

# Liner Shipping in the European Union



**GLOBAL  
INSIGHT**



WORLD SHIPPING COUNCIL  
PARTNERS IN TRADE

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Dear Reader:

The World Shipping Council recently engaged IHS Global Insight to evaluate the liner shipping industry and its contribution to the global economy. A copy of the full global evaluation is available at [www.worldshipping.org](http://www.worldshipping.org) and [www.ihsglobalinsight.com](http://www.ihsglobalinsight.com).

As part of our evaluation, we felt that it was important to undertake a more in-depth review of liner shipping activity in the European Union, and the attached report summarizes those findings. We realized that the information available in three of IHS Global Insight's primary products, its *World Trade Service*, *World Industry Service* and *Lloyd's Register-Fairplay* fleet databases, combined with other sources, would enable us to look at the liner industry activity in the European Union in a way not previously explored.

We hope you find the information useful and we welcome your comments and questions.

Sincerely,



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## Executive Summary

Liner shipping is the service of transporting goods by means of high capacity, ocean going ships that traverse regular routes on fixed schedules. The liner shipping industry is the primary conduit of world trade and an increasingly important part of the maritime industry. Liner shipping carries the majority of the world's ocean-borne trade in value terms and facilitates a significant portion of the merchandise trade of the world. The industry has contributed to advances in the standard of living of most of the world's population in the last 35 years, as the gains from trade through advancing global commerce were enabled by the reliable, efficient and relatively low-cost transportation provided by the industry.

Quantifying the significance of the liner shipping industry can be done using many metrics. Valuable perspectives on the liner industry include how much of world trade is handled by the liner industry; the employment, investment, and value added the industry contributes to the world economy, and the operational characteristics of the industry in providing services globally.

### WHAT IS THE LINER SHIPPING INDUSTRY?

The liner shipping industry is the portion of the maritime industry that includes all operations and related infrastructure involved in scheduled ocean-borne shipping. It consists of liner vessels and the people working on-board these vessels, ports, shipbuilding operations, longshore dock workers, shipbuilders, and all other on-shore support staff. Liner operating companies transport most of the high-unit value consumer and intermediate goods, including ocean containerized cargo, vehicles, and other mobile machinery. The industry operates on all oceans and many of the navigable inland waterways world-wide, benefitting consumers and exporters globally.

### KEY FINDINGS

This report provides measures that describe the important role of the liner shipping industry in the world in general and in the European Union (EU) in particular, using 2007 as a reference year. Among the findings are:

- The liner industry produced over US \$183 billion of direct output globally. Of this, more than a third, or US\$ 65.2 billion was produced in the European Union.
- The direct contribution of the shipbuilding sector in Germany alone was almost US\$ 7 billion.
- The liner industry directly employed over 4 million people globally and almost one-quarter million in the European Union, providing compensation to the EU employees in excess of US\$ 8 billion.
- The value of imports to and exports from the European Union transported by the liner shipping industry exceeds US\$ 1.6 trillion and represents more than 65 percent of the EU's seaborne trade by value (exclusive of intra-EU short-sea shipping), and just over 19 percent of total EU seaborne tonnage.
- EU trade transported by sea was valued at US \$2.5 trillion or 24 percent of total EU trade. The liner industry moved just under 16 percent of total EU trade by value.
- Containerized trade to and from all countries in the European Union was 34.3 million TEU.

- The largest liner trade route in the world was from the Greater China region<sup>1</sup> to the European Union.
- Transshipment of containers accounted for 27.5 percent of the total world container handling activity. In Western Europe, almost one-third of the total port handling is attributable to transshipment and empty movements account for another 21 percent. This means that approximately half of all port handling in Western Europe or more than 48 million TEU is attributable to empty moves or transshipments.
- Ports in Western Europe transhipped approximately 28.8 million TEU, of which an estimated 1.7 million were empty. Ports in Western Europe handled approximately 19.3 million empty containers.
- Twenty-nine percent of the global liner fleet is operated by companies based in the European Union.
- Cumulatively, European companies have invested almost US\$ 106 billion in liner vessels or about 45 percent of the total investment made globally.
- Twenty-seven percent of the total or more than US\$ 63 billion has been spent over time in European countries for new liner vessels.
- The European Union has more than 50 active container ports in 18 countries, and over 15 of those ports have throughput that exceeds 1 million TEU per year.
- In 2008, the global container fleet consisted of 17.8 million containers, which cost the industry over US\$ 80 billion. Europe accounts for the largest container fleet at 6.9 million units or nearly 39 percent of the total fleet.
- In mid-2007, the liner industry operated more than 200 scheduled services linking Europe with the rest of the world.

