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# REVIEW OF MARITIME TRANSPORT 2009

*Report by the UNCTAD secretariat*

Chapter 1

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# Chapter 1

## DEVELOPMENTS IN INTERNATIONAL SEABORNE TRADE

*On the heels of the unfolding global financial crisis and economic downturn, growth in the world economy and in global merchandise exports decelerated in 2008, and is projected to decline in 2009. Reduced global production and demand, and the resulting lower levels of trade, have undermined growth in seaborne trade. Downside risks, including the adverse feedback loop between the financial sector and the real economy, make the outlook for seaborne trade uncertain. Climate change and the need to adopt an international regulatory regime for greenhouse gas emissions from international shipping are adding a further challenge to the maritime transport sector.*

### A. WORLD ECONOMIC SITUATION AND PROSPECTS

#### 1. World economic growth<sup>1</sup>

The year 2008 marked a major turning point in the history of the world economy and trade. Growth in the world economy measured by gross domestic product (GDP) slowed abruptly in the last part of 2008, as the financial crisis that had started in the United States in 2007 deepened and entered a more severe phase.

Global GDP expanded by just 2.0 per cent, a much slower rate than the 3.7 per cent recorded in 2007, and below the annual average rate of 3.5 per cent recorded during the period 1994–2008. The overall

picture was one of continuing growth in the first three quarters of 2008 with oil-exporting countries in particular benefiting from record high commodity prices, followed by faltering growth in late 2008 and in the first half of 2009 – first in developed regions and

then spreading to developing economies and countries with economies in transition (table 1). World output in 2009 is projected to contract by 2.7 per cent, heralding the first contraction in global output since the 1930s. As demand for maritime transport is derived from economic activities and trade, the global economic downturn entails serious implications for the maritime transport sector and seaborne trade.

Developed economies are leading the global downturn, with most of their economies already in recession. As a group, developed economies achieved a meagre

growth of 0.7 per cent in 2008. GDP grew by 1.1 per cent in the United States, and by less than 1 per cent in the European Union. Japan and Italy were the hardest hit, with their outputs falling by 0.6 per cent

and 1.0 per cent respectively. Advanced economies are expected to shrink by 4.1 per cent in 2009.

Developing economies and countries with economies in transition have also felt the brunt of the downturn.

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**Global GDP expanded by just 2.0 per cent, a much slower rate than the 3.7 per cent recorded in 2007 ...**

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In 2008, developing economies expanded output by 5.4 per cent, down from 7.3 per cent in 2007. Although significantly reduced, compared with its double-digit growth rate of the past few years, China continued to

lead, with its GDP growing by 9.0 per cent. Other major developing economies, including Brazil, India and South Africa, recorded positive growth, although at slower rates compared to the performance they achieved in

Table 1  
World economic growth, 2006–2009 <sup>a</sup>  
(annual percentage change)

| Region/country <sup>b</sup> | 2006 | 2007 | 2008 <sup>c</sup> | 2009 <sup>d</sup> |
|-----------------------------|------|------|-------------------|-------------------|
| <b>WORLD</b>                | 3.9  | 3.7  | 2.0               | -2.7              |
| <b>Developed economies</b>  | 2.8  | 2.5  | 0.7               | -4.1              |
| <i>of which:</i>            |      |      |                   |                   |
| <b>United States</b>        | 2.8  | 2.0  | 1.1               | -3.0              |
| <b>Japan</b>                | 2.0  | 2.4  | -0.6              | -6.5              |
| <b>European Union (27)</b>  | 3.1  | 2.9  | 0.9               | -4.6              |
| <i>of which:</i>            |      |      |                   |                   |
| <b>Germany</b>              | 3.0  | 2.5  | 1.3               | -6.1              |
| <b>France</b>               | 2.4  | 2.1  | 0.7               | -3.0              |
| <b>Italy</b>                | 1.9  | 1.5  | -1.0              | -5.5              |
| <b>United Kingdom</b>       | 2.9  | 3.1  | 0.7               | -4.3              |
| <b>Developing economies</b> | 7.2  | 7.3  | 5.4               | 1.3               |
| <i>of which:</i>            |      |      |                   |                   |
| <b>China</b>                | 11.1 | 11.4 | 9.0               | 7.8               |
| <b>India</b>                | 9.7  | 9.0  | 7.3               | 5.0               |
| <b>Brazil</b>               | 4.0  | 5.7  | 5.1               | -0.8              |
| <b>South Africa</b>         | 5.4  | 5.1  | 3.1               | -1.8              |
| <b>Transition economies</b> | 7.5  | 8.4  | 5.4               | -6.2              |
| <i>of which:</i>            |      |      |                   |                   |
| <b>Russian Federation</b>   | 6.7  | 8.1  | 5.6               | -8.0              |

*Source:* UNCTAD secretariat calculations, based on the United Nations Department of Economic and Social Affairs (UN-DESA), National Accounts Main Aggregates Database, and the World Economic Situation and Prospects (WESP) 2009: Update as of mid-2009; Organization for Economic Cooperation and Development (OECD), Economic Outlook No 85, Preliminary Edition, June, 2009, Economic Commission for Latin America and the Caribbean, Economic Survey of Latin America and the Caribbean 2008-2009, July, 2009; and national sources.

<sup>a</sup> Calculations for country aggregates are based on GDP at constant 2000 dollars.

<sup>b</sup> Regions and country groups correspond to those defined in the UNCTAD's *Trade and Development Report, 2009*

<sup>c</sup> Preliminary estimates.

<sup>d</sup> Forecast.

2007. In aggregate, developing economies are expected to grow marginally in 2009 (1.3 per cent), with some countries, including Brazil and South Africa, suffering GDP contractions (of -0.8 per cent and -1.8 per cent, respectively).

Countries with economies in transition are affected too, with growth slowing to 5.4 per cent in 2008, compared to a rate of 8.4 per cent in 2007. The 2009 outlook for these economies is bleak, with GDP expected to fall by 6.2 per cent for the entire group, and by 8.0 per cent for the Russian Federation.

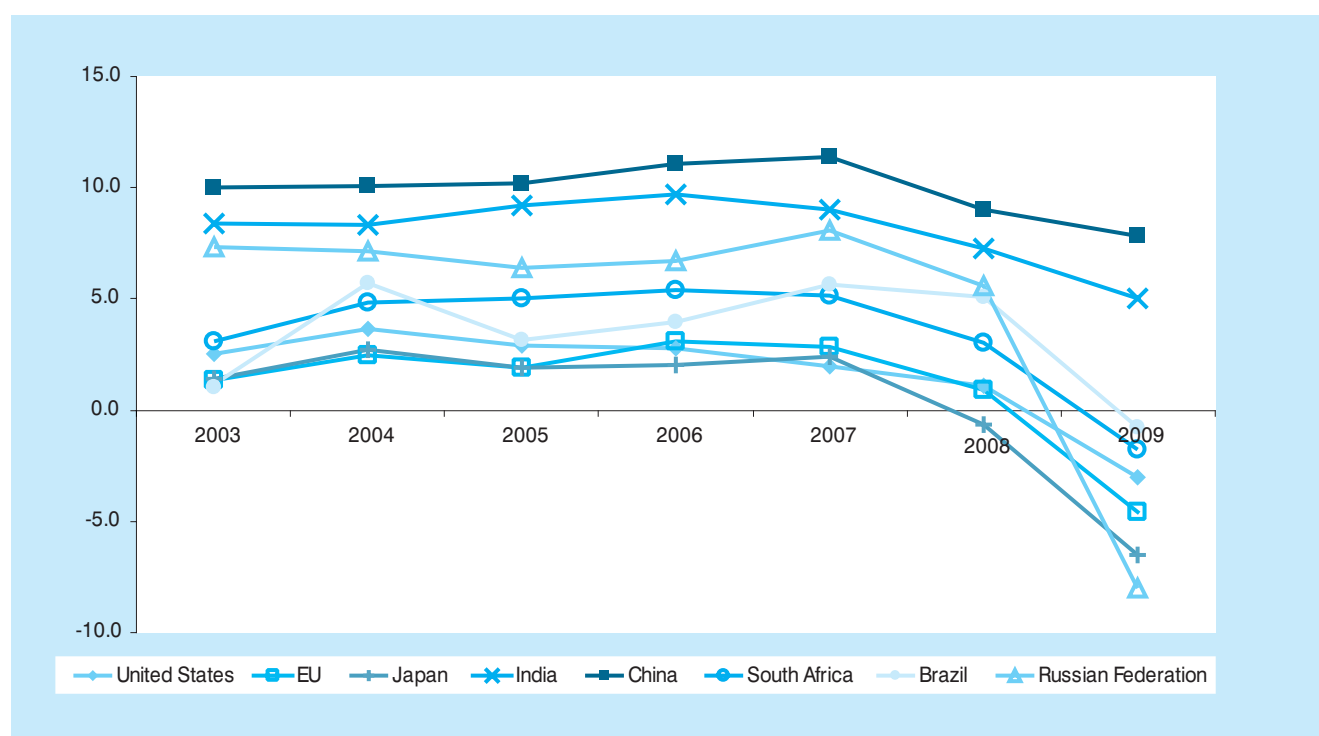
While the spillover of the downturn from developed to developing regions might have been slow, the contagion could not be prevented. China – the main engine of the global economic and trade expansion over recent years – could not insulate itself from the effects of the deteriorating economic situation when its major trading

partners had already entered into recession. Growth in developing economies and countries with economies in transition has turned out to be less resilient than expected suggesting that there is no “decoupling” effect between the economies of developed and developing regions.

In an interdependent and globalized economy, developing economies and countries with economies in transition cannot be sheltered from the effects of a global downturn. The rapid spread of the economic downturn beyond advanced economies has been channelled – amongst other things – through financial and trade mechanisms: the credit crunch has made trade finance difficult and expensive, while global supply chains have acted as a conduit for the economic downturn. Therefore, the world is witnessing a broad, deep and synchronized downturn, which will be the first since the post-war era (see fig. 1 (a)).

Figure 1 (a)

**World GDP growth, 2003–2009, selected countries**  
(annual percentage change)



Source: UNCTAD secretariat calculations, based on the United Nations Department of Economic and Social Affairs (UN-DESA), National Accounts Main Aggregates Database, and the World Economic Situation and Prospects (WESP) 2009: Update as of mid-2009; Organization for Economic Cooperation and Development (OECD), Economic Outlook No 85, Preliminary Edition, June, 2009, Economic Commission for Latin America and the Caribbean, Economic Survey of Latin America and the Caribbean 2008-2009, July, 2009; and national sources.

Developments affecting industrial production provide a good indicator of how severe the global downturn may be, and the extent to which demand for maritime transport services is being affected. Global industrial production dropped by 13 per cent in late 2008<sup>2</sup> and adversely affected demand for raw materials and energy. The Industrial Production Index of the Organization for Economic Cooperation and Development (OECD) dropped from 106.8 in 2007 to 104.9 in 2008. It fell significantly, to 98.7, over the last quarter of 2008, and this was down from 108.5, 107.4 and 105.1 registered during the first, second and third quarters respectively. By June 2009, the OECD Industrial Production Index had dropped further, standing at 91.3. Industrial production in emerging developing economies and countries with economies in transition – including Brazil, India and the Russian Federation – slowed too, albeit at a less dramatic pace than advanced economies. In 2008,

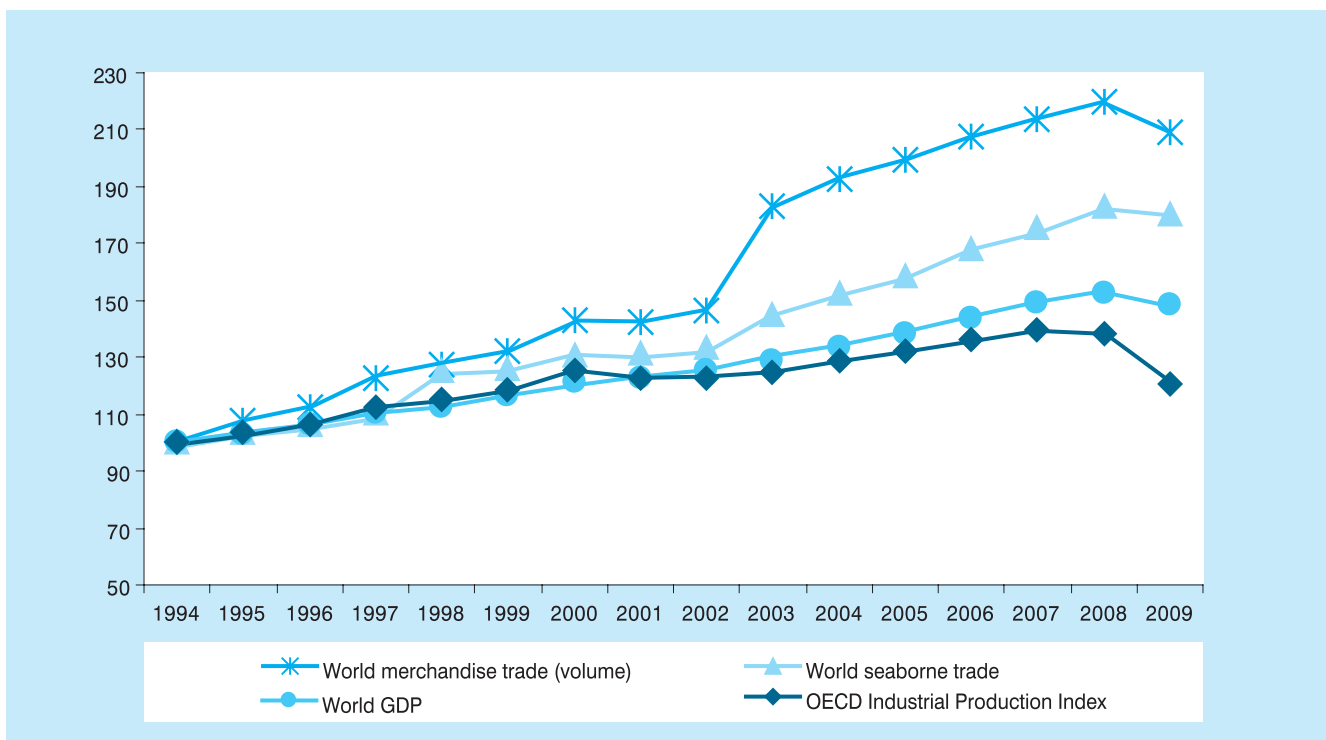
industrial production in China increased on average by 17.6 per cent, up from 16.4 per cent recorded in 2007.<sup>3</sup> However, during the first eight months of 2009, industrial production in China was growing on average by 8.2 per cent, less than half the annual growth rate recorded in 2008.<sup>4</sup>

Highlighting the strong interdependence between industrial production, economic growth, global trade and maritime transport services, figure 1 (b) illustrates how these variables are moving in tandem, including falling in unison in 2008 and 2009. A contraction in industrial production reduces output and trade, and by extension, reduces demand for maritime transport services and depresses global seaborne trade.

A global economic recovery, and by extension, world merchandise trade and demand for maritime transport

Figure 1 (b)

**Indices for world economic growth (GDP), OECD Industrial Production Index and world seaborne trade (volume), 1994–2009**  
(1994 = 100)



Source: UNCTAD secretariat on the basis of OECD Main Economic Indicators, June 2009; UNCTAD *Trade and Development Report 2009* and UNCTAD *Review of Maritime Transport*, various issues. The 2009 data for seaborne trade was derived by applying the growth rate forecasted by Fearnleys and Clarkson Research Services. The 2009 data for the volume of world merchandise trade was derived by applying the growth rate forecasted by WTO. Trade volumes data are derived from customs values deflated by standard unit values and adjusted price index for electronic goods.

services, will, to a large extent, depend on actions taken to reinvigorate economic activity, stimulate consumption and investment, and promote trade. Governments, individually, and as a group, including within the framework of the G-20,<sup>5</sup> are taking action and pledging to help overcome the crisis. Governments at the G-20 meeting held in London in April 2009 agreed on an additional \$1.1 trillion support programme which includes, among other things, support for trade finance worth \$250 billion. In addition, the Governments of some 40 economies – including Governments in developing regions, such as those of China and India – have taken policy measures, both monetary and fiscal (amounting to approximately \$21 trillion) to stabilize their respective financial sectors and to stimulate their national economies.<sup>6</sup>

The IMF predicts – subject to the timely and effective implementation of the various policy and support measures adopted or planned – that the global economy will turn around in 2010, albeit at the sluggish rate of 1.9 per cent. It should be noted, however, that despite the various efforts to pull the world economy out of recession, credit conditions remain difficult, given the negative feedback loop between the financial sector and the real economy. Tighter credit conditions constrain investment and consumer spending, which, in turn, prevent economic recovery and undermine financial stability.

## 2. Merchandise trade<sup>7</sup>

### *Recent developments in international trade*

The collapse in global demand has significantly impacted growth in world merchandise trade. In 2008, the volume of world merchandise exports grew by 2.0 per cent, four percentage points lower than 2007 (table 2). The magnitude of this deceleration is such that, unlike previous years, growth in export volumes did not outpace growth in global output. As shown in figure 2, trade has usually grown at a faster rate than GDP, with trade expanding two to three times faster. The multiplier effect is, to a large extent, the result of globalized production processes and trade in parts and components, greater economic integration, and the deepening and widening of global supply chains.<sup>8</sup>

According to the World Trade Organization (WTO), monthly trade volumes of major developed and developing economies have been falling in tandem since

September 2008. The global downturn that started in late 2008 is considered particularly severe, with recorded declines in trade being larger than in past slowdowns. The most commonly cited reason within the maritime industry for the speed with which the downturn has spread to global trade is the shortage of trade finance. In fact, banks stopped issuing letters of credit, and cargoes could not be lifted and trades executed. Developing economies' trade is particularly affected by the shortage of finance. Unmet demand for trade financing in developing economies is estimated to range between \$100 billion and \$300 billion annually.<sup>9</sup>

In 2008, North American export volumes grew by a meagre 1.5 per cent, while the European Union registered the slowest export growth of any region. The collapsing demand for imported goods, in particular consumer goods, resulted in both regions recording sharp falls in import volumes, -2.5 per cent for North America and -1.0 per cent for the European Union.

