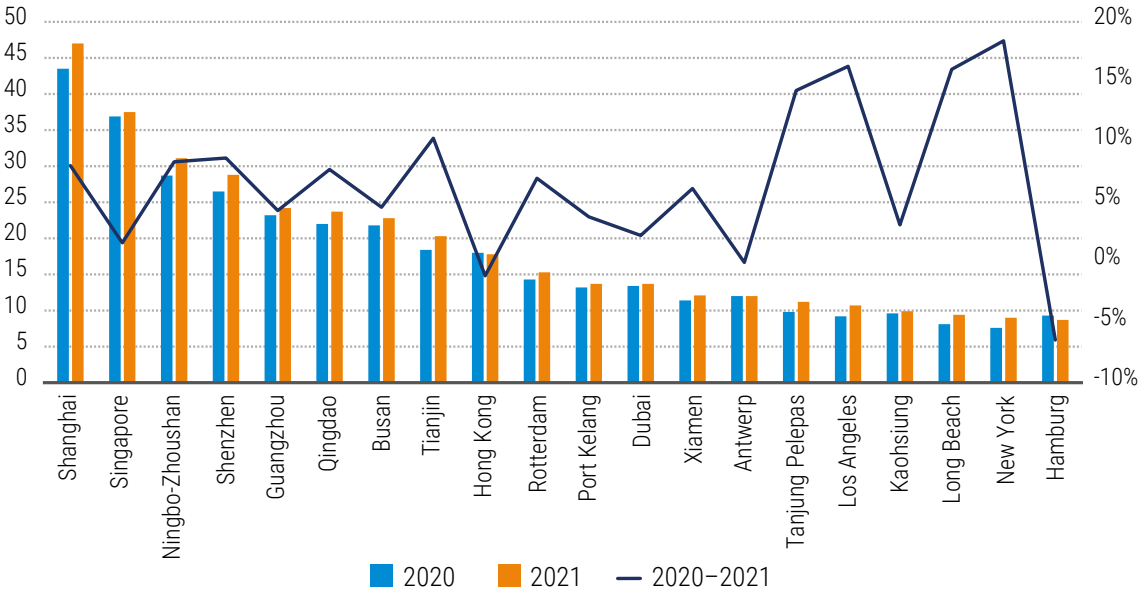
*Source:* UNCTAD secretariat based Drewry Maritime Research. Container Forecaster. Second Quarter.

**Figure 2.10 World container port throughput by region (in 20-foot equivalent units), 2021–2022, percentage share in total**




*Source:* UNCTAD secretariat calculations, derived from table 2.10 of this report.

**Figure 2.11 Leading 20 global container ports, 2020–2021**
(millions 20-foot equivalent units, and percentage annual change)




*Source:* UNCTAD based on data reported published on Hamburg Port Authority website (www.hafen-hamburg.de/en/statistics/top-20-container-ports), Accessed July 2022.

**Box 2.2 Subregional port throughput in Latin America and the Caribbean**

The COVID-19 pandemic seriously disrupted containerized seaborne trade, and exports and imports in Latin America and the Caribbean (LAC). During the first half of the pandemic international seaborne container trade fell globally by 7 per cent, but in LAC the drop was 12.2 per cent making this the worst-hit region.[40]

Although the region is set for recovery, not all subregions have yet reached that stage (table 2.11). In the first half of 2022, most LAC subregions had growth in containerized exports. However, exports from the Gulf Coast of Mexico remained flat[41] while exports from the East Coast of South America (ECSA) and the Pacific coast of Panama fell.

The results were less positive for imports. Between January and June 2022, imports to ECSA, the Pacific coast of Central America, and the Gulf coast of Mexico were lower than in the same period in 2021. In Panama, for the Pacific coast, imports increased did not recover to the 2019 levels, and for the Caribbean coast there was also recovery in imports.

In the first half of 2022, throughput for regional container ports was mostly similar to 2020.[42] The main exception was the Mexican Pacific coast, which showed greater dynamism. During the pandemic there were more transhipments through the region's large hub ports, so the recent lower dynamism could signal a return to pre-pandemic levels.

*Source:* Inputs provided by UN-ECLAC Secretariat.

## 2. Navigating unprecedented port congestion

During the past year, ports worldwide have faced chronic congestion – which between September and December 2021 is estimated to have removed around 16 per cent of global container ship sailing capacity.[43] Between the January 2016–February 2020 and March–July 2022, the proportion of container ship capacity waiting in ports rose by 5 per centage points to 37 per cent.