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<sup>1</sup> The definitions for the regions of the world utilized in this report are found in Appendix B. The Greater China region is comprised of all China, including Hong Kong S.A.R. and Taiwan, China.

## Introduction

The liner industry is a crucial segment of the global economy and contributes significantly to world economic output. The industry is broadly defined as the operations and underlying infrastructure involved in scheduled ocean-borne shipping. As such, it consists of a variety of components with significant economic impact, including:

- Liner operating companies
- Liner vessels
- Ports of Call
- Shipbuilding operations
- Liner industry operations

Liner operating companies generally transport high-value consumer and intermediate goods, including all seaborne containerized cargo, automobiles, and other machinery. As a result, the industry has a profound effect on consumers and exporters. In 2007, the industry carried almost 60% of the total value of the world's seaborne commodities on more than 7,000 registered vessels.<sup>2</sup>

The industry is especially significant to the economies of the European Union and South Korea in terms of shipbuilding and to the European Union, China, United States, and the Americas in its economic contribution from transport operations. Globally, the industry was directly or indirectly responsible for over US\$ 436.3 billion in output and 13.5 millions jobs in 2007.

### PURPOSE OF REPORT

This report was commissioned by the World Shipping Council in order to better understand the value and size of the liner shipping industry and its contribution to global trade and the economy of the European Union. The estimates presented in this report are an initial effort using readily available data from various IHS companies for valuing and sizing the industry. The majority of the data presented here is from 2007, the most recent year for which economic and trade data is complete. This year also presents the size and impact of the industry prior to the current global recession and is thus indicative of future operations.

### METHODOLOGY AND DATA SOURCES

The primary information presented in this report is derived from three IHS data sources, described in greater detail in the body of this report:

1. **IHS Global Insight World Trade Service (WTS)**: used to estimate the trade impact of the liner industry.
2. **IHS Global Insight World Industry Service (WIS)**: used to estimate the economic and employment impact of the liner industry.
3. **IHS Lloyd's Register - Fairplay Research (LRF)**: used for determining the size of the global liner fleet, its capacity and operating statistics. LRF maintains a comprehensive ongoing registry of all seagoing vessels of 100 gross tons or larger and tracks their operations on an ongoing basis.

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<sup>2</sup> IHS Lloyd's Register–Fairplay fleet database and IHS Global Insight World Trade Service.

Where enough geographic detail was available, economic, trade and operating metrics were aggregated by region. The WTS regional trade aggregations are presented in Appendix B.

These three databases were supplemented with data obtained from websites and annual reports of liner industry participants including ports and port authorities, terminal operators, and equipment manufacturers. Consulting and other research reports were also reviewed. For a full list of reviewed sources please see Appendix C.

## Economic Valuation of the Liner Industry

The most common measures of the value of an industry in the economy are the value of output produced by the sector and the associated employment provided by this activity. These are commonly measured through the value of the output of the companies in the industry and the number of workers they employ. This section reviews available economic metrics for the liner industry and provides estimates of the economic value of the liner industry and its contribution to the global economy and regional economies.

An ideal measure of this value would include both the value of liner vessels, their operations, and the value of on-shore assets that support the industry. In practice however, because some on-shore assets and personnel are shared in their use with non-liner transportation services, such measures are very difficult to produce and would require a significant effort in summing up values using a "bottom-up" approach. This process faces limitations in the inconsistencies between national financial accounting standards and gaps in the data collected and published by different government agencies and facilities such as liner ports around the world.

The analysis of the industry included here has been produced using "top-down" economic measures of the liner industry derived from IHS Global Insight's World Industry Service databases. The detailed methodology and data sources used to derive the liner share portion of these measures are presented in Appendix A. The key indicators presented here are Capital Expenditures, Gross Output, Labor Compensation, and Number of Employees for both the liner industry and the portion of the shipbuilding industry devoted to building and maintaining liner vessels.