Developing economies and transition economies continued to drive growth in world merchandise trade, albeit at a slower pace than in 2007. Asia – led by China – expanded its export volumes by 4.5 per cent, a dramatic fall from the double-digit rate recorded in previous years. Growth in export volumes from China slowed to 8.5 per cent, less than half the growth rate recorded in 2007. Asia's imports – and those of China in particular – also grew at a slower pace than in 2007. Asia's openness to trade has made it more vulnerable to the recession, especially those countries that rely heavily on the production and export of manufactured goods, the demand for which has substantially dropped.

Other developing regions in Africa and the Middle East expanded their export and import volumes despite the

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**In 2008, the volume of world merchandise exports grew by 2.0 per cent, four percentage points lower than 2007.**

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relatively slower pace. Exporters of primary commodities, including oil and metals, maintained relatively high import volume levels, as they benefited from gains in the terms of trade as a result of price surges in

the first half of 2008. Africa's export volumes grew by 3.0 per cent in 2008, compared to 4.5 per cent in 2007, while imports expanded by 13.0 per cent. Similarly, export volumes from the Middle East grew by 3.0 per cent (4.0 per cent in 2007), while imports grew by 10.0 per cent (14.0 per cent in 2007). Import volumes in Latin America expanded faster than in any other region. They increased at a double-digit rate (15.5 per cent), although at a slower pace than in 2007 and at a much

Table 2

**Growth in the volume <sup>a</sup> of merchandise trade, by geographical region, 2006–2008**  
(percentages)

| Exports |      |      | Countries/Regions                               | Imports |      |      |
|---------|------|------|---|---------|------|------|
| 2006    | 2007 | 2008 |   | 2006    | 2007 | 2008 |
| 8.5     | 6.0  | 2.0  | <b>WORLD</b>                                    | 8.0     | 6.0  | 2.0  |
| 8.5     | 5.0  | 1.5  | <b>North America</b>                            | 6.0     | 2.0  | -2.5 |
| 7.5     | 3.5  | 0.0  | <b>European Union (27)</b>                      | 7.0     | 3.5  | -1.0 |
| 1.5     | 4.5  | 3.0  | <b>Africa</b>                                   | 10.0    | 14.0 | 13.0 |
| 3.0     | 4.0  | 3.0  | <b>Middle East</b>                              | 5.5     | 14.0 | 10.0 |
| 4.0     | 3.0  | 1.5  | <b>South and Central America<sup>b</sup></b>    | 15.0    | 17.5 | 15.5 |
| 13.5    | 11.5 | 4.5  | <b>Asia</b>                                     | 8.5     | 8.0  | 4.0  |
| 22.0    | 19.5 | 8.5  | <b>China</b>                                    | 16.5    | 13.5 | 4.0  |
| 6.0     | 7.5  | 6.0  | <b>Commonwealth of Independent States (CIS)</b> | 20.5    | 20.0 | 15.0 |

Source: WTO press release: World trade 2008, prospects for 2009. March 2009.

<sup>a</sup> Trade volumes data are derived from customs values deflated by standard unit values and adjusted price index for electronic goods.

<sup>b</sup> Includes the Caribbean.

faster pace than did exports (1.5 per cent as compared with 3.0 per cent in 2007).

The region with the fastest export volume growth and the second-highest import volume in 2008 was the Commonwealth of Independent States (CIS).<sup>10</sup> Export volumes expanded by 6.0 per cent as compared with 7.5 per cent in 2007, while imports grew by 15 per cent compared to 20 per cent in 2007.

Prospects for 2009 are rather gloomy. According to WTO, the volume of world exports is expected to fall by 10 per cent in 2009, the first drop since 1982 and the largest since the Second World War. The maritime transport industry is concerned that protectionist measures introduced in the face of the global economic downturn may hinder trade further, ultimately deepening the global recession.

Developed economies' trade is expected to contract the most, with exports falling by 14 per cent, while exports of developing economies are expected to drop by 7 per cent. Although faced with a relatively less dramatic export fall than in developed economies, developing

economies are likely to be hit much harder as they rely much more on trade for their growth and development. For many developing economies, especially the most vulnerable and trade-dependent, a sharp decline in production, economic growth and trade constitutes a considerable setback to progress made to date in terms of alleviating poverty and attaining the Millennium Development Goals. The World Bank estimates that over 40 per cent of developing economies are highly exposed to the poverty effects of the crisis, and that in 2009, 55 million more people in developing economies will live below the poverty line than was expected before the crisis.

**... growth in international seaborne trade continued albeit at the slower rate of 3.6 per cent in 2008 as compared with 4.5 per cent in 2007.**

## **B. WORLD SEABORNE TRADE<sup>11</sup>**

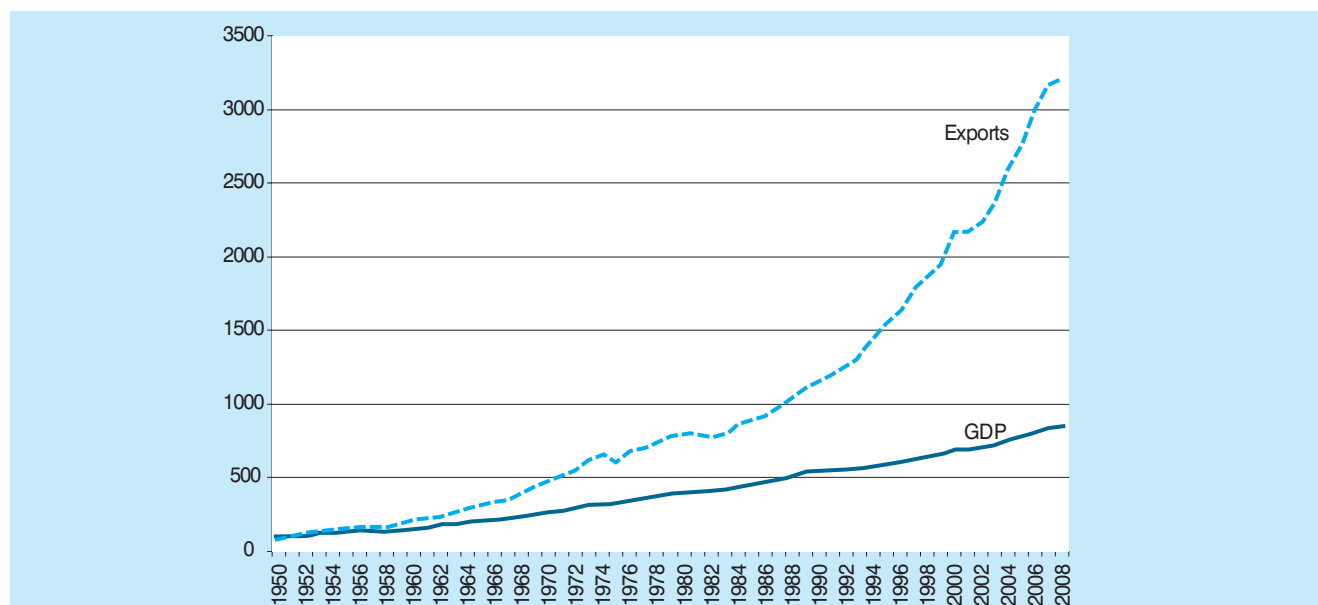
### **1. Overall seaborne trade**

Following the global economic downturn and sharp decline in world merchandise trade in the last quarter of 2008, growth in international seaborne trade continued, albeit at the slower rate of 3.6 per cent in 2008 as compared with 4.5 per cent in 2007. UNCTAD estimates



Figure 2

**Indices for world economic growth (GDP) and world merchandise exports (volume), selected years**  
(1950 = 100)



Source: UNCTAD, based on World Trade Organization, Table A1, Trade Statistics, 2008. Trade volumes data are derived from customs values deflated by standard unit values and adjusted price index for electronic goods.

the 2008 international seaborne trade at 8.17 billion tons of goods loaded, with dry cargo continuing to account for the largest share (66.3 per cent) (tables 3 and 4, and fig. 3).

Consistent with the past trend, major loading areas were located in developing regions (60.6 per cent), followed by developed economies (33.6 per cent) and countries with transition economies (5.9 per cent). Asia continued to dominate the picture, with a share of 40 per cent of total goods loaded, followed in descending order by the Americas, Europe, Africa and Oceania (fig. 4 (a)). As shown in figure 4 (b) on page 12, developing economies have consistently increased their share of global goods unloaded. Over the years, developing economies have increased their share of imports – including finished consumer goods, and also parts and components used as inputs in globalized production processes.

Reflecting a sharp decline in demand for consumption goods, as well as a fall in industrial production in major economies and reduced energy demand, especially in developed regions, the deceleration in seaborne volumes affected all shipping sectors. Growth in dry bulk trade is estimated

at 4.7 per cent, as compared with 5.7 per cent in 2007. Accounting for about 16 per cent of world goods loaded in volume terms (tons), container trade recorded the sharpest deceleration, with a growth rate falling by more than half, from 11 per cent in 2007 to 4.7 per cent in 2008.<sup>12</sup> Measured in twenty-foot equivalent units (TEU), container trade volumes increased from 130 Million TEUs in 2007 to 137 Million TEUs in 2008.<sup>13</sup> Signs of reduced energy demand emerged in the oil trade sector, especially in developed regions. Together the volume of crude oil and products loaded grew by just 1.6 per cent, as compared with 2.1 per cent in 2007.

Some challenging times lie ahead for the shipping industry and international seaborne trade. Forecasts for seaborne trade have been marked downwards, with dry

**Some challenging times lie ahead for the shipping industry and international seaborne trade.**

bulk – the mainstay of the boom experienced over the past few years – projected to fall sharply. Experts at Fearnleys, a leading shipbroker, expect world seaborne trade to fall by 1.4 per cent in 2009,

before turning around and growing at a slower rate of 2.0 per cent in 2010. A similar outlook is projected for 2009 by Clarkson Shipping Services, another leading shipbroker. For 2009, Clarkson Research Services<sup>14</sup> are



Table 3

## Development of international seaborne trade, selected years

*(millions of tons loaded)*

| Year              | Oil   | Main bulks <sup>a</sup> | Other dry cargo | Total<br>(all cargoes) |
|-------------------|-------|-------------------------|-----------------|------------------------|
| 1970              | 1 442 | 448                     | 676             | 2 566                  |
| 1980              | 1 871 | 796                     | 1 037           | 3 704                  |
| 1990              | 1 755 | 968                     | 1 285           | 4 008                  |
| 2000              | 2 163 | 1 288                   | 2 533           | 5 984                  |
| 2006              | 2 648 | 1 888                   | 3 009           | 7 545                  |
| 2007              | 2 705 | 2 013                   | 3 164           | 7 882                  |
| 2008 <sup>b</sup> | 2 749 | 2 097                   | 3 322           | 8 168                  |

*Source:* Estimated by the UNCTAD secretariat, on the basis of data supplied by reporting countries, ports and specialized sources. Data have been updated to the most recent available.

<sup>a</sup> Iron ore, grain, coal, bauxite/alumina and phosphate.

<sup>b</sup> Preliminary.

expecting dry cargo volumes to fall by 4.4 per cent, the first drop since 1983. Within the dry bulk trade, the largest decline is expected to affect Phosphate Rock volumes (-9 per cent), Bauxite and Alumina (-5.8 per cent), Coal (-2.3 per cent) and Grains (-0.6 per cent). Iron ore volumes are expected to remain steady due in particular to continued high import volumes of China which are determined not only by China's consumption needs but also the prices negotiated for iron ore. Negotiated iron ore prices determine the balance between use of locally produced and imported iron ore.<sup>15</sup> Oil trade, including crude and oil products, is expected to remain at practically the same level as 2008. As for the future prospects for liquefied natural gas trade, it will very much depend on the global economic situation and energy demand as well as on the completion of a number of ongoing projects.

Since the early 2000s, the shipping industry and global seaborne trade expanded at healthy rates, benefiting in particular from the boom in trade driven by the economic expansion of emerging dynamic developing economies such as China and India. The buoyant markets that emerged, and the sustained record-high freight rates (see chapter 4 for more details) made the world almost

forget the cyclical nature of shipping and its notorious volatility.<sup>16</sup> In common with other economic sectors – and even more so in view of the fact that demand for maritime transport services is derived from economic growth and the need to carry goods between producers and consumers as well as buyers and sellers – shipping is vulnerable to economic downturns. The vulnerability of shipping to the broader economic situation is illustrated by the significant contraction in trade volumes of the early-1980s recession, and also by the slowdown in the growth of global seaborne trade in the late 1990s when the Asian financial crisis erupted. At the same time, these precedents also underscore the ability of shipping and seaborne trade to rebound and recover from economic downturns and reduced trade.

*Other developments affecting seaborne trade*

The current preoccupation with the financial crisis and global recession should not play down concerns over other challenges that affect maritime transport and seaborne trade. These include, for example, security at sea, which is being challenged by a surge in piracy incidents in key strategic transit points such as the Gulf of Aden (see chapter 6 for more details). In 2008, the rise in

Table 4

## World seaborne trade in 2006–2008, by type of cargo and country group

| Country group        | Year | Goods loaded |         |          |           | Goods unloaded |         |          |           |
|----------------------|------|--------------|---------|----------|-----------|----------------|---------|----------|-----------|
|                      |      | Total        | Crude   | Products | Dry cargo | Total          | Crude   | Products | Dry cargo |
| Millions of tons     |      |              |         |          |           |                |         |          |           |
| World                | 2006 | 7 545.0      | 1 783.0 | 865.2    | 4 896.9   | 7 720.1        | 1 833.2 | 895.0    | 4 991.9   |
|                      | 2007 | 7 882.0      | 1 813.9 | 891.1    | 5 177.1   | 8 061.3        | 1 995.0 | 906.2    | 5 160.1   |
|                      | 2008 | 8 168.0      | 1 834.1 | 915.3    | 5 418.6   | 8 180.7        | 1 891.4 | 910.0    | 5 379.4   |
| Developed economies  | 2006 | 2 460.5      | 132.9   | 336.4    | 1 991.3   | 4 165.7        | 1 283.0 | 535.5    | 2 347.2   |
|                      | 2007 | 2 623.6      | 134.2   | 363.5    | 2 125.8   | 3 990.5        | 1 246.0 | 524.0    | 2 220.5   |
|                      | 2008 | 2 742.0      | 116.9   | 375.4    | 2 249.7   | 4 028.7        | 1 180.8 | 510.8    | 2 337.1   |
| Transition economies | 2006 | 410.3        | 123.1   | 41.3     | 245.9     | 70.6           | 5.6     | 3.1      | 61.9      |
|                      | 2007 | 417.9        | 124.4   | 39.9     | 253.7     | 76.8           | 7.3     | 3.5      | 66.0      |
|                      | 2008 | 480.2        | 133.4   | 33.9     | 312.8     | 88.1           | 6.3     | 4.5      | 77.4      |
| Developing economies | 2006 | 4 674.2      | 1 527.0 | 487.5    | 2 659.7   | 3 483.7        | 544.6   | 356.4    | 2 582.8   |
|                      | 2007 | 4 840.6      | 1 555.3 | 487.8    | 2 797.5   | 3 994.1        | 741.7   | 378.7    | 2 873.6   |
|                      | 2008 | 4 945.8      | 1 583.8 | 506.1    | 2 856.0   | 4 063.9        | 704.3   | 394.7    | 2 964.9   |
| Africa               | 2006 | 704.0        | 353.8   | 86.0     | 264.2     | 357.5          | 41.1    | 39.9     | 276.5     |
|                      | 2007 | 719.6        | 362.5   | 81.8     | 275.3     | 376.6          | 45.5    | 45.5     | 285.6     |
|                      | 2008 | 718.7        | 358.8   | 83.7     | 276.2     | 377.7          | 42.2    | 45.2     | 290.3     |
| America              | 2006 | 1 030.7      | 251.3   | 93.9     | 685.5     | 376.3          | 49.6    | 60.1     | 266.6     |
|                      | 2007 | 1 076.8      | 252.3   | 90.1     | 734.5     | 423.0          | 76.0    | 64.0     | 283.0     |
|                      | 2008 | 1 135.6      | 258.6   | 100.1    | 776.9     | 432.8          | 78.8    | 65.4     | 288.5     |
| Asia                 | 2006 | 2 932.7      | 917.6   | 307.5    | 1 707.7   | 2 737.0        | 453.9   | 249.6    | 2 033.5   |
|                      | 2007 | 3 037.0      | 936.0   | 315.7    | 1 785.3   | 3 181.0        | 620.2   | 262.2    | 2 298.6   |
|                      | 2008 | 3 084.2      | 961.8   | 322.1    | 1 800.3   | 3 239.7        | 583.2   | 277.0    | 2 379.4   |
| Oceania              | 2006 | 6.8          | 4.4     | 0.1      | 2.4       | 12.9           | 0.0     | 6.7      | 6.2       |
|                      | 2007 | 7.1          | 4.5     | 0.1      | 2.5       | 13.5           | 0.0     | 7.0      | 6.5       |
|                      | 2008 | 7.3          | 4.6     | 0.1      | 2.5       | 13.8           | 0.0     | 7.1      | 6.6       |

(continued over)

piracy activities in the Gulf of Aden brought the issue of maritime security to the forefront of international debate. In addition to the direct impact on ships, crews and cargoes, and on the maritime industry and governments, piracy threatens global seaborne trade (over 80 per cent of international seaborne trade moving through the Gulf of Aden is with Europe),<sup>17</sup> and impacts on energy security and the environment. By hijacking large tankers, seizing their cargoes, and delaying or preventing their delivery, and by causing oil spills or other incidents causing environmental damage, piracy poses additional risks and costs to all. The implications entail increased military presence and operations in affected areas, the re-routing of ships to bypass the Gulf of Aden and the Suez Canal, higher insurance premiums, and increased

costs associated with the hiring of security personnel and the installation of deterrent equipment.