For the same period, the proportion of deep-sea – Capesize and Panamax – bulk-carrier fleet capacity waiting in ports was around 30 per cent. The proportion peaked at 35 per cent during the periods October– November 2021 and January–June 2022, the highest levels recorded since 2016.[44]

Ports were congested around the world although the extent of the congestion, and the ensuing delays, differed between countries.[45] Congestion was exceptionally high in export hubs in China, such as Shanghai, Qingdao and Tianjin, mainly due to China's zero-Covid policy. It was also high in the United States around the ports of Los Angeles and Long Beach which are major gateways on the west coast trade line and cannot be circumvented. In Asia or Europe, on the other hand, if waiting times are too high carriers can usually skip congested ports.[46]

**Table 2.11 Trends in containerized trade and container port throughput January–June 2022 year-on-year variation**
(percentage change)

| Coast | Ports and total representation by coast | Export variation | Import variation | Throughput variation |
|---|---|---|---|---|
| East Coast South America | Brazil (total), Uruguay (total), and Buenos Aires port zone, Zárate and Rosario in Argentina (97.8%) | -3.0% | -6.9% | -0.8% |
| West Coast South America | Callao in Peru, San Antonio, Talcahuano/San Vicente and Valparaíso in Chile, and Guayaquil in Ecuador (77.7%) | 11.0% | 6.2% | 2.0% |
| Caribbean | Cartagena Bay, Barranquilla and Santa Marta in Colombia, Kingston in Jamaica, Port of Spain and Point Lisas in Trinidad and Tobago (64.7%) | 8.2% | 7.2% | 2.1% |
| Central America, Caribean coast | Puerto Barrios and Santo Tomás de Castilla in Guatemala, Puerto Castilla and Puerto Cortés in Honduras, Arlen Siu in Nicaragua and Limón-Moín (APM) in Costa Rica (100.0%) | 5.3% | 11.6% | 4.0% |
| Central America, Pacific coast | Acajutla in El Salvador, Puerto Quetzal in Guatemala, San Lorenzo in Honduras, Corinto in Nicaragua and Puerto Caldera in Costa Rica (100.05) | 8.1% | -4.0% | 0.7% |
| Mexico, Gulf coast | Veracruz, Altamira and Tampico in Mexico (90.0%) | 0.2% | -2.9% | -1.9% |
| Mexico, Pacific coast | Manzanillo and Lázaro Cárdenas in Mexico (90.0%) | 10.9% | 13.5% | 15.3% |
| Panama, Caribbean coast | Colon Container Terminal (CCT), Manzanillo International Terminal (MIT) and Cristótal in Panama (97.1%) | 14.2% | 10.4% | 3.2% |
| Panama, Pacific coast | Balboa and Rodman (PSA) in Panama (100.0%) | -18.5% | 14.8% | -6.6% |

*Source:* United Nations Economic Commission for Latin America and the Caribbean (UN-ECLAC), with data based on official port data from operators and port authorities.

*Notes:* The total representation of ports by coast are indicated in parenthesis calculated by 2021 level of representation of port throughput in the whole Latin America and the Caribbean, measured in TEU; Some data are provisory; Tables in blue and yellow represent positive variation, and tables in red represent negative variation.

In the first quarter of 2020, average global container schedule delays doubled, but they increased far more for the Far East and North America trade, from 2 to 12 days.[47] For 2021, Drewry estimated effective container ship capacity at about 17 per cent below its potential, and expected a similar outcome for 2022.[48]

Congested ports also suffered from ad hoc ship calls, off-schedule vessel arrivals and longer dwell times. This resulted in severe shortages of labour and equipment at ports and across their hinterland connections. In China, Ningbo's Meishan terminal closed in August 2021 due to COVID-19 infections. In Northern Europe, carriers diverted vessels from the most-congested terminals, increasing delays for shippers, as barge and feeder services struggled to keep up with demand.[49] Congestion reduced port productivity and undermined the reliability of schedules.

Carriers responded by consolidating port calls. In Europe, over the period January-May 2022 compared with 2021, average call sizes were up – by 30 per cent at Felixstowe, 26 per cent at Gdansk, 20 per cent at Rotterdam, and 10 per cent at both Antwerp and Hamburg.

Across North Europe, the productivity of container terminals could have significantly deteriorated. A major issue has been increases in cargo exchanges which have created problems similar to those from vessel upsizing. For deep-sea vessels, in the first five months of 2022 compared with 2021, average port hours across North Europe hubs increased by 20 per cent, to 52 hours, while the average anchorage hours increased by 38 per cent.[50]

Shippers using congested ports suffered from shortages of vessel space and containers. But they also faced capacity constraints in the port/inland interface as a result of shortages of chasses, and of inland transport capacity, storage, warehousing space and operational capabilities, all of which reduced service levels and increased costs.[51]

Ports took a number of steps to manage the logjams – extending working hours and the number of shifts, and adjusting regulations on stacking heights. For their part, shippers committed to moving containers out of terminals more quickly and at weekends. The logjams will take time to resolve. And further costly disruption to supply chain operations can be anticipated as a result of strikes in the Republic of Korea and Germany where workers are facing rising living costs.