The liner industry produced over US\$ 183 billion of direct output globally in 2007 from both operations and shipbuilding. Of this, more than a third was produced in the European Union. The liner industry also accounts for more than 4 million direct jobs world-wide and almost one-quarter million in the European Union, providing compensation to the EU employees in excess of US\$ 8 billion. Global investment in fixed assets exceeds US\$ 29 billion, twenty-seven percent of which was expended in the European Union. This estimate of the value of the industry does not include related activities such as cargo handling and storage activities at ports, nor does it include the inland transportation of liner cargoes, unless moved inland by water.

In addition to the direct impacts of the liner industry measured in value and jobs, the spending by the industry creates additional indirect economic impact on other sectors of the economy. Furthermore, this spending induces additional economic activity and employment in the economy.

**Table 1: Direct Economic Contribution of Shipbuilding and Liner Industry Operations, 2007**  
(Million US Dollars)

Region	Gross Output	Labor Compensation	Employees (Thousand)	Capital Expenditure
European Union	65,235.7	8,134.2	209.5	8,030.4
<b>Total</b>	<b>183,305.0</b>	<b>27,177.9</b>	<b>4,146.8</b>	<b>29,406.0</b>

*Notes: The European Union region in the WIS data base excludes Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta and Slovenia, due to inadequacies in the underlying data. The countries either do not report the data or do not report it in a robust enough manner for inclusion in the database.*

*Sources: IHS Global Insight World Industry Service and World Trade Service.*

The direct global economic contribution generated from the operations of the liner industry produced over US\$ 141 billion, or about 77 percent, of liner industry related direct output in 2007. Detail of this economic contribution for the European Union is found in Table 2. Of the industry's total contribution, just over a third was produced in the European Union.

**Table 2: Direct Economic Contribution of Liner Industry Operations, 2007**  
(Million US Dollars)

Region	Gross Output	Labor Compensation	Employees (Thousand)	Capital Expenditure
European Union	51,431.0	5,468.7	161.1	7,611.2
<b>Total</b>	<b>141,528.3</b>	<b>20,792.2</b>	<b>3,869.9</b>	<b>27,527.8</b>

*Notes: The European Union region in the WIS data base excludes Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta and Slovenia, due to inadequacies in the underlying data. The countries either do not report the data or do not report it in a robust enough manner for inclusion in the database.*

*Sources: IHS Global Insight World Industry Service and World Trade Service.*

In addition to the extensive global operations of the liner industry, the value and employment of the manufacturing required to supply the equipment for liner industry operations is also significant, especially for countries with advanced and sizable shipbuilding operations. The direct economic contribution of liner vessel manufacturing for countries that delivered at least one liner vessel in 2007 is shown in Table 3. The construction of liner vessels provided almost 277,000 jobs in shipbuilding countries and generated almost US\$ 42 billion of gross output, more than US\$ 6 billion of which was labor compensation. The liner shipbuilding industry also invested almost US\$ 1.9 billion in fixed assets during the year 2007. The leader in liner vessel construction is South Korea, with almost US\$ 16 billion worth of output, followed closely by the European Union, driven by the robust shipbuilding activity in Germany.

**Table 3: Direct Economic Contribution of Shipbuilding, 2007**  
(Million US Dollars)

Country	Gross Output	Labor Compensation	Employees (Thousand)	Capital Expenditures
<b>European Union Total</b>	<b>13,804.7</b>	<b>2,665.5</b>	<b>48.4</b>	<b>419.2</b>
Germany	8,694.8	1,531.4	24.5	166.8
<b>South Korea</b>	<b>15,857.3</b>	<b>2,400.7</b>	<b>77.9</b>	<b>958.1</b>
<b>Rest of World</b>	<b>12,114.7</b>	<b>1,319.6</b>	<b>150.60</b>	<b>500.90</b>
<b>World Total</b>	<b>41,776.7</b>	<b>6,385.8</b>	<b>276.9</b>	<b>1,878.2</b>

*Sources: IHS Global Insight World Industry Service and Lloyd's Register-Fairplay Research.*

## The Liner Industry's Contribution to Global and European Trade

The amount of trade transported by the liner industry is an important indicator of the industry's contribution to the world economy. The value of this trade provides perspective on the critical trade facilitation function that the liner industry provides that is fundamental to the functioning of the global economy and by implication, the European economies.