Carriers can either avoid the piracy-ridden areas by re-routing their ships via the Cape of Good Hope, or accept additional risks and costs and continue to sail along the same lanes.<sup>18</sup> Re-routing via the Cape of Good Hope will likely affect the Egyptian authorities (e.g. foreign currency earnings, GDP), the Suez Canal Authority (e.g. operating earnings, unemployment), Mediterranean port authorities and terminals (e.g. reduced vessel calls and transshipments), and also industry and consumers because of additional costs. Based on 2007 data, the total annual round-trip costs of routing via the Suez Canal has been estimated at \$25.7 billion, whereas

Table 4 (continued)

| Country group               | Year | Goods loaded |       |          |           | Goods unloaded |       |          |           |
|-----------------------------|------|--------------|-------|----------|-----------|----------------|-------|----------|-----------|
|                             |      | Total        | Crude | Products | Dry cargo | Total          | Crude | Products | Dry cargo |
| <b>Percentage share</b>     |      |              |       |          |           |                |       |          |           |
| <b>World</b>                | 2006 | 100.0        | 23.6  | 11.5     | 64.9      | 100.0          | 23.8  | 11.6     | 64.7      |
|                             | 2007 | 100.0        | 23.0  | 11.3     | 65.7      | 100.0          | 24.8  | 11.2     | 64.0      |
|                             | 2008 | 100.0        | 22.5  | 11.2     | 66.3      | 100.0          | 23.1  | 11.1     | 65.8      |
| <b>Developed economies</b>  | 2006 | 32.6         | 7.5   | 38.9     | 40.7      | 54.0           | 70.0  | 59.8     | 47.0      |
|                             | 2007 | 33.3         | 7.4   | 40.8     | 41.1      | 49.5           | 62.5  | 57.8     | 43.0      |
|                             | 2008 | 33.6         | 6.4   | 41.0     | 41.5      | 49.3           | 62.4  | 56.1     | 43.5      |
| <b>Transition economies</b> | 2006 | 5.4          | 6.9   | 4.8      | 5.0       | 0.9            | 0.3   | 0.4      | 1.2       |
|                             | 2007 | 5.3          | 6.9   | 4.5      | 4.9       | 1.0            | 0.4   | 0.4      | 1.3       |
|                             | 2008 | 5.9          | 7.3   | 3.7      | 5.8       | 1.1            | 0.3   | 0.5      | 1.4       |
| <b>Developing economies</b> | 2006 | 62.0         | 85.7  | 56.3     | 54.3      | 45.1           | 29.7  | 39.8     | 51.7      |
|                             | 2007 | 61.4         | 85.7  | 54.7     | 54.0      | 49.6           | 37.2  | 41.8     | 55.7      |
|                             | 2008 | 60.6         | 86.4  | 55.3     | 52.7      | 49.7           | 37.2  | 43.4     | 55.1      |
| <b>Africa</b>               | 2006 | 9.3          | 19.8  | 9.9      | 5.4       | 4.6            | 2.2   | 4.5      | 5.5       |
|                             | 2007 | 9.1          | 19.8  | 9.2      | 5.3       | 4.7            | 2.3   | 5.0      | 5.5       |
|                             | 2008 | 8.8          | 19.6  | 9.2      | 5.1       | 4.6            | 2.2   | 5.0      | 5.4       |
| <b>America</b>              | 2006 | 13.7         | 14.1  | 10.9     | 14.0      | 4.9            | 2.7   | 6.7      | 5.3       |
|                             | 2007 | 13.7         | 13.9  | 10.1     | 14.2      | 5.3            | 3.8   | 7.1      | 5.5       |
|                             | 2008 | 13.9         | 14.1  | 10.9     | 14.3      | 5.3            | 4.2   | 7.2      | 5.4       |
| <b>Asia</b>                 | 2006 | 38.9         | 51.5  | 35.5     | 34.9      | 35.5           | 24.8  | 27.9     | 40.7      |
|                             | 2007 | 38.5         | 51.6  | 35.4     | 34.5      | 39.5           | 31.1  | 28.9     | 44.6      |
|                             | 2008 | 37.8         | 52.4  | 35.2     | 33.2      | 39.6           | 30.8  | 30.4     | 44.2      |
| <b>Oceania</b>              | 2006 | 0.1          | 0.2   | 0.0      | 0.1       | 0.2            | 0.0   | 0.8      | 0.1       |
|                             | 2007 | 0.1          | 0.3   | 0.0      | 0.1       | 0.2            | 0.0   | 0.8      | 0.1       |
|                             | 2008 | 0.1          | 0.3   | 0.0      | 0.1       | 0.2            | 0.0   | 0.8      | 0.1       |

*Source:* Estimated by the UNCTAD secretariat, on the basis of data supplied by reporting countries, ports and specialized sources. Data have been updated to the most recent available.

costs – including inventory costs of cargo – when ships are routed via the Cape of Good Hope are estimated at \$32.2 billion.<sup>19</sup> Taking into account all cost factors, it was estimated that re-routing 33 per cent of cargo via the Cape would cost shipowners an additional \$7.5 billion per annum.<sup>20</sup> These costs will ultimately be passed on to shippers and consumers.

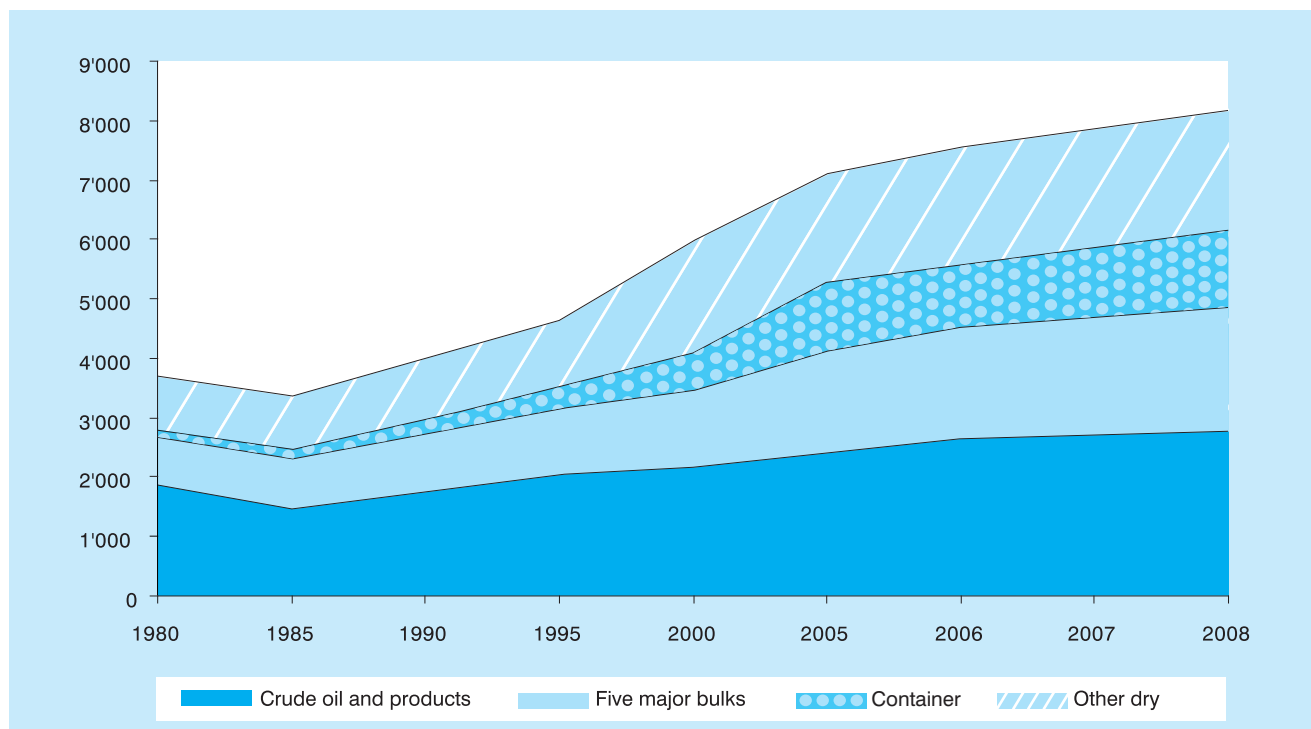
Independently of the piracy concerns, the confluence of other factors, including the global economic downturn, the fall in oil prices and, by extension, in fuel costs, as well as the decline in trade volumes, have already resulted in large containerships being re-routed via the Cape of Good Hope. For example, Maersk Line's AE7 service has been routed via the Cape on its eastbound leg to Asia. CMA

CGM and China Shipping Container Line have taken similar action with a joint service.<sup>21</sup> While taking this longer route leads to greater fuel consumption and adds another 7 to 10 days as ships continue to reduce speed, lines were considering it more economical. However, as bunker fuel prices started to increase in mid-2008,<sup>22</sup> the decision to divert various ships around the Cape of Good Hope was being revisited and the policy of re-routing to the Cape of Good Hope was being reversed.<sup>23</sup>

Ships that continue to transit via the Gulf of Aden and the Suez Canal have to purchase a war risk insurance coverage at \$20,000 per ship per voyage (excluding injury, liability and ransom coverage), as compared with the \$500 required a year ago to purchase additional

Figure 3

**International seaborne trade, selected years**  
(millions of tons loaded)



Source: *Review of Maritime Transport*, various issues. Data for container trade based on Clarkson Research Services, Shipping Review Database, Spring 2009.

insurance coverage.<sup>24</sup> Overall, it is estimated that the increased cost of war risk insurance premiums for the 20,000 ships passing through the Gulf of Aden could reach as much as \$400 million.<sup>25</sup>

In addition to security at sea, shipping and seaborne trade are affected by developments pertaining to a number of other intertwined issues, namely energy security, energy prices and bunker fuel costs, as well as climate change. The climate change challenge, in particular, entails critical implications for shipping and trade in view of the current negotiations under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC). Set to conclude in December 2009, these negotiations aim to adopt a successor agreement to the Kyoto Protocol. Such an agreement is expected to include a regulatory regime for greenhouse gas emissions from international shipping. No doubt, any such instrument will affect the maritime transport industry and international seaborne trade (see section D).

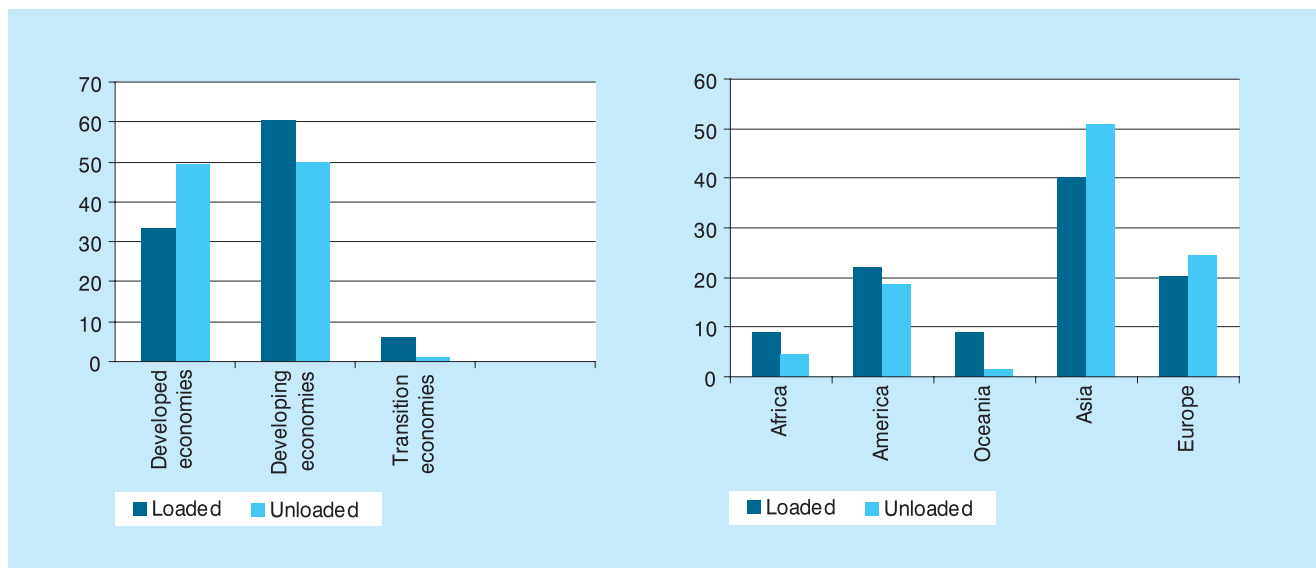
## 2. World shipments by country groups

### *Developed economies*

In 2008, developed economies accounted for 33.6 per cent of global goods loaded. Europe accounted for the lion's share of this total, with 43.3 per cent, followed by Australia and New Zealand (26.3 per cent), North America (24.1 per cent) and Israel and Japan (6.3 per cent). Dry cargo remained the mainstay of developed regions' exports. Developed economies accounted for 49.3 per cent of all goods unloaded at ports globally. Goods unloaded in European ports accounted for 47.7 per cent of all goods unloaded globally. The next-largest importer of goods by sea was North America (27.2 per cent), followed by Australia and New Zealand (22.5 per cent), and finally by Israel and Japan (2.6 per cent). More than half the goods unloaded at developed economies' ports were made of dry cargo, with crude oil imports accounting for a little less than one third.

Figure 4 (a)

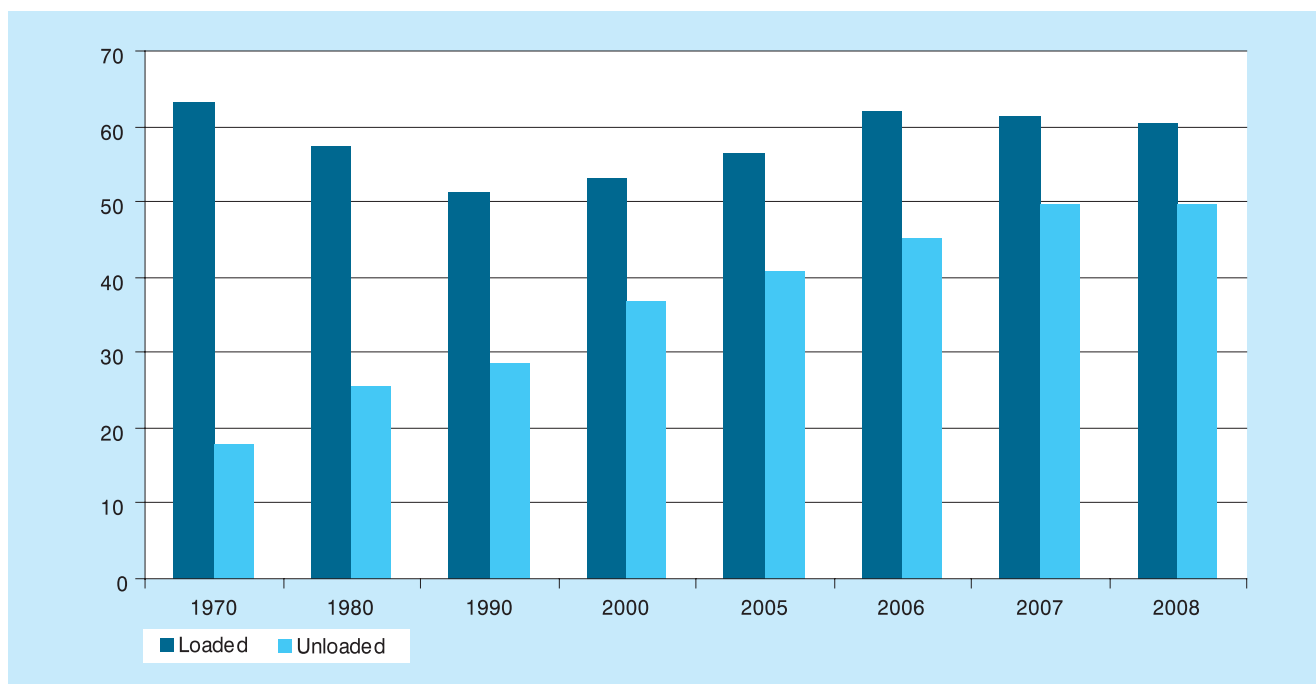
**World seaborne trade, by country group and region, 2008**  
(percentage share in tonnage)



Source: Compiled by the UNCTAD secretariat, on the basis of data supplied by reporting countries, ports and specialized sources.

Figure 4 (b)

**Developing countries' seaborne trade, selected years**  
(percentage share in tonnage)



Source: *Review of Maritime Transport*, various issues.

### *Developing economies*

In 2008, 60.6 per cent of goods loaded in the world originated in developing regions. A total of 49.7 per cent of global seaborne imports were received at developing economies' ports (see fig. 4 (b)). In 2008, over 86 per cent of crude oil exported by sea globally and 55.3 per cent of total world exports of petroleum products originated in developing economies. In terms of goods unloaded, ports in developing economies accounted for 55.1 per cent of world dry cargo imports, 43.4 per cent of world petroleum products, and 37.2 per cent of crude oil. Developing Asia continues to account for the largest share of developing economies' seaborne trade. Transition economies accounted for 5.9 per cent of world goods loaded and 1.1 per cent of world goods unloaded. Crude oil shipments loaded at their ports are estimated to have reached 7.3 per cent of total world oil loaded, reflecting, in particular, increasing oil exports from the CIS.

### **3. Demand for shipping services**

Demand for maritime transport services is more adequately expressed in ton-miles, as this reflects the evolution of both the cargo volumes as well as the distances travelled and the geographical distribution of suppliers and consumers and buyers and sellers. As indicated in table 5, and based on estimates by Fearnleys, world seaborne trade measured in ton-miles amounted to 32,746 billion ton-miles in 2008. This represents an increase of 4.2 per cent over the previous year, a rate equivalent to the Fearnleys estimated growth rate for seaborne trade measured in tons.

In 2008, dry cargo ton-miles increased by 5.5 per cent, up from 5.3 per cent recorded in 2007. Ton-miles for the five major dry bulks slowed down, increasing only by 5.0 per cent – down from a 7.0 per cent increase in 2007. For the remaining dry cargoes (minor bulks and liner cargoes), ton-miles expanded by 6.0 per cent, reflecting mainly growth in volumes.