Some of the pressures may be alleviated in 2023–2024 by the delivery of new ships, which will reduce the need for port skipping for repositioning containers. But landside operations and the logistics sector also need to play their parts, by tackling the availability of labour and warehousing, and the turnover of trucking equipment.

## 3. Different visions of resilience-building

Players across the maritime supply chain are adjusting to the new trends and aiming for greater resilience. Confronted with soaring costs, shippers have been negotiating longer contracts or turning to other modes of transport such as air and rail.

Shipping companies and ports have also been expanding their fleets and extending their services to include air freight, final-mile transport, and e-commerce. Shipping companies have thus been acquiring companies specializing in freight forwarding, logistics, and e-commerce so as to have greater control over the supply chain. In addition, they have been moving further inland, getting closer to customers, and offering integrated door-to-door logistics. Maersk and CMA CGM have bought air fleets to offer air services.

Ports are also aiming for greater control over supply chains – through cross-border mergers and acquisitions and deploying end-to-end logistics. In 2021, PSA International, the world's largest port operator, acquired BDP, an American supply chain company with end-to-end logistics capabilities, officially embarking on becoming a full-service logistics provider. In 2021, DP World purchased North American and South African logistics companies to gain more control over the supply chain.[52] [53] In Europe in April 2022, the ports of Antwerp and Zeebrugge completed their merger.[54] And to take advantage of the congestion crisis in Sri Lanka, India is planning to deepen the channel of Cochin Port.[55]

The UNCTAD Guidebook for building the capacity and resilience of ports[56] recommends five actions:

i. Identifying hazards from a wide range of natural and anthropogenic disruptions that are specific to the port being considered.

ii. Assessing vulnerability and potential impacts by identifying port-specific risks, levels of exposure to risks, and the potential consequences of a hazard.

iii. Elaborating response and mitigation measures involving port infrastructure and processes related to port management and operations. These measures can aim for prevention and preparedness, or be responsive and adaptive and aiming to speed up recovery.

iv. Prioritizing response and mitigation measures, such as cost-benefit analysis and resource allocation for finance, labour and other resources.

v. Implementing response and mitigation measures. A review process should then assess their effectiveness and make any requisite adjustments.

## F. CONCLUSIONS AND POLICY CONSIDERATIONS

In 2021, the world fleet grew modestly. Shipbuilding and orderbooks were higher than in previous years but many owners were uncertain about fuel choices or the best ways to reduce GHG emissions, so were hesitating to invest and instead were sticking to their ageing fleets. Owners are turning to alternative fuels and dual-fuel capability, but only slowly.

This is producing an ageing fleet. Since 2011, the average age of the total fleet has increased by 7 per cent, from 20 to 22 years – making it more difficult to comply with increasingly stringent environmental regulations. Reducing shipping emissions will require significant investment in technical and operational improvements and new processes, all of which will increase costs for operators and ultimately for shippers.

In the past year there have been public-private initiatives involving ports, carriers and diverse maritime supply chain stakeholders for scaling up both the demand for, and supply of, alternative fuels, and creating decarbonized fleets. This could redefine the competitive landscape for low-carbon shipping, but could also create a two-tier system of ports, in which only a small proportion are alternative-energy-ready. It will be important therefore to help ports in developing countries replicate best practices and harness the opportunities offered by the energy transition.

At the same time, the shipping industry has faced many forms of disruption, most recently from the war in Ukraine, all of which have increased costs. This has underlined the importance of building resilience and of future-proofing both shipping and logistics.

Many countries have been seeking to reduce vulnerability by encouraging local supply of shipping and associated services by changing legislation and incentives as to strengthen national registries and make their cabotage regimes more flexible. However, sustaining high quality local services at competitive rates also requires upgrading the whole maritime ecosystem and investing in infrastructure, workforce skills and port efficiency.

Prompted by recent disruptions and related economic and other restrictive measures, carriers and ports are rethinking their roles and functions. Seeking to gain greater control over supply chains, operators are investing in port and shipping assets as well as in non-shipping assets – increasingly blurring the boundaries between different modes of transport.

Vulnerable economies that depend heavily on maritime transport networks and access to the global marketplace also need to prepare for, respond to and recover from significant multi-hazard threats. To achieve agile and resilient maritime transport systems they need to futureproof ports and the broader maritime supply chains by investing in risk management and emergency response.

To anticipate, plan, prepare, forecast, and integrate for uncertainty, they will need to gather data and intelligence, and plan scenarios. They also need emergency response protocols to mitigate the impacts, enable recovery, and adapt to each new normal.

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