The liner industry is the foundation for global commerce, transporting 60 percent of world seaborne trade by value in a cost-effective and reliable manner. As the use of containerization continues to increase and ever more goods are moved in the standard sized, multi-modal containers, the liner industry is likely to continue to grow in importance for the handling of global commerce.

### METHODOLOGY AND DATA SOURCES

To quantify the trade handled by the liner shipping industry, IHS Global Insight used its World Trade Service (WTS) database of world merchandise trade to examine patterns of commodity trade by commodity type and route. WTS is a proprietary database that captures the value and volume of trade across 77 commodity groups between all countries of the world. The database contains data on all world trade with detail for 54 major individual countries plus the remaining countries aggregated into 16 trade regions.

The data presented in this report is inclusive of all commodities transported by the liner industry. In 2007, approximately 94 percent of the value of liner trade consisted of shipments by container vessels. Motor vehicles and wheeled equipment are also shipped by the liner industry. However, there is a small share of commodities shipped on other scheduled services by non-container and non-vehicle vessels, such as combination vessels, which are difficult to account for with precision. The shipments of these commodities are included in the report, but assumptions were made regarding their share of seaborne cargo that could be conservatively attributed to the liner industry.

### LINER TRADE DATA

The liner industry contributes to a significant share of both world and European international trade. In 2007, the liner industry accounted for 60 percent of global seaborne trade in value, equal to more than US\$ 4.6 trillion. Of that, liner trade in the European Union represented US\$ 1.7 trillion or 37 percent and accounts for more than 65 percent of the EU's seaborne trade by value (exclusive of intra-EU short-sea shipping), and just over 19 percent of total EU seaborne tonnage. EU trade transported by sea was valued at US \$2.5 trillion or 24 percent of total EU trade and equated to 1.46 billion tons or 28 percent of EU trade by tonnage. In the same year, liner ships transported 14 percent of global seaborne volume, or over 1 billion metric tons. The liner EU trade represented just over 281 million tons or 28 percent of the total liner volume and over 5 percent of total EU trade by volume. Since more than 56 percent of the total value of trade<sup>3</sup> moved by sea in 2007, the liner industry transported about one-third of total global trade and just under 16 percent of total EU trade by value.<sup>4</sup> Goods transported by liner operations thus tend to be of high value relative to their volume.

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<sup>3</sup> Total value as reported by national customs agencies around the world for goods imports and exports. Some international goods shipments not counted in official trade statistics (e.g. some military shipments) are excluded.

<sup>4</sup> Total global trade is estimated at approximately US\$ 13.8 trillion.

The following tables in this section examine the impact of the liner industry on regional trade and trading partners. Regional trade groupings are detailed in Appendix B. The top 20 liner trade routes account for nearly two-thirds of global liner trade. Liner goods flowing from Greater China (including Taiwan, China and Hong Kong S.A.R.) to the European Union comprise nearly seven percent of global liner trade.

**Table 4: Top 20 Liner Trade Routes, 2007**  
(Million Nominal US Dollars and Thousand Metric Tons)

Origin	Destination	Value	Tons	% Total Value
Greater China	European Union	313,024	49,855	6.8%
Greater China	Greater China	254,457	39,625	5.5%
Greater China	United States	243,663	58,150	5.3%
European Union	Other Asia	217,101	23,466	4.7%
Greater China	Other Asia	184,743	39,218	4.0%
European Union	Middle East & Africa	179,984	32,236	3.9%
Other Asia	European Union	165,231	30,865	3.6%
Japan	Greater China	152,270	22,939	3.3%
Other Asia	Other Asia	142,535	45,066	3.1%
European Union	United States	131,926	24,366	2.9%
Greater China	Japan	120,194	18,813	2.6%
Other Asia	Greater China	117,744	30,409	2.5%
European Union	Greater China	106,100	21,029	2.3%
Japan	Other Asia	101,424	14,657	2.2%
Other Europe	Other Asia	101,401	8,875	2.2%
Japan	United States	95,822	9,101	2.1%
Japan	European Union	95,584	5,848	2.1%
Other Asia	Middle East & Africa	83,347	23,388	1.8%
South Korea	Greater China	79,293	15,745	1.7%
Other Asia	United States	75,824	19,675	1.6%
Rest of World	Rest of World	1,662,629	470,139	36.0%
	<b>Total</b>	<b>4,624,298</b>	<b>1,003,465</b>	<b>100.0%</b>

Source: IHS Global Insight, World Trade Service

Greater China dominates the top three containerized trade routes, with the European Union being the second largest receiver of China's containerized cargo, and almost seven percent of the world total. The top twenty containerized trade routes account for about 62 percent of total containerized trade.