The new geography of trade (e.g. South–South trade, changes in the composition of trade, and a larger share of trade in parts and components) and deeper international economic integration are to some extent reflected in the figures featured in table 5. Ton-miles increased by a factor of three between 1970 and 2000, and expanded by 43 per cent between 2000 and 2008. Rapid growth in world ton-miles partly reflects the growing importance of some dynamic emerging developing economies, such

as China and India. Industrialization in these economies, their fast-growing demand for raw materials required for industrial production, and their desire to diversify sources of supply have led these economies to tap into resources found in distant locations such as Latin America and Africa. In addition to the world economic and trade situation and prospects, the outlook for ton-miles will also depend on policies and measures affecting the composition and direction of trade flows (e.g. measures to promote energy security by switching to alternative energies, promoting domestic production over imports, and climate-change action favouring sourcing from shorter distances or switching to cleaner fuel sources etc.). Growth in world ton-miles will also likely be influenced by the development stage of economies. Some fast-growing developing regions will likely become much less dependent on the industrial or agricultural sectors. Consumption needs in some economies may evolve to reflect higher incomes and more sophisticated consumption preferences. These structural changes are likely to affect demand for maritime transport services and maritime transport activity measured in ton-miles.

## **C. SECTORS OF WORLD SEABORNE TRADE**

### **1. Seaborne trade in crude oil and petroleum products<sup>26</sup>**

#### *General developments affecting oil seaborne trade*

In 2008, the oil seaborne trade was particularly affected by developments in energy prices and markets, by the world economic situation, and by the rising profile of environmental considerations, including global climate change.

For the first time since the 1980s, global oil demand fell in the third quarter of 2008, as a result of reduced demand in developed economies, especially in Japan, and in the United States which saw its biggest fall since 1982. The economic downturn dampened these economies' demand for energy, owing to a reduction in production, manufacturing and consumer demand for goods.

In 2008, energy consumption in developing economies and countries with economies in transition continued to grow, although at a slower pace, with consumption among exporting regions in the Middle East and Africa remaining robust. While the outlook for 2009 and beyond will depend on the extent and duration of the economic



Table 5

## World seaborne trade in ton-miles, selected years

*(billions of ton-miles)*

| Year | Oil   |          |                     | Iron ore | Coal  | Grain <sup>a</sup> | Five main dry bulks <sup>b</sup> | Other dry cargoes | World total |
|------|-------|----------|---------------------|----------|-------|--------------------|----------------------------------|-------------------|-------------|
|      | Crude | Products | Crude plus products |          |       |                    |                                  |                   |             |
| 1970 | 5 597 | 890      | 6 487               | 1 093    | 481   | 475                | 2 049                            | 2 118             | 10 654      |
| 1980 | 8 385 | 1 020    | 9 405               | 1 613    | 952   | 1 087              | 3 652                            | 3 720             | 16 777      |
| 1990 | 6 261 | 1 029    | 7 290               | 1 978    | 1 849 | 1 073              | 5 259                            | 3 891             | 16 440      |
| 2000 | 8 180 | 1 319    | 9 499               | 2 545    | 2 509 | 1 244              | 6 638                            | 6 790             | 22 927      |
| 2001 | 8 074 | 1 345    | 9 419               | 2 575    | 2 552 | 1 322              | 6 782                            | 6 930             | 23 131      |
| 2002 | 7 848 | 1 394    | 9 898               | 2 731    | 2 549 | 1 241              | 6 879                            | 7 395             | 23 516      |
| 2003 | 8 390 | 1 460    | 9 850               | 3 035    | 2 810 | 1 273              | 7 118                            | 7 810             | 25 124      |
| 2004 | 8 795 | 1 545    | 10 340              | 3 444    | 2 960 | 1 350              | 9 521                            | 8 335             | 26 814      |
| 2005 | 8 875 | 1 652    | 10 527              | 3 918    | 3 113 | 1 686              | 9 119                            | 8 730             | 28 376      |
| 2006 | 8 983 | 1 758    | 10 741              | 4 192    | 3 540 | 1 822              | 9 976                            | 9 341             | 30 058      |
| 2007 | 9 214 | 1 870    | 11 084              | 4 544    | 3 778 | 1 927              | 10 676                           | 9 665             | 31 425      |
| 2008 | 9 300 | 1 992    | 11 292              | 4 849    | 3 905 | 2 029              | 11 209                           | 10 245            | 32 746      |

Source: Fearnleys Review, various issues.

<sup>a</sup> Includes wheat, maize, barley, oats, rye, sorghum and soya beans.

<sup>b</sup> Includes iron ore, coal, grain, bauxite/alumina and phosphate.

downturn and financial crisis, the International Energy Agency (IEA) expects oil demand to fall by 2.4 million barrels per day (mbd) in 2009.

In 2008, global oil supply was not constrained, and remained above 2007 levels with production growth exceeding consumption growth due to increased production by the Organization of Petroleum Exporting Countries (OPEC). Increased production in OPEC countries helped offset the fall in non-OPEC production, namely from Mexico and the North Sea.

In addition to developments affecting oil supply and demand, oil prices fluctuated significantly throughout 2008, declining sharply before fixing at a much lower level with the abrupt eruption of the global financial and economic crises. After rising steadily throughout 2007, oil prices, as illustrated by Brent spot prices,<sup>27</sup> surpassed the \$143 per barrel (pb) mark in July 2008, before crashing to a low of \$33.73 pb in December 2008, trending upwards again in the first half of 2009 and hovering around \$69 pb in September 2009. Brent spot prices increased by over 147 per cent between January 2007 and July 2008, and then fell by 70 per cent between

July and December 2008. Rising oil prices reflected the tight balance between supply and demand and the effect of increased speculation. Despite oil production cuts announced by OPEC in October 2008, crude oil prices continued to fall, with average crude oil prices for 2008 nevertheless remaining higher than in 2007. Annual oil prices increased for the seventh consecutive year, a first in the nearly 150-year history of the oil industry. Combined with the economic slowdown, the relatively higher average oil prices implied higher import bills, which contributed to keeping oil demand flat in 2008. Prices for natural gas and coal followed similar trajectories. During 2008, all types of primary energy saw their average prices increase significantly.

With the collapse in energy prices in the last part of 2008, it must be taken into consideration that low oil prices have the potential to provide disincentives to undertake the much needed investments in energy-related infrastructure and technology, and in alternative energy. Markedly low energy prices discourage investment in exploration and production, especially in the context of the steady rise in the extraction and processing costs associated with reservoir characteristics and

increasingly remote or difficult-to-access discoveries. Environmental considerations also often add to the end production cost. Scaling up investments in these areas is considered crucial to address the triple challenge of meeting energy needs, environmental sustainability, and economic growth and development. The *International Energy Outlook 2009* of the United States Energy Information Administration projects the world market energy consumption to increase by 44 per cent between 2006 and 2030<sup>28</sup> (slower than the growth projected by the IEA's *World Energy Outlook 2008*). Total world energy use is projected to grow by 17 per cent between 2006 and 2015, and by about 23 per cent between 2015 and 2030, with non-OECD economies accounting for the largest share of the growth. Liquids are expected to remain the world's dominant energy source, given their importance for transportation. World consumption of liquids and other petroleum is forecast to grow from 85 mbd in 2006 and 107 mbd in 2030, with unconventional liquids making up about 13 per cent of total liquid production.

As economic recovery is anticipated to re-emerge in 2010,<sup>29</sup> all countries are expected to resume their appetite for energy. However, the speed, scale and order of this recovery are difficult to predict with certainty, making future energy projections a difficult task. The IEA predicts that to meet the projected global demand in 2030, about \$26 trillion of infrastructure-related investments (e.g. offshore rigs, pipelines, refineries and pump units) will be needed. Given the current worldwide economic and financial crises, the IEA also predicts that a significant investment decline in the global energy sector will occur in 2009. Investment in oil and gas exploration is expected to slide by 21 per cent or \$100 billion in 2009, as compared with 2008.<sup>30</sup> As oil prices do not cover production costs, new exploration projects are being cancelled. With fossil fuels being finite and increasingly depleted, and with world economic growth expected to pick up in 2010, oil prices have the potential to surge again and disrupt the supply and demand balance.

The opportunity offered by the various stimulus packages, and the so-called Global Green New Deal spearheaded by the United Nations Environment Programme (UNEP) together with other United Nations organizations, is one of the initiatives that could provide certain options out of the current dilemma.<sup>31</sup> The Global Green New Deal also has the potential to help reshape the future landscape of oil supply and demand, as well as its trade and transport. The Global Green New Deal in particular aims to revive the international economy and forge a new

global economic development that is environmentally sustainable and supportive of the achievement of the Millennium Development Goals.

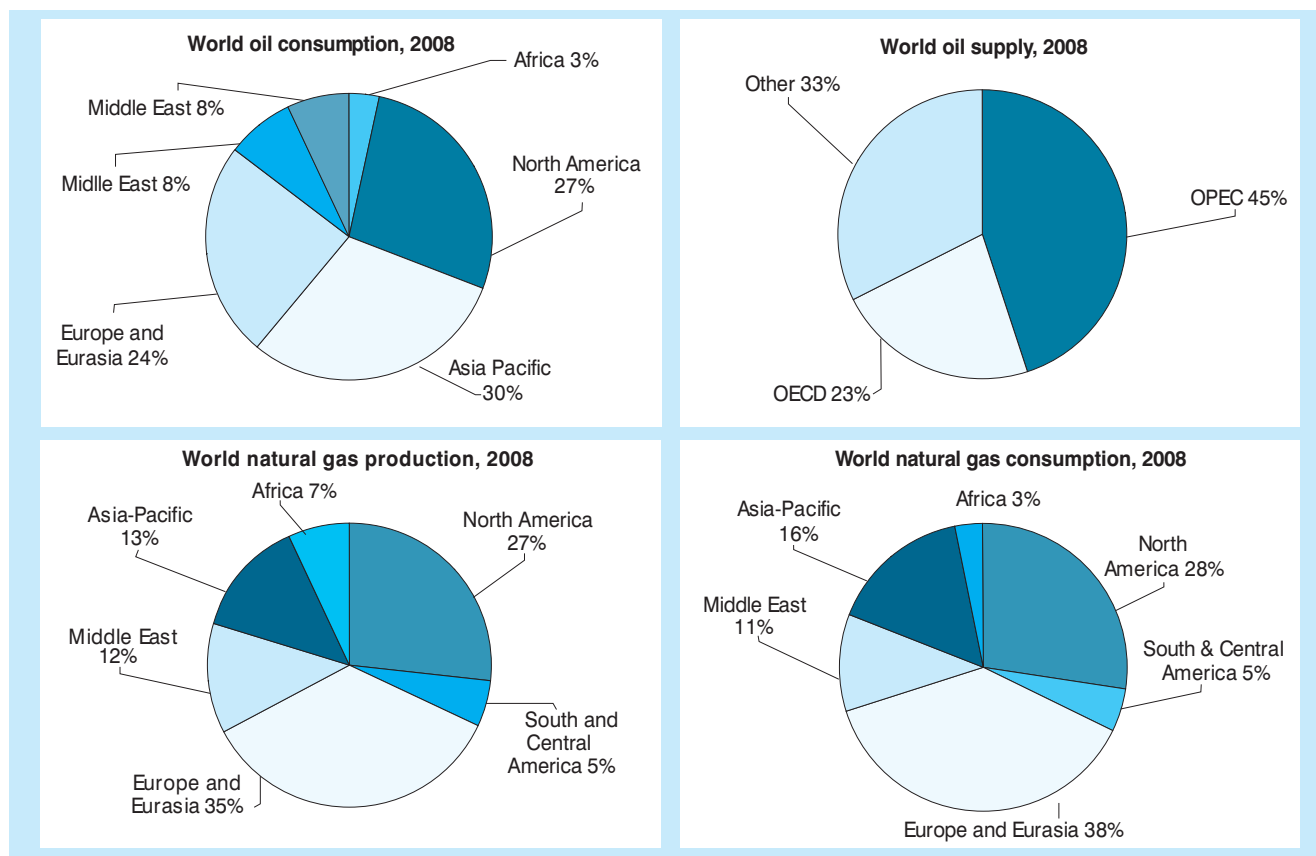
An important consideration in any debate on energy security and environmental sustainability is the potential for renewable energy to supplement and/or replace finite fossil-fuel sources. The renewable energy sectors continued to grow, despite the global economic downturn. Projects continued to progress and much economic stimulus legislation included components for supporting renewable energy. Development assistance for renewables in developing economies expanded, reaching about \$2 billion in 2008. Many forms of policy support measures, such as subsidy programmes and new laws and policies were adopted (e.g. in Australia, Brazil, Chile, China, Egypt, Japan, Luxembourg, Mexico, the Netherlands, South Africa, the Syrian Arab Republic, Uganda and the United States).<sup>32</sup> Annual renewable energy investment increased by a factor of four since 2004, to reach \$120 billion in 2008. Solar photovoltaic capacity increased sixfold, while wind power capacity increased 250 per cent, and total power capacity from renewables increased 75 per cent, including significant gains in small hydro, geothermal, and biomass power generation. The United States became the leader in new capacity investment, with \$24 billion invested, or 20 per cent of total global investment, and overtook Germany, the long-time wind power capacity leader. For the fifth consecutive year China doubled its wind capacity, moving up the ranks to become fourth in the world. Developing economies, particularly India and China, are increasingly playing a major role in both the manufacture and installation of renewable energy.<sup>33</sup>

#### *Oil production and consumption*

In 2008, global oil production<sup>34</sup> increased by 0.4 per cent (380,000 barrels per day) to reach 81.8 mbd. Oil supply is concentrated in Western Asia, certain transition economies, North America and Africa. In 2008, production in OECD countries fell by 4.0 per cent, with a share of 22.5 per cent of global oil production. OPEC countries increased production by 2.7 per cent, raising their share in global oil production from 43.8 per cent in 2007 to 44.9 per cent in 2008 (see fig. 5).

For the first time since 1983, world oil demand declined by 0.6 per cent to reach 84.4 mbd, the largest fall since 1982. Led by a drop of 6.4 per cent in the United States, consumption in OECD countries fell by 3.2 per cent to 47.3 mbd, a third consecutive year of decline. Outside

Figure 5

**Oil and natural gas: major producers and consumers, 2008***(percentages)*

Source: UNCTAD secretariat, on the basis of data published by British Petroleum in the *BP Statistical Review of World Energy 2009*.

the OECD, consumption increased by 3.1 per cent, a slower pace than in 2007. The strong growth among oil-exporting countries was partly offset by a slower growth among Asia-Pacific consumers.

Against a backdrop of a deeper and wider global economic downturn and financial crisis, the IEA projects a further decline (3.0 per cent) in global oil demand in 2009, as well as a drop in supply (0.3 per cent). Reduced production is due to OPEC's production cuts introduced in response to falling oil prices and in anticipation of a decline in global demand.

#### *OPEC members*

Although OPEC began cutting production late in the year, average annual production rose by 2.7 per cent in 2008. Western Asia OPEC accounted for the entire increase, with Saudi Arabian production rising by 4.0 per

cent to 10.8 mbd, and Iraqi output growing by 13.0 per cent to 2.4 mbd.

In 2008, Saudi Arabia remained the number one world producer with a share of 13.1 per cent of total world production. It accounted for 29.5 per cent of OPEC's total production. Other major producers within the group included the Islamic Republic of Iran (11.8 per cent of OPEC's total production) and the United Arab Emirates (8.1 per cent). The share of OPEC members outside Western Asia and Africa (Ecuador and the Bolivarian Republic of Venezuela) stood at 8.4 per cent, while African members' share of OPEC's total production fell from 22.2 per cent in 2007 to 21.5 per cent in 2008.

#### *OECD members*

In 2008, North America remained the main crude oil producer among OECD members, with a share

of 71.4 per cent of the group's total supply. The United States – which accounted for more than one third of OECD's oil production – reduced its output by 1.8 per cent. Production in Europe fell by 4.9 per cent, reflecting a drop in all relevant producers, namely Denmark, Italy, Norway and the United Kingdom.

#### *Other producers*

In 2008, the total production of non-OPEC and non-OECD economies – including the Russian Federation, China and Brazil – increased marginally by 0.7 per cent over the previous year. With a total of 26.7 mbd, the market share of these countries remained steady at 32.6 per cent. The Russian Federation decreased production by 0.8 per cent, to 9.9 mbd. Other producers have either increased (e.g. China, Brazil) or decreased (e.g. Argentina, India, Viet Nam) their production levels.

#### *Refinery developments*

In 2008, the total throughput of world refineries dropped by 0.3 per cent to 75.2 mbd. OECD countries continued to account for over half of this total. A decline in throughput was recorded in all developed regions: throughput from refineries in the United States fell by 3.4 per cent, while that of Canada, Europe, Australasia and Japan fell by 2.1 per cent, 0.2 per cent, 1.4 per cent and 1.2 per cent respectively. According to the IEA, no new refineries have been built in the United States in 29 years, and the expansion of existing facilities in the country has failed to keep pace with rising demand. Europe's last new refinery was completed in 1989.

In contrast, refineries in developing economies recorded some growth, for example Africa (1.0 per cent), the Middle East (0.6 per cent) and China (4.4 per cent). Increased refinery capacity is expected to come online in developing Asia, as illustrated by the commissioning of a new export-oriented refinery in Jamnagar, India, which holds a capacity of 0.6 mbd and is expected to supply diesel to Europe. New refining capacity in the Middle East and Asia is also expected in 2010, although several of the projects have been held up due to the deterioration of the economic situation. Current tight economic conditions and lack of credit, combined with the capital-intensive nature of refinery expansion plans, suggest that the required investments may be further deferred and may create a lag in supply when the economy recovers and demand rebounds. In 2005,

the IEA estimated that global refining capacity needs to increase by 42 per cent to 118 mbd by 2030, and that oil companies and Governments worldwide will need to spend \$487 billion between 2005 and 2030 to keep pace with demand for products such as gasoline, diesel and jet fuel.<sup>35</sup> That being said, commentators also argue that the large investments required to develop new refineries might not be economically viable, given the limited volumes of crude oil that are left to refine. The energy sector is close to bumping up against supply constraints, and the gradual depletion of world crude oil and the imminent "peak oil" (i.e. world oil production has already started to decline or will soon start to decline) are likely to make additional refinery expansions unnecessary.

#### *Crude oil shipments*

In 2008, the share of tanker trade in the total world seaborne trade amounted to 33.7 per cent. World shipments of tanker cargoes reached 2.75 billion tons, two thirds of which were crude oil. Crude oil seaborne shipments increased by an estimated 1.1 per cent, to reach 1.83 billion tons (table 4). Unlike other bulk and container trade sectors, tanker markets fared relatively better, with shipowners' earnings holding up. The phasing out of single-hull tankers in 2010 and the conversion during the year of some tankers into oil storage units helped moderate the incidence of an oversupply of tonnage. However, the delivery schedule for the remainder of 2009 highlights the significant supply and demand imbalance that will affect tanker trade, with potential implications for freight rates and earnings.

In 2008, Western Asia remained one of the major crude oil loading areas, with 758.9 million tons. Other loading areas included, South America's northern and eastern seaboard (132.3 million tons), Central Africa (131.5 million tons), Northern Africa (116.6 million tons), Western Africa (99.1 million tons), and the Caribbean and Central America (92.3 million tons). Major unloading areas included Europe (483.4 million tons loaded), North America (453.9 million tons) and Japan (215.2 million tons). Major unloading developing regions included Southern and Eastern Asia (414.1 million tons) and South-Eastern Asia (133.0 million tons). With demand for oil expected to remain robust in developing regions, namely in China, India and the Middle East, it is hoped that some excess

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**Crude oil seaborne shipments increased by an estimated 1.1 per cent.**

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capacity resulting from the economic downturn would be absorbed by this new additional demand.

#### *Shipments of petroleum products*

In 2008, world shipments of petroleum products are estimated to have increased by 2.7 per cent, to reach 915.3 million tons. Developed regions accounted for 41.0 per cent of world petroleum products loaded, and 56.1 per cent of world petroleum products unloaded. Developing economies accounted for 55.3 per cent of world products loaded and 43.4 per cent of world products unloaded. Economies in transition accounted for the balance. Although demand for petroleum products is also influenced by the wider international environment, including the performance of the world economy, such demand remains particularly subject to unforeseen events, including natural disasters and weather-related incidents.

An abrupt economic downturn, ship capacity oversupply, high stock levels brought about by lower oil prices (the United States and China have been reported to have used the opportunity to fill their strategic petroleum reserves), all combined with a global limited refinery capacity provide a good indication of the challenges that lie ahead for petroleum products trade.

#### *Natural gas production and consumption*

In 2008, world production of natural gas increased by 3.8 per cent over the previous year, to reach 3,065.6 billion cubic metres (bcm). The Russian Federation remained the world's largest producer with a market share of 19.6 per cent, followed by the United States with a share of 19.3 per cent. Other producers included Canada (5.7 per cent), the Islamic Republic of Iran (3.8 per cent), Norway (3.2 per cent), Algeria (2.8 per cent), China (2.5 per cent), Indonesia (2.3 per cent) and Malaysia (2.0 per cent) (see fig. 5).

During the same year, world natural gas consumption increased by 2.5 per cent, to reach 3,018.7 bcm. The United States and the Russian Federation remained the main natural gas consumers, with market shares of 22.0 per cent and 13.9 per cent respectively. Other major consumers included the Islamic Republic of Iran (3.9 per cent), Canada (3.3 per cent), the United Kingdom (3.1 per cent) and Japan (3.1 per cent).

The natural gas sector also went through two distinct phases: a tight supply and demand balance with rising energy prices, followed by a weakening demand and a plummeting of spot prices. The combination of weak demand and lower prices could undermine future investments.

#### *Liquefied natural gas shipments*

In 2008, the liquefied natural gas (LNG) trade remained steady with the total volume of LNG shipped amounting to 226.5 bcm. LNG importers included a mix of developed and developing economies, namely France, India, Japan, the Republic of Korea, Spain and the United States. The main LNG exporters were located in developing regions, with Qatar being the largest (17.5 per cent). Other exporters included Algeria, Indonesia, Malaysia and Nigeria.

Over the years, LNG trade has been constrained by difficulties in sourcing sufficient gas supplies, with a number of liquefaction projects suffering from delays in the approval and building process. As most ships are ordered to serve specific LNG projects, a surplus of LNG capacity is created when the completion of the projects is delayed and the relevant cargo is not available for carriage. However, the world is now experiencing a major reversal of the situation: a boom in supply is being met with falling demand.

On the supply side, at least seven new LNG export terminals are expected to start in 2009. At least 82 million tons per year of new liquefaction capacity are due on stream in North America over the next three years. Sakhalin II was reported to have loaded its first ship in March 2009, while the completion of two trains at the Qatargas 2 project is imminent. The Middle East LNG expansion is in full flow, with the Yemen LNG project coming on stream in 2009. It is estimated that once all the projects that were delayed in 2008 come on stream, some 45 million tons per year of new LNG capacity will be online and will boost existing capacity by 25 per cent. On the demand side, the LNG trade in 2008 had also suffered from the economic downturn and a suppressed demand, especially for electricity usage. Another side-effect of the economic downturn was the impact on gas prices. For example, it was reported that in September 2008, Asian utilities were willing to pay up to \$21 per million British thermal units for spot LNG

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**In 2008, world shipments of petroleum products are estimated to have increased by 2.7 per cent ...**

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cargoes. By March 2009, LNG prices had collapsed by 75 per cent.<sup>36</sup>

## 2. Dry cargo shipments<sup>37</sup>

### *General developments*

Dry bulk trade, the mainstay of the boom experienced by the shipping industry over the past few years, slowed down in 2008 (with a 4.7 per cent growth rate as compared to 5.7 per cent in 2007) and is forecast to fall by more than 4.4 per cent in 2009. The total volume of dry bulk cargoes loaded in 2008 stood at 5.4 billion tons. These shipments accounted for 66.3 per cent of total world goods loaded. Trade in the major dry bulks (iron ore, coal, grains, bauxite/alumina and rock phosphate) was estimated at 2.1 billion tons. The difference was made up of minor bulks and liner cargoes, which together were estimated at 3.3 billion tons. Figures 6 (a) and (b) present an overview of the major players involved in the production, consumption and trade of some major dry bulks.

The collapse that started in the fourth quarter of 2008 has been more readily visible in the dry bulk sector. The Baltic Dry Index fell sharply, and average earnings for bulk carriers in October 2008 were 80 per cent lower than their levels in April of the same year. The main driver of the slowdown in 2008 and the projected slump of 2009 relate to steel production cuts in all-major steel producing regions. Steel production is a key indicator for the bulk shipping market as it determines the demand for raw materials such as iron ore and coal and the need for larger bulkers (e.g. capesize ships). In 2008, China's steel production slowed down as the real estate sector in China reached a plateau, and as developers were having difficulties in obtaining finance for new projects. An important factor that helped the dry bulk sector show some resilience in the face of falling demand and tight trade finance relates to the supply side of the bulk carrier market. In 2008, deliveries of bulk carriers were modest compared to tankers and container ships. Ultimately, the ship capacity ordered might be reduced by way of cancellations or conversions into other ship types, although empirical evidence has shown that there have been very few such conversions reported. Most negotiations with the yards have focused on delaying the delivery of vessels so as to limit the impact the supply side will have in 2009–2011 (see chapter 2 for more details). With projected fall in dry bulk volumes and growth in bulker tonnage capacity, the short- to medium-term outlook for the dry bulk sector looks challenging.

### *World crude steel production and consumption*

In 2008, world steel production declined by 1.2 per cent, standing at 1.3 billion tons. Steel production declined in nearly all major steel-producing economies, including the European Union (-5.3 per cent), North America (-5.5 per cent), Japan (-1.2 per cent), the CIS (-8.1 per cent) and South America. Asia continued to account for more than half of the world's total production, with China producing more than 500 million tons in one year – a 2.6 per cent increase over 2007. The Republic of Korea and India expanded their production too, at 3.8 per cent and 3.7 per cent respectively. ArcelorMittal – accounting for 10 per cent of world steel output, the world's leading steel producer by volume – announced plans to reduce production in North America by 35 per cent and in Europe by 30 per cent. The company made temporary production cuts totalling up to 45 per cent of global production capacity in order to accelerate inventory reduction, and it has also paused growth plans for the immediate future.<sup>38</sup> Steel production and revenues in the United States are expected to fall in 2009, while China's steelmakers are expected to collectively decrease active production by 20 per cent in 2009.<sup>39</sup>

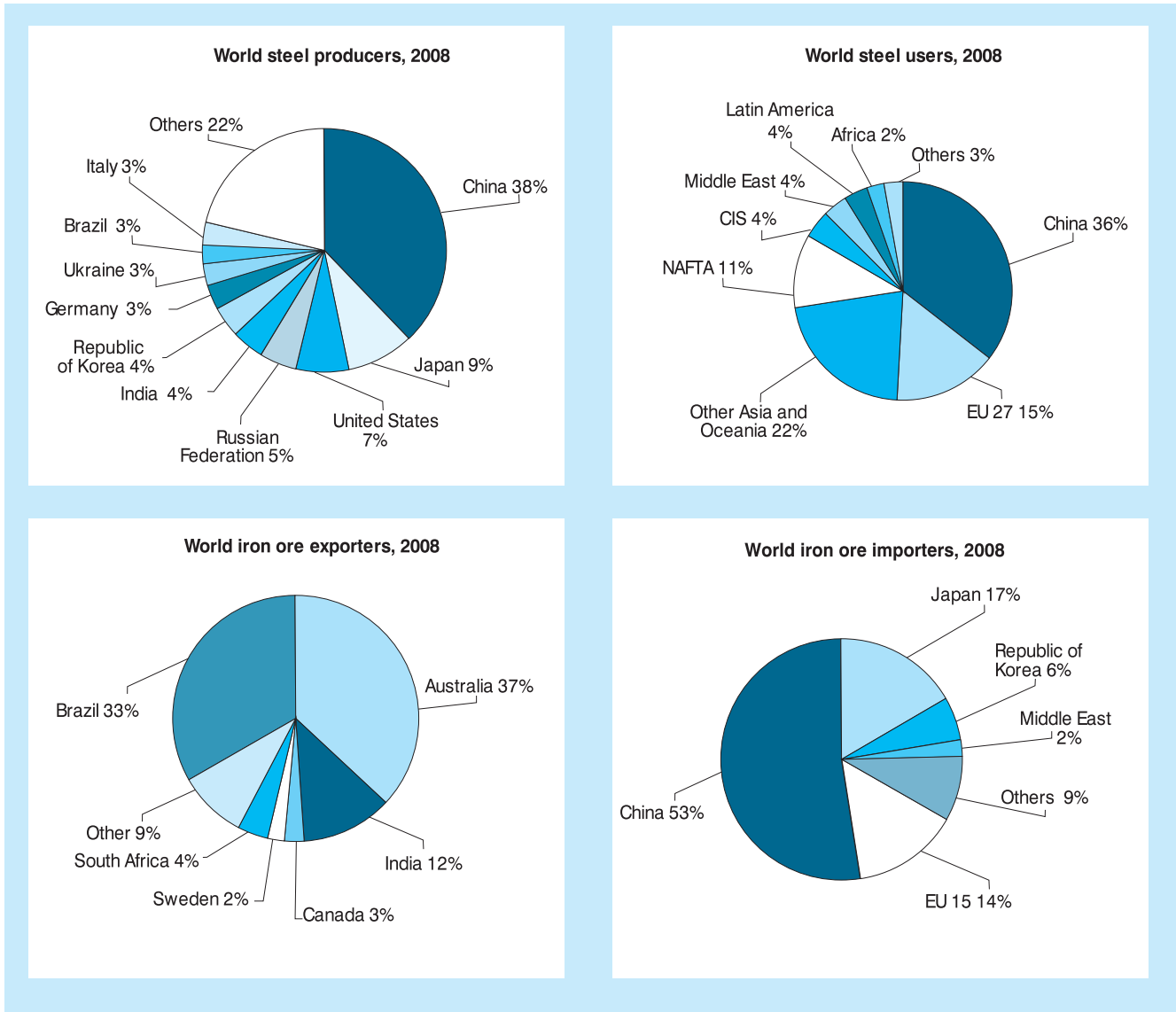
Production of ferrous scrap, which averages 300 million tons per year globally, is also affected by the economic downturn.<sup>40</sup> Until mid-2008, global steel production and prices were at historic highs, after which demand and prices for steel products began to decline, followed by a declining demand for scrap. As the global economy retracted, buyers of scrap steel in Asia and Europe began cancelling orders, which may lead to a scrap steel oversupply of more than 5 million tons in ports, ships and yards. Profit margins have dropped in the scrap steel industry from \$200 to \$20 per ton.

World steel consumption fell by 0.3 per cent in 2008, bringing the total to 1.2 billion tons. China continued to drive Asia's steel consumption, which increased by 3.4 per cent during the year. The Asian region remained the world's largest consumer, with a share of 55.8 per cent. Consumption increased in Central/South America and in Africa, which saw their consumption expand by 8.3 per cent and 3.5 per cent respectively.

Reflecting the global economic context and the geographical spread of the financial and economic downturn to developing regions, world steel consumption is expected to fall by 14.9 per cent in 2009. The economic downturn and difficulties associated with the credit



Figure 6 (a)

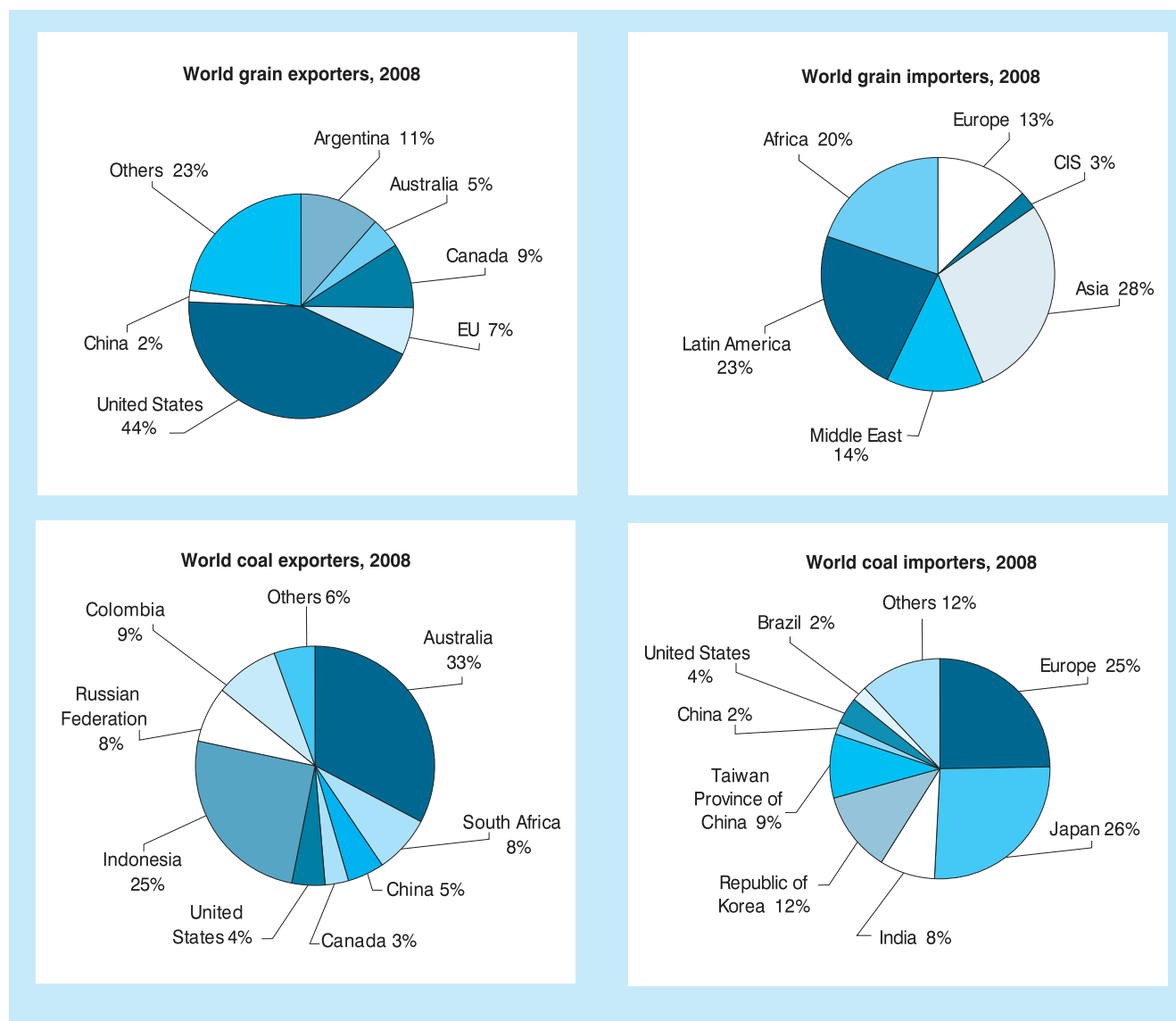
**Major bulks (steel and iron ore): producers, consumers and traders in 2008***(world market share in percentages)*

Source: UNCTAD secretariat, on the basis of data supplied by Clarkson Research Services in *Shipping Review and Outlook*, spring 2009; and *Dry Bulk Trade Outlook*, May 2009; and by the International Iron and Steel Institute, June 2009.

and financial sectors have already adversely affected customers of the steel used in construction, industrial equipment and vehicles. Reduced consumption of steel has led to a rapid decline in steel prices, prompting steelmakers in Asia, Europe and North America to cut output and delay mill-expansion plans. The largest drop in consumption levels is expected to affect the NAFTA region, followed by the European Union, the CIS, Central/South America, and the Middle East. Consumption in Asia is expected to decline by 8.1 per cent.