**Table 5: Top 20 Containerized Trade Routes, 2007**

Origin	Destination	TEU <sup>5</sup> (Millions)	% Share
Greater China	United States	9.4	7.8%
Greater China	European Union	7.9	6.5%
Greater China	Greater China	4.9	4.0%
Other Asia	Other Asia	4.9	4.0%
Greater China	Other Asia	4.5	3.8%
Other Asia	European Union	3.8	3.2%
Other Asia	Middle East & Africa	3.5	2.9%
Other Asia	Greater China	3.4	2.8%
European Union	Middle East & Africa	3.3	2.7%
European Union	Other Asia	3.1	2.6%
United States	Greater China	2.9	2.4%
Latin America & Caribbean	United States	2.8	2.4%
Other Asia	United States	2.6	2.2%
Greater China	Japan	2.6	2.2%
European Union	Greater China	2.6	2.2%
Japan	Greater China	2.5	2.1%
European Union	United States	2.4	2.0%
Middle East & Africa	European Union	2.4	2.0%
Greater China	Middle East & Africa	2.3	1.9%
Greater China	Other Europe	2.3	1.9%
Rest of World	Rest of World	46.2	38.4%
<b>Total</b>		<b>120.2</b>	<b>100.0%</b>

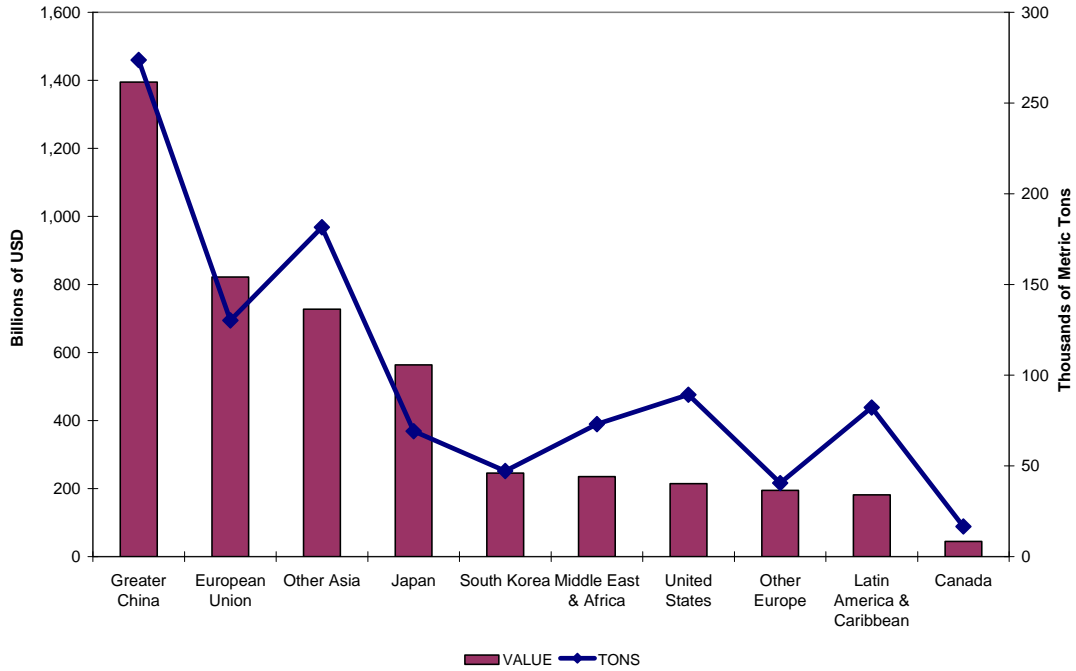
*Note: TEU are fully loaded.*

*Source: IHS Global Insight, World Trade Service*

Greater China and the European Union are the two largest liner trade-exporting regions of the world, followed by Other Asia and Japan. Greater China alone accounts for more than 30 percent of liner exports by value. The European Union captures about 18 percent of liner export value, but is ranked third in tonnage, because the goods it exports are relatively higher in value per ton. Conversely, the United States and Latin America and Caribbean regions are ranked fourth and fifth in tonnage terms but not in value, because the goods they tend to export are heavier per dollar.