In 2008, the world steel industry furthered its commitments to advancing sustainability by taking measures aimed at reducing the carbon footprint of the industry. In June 2009, the World Steel Organization launched its Climate Action Recognition Programme and a new dedicated website – the climate change microsite. A key objective of the Climate Action Recognition Programme is to measure the current level of emissions from the production of steel worldwide, to enable individual steel plants to position themselves against

Figure 6 (b)

**Major bulks (coal and grain): producers, consumers and traders in 2008***(world market share in percentages)*

Source: UNCTAD secretariat, on the basis of data supplied by Clarkson Research Services in *Shipping Review and Outlook*, spring 2009; and *Dry Bulk Trade Outlook*, May 2009; by the Economist Intelligence Unit in *World Commodity Forecasts: Food, Feedstuffs And Beverages*, May 2009; and by the International Grains Council, April 2009.

both average and best performance, and to identify scope for improvement.<sup>41</sup>

#### *Iron ore shipments*

Iron ore is a widely used metal in areas such as structural engineering, and for industrial applications, and also in the automotive sector. The major iron ore producers include China, Australia, Brazil, India, the Russian Federation, the United States, South Africa,

Canada and Sweden. The world's largest producers of iron ore are Vale in Brazil, BHP Billiton, and Rio Tinto (Australia/United Kingdom). In late 2008, BHP Billiton abandoned its plans for a \$66 billion takeover of Rio Tinto, arguing that the steep drop in commodity prices combined with the unfavourable financial environment made the takeover no longer feasible.<sup>42</sup> Instead, in June 2009, Rio Tinto and BHP Billiton signed a non-binding agreement to establish a production joint venture covering both companies' Western Australian iron ore

assets. The joint venture will encompass all current and future Western Australian iron ore assets and liabilities, and will be owned fifty-fifty by both companies.<sup>43</sup>

The world's iron ore shipments were estimated at 844 million tons in 2008, an increase of 6.5 per cent over 2007. While many exporters increased their volumes in 2008, others – including Canada, Sweden, Mauritania and Peru – recorded a fall. Together, Australia and Brazil accounted for over two thirds of world iron ore exports. Australia regained its position as the world's largest iron ore exporter, increasing its volumes by 16.0 per cent to reach 309.5 million tons. Exports from Brazil amounted to 281.7 million tons, an increase of 4.6 per cent over 2007. The balance of world iron ore exports originated in India (101.1 million tons), South Africa (31.6 million tons), Canada (22.4 million tons), Sweden (17.6 million tons), Mauritania (12.4 million tons) and Peru (6.9 million tons).

With 444.1 million tons unloaded in Chinese ports in 2008, China remained the main destination for world iron ore shipments. Its imports grew at a slightly slower rate than in 2007 (16.0 per cent). Other major importers included Japan with 140.4 million tons (a 1.1 per cent increase), and Western Europe with 127.5 million tons (a 5.3 per cent decrease). Smaller importers in Asia, such as the Republic of Korea, recorded increases of 3.3 per cent, while others, such as Taiwan Province of China, and Pakistan, recorded a decline in their imports. Iron ore imports into India and the Philippines remained steady at their 2007 levels. At the regional level, imports into North America dropped by 12.5 per cent, while imports into South America and the Middle East increased by 3.3 per cent and 18.7 per cent respectively.

The record trade growth in the first half of 2008 and the collapse experienced in the second half make 2008 a year of two parts: a prosperous part and a poor part. Before the end of 2008, major iron miners saw iron ore prices fall, as global steel output declined. Leading iron producers and exporters, including in Brazil, have already cut or are planning to cut production.<sup>44</sup> Looking ahead, Clarkson Research Services expects global iron ore trade volumes to remain steady in 2009 and to grow rapidly (16 per cent) in 2010, driven mainly by expected growth in China.<sup>45</sup>

#### *Coal production and consumption*

Coal is a fossil fuel energy source which is much more abundant than oil or gas; there are around 130 years of

coal remaining worldwide. Different types of coal have different uses. Steam coal – also known as thermal coal – is mainly used in power generation. Coking coal – also known as metallurgical coal – is mainly used in steel production. Other important users of coal include alumina refineries, paper manufacturers, and the chemical and pharmaceutical industries. Several chemical products can be made from the by-products of coal. Refined coal tar is used in the manufacture of chemicals such as creosote oil, naphthalene, phenol and benzene.

In 2008, world coal production increased by 5.3 per cent, reaching 3,324.9 million tons oil equivalent (mtoe), with much of global coal production being used in the country in which it was produced. China remained the world's largest producer, with a share of 42.5 per cent, followed by the United States (18.0 per cent), Australia (6.6 per cent), South Africa (4.2 per cent), the Russian Federation (4.6 per cent), India (5.8 per cent) and Indonesia (4.2 per cent).

In 2008, global coal consumption slowed, rising by just 3.1 per cent. Nevertheless, coal remained the fastest-growing fuel in the world for the sixth consecutive year. China – the world's largest consumer (with a 42.6 per cent share) – increased its consumption by 6.8 per cent. While below the 10-year average, this growth rate was sufficient to account for 85 per cent of global growth. Consumption growth outside China was negligible (0.6 per cent) with growth rates below the 10-year average for all regions except South/Central America and Africa, which increased their coal consumption by 3.3 per cent and 4.0 per cent respectively.

Coal mining raises a number of environmental challenges, including soil erosion, dust, noise pollution, water pollution, and impacts on local biodiversity. However, the most important challenge facing the coal industry and the international community is how to reconcile the growing use of coal with climate change action. According to the World Coal Institute, the coal industry is committed to minimizing its greenhouse gas emissions and action is being taken in a number of areas. The IEA maintains that replacing older coal-fired power stations with larger more efficient plants could reduce global greenhouse gas emissions by 5.5 per cent. Carbon capture and storage technology is being considered as a potential solution that could offer deep cuts in greenhouse gas emissions from coal-fired power while maintaining the energy infrastructure needed for growth.<sup>46</sup>

### *World coal shipments*

In 2008, coal shipments were estimated to have reached 814.5 million tons, a volume increase of 3.2 per cent over 2007. Reflecting the adverse effects of the economic difficulties that erupted in the fourth quarter of 2008, this rate is half the growth rate recorded in 2007. Thermal coal exports were estimated at 590.1 million tons, representing 72.4 per cent of world coal shipments, while coking coal shipments increased by 4.1 per cent to reach 224.4 million tons.

Together, Indonesia and Australia accounted for over half the world's thermal coal shipments. Indonesia continued to overtake Australia as the largest thermal coal exporter. In 2008, Indonesia increased its thermal coal exports by 6.1 per cent to reach 200 million tons. Less troubled by the logistical problems it experienced in 2007, Australia increased its coal exports by 8.5 per cent. Other major thermal coal exporters in 2008 included South Africa (61.5 million tons), Colombia (68.7 million tons), China (35.8 million tons), the Russian Federation (60.4 million tons) and the Bolivarian Republic of Venezuela (6.2 million tons).

In 2008, Australia remained the world's largest coking coal exporter, with a total of 136.9 million tons, a fall of 0.5 per cent over 2007. Other lesser exporters, such as Canada, have also recorded a decline in their export volumes. Marked growth was achieved by the United States, with an increase of 34.0 per cent. The main destinations of both types of coal exports (thermal and coking) are Japan and the European Union, which together accounted for 48.1 per cent of the world's coal imports in 2008. In 2008, thermal coal imports into China fell by 11.0 per cent, while imports into the Republic of Korea increased by 18.2 per cent.

Coal shipments are forecast to decline by 2.3 per cent in 2009. The coking coal trade is forecast to drop by 6.4 per cent in 2009. Thermal coal shipments are also likely to be negatively affected, as industrial production cuts have the effect of impacting on electricity consumption. Reduced demand for coal and the expected growth in ship carrying capacity are likely to negatively affect freight rates and profitability.

### *Grain market*

According to the International Grains Council, production of grain (wheat and coarse grain) increased from 1,588 million tons in 2007 to 1,697 million tons

in 2008. World wheat production increased by 6.5 per cent, as farmers increased planted areas in response to favourable prices. A large output was recorded in all major exporting areas, especially in Australia (+63.3 per cent), the Russian Federation (+28.9 per cent), the European Union (+26.6 per cent) and the United States (+21.9 per cent).

In 2008, world grain shipments are estimated to have grown by 5.6 per cent, reaching 323.3 million tons. Wheat totalled about 110 million tons, while coarse grains such as corn, barley, soybeans, sorghum, oats, rye and millet totalled 213.3 million tons. In 2008, Canada and the United States accounted for 53.1 per cent of world grain exports (excluding soybean). Export growth in North America was driven by increased exports of both wheat and coarse grains from the United States. Argentina maintained its 11.2 per cent share, while Australia and the European Union recorded declines in their export volumes.

Asia remained the main unloading area for grain (excluding soybean) with 67.5 million tons, followed by Latin America (54 million tons), Africa (42.4 million tons), the Middle East (32 million tons), Europe (27.6 million tons) and the CIS (6.6 million tons). Japan, by far the largest importer (with a 9.8 per cent share in 2008), reduced its grain imports by 5.3 per cent. Overall, imports into Asia fell by 7.4 per cent. Imports increased by 6.6 per cent in the Middle East, 7.0 per cent in Africa, 2.4 per cent in Latin America, and more than doubled in Europe.

Trade in grain is expected to decline in both 2009 (-0.6 per cent) and 2010 (-6.0 per cent). Argentina, Canada and the United States are expected to record a decline in coarse grain exports. Improved weather conditions in some grain importing countries mean that shortages in those regions will no longer need to be met by imports.

In addition to the unfolding of the global financial and economic crises, 2008 witnessed the eruption of a global food crisis which resulted in high and dramatically increasing prices of food, shortages and declining food stocks. According to the Director-General of the Food and Agriculture Organization of the United Nations (FAO), globally there are now 1.02 billion people hungry, up 11.0 per cent from 915 million in 2008. To put things in context: one in six people in the world. In addition to the direct effect on incomes and employment, the global financial crisis reduced the already scarce



capital available for investment in agriculture in Africa, which amplified the effect of the food crisis.<sup>47</sup>

The food crisis highlighted the vulnerability of developing economies, especially Africa, to food insecurity. Agricultural productivity in Africa compares unfavourably with other regions, and has not seen any real improvement over the past decades. Yields and productivity per worker have both remained low, whereas in other regions they have increased.<sup>48</sup> Of the 36 countries worldwide currently facing a food security crisis, 21 are African, and it is estimated that there are now over 300 million Africans facing chronic hunger – nearly a third of the continent’s population. It is estimated that doubling the productivity of food staples across Africa by 2015 would lift over 70 million people out of poverty, and turn Africa from a region with a food deficit into a region with a food surplus, with food prices that were 20–40 per cent lower.<sup>49</sup> The World Bank estimates that demand for food will have risen by 50 per cent in 2030, as a result of rising affluence and the growing world population. Meeting growing food demand will require major investment in the agricultural sectors of developing economies, particularly in Africa. This entails some implications for the demand for maritime transport services, ship tonnage capacity, and port handling equipment, and potentially a change in the geography of trade. Pending the requisite investments and productivity gains in the agricultural sectors, Africa could reverse its dependency on food imports and emerge as a world exporter of grains and other agricultural-based food products.

#### *Other bulk shipments*

Bauxite resources are located in Africa (33 per cent), Oceania (24 per cent), South America and the Caribbean (22 per cent), Asia (15 per cent), and other areas (6 per cent). In 2008, world trade of bauxite and alumina was estimated to have reached 83.5 million tons. During the same year, major loading areas of bauxite included Asia (32.7 per cent of market share), Africa (28.7 per cent), the Americas (25.6 per cent) and Australia (12.2 per cent). The main importing areas are Europe and North America.

With respect to alumina, Australia was the major exporter, accounting for about half of world exports, while Jamaica alone contributed 14.0 per cent. Other loading areas span

the Mediterranean, Africa and Asia. Europe remains the largest alumina importer, followed by other developed regions, namely North America and Japan.

The largest sedimentary deposits of phosphate rock are found in North Africa, China, the Middle East and the United States. In 2008, world trade of rock phosphate totalled 32 million tons. Morocco remained the major exporter, and the United States the major importer. Morocco’s exports accounted for nearly half of world shipments, the bulk of which was exported to Europe and the Americas. Shipments by lesser exporters in other African countries and the Middle East accounted for 40 per cent of world exports. High phosphate rock prices have renewed the interest in exploiting the offshore resources of Mexico and Namibia.

The minor dry bulks (manufactures, agribulks, metals and minerals) were estimated to have remained at 993 billion tons in 2008. Agricultural products (soymeal and oilseed) and metals and minerals (e.g. scrap) each increased by a meager 1.0 per cent, while manufactures (e.g. steel products) dropped marginally (-1.0 per cent). Trade in steel products accounted for 60.1 per cent of this total, and unlike forest products, fell by 1.2 per cent compared to 2007. Minor bulk volumes are expected to decline by 5.0 per cent in 2009 and grow again by 4.0 per cent in 2010.<sup>50</sup>

### **3. Liner shipments of containerized cargoes<sup>51</sup>**

The balance of 2.32 billion tons of dry cargoes included cargo carried in containers along the three major east–west liner trade routes: the trans-Pacific, Asia–Europe, and the trans-Atlantic. In 2008, the world total of containerized trade was estimated at 137 million TEUs (1.3 billion tons), an increase of 5.4 per cent over the previous year.<sup>52</sup> Over the last two decades, global container trade is estimated to have grown at an average annual rate of about 10 per cent. The share of containerized trade in the world’s total dry cargo increased from

5.1 per cent in 1980 to 25.4 per cent in 2008. The value of world maritime container trade grew from \$2 trillion in 2001 to \$4 trillion in 2008 accounting for around one in every \$14 of global economic output.<sup>53</sup> Against a backdrop of growing container trade and profitable earnings, the shipping industry responded by investing in larger and more sophisticated container ships and

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**In 2008, the world total of containerized trade was estimated at 137 million TEUs (1.3 billion tons), an increase of 5.4 per cent over the previous year.**

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equipment, as well as in container port and terminal operations. A key feature of container trade over recent years has been the large order book and increased tonnage supply. Expecting a continuously booming trade, shipowners have consistently commissioned large tonnage capacity, keeping shipyards busy. An important share of the container capacity on order is expected to be delivered in the midst of depressed global trade and a contracting global economy.

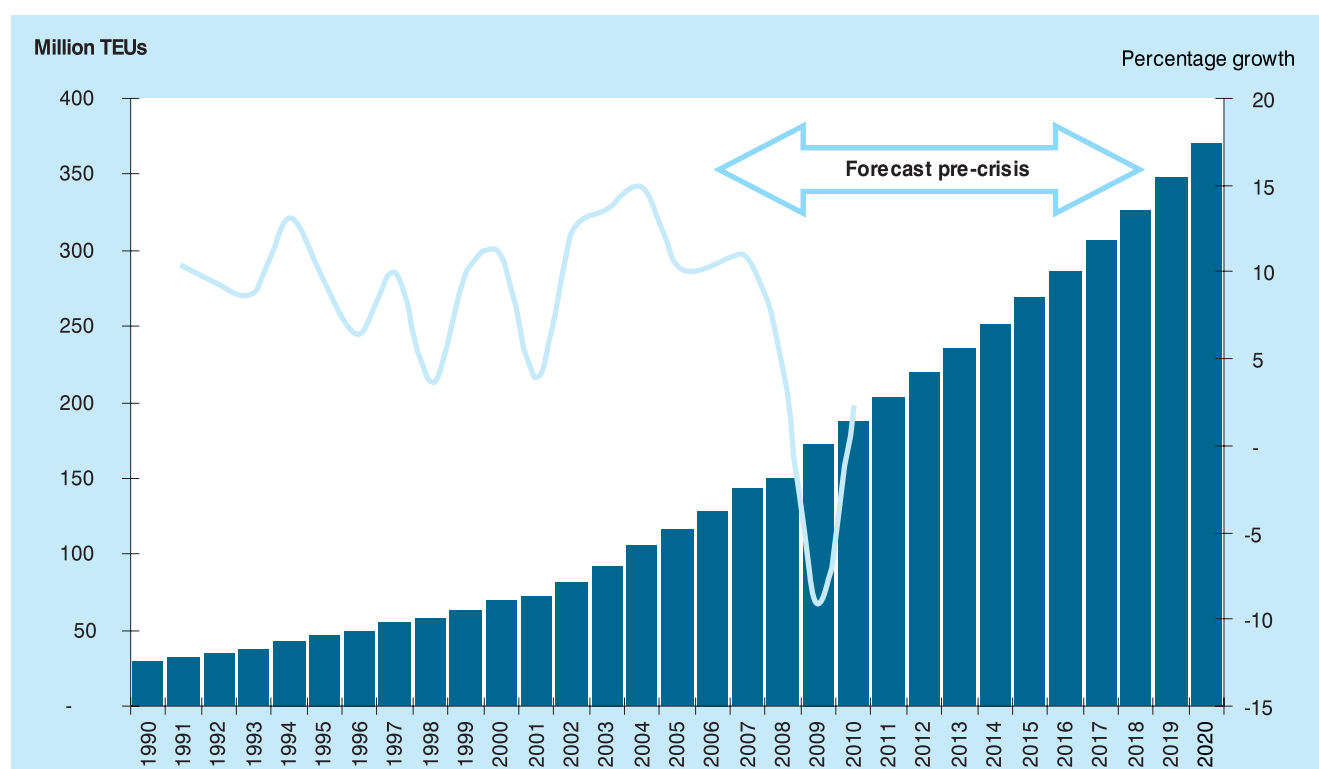
Since the worsening of the global financial crisis and the unfolding of a worldwide economic downturn, the landscape of container trade has changed and the prospects have become uncertain. As illustrated in figure 7, projections for container trade made before the unfolding of the current global economic crisis, appear less likely to materialize if the current downward trend is maintained or deepened. A few

years back, Drewry Shipping Consultants forecast that container trade would double by 2016 to reach 287 million TEUs, and more than double by 2020 to exceed 371 million TEUs. Although much will depend on the duration and the extent of the current economic downturn and financial crisis, the abrupt fall in container trade volumes since 2008 and into 2009 makes the realization of such a forecast uncertain. Despite the positive growth expected starting 2010, the relevant rate remains significantly below the pre-crisis levels. Clarkson Shipping Services are forecasting a 9 per cent drop in container trade for 2009 and a sluggish growth in 2010 (2.2 per cent).<sup>54</sup> Similarly, Drewry Shipping Consultants is forecasting a fall of 10.3 per cent for 2009 and a marginal growth in 2010.<sup>55</sup> With growing container-carrying capacity and declining and uncertain container traffic, container trade will face difficult times ahead. Drewry suggests that even

... the landscape of container trade has changed and the prospects have become uncertain.

Figure 7

**Global container trade, 1990–2020**  
(TEUs and percentage change)



Source: Drewry Shipping Consultants, *Container Market Review and Forecast 2006/2007* and *2008/2009*, and Clarkson Research Services Limited, *Container Intelligence Monthly*, September 2009.

Notes: Forecasts of container trade volumes for 2009–2020 were made in 2006/2007 and precede the global financial and economic crisis of late 2008. Annual percentages changes for 2008–2010 are obtained from *Container Intelligence Monthly*, September 2009.



if container market conditions were to be restored to return to balance by 2013, at least 3 million TEU of capacity would need to be cancelled or deferred.<sup>56</sup> This entails some critical implications for investments in container ship tonnage capacity, shipyards, container port developments, cargo handling equipment, and container production.

Loss in consumer confidence in the developed regions resulted in plummeting consumption of manufactured goods, and consequently, in declining container trade volumes and lower freight rates at a time when the tonnage supply is at its peak. With over 10 per cent of container ship capacity reported to be idle, and despite cancellations and slippage, a collapse in demand and cargo flows is putting huge pressure on the container trade sector.

Although growth in container trade seem to have been less affected on certain routes and in certain directions, including the North–South and South–South trades, growth in container trade has slowed considerably in 2008, with, at best, a 10 per cent increase in volumes on non-mainlane East–West routes and 3.8 per cent on North–South routes.<sup>57</sup> Cargo flows on the trans-Atlantic route recorded a positive growth (1.5 per cent), albeit much slower than the rate recorded in 2007. Container cargo flows on the trans-Pacific and Asia–Europe routes contracted on both routes (table 6).

A combination of lower freight rates, depressed trade volumes and tonnage oversupply provided additional reasons for shipowners to rethink their strategies and reconsider their cost calculations. As a result, and in an effort to cut costs, services are being cut (e.g. by the

end of 2008, APL, the New World Alliance, COSCON, Maersk Line and others had cut service strings from the trade) and trades have being re-routed via the Cape of Good Hope. This route was deemed more economical, given the economic situation and the lower bunker fuel prices.

Recent analysis suggests that a restructuring of certain economies is taking place. China is expanding its imports (i.e. re-stocking and domestic consumption) without expanding its exports. During the second quarter of 2008, there were about 56 tons of Chinese imports for every 100 tons of exports. In the equivalent quarter in 2009, this ratio increased to 80 tons of Chinese imports for every 100 tons of exports. This shift in the overall balance of containerized trade is likely to have implications for liner shipping operators serving the Chinese market.<sup>58</sup>

#### D. MARITIME TRANSPORT AND THE CLIMATE CHANGE CHALLENGE

Climate change is a global challenge and “a defining issue of our era.”<sup>59</sup> Compelling scientific evidence and a better understanding of the economics of climate change have moved the issue to the forefront of the international agenda. The impacts of climate variability and climate change (see box 1) are already being felt, in particular in the more vulnerable countries.<sup>60</sup> Unchecked climatic changes may reach tipping points, resulting in disastrous and irreversible consequences for humanity. In any event, time is a real concern. According to the IEA, current trends suggest that if no decisive action is taken within the next two years – including relevant investment decisions to determine the type of technologies that will be locked in

Climate change is a global challenge and "a defining issue of our era".

Table 6

#### Estimated cargo flows on major trade routes, 2007–2008

(millions of TEUs and percentage change)

| Year     | Trans-Pacific |           | Europe–Asia |             | Transatlantic |            |
|----------|---------------|-----------|-------------|-------------|---------------|------------|
|          | Asia–USA      | USA–Asia  | Asia–Europe | Europe–Asia | USA–Europe    | Europe–USA |
| 2007     | 15 247 955    | 4 986 106 | 17 236 936  | 10 085 181  | 2 711 037     | 4 464 206  |
| 2008     | 14 527 722    | 5 614 366 | 16 740 642  | 10 500 068  | 2 938 168     | 4 343 506  |
| % change | -4.7%         | 12.6%     | -2.9%       | 4.1%        | 8.4%          | -2.7%      |

Source: Containerisation International. Online, accessed in September 2009.

## Box 1

**Scientific evidence, global warming and some associated effects**

The atmospheric concentration of carbon dioxide (CO<sub>2</sub>), the most significant greenhouse gas (GHG), has increased from 280 parts per million (ppm) in the pre-industrial period to 379 ppm in 2005. The increased concentration of greenhouse gases in the atmosphere and the associated warming effect are considered to cause climate change. Over the last century, the global average surface temperature increased by around 0.74°C. Under “business as usual” scenarios, the climate models of the Intergovernmental Panel on Climate Change (IPCC) indicate a further temperature rise of 1.1–6.4°C during the twenty-first century. To ensure that the global average temperature increase does not exceed 2°C above pre-industrial levels – the threshold above which dangerous climate change effects are likely to be triggered (tipping point) – the atmospheric concentration levels of CO<sub>2</sub> should be stabilized at 350–400 ppm, while emissions should peak by 2015 and decline thereafter.

Observations from all regions and oceans show that many natural systems are being affected. The effects observed include a decline in mountain glaciers and in snow cover, a change in the Arctic ice coverage, and a rise in the global average sea level. The sea level rise is thought to be caused by increased volumes of water in the ocean basins (due to melting ice) and by the thermal expansion of seawater. The average global sea level increased by 0.17m over the last century. Relative sea level rise is particularly relevant, and varies according to local conditions, including land subsidence. More frequent extreme weather conditions – such as storms, heatwaves, droughts, and an increased intensity of tropical cyclones – are also being observed. Scientists are also concerned about abrupt climate change effects. These so-called “surprise effects” relate, amongst other things, to the instability of the ice sheets and to the planet’s feedback mechanisms (self-reinforcing loop). The uncertainty about these effects is due to the limited information on the nature of climate–carbon cycle feedbacks. For example, reaching climatic tipping points could lead to a potentially “abrupt” effect known as shutdown of the thermohaline ocean circulation, or to an acceleration of global warming due to released methane from thawing permafrost.

Clear signs of urgency are already apparent, with many developing countries – especially countries in Africa, and small island developing States (SIDS) – in the grip of increasing temperatures, severe droughts, encroaching seas, devastating floods, melting ice, changing weather patterns, and cyclones with increasing destructive power. These factors can – just as much as the financial and economic crises – compromise global security, upset human settlement and induce migration. They can also shift agricultural and industrial production, trade, infrastructure and operations, including in coastal zones and ports, and can affect any field related to shipping routes and navigation.

*Source:* UNCTAD, based on an extensive review of literature, including *IPCC Fourth Assessment Report 2007*; *IPCC Third Assessment Report 2001*; *IPCC Second Assessment Report 1995*; *IPCC Special Report*; IPCC (1997), *The Regional Impacts of Climate Change: An Assessment of Vulnerability*; United Nations Development Programme, *Human Development Report 2007/2008*; UNEP (2007), *Global Environmental Outlook – Environment for Development (GEO-4)*; and projections by the United States National Snow and Ice Data Centre and Naval Postgraduate School, Monterey, California, 2008.

– the world will miss forever the opportunity to stabilize emissions at “manageable” levels, along either the 450 parts per million (ppm) or the 550 ppm CO<sub>2</sub>-equivalent scenarios.<sup>61</sup> Economists have also warned that the costs of inaction significantly outweigh the costs of mitigation, and that delaying action now will only make future action more costly.<sup>62</sup> The current global economic crisis shows how a relatively small reduction of output, such as 1 or 2 per cent of GDP, may have considerable and disturbing implications for businesses, employment, trade, and the well-being of societies.

Like other economic sectors, maritime transport, which by volume carries over 80 per cent of global trade, has a role to play in addressing this formidable challenge. International maritime transport is playing a part in contributing to climate change, but more importantly, it is also likely to be directly and indirectly impacted itself, by the various climate change factors such as rising sea levels, extreme weather events and rising temperatures.<sup>63</sup> The wide-ranging impacts of climate change, including on maritime transport, and their potential implications for trade, economic growth and development, underscore the need to integrate climate considerations into strategies for transport planning and development. Increasingly, it is being recognized that considered and concerted action is urgently required to ensure effective control of greenhouse gas emissions and to establish the requisite adaptive capacity, especially in developing countries.

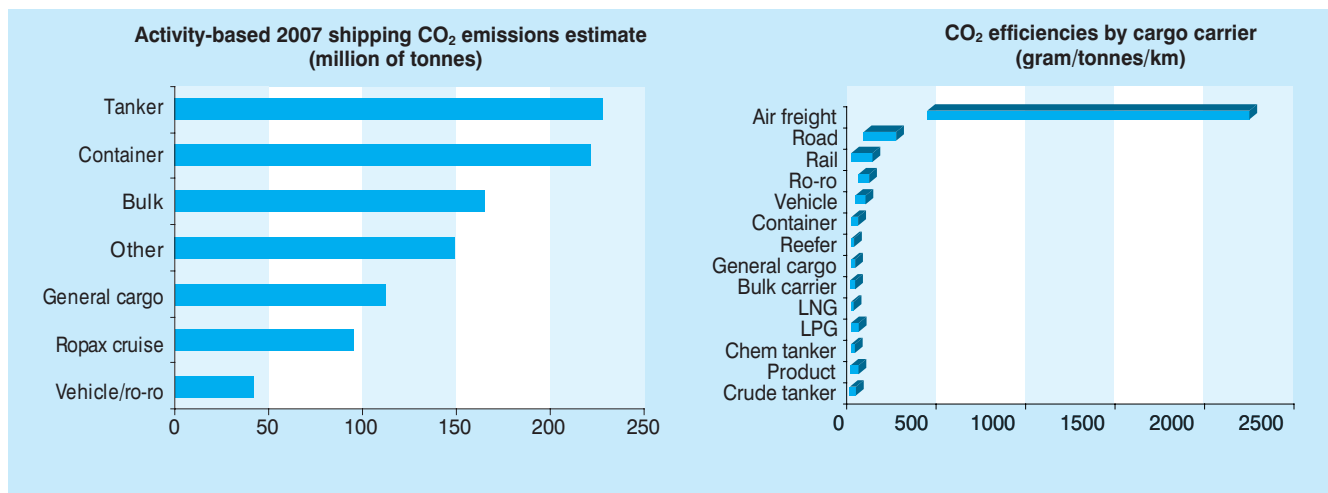
Greenhouse gas emissions from international shipping are significant<sup>64</sup> and are set to grow with increased demand for maritime transport services, driven by economic and demographic growth.<sup>65</sup> Possible mitigation measures are therefore being considered, at both the regulatory and industry levels. As may be recalled, emissions from international shipping are currently not covered under the UNFCCC and the Kyoto Protocol. Rather, parties to the UNFCCC have asked the International Maritime Organization (IMO) to address the question of emissions of greenhouse gases from ships.<sup>66</sup> In view of the ongoing UNFCCC negotiations towards the adoption of an international climate change agreement in December 2009,<sup>67</sup> IMO has recently intensified its work in the field.<sup>68</sup>

### 1. Greenhouse gas emissions from international shipping and efforts at mitigation

Maritime transport compares favourably to other modes of transport both in terms of fuel efficiency and of climate-friendliness (see fig. 8). However, as shown in table 7, CO<sub>2</sub> emissions from international shipping are estimated to account for between 1.6 per cent and 4.1 per cent of world CO<sub>2</sub> emissions from fuel combustion. The *Second IMO GHG Study 2009* – the most recent relevant study prepared on behalf of IMO – estimated

Figure 8

#### Shipping sector CO<sub>2</sub> emission and CO<sub>2</sub> efficiencies by cargo carrier (gram/ton/km)



Source : UNCTAD, based on IMO 2000 Updated On Greenhouse Gas Emission from Ships, 2008. Includes international and domestic shipping and excludes fishing and military vessels.

CO<sub>2</sub> emissions from international shipping at 870 million tons in 2007. According to the same study, these emissions are projected to increase by a factor of 2.2 to 3.1 between 2007 and 2050.<sup>69</sup>

Maritime transport relies heavily on oil, in particular on heavy grade fuel oil for propulsion, and is not yet in a position to adopt energy substitutes. Although renewable energy in the form of wind and solar power can be used on board ship as additional power, the total share of energy that can be covered in this way is limited by the availability and variable intensity of wind and solar energy, as well as by the current technology. While LNG gas may be used as an alternative fuel in shipping, there remains the challenge of finding sufficient space for the onboard storage of the fuel, and also concerns over increases in the emission of methane – another greenhouse gas. Furthermore, current

LNG technology is only available for certain types of ships with a certain number of engines. The potential for using biofuel is limited by technology-related issues, and also by cost.<sup>70</sup>

The Second IMO GHG Study 2009 estimates that a significant potential for reducing GHG emissions is available through technical<sup>71</sup> and operational measures which, in combination, could increase efficiency and reduce the emissions rate by 25 per cent to 75 per cent compared to current levels. Many of these measures are likely to be cost-effective, with obstacles to implementation likely to be unrelated to financial considerations. For example, in the case of renewable energy, limitations posed by the availability and variable intensity of wind and solar energy could prove challenging for the implementation.<sup>72</sup> Technical measures affecting ship

... a significant potential for reducing GHG emissions is available through technical and operational measures ...

Table 7

### Estimates of fuel consumption, CO<sub>2</sub> emissions from international shipping, and projected growth

|                                     | Base year | CO <sub>2</sub> : millions of tonnes | Fuel: millions of tonnes | Percentage of world fuel combustion <sup>a</sup> | Projected emissions growth                                    |
|-------------------------------------|-----------|--------------------------------------|--------------------------|--|---|
| Second IMO GHG Study 2009           | 2007      | 870                                  | 277                      | 3.1  | By a factor of 1.1-1.2 by 2020 & 2.2-3.1 by 2050 <sup>c</sup> |
| IMO/Group of Experts (2007)         | 2007      | 1120                                 | 369                      | 4.1  | +30% by 2020  |
| IMO GHG Study (2000)                | 1996      | 419.3                                | 138                      | 1.6  | --  |
| IEA (2005)                          | 2005      | 543                                  | 214                      | 2.0  | --  |
| TRT Trasporti e Territorio          | 2006      | 1003                                 | NA                       | 3.7  | --  |
| Endressen et al., 2007 <sup>b</sup> | 2002      | 634                                  | 200                      | 2.3  | + 100–200% by 2050  |
| Eide et al., 2007 <sup>b</sup>      | 2004      | 704                                  | 220                      | 2.6  | + 100–200% by 2050  |
| Eide et al., 2007 <sup>b</sup>      | 2006      | 800                                  | 350                      | 2.9  | + 100–200% by 2050  |
| Corbett et al., 2003 <sup>b</sup>   | 2001      | 912                                  | 289                      | 3.1  | --  |

<sup>a</sup> Based on IEA 2005 data for world CO<sub>2</sub> emissions from fuel combustion.

<sup>b</sup> Obtained from secondary sources, including the Second IMO GHG Study 2009.

<sup>c</sup> Base values, and according to six main scenarios under the IPCC *Special Report on Emission Scenarios*: A1F1, A1B, A1T, A2, B1 and B2.

design (mainly new buildings) and operational measures (all ships) each have the potential to reduce CO<sub>2</sub> emissions by 10 to 50 per cent.<sup>73</sup> Technology and operational fuel-saving and GHG emission reduction strategies can be grouped into strategies affecting vessel design, engine design, propulsion systems, other technology-related strategies, and operational measures (box 2).

Recognizing the importance for the maritime transport sector of contributing to global efforts at reducing emissions of greenhouse gases, IMO's Marine Environment Protection Committee (MEPC) is considering a number

of mitigation measures aimed at reducing emissions of greenhouse gases from international shipping.<sup>74</sup> In addition to the technical and operational measures with CO<sub>2</sub> reduction potential, a number of supporting policy measures are also being considered to ensure an effective reduction of CO<sub>2</sub> emissions. Relevant policies currently under consideration at the Marine Environment Protection Committee include:

(a) policies aimed at reducing maritime emissions irrespective of the ship design, operation or energy source (e.g. market-based instruments such as emissions trading,

#### Box 2

#### Potential efficiency gains of selected technology and operational measures

| Strategy                             | Potential efficiency gains |
|--------------------------------------|----------------------------|
| Efficiency of scale                  | <4 per cent                |
| Design for reduced ballast operation | <7 per cent                |
| Lightweight construction             | <7 per cent                |
| Optimum hull dimensions              | <9 per cent                |
| Air lubrication                      | <15 per cent               |
| Bulbous bow                          | <20 per cent               |
| Diesel electric drives               | 5-30 per cent              |
| Waste heat recovery                  | <10 per cent               |
| Counter-rotating propellers          | <12 per cent               |
| Propeller efficiency monitoring      | <5 per cent                |
| Efficient propeller speed modulation | <5 per cent                |
| Wind power: Flettner rotor           | <30 per cent               |
| Wind power: kites and sails          | <20 per cent               |
| Solar power                          | <4 per cent                |
| Automation                           | <10 per cent               |
| Fuel additives                       | <2 per cent                |
| Port turnaround time                 | <10 per cent               |
| Propeller surface maintenance        | <10 per cent               |
| Hull coating                         | <5 per cent                |
| Ship speed reduction                 | <23 per cent               |
| Voyage planning and weather routing  | <10 per cent               |
| Overall energy awareness             | <10 per cent               |

Source: UNCTAD, based on Philippe Crist, "Greenhouse gas emissions reduction potential from international shipping", discussion paper no. 2009-11, International Transport Forum, May 2009.



an emissions levy or an international compensation fund);

(b) policies aimed at improving the operational fuel efficiency of the fleet (e.g. market-based instruments such as the Energy Efficiency Operational Indicator (EEOI) levy, the Energy Efficiency Design Index (EEDI) levy/benefit scheme; command-and-control instruments such as the mandatory the EEOI limit, mandatory EEOI reporting, and the mandatory Ship Efficiency Management Plan (SEMP); and, voluntary measures, such as voluntary agreements to improve EEOI and to implement SEMP);

(c) policies aimed at improving the design efficiency of the fleet (e.g. market-based instruments such as the EEDI levy, the EEDI levy/benefit scheme; command-and-control instruments such as the mandatory EEDI limit for new ships; and voluntary measures, such as a voluntary agreement to improve EEDI and voluntary standards); and

(d) policies aimed at reducing fuel life-cycle carbon emissions, such as policies that favour the use of natural gas or biofuels (e.g. market-based instruments such as a differentiated levy, and command-and-control instruments such as a fuel life-cycle carbon emissions standard and a biofuel standard).