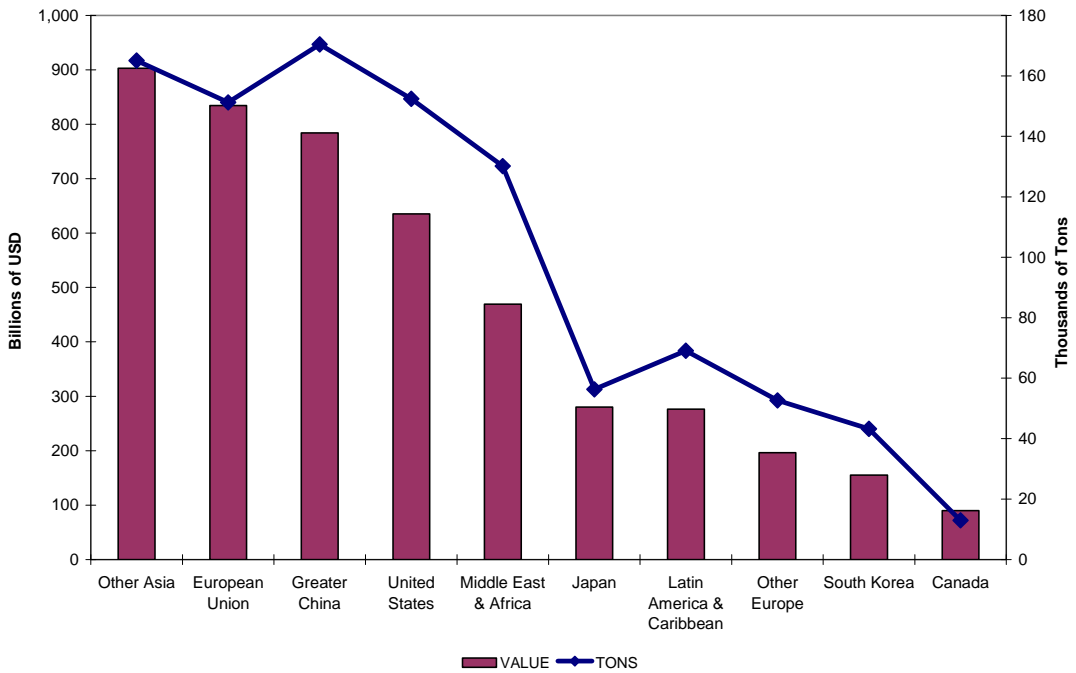
<sup>5</sup> A TEU is the standard unit of measure for liner shipping containers and refers to a twenty-foot equivalent unit. Most containers are forty-foot or two TEU.

**Figure 1: Liner Exports Value and Volume by Region, 2007**



Source: IHS Global Insight, World Trade Service

**Figure 2: Liner Imports Value and Volume by Region, 2007**



Source: IHS Global Insight, World Trade Service

Table 6 and Table 7 below provide additional detail on both total liner and container only trade in the European Union. Germany is the leader in both liner imports and exports, accounting for 21 and 26

percent of the total, respectively. It is followed by the United Kingdom and France. Together, these three large member countries comprise 49 percent of the European Union's exports and 39 percent of its liner imports. The liner industry is crucial even for landlocked countries such as Austria and the Czech Republic, which rely on the industry and the ports in neighboring maritime countries to trade billions of dollars worth of goods with the world.

**Table 6: Liner Trade in the European Union, 2007**  
(Million Nominal US Dollars and Thousand Metric Tons)

Country	Exports		Imports	
	Value	Tons	Value	Tons
Austria	26,977	4,080	15,540	2,028
Belgium	41,717	9,516	64,092	14,239
Bulgaria	1,469	550	4,153	861
Cyprus	2,275	710	7,143	1,553
Czech Republic	8,501	1,151	13,643	1,668
Denmark	19,858	2,779	12,290	2,436
Estonia	1,120	222	1,420	336
Finland	20,773	5,295	15,827	2,194
France	91,497	12,987	91,214	13,803
Germany	212,283	25,411	172,672	23,161
Greece	5,511	1,858	9,100	2,667
Hungary	8,180	519	15,139	1,133
Ireland	20,683	1,612	16,974	2,688
Italy	89,240	16,854	64,903	17,486
Latvia	466	330	2,223	434
Lithuania	1,603	340	1,982	790
Luxembourg	1,330	167	2,661	196
Malta	3,627	183	3,671	816
Netherlands	93,639	12,834	81,145	14,324
Poland	6,173	1,593	17,756	3,461
Portugal	5,994	1,814	4,773	1,618
Romania	4,149	963	4,838	1,498
Slovak Republic	3,700	423	8,384	878
Slovenia	1,598	350	3,127	899
Spain	28,615	10,611	48,555	15,712
Sweden	27,412	4,415	14,425	2,760
United Kingdom	95,216	12,778	139,538	21,761
<b>Total</b>	<b>822,275</b>	<b>130,180</b>	<b>834,528</b>	<b>151,203</b>

*Note: Excludes intra-Europe short-sea shipping.*

*Source: IHS Global Insight, World Trade Service*

Similarly, Germany is also the leader in containerized trade, with about six million TEU of imports and exports, or 17 percent of the total European Union container volume. The second largest container trading country is the United Kingdom, followed by Italy, which is the second largest exporter. Once again, smaller and landlocked countries are also participants in container trade.

**Table 7: Containerized Trade in the European Union, 2007 TEU**

Country	Exports	Imports
Austria	454,271	263,996
Belgium	1,014,793	1,669,292
Bulgaria	61,850	126,508
Cyprus	84,078	191,667,
Czech Republic	153,231	274,695
Denmark	305,020	349,040,
Estonia	29,442	45,452
Finland	632,445	252,597
France	1,475,885	1,788,698
Germany	2,874,878	2,997,305
Greece	223,367	341,073
Hungary	70,751	208,634
Ireland	192,518	359,312
Italy	1,903,337	2,171,943
Latvia	33,234	65,141
Lithuania	43,869	102,293
Luxembourg	17,556	21,748
Malta	24,533	104,158
Netherlands	1,505,975	1,702,223
Poland	182,131	479,597
Portugal	187,290	188,906
Romania	129,996	187,786
Slovak Republic	44,279	139,995
Slovenia	44,358	128,444
Spain	1,150,563	1,890,723
Sweden	491,241	367,333
United Kingdom	1,546,521	2,992,796
<b>Total</b>	<b>14,877,230</b>	<b>19,411,356</b>

*Note: Excludes intra-Europe short-sea shipping.  
TEUS are fully-loaded.*

*Source: IHS Global Insight, World Trade Service*

In summary, the liner industry accounts for about 60 percent of seaborne trade by value and about one-third of total global trade. The European Union is a large participant in liner trade, accounting for about 29 percent of global containerized imports and exports with Germany being the largest trader particularly in exports. EU trade transported by liner vessels represented 16 percent of total EU trade value and 5 percent of total EU trade volume.

## Liner Industry Operations and Expenditures

This section of the report examines both the seaborne operations of the liner industry as well as its on-shore component, including port expenditures, where possible. The size and impact of the liner industry can be quantified by examining its expenditure on capital such as vessels, containers and equipment as well as the cost of its operations. In addition, non-monetary measures of the industry's operations also provide useful information on the industries magnitude and scope. Where data was available, this report quantifies the dollars spent on capital and operations by the industry as well as the following operational statistics: port throughput, the number of services provided and available liner capacity. The size and geographic scope of the liner fleet is examined in greater detail. Lastly,

the number of containers and other equipment utilized by the liner industry is quantified where possible.

In mid-2009, the global liner fleet consisted of 7,210 vessels with approximately 185 million deadweight tons (dwt) of capacity, including 12.5 million TEU of container capacity and 3.2 million CEU<sup>6</sup> of automotive capacity. As of July 2009, approximately US\$236 billion has been spent cumulatively on purchasing new liner vessels since the inception of the liner trade and 45 percent of that investment has been made by companies in Europe. This amount does not include the additional and potentially substantial amounts spent subsequently in the second-hand market