While market-based instruments are likely to be cost-effective policy instruments with high environmental effectiveness,<sup>75</sup> there remains the need to improve understanding of the respective merits of different options and to assess the potential implications of the proposed mitigation measures for global trade and market distortions, especially regarding the trade and development of developing countries.<sup>76</sup> There also remains the question of how best to reconcile the principle of common but differentiated responsibilities under the UNFCCC, and the principle of uniform application/obligations under the IMO.<sup>77</sup>

## 2. Adaptation requirements and funding

While international maritime transport contributes to global greenhouse gas emissions, it is important to

note that maritime transport systems are also likely to be directly and indirectly impacted by various climate change factors such as rising sea levels, extreme weather events and rising temperatures. The type, range and magnitude of impacts will vary according to local conditions, transportation systems, designs and policies, and also according to the capacity to adapt and to minimize the costs.<sup>78</sup> Direct impacts may affect maritime transport infrastructure, operations and maintenance, and also shipping patterns; while indirect effects could result from changes in demand for maritime transport services.<sup>79</sup> These may be induced by climatic changes affecting trade, investment decisions, demographics, agricultural production, forests, energy exploration, energy demand, or fishing activity.

Against the background of a globalized world economy and growing interdependence between countries, climatic impacts on transport systems – in particular ports and other transport infrastructure in the coastal zone – entail serious implications for all countries: developed and developing, coastal and landlocked. Given the critical role of maritime transport in enabling global trade and growth, well-functioning and efficient ports and shipping services are crucial for global trade, international production processes and deeply integrated economies.<sup>80</sup>

Although attention has mainly been paid so far to the question of mitigation, a better understanding of the effects of climate change, and any relevant implications for maritime transport and for access to cost-efficient and sustainable international transport services

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**... there remains the need to improve understanding of the respective merits of different options and to assess the potential implications of the proposed mitigation measures for global trade and market distortions ...**

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is important, so that appropriate adaptation measures may be taken to ensure that countries will be able to cope. This is particularly relevant for coastal states, especially the most vulnerable countries such as small island developing States (SIDS) and the least developed countries (LDCs), which are both highly exposed and least able to adapt, but also for landlocked developing countries (LLDCs), whose

ability to access global markets ultimately depends on access to efficient maritime transport services.

Adaptation to the effects of climate change is not a “one size fits all” process. The impacts of climate change will vary from country to country, as will the institutions and legal and political tools available to decision-makers. Adaptation actions need to be tailored to the circumstances



and abilities of different countries and regions. In this respect, available funding is a key consideration, and in the context of adaptation, financing requirements as they pertain to maritime transportation networks must be better understood.<sup>81</sup> Identifying adaptation needs and the requisite funding is not a straightforward exercise. Uncertainty still remains with regard to the costs of climate adaptation for maritime transport, including in developing countries, and also with regard to the way funding should be generated and delivered. The issues highlighted here were discussed in more detail at a recent intergovernmental expert meeting convened by UNCTAD, entitled “Maritime Transport and the Climate Change Challenge”.<sup>82</sup> Experts emphasized the urgent need to reach agreement in the ongoing negotiations towards a regulatory regime for greenhouse gas emissions from international shipping. At the same time, experts noted with great concern that so far, insufficient attention had been paid to the potential impacts and implications of climate change

for transportation systems, and in particular for ports – key nodes in the supply chain and vital for global trade. Increased focus on responding to the challenge was important for the long-term prospects of the maritime transport sector, and more generally for global trade.

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**Increased focus on responding to the challenge was important for the long-term prospects of the maritime transport sector and, more generally, global trade.**

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Planning for the already predicted impacts should be pursued without delay. Among other things, experts called for increased scientific research, and well-targeted and appropriate vulnerability studies – especially for ports and transport infrastructure in coastal zones in developing countries – to help

assess potential climate-change impacts and develop appropriate adaptation responses. Scientists and engineers, industry, international organizations and policymakers were called upon to increase their cooperation, in order to ensure that up-to-date relevant information on climate-change impacts and adaptation measures was available, widely disseminated, and taken into account by policymakers, transportation planners and development strategists.

## ENDNOTES

- <sup>1</sup> For a more comprehensive overview of world economic development, see the *Trade and Development Report 2009*, available at <http://www.unctad.org/Templates/WebFlyer.asp?intItemID=4579&lang=1>.
- <sup>2</sup> International Monetary Fund (IMF), *World Economic Outlook Update*. Global economic slump challenges policies. January 2009.
- <sup>3</sup> Clarkson Research Services. *Dry Bulk Trade Outlook*, September 2009.
- <sup>4</sup> *ibid.*
- <sup>5</sup> The G-20 refers to the Group of Twenty Finance Ministers and Central Bank Governors. In 2009, the 20 members of the Group included nine developing economies (e.g. Argentina, Brazil, China and India) and one economy in transition (the Russian Federation). Together, the G-20 economies account for around 90 per cent of global GDP, 80 per cent of world trade (including European Union intra-trade) and two thirds of the world’s population.
- <sup>6</sup> UN-DESA. Monthly briefing on the world economic situation and prospects. 2 April 2009.
- <sup>7</sup> Based, in particular, on information published by the World Trade Organization (WTO) in “World trade 2008, prospects for 2009”. Press release. March 2009. Available at [http://www.wto.org/english/news\\_e/pres09\\_e/pr554\\_e.pdf](http://www.wto.org/english/news_e/pres09_e/pr554_e.pdf).
- <sup>8</sup> According to research by the World Bank, the elasticity of global trade volumes to real world GDP has increased gradually from around 2 in the 1960s to above 3 in 2008, as a consequence of production-sharing networks and lean retailing. As a result, trade drops faster when GDP falls, and grows faster when recessions end and GDP growth picks up again.
- <sup>9</sup> See, for example, the “Report to the Trade Policy Review Body (TPRB) from the Director-General on the financial and economic crisis and trade-related developments”. JOB(09)/30. 26 March 2009. See also the Reuters India article entitled “Trade finance shortfall up to \$300 billion - World Bank”. 19 March 2009.

- <sup>10</sup> It should be noted that when data are obtained from external sources, including, for example, WTO, reference is made to the Commonwealth of Independent States (CIS) and not to economies in transition. The CIS is comprised of former republics of the Soviet Union.
- <sup>11</sup> Projections for 2009 and 2010 by leading firms providing shipping market intelligence, including Clarkson Research Services, Fearnleys and Drewry Shipping Consultants are provisional and are likely to be revised over the year given the uncertainty that prevails. The recovery in the dry bulk sector rests heavily on China's performance and therefore, on the effect of the stimulus money allocated to infrastructure investments and on the strength of domestic demand in China.
- <sup>12</sup> Clarkson Research Services Limited. *Container Intelligence Monthly*. September 2009.
- <sup>13</sup> *ibid.*
- <sup>14</sup> Clarkson Research Services Limited. *Dry Bulk Trade Outlook*. September 2009
- <sup>15</sup> See, for example: "Who will blink first in iron ore price talks?" China Trade News. 4 July 2009.
- <sup>16</sup> See, for instance: Stopford M (2006). *Maritime Economics*. Second edition. See also: "International shipping: global regulation for a global industry – conclusions from modal workshop 4 at the 2009 International Transport Forum – statement by the International Chamber of Shipping and the International Maritime Organization", available at: <http://www.internationaltransportforum.org/2009/workshops/pdf/Mws4-conclusions.pdf>; and UNCTAD Transport Newsletter No. 24, available at: [http://www.unctad.org/en/docs/websdtetlb20042\\_en.pdf](http://www.unctad.org/en/docs/websdtetlb20042_en.pdf).
- <sup>17</sup> United States Department of Transportation, Maritime Administration. "Economic impact of piracy in the Gulf of Aden on global trade". Available at: [http://www.marad.dot.gov/documents/HOA\\_Economic%20Impact%20of%20Piracy.pdf](http://www.marad.dot.gov/documents/HOA_Economic%20Impact%20of%20Piracy.pdf)
- <sup>18</sup> See, for example: Beddow M. More carriers cut out Suez. *Containerisation International*. 11 November 2008.
- <sup>19</sup> PowerPoint presentation by G. De Monie, Senior Director, Policy Research Corporation, European Commission. Seminar: Piracy and armed robbery against shipping. 21 January 2009.
- <sup>20</sup> *ibid.*
- <sup>21</sup> See also: Beddow M. Maersk reschedules AE7 eastbound service away from Suez. *Containerisation International*. 26 January 2009.
- <sup>22</sup> In May 2009, Rotterdam-sourced IFO 380 doubled as compared with December.
- <sup>23</sup> Wackett M. Bunker prices surge 25 per cent in May. *Containerisation International*. 28 May 2009. See also: Sanga B. Shipping lines return to piracy-prone route. *Business Daily*. 1 July 2009.
- <sup>24</sup> Osler D. The long way around. *Lloyd's List*. 26 November 2008.
- <sup>25</sup> Frank J. and Osler D. Piracy could add \$400m to owners' insurance cover costs. *Lloyd's List*. 20 November 2008.
- <sup>26</sup> UNCTAD secretariat, based on various specialized sources, including the International Energy Agency's *Oil Market Report*, various issues; British Petroleum's *BP Statistical Review of World Energy 2009*, available at <http://www.bp.com>; *Fearnleys Review 2008*; *Shipping Review and Outlook* from Clarkson Research Services Limited, spring 2009; *DynaLiners* from Dynamar, various issues; and various press articles from *Fairplay* at <http://www.fairplay.co.uk> and from *Lloyd's List* at <http://www.lloydslist.com/ll/home/index.htm>.
- <sup>27</sup> Energy Information Administration. Daily and monthly Europe Brent spot price FOB (dollars per barrel). Accessed September 2009.
- <sup>28</sup> Based on the reference scenario whereby current laws and policies throughout the projection period remain unchanged.
- <sup>29</sup> Based on various forecasts, including by IMF.
- <sup>30</sup> Reuters. 21 per cent slide in energy investment in 2009. 25 May 2009.
- <sup>31</sup> In 2008, UNEP – together with other United Nations sister organizations – launched the Global Green New Deal initiative, as part of the international responses to the prevailing economic and financial crisis. The aim is to revive the international economy and to forge a new global economic development model based on reducing environmental

harm and scarcities, training workers for twenty-first century skills, creating new opportunities to employ those skills, and reducing the carbon dependency and resource use of all economies, while improving conditions for meeting the Millennium Development Goals. UNEP estimates the financial cost at \$750 billion.

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- 56 *ibid.*
- 57 Clarkson Research Services. *Container Intelligence Monthly*. September 2009.
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- 59 Secretary-General of the United Nations, Ban Ki-moon. G8 Summit. June 2007.
- 60 See, for example: Huq S and Ayers J (2007), "Critical list: the 100 nations most vulnerable to climate change". International Institute for Environment and Development. See also: Intergovernmental Panel on Climate Change (2007), "Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change"; and United Nations Development Programme, *Human Development Report 2007/2008*.
- 61 See IEA's *World Energy Outlook 2008*. See also: Centurelli R. "World energy outlook 2008: focus on post-2012 climate scenarios" – a presentation delivered at the UNCTAD Multi-year Expert Meeting on Transport and Trade Facilitation: Maritime Transport and the Climate Change Challenge. Available at: [http://www.unctad.org/sections/wcmu/docs/cimem1p22\\_en.pdf](http://www.unctad.org/sections/wcmu/docs/cimem1p22_en.pdf).
- 62 See, for example: Stern N (2006). *The Economics of Climate Change – The Stern Review* ([http://www.hm-treasury.gov.uk/sternreview\\_index.htm](http://www.hm-treasury.gov.uk/sternreview_index.htm)). See also: Stern N and Edenhofer O. "Towards a global green economy – recommendations for immediate G-20 action". Report submitted to the G-20 London summit. 2 April 2009.
- 63 For more detailed consideration of the issues raised here, see: UNCTAD, "Maritime transport and the climate change challenge". TD/B/C.I/MEM.1/2. Available at: <http://www.unctad.org/ttl/legal>.
- 64 For example, based on country data on GHG emissions from the UNFCCC and data published in the Second IMO GHG Study 2009, the CO<sub>2</sub> emissions in 2006 from international shipping (838 million tons) were equivalent to Germany's total CO<sub>2</sub> emissions (843.4 million tons) and larger than the United Kingdom's CO<sub>2</sub> emissions (556.6 million tons).
- 65 See, for example, the Second IMO GHG Study 2009. MEPC 59/INF.10. 9 April 2009.
- 66 See article 2 of the Kyoto Protocol.
- 67 Additional information about current negotiations under the UNFCCC is available at: <http://unfccc.int/2860.php>.
- 68 See also chapter 6. For additional information about current developments at IMO, see, for example: resolution A.963(23), MEPC 77/4, MEPC 57/4/6, MEPC 57/21, MEPC 58/4/5, MEPC 58/23, MEPC 59/4, MEPC 59/4/7, MEPC 59/4/40 and MEPC 59/INF.29. Available at <http://www.imo.org>.
- 69 Future emissions of CO<sub>2</sub> from international shipping were estimated in accordance with the scenarios developed by the IPCC in the *Special Report on Emission Scenarios* and are based on three categories of parameters, namely economic growth (demand for maritime transport services), transport efficiency and energy.
- 70 IMO. Second IMO GHG Study 2009. MEPC 59/INF.10.
- 71 For an overview of existing and potential relevant technologies, see, for example: Gunton P. "Controlling GHGs: For love or money?" Lloyd's Register – Fairplay. Paper submitted to UNCTAD Multi-year Expert Meeting on Transport and Trade Facilitation: Maritime Transport and the Climate Change Challenge (<http://www.unctad.org/ttl/legal>).
- 72 IMO. Second IMO GHG Study 2009. MEPC 59/INF.10.
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- 74 See, in particular, the technical and operational measures and policy options set out in the Second IMO GHG Study 2009. MEPC 59/INF.10.
- 75 Second IMO GHG Study 2009. MEPC 59/INF.10.

76 A 2008 study by CE Delft, entitled “Left on the high seas: Global climate policies for international transport” argues that climate change mitigation by the maritime transport sector could bring significant climate benefits, and also costs – ranging from direct impacts such as higher costs for food imports, to indirect impacts such as changed incentives for fragmentation of production. It could also result in increased demand for ships with lower CO<sub>2</sub> emissions. This entails a number of implications for research and development in terms of the relevant shipbuilding technology, and also for shipyard services – the majority of which are located in developing Asia, namely in China and in the Republic of Korea.

77 This issue constitutes a key point of divergence of views about a global regime to regulate GHG emissions from shipping. See, for example, a summary of relevant discussions contained in UNCTAD’s Report of the Multi-year Expert Meeting on Transport and Trade Facilitation: Maritime Transport and the Climate Change Challenge. TD/B/C.I/MEM.1/3. Available at: [http://www.unctad.org/en/docs/cimem1d3\\_en.pdf](http://www.unctad.org/en/docs/cimem1d3_en.pdf). See also a note by the IMO secretariat, entitled “Prevention of air pollution from ships, Shipping-relevant ideas and proposals to the UNFCCC process in 2008” MEPC 59/INF.29, 22 May 2009.

78 See, for instance: United States Climate Change Programme (2008), *Impacts of Climate Change and Variability on Transportation Systems and Infrastructure: Gulf Coast Study, Phase I*; and National Research Council (2008), *Potential Impacts of Climate Change on U.S. Transportation*. See also “Maritime transport and the climate change challenge”, a note by the UNCTAD secretariat, TD/B/C.I/MEM.1/2, 9 December 2008; and Savonis M (United States Department of Transportation), “The Gulf Coast study”, a presentation delivered at the UNCTAD Multi-year Expert Meeting on Transport and Trade Facilitation: Maritime Transport and the Climate Change Challenge ([http://www.unctad.org/sections/wcmu/docs/cimem1p16\\_en.pdf](http://www.unctad.org/sections/wcmu/docs/cimem1p16_en.pdf)).

79 *ibid.*

80 See, for example, the report by the UNCTAD secretariat entitled “Maritime security: ISPS code implementation, costs and related financing”. UNCTAD/SDTE/TLB/2007/1. The report relays the results of a global survey questionnaire of the world maritime industry and States parties to the Safety of Life and Sea Convention (SOLAS Convention). The study highlighted some of the difficulties faced by many ports in developing countries when seeking to upgrade infrastructure, equipment and operations to satisfy the new international security requirements adopted under the auspices of IMO as part of the 2002 amendments to the SOLAS Convention, including the International Ship and Port Facility Security Code (ISPS code). In many developing countries, constraints faced by ports hinder the effective integration of these countries into the global transport and trading networks.

81 See, for example: UNFCCC (2007), “Investment and financial flows to address climate change”; and UNDP (2008), *Negotiations on Additional Investment and Financial Flows to Address Climate Change in Developing Countries*.

82 For further information about the meeting, as well as all relevant documentation, including a background note by the secretariat, the report of the meeting, and presentations by experts, see: <http://www.unctad.org/ttl/legal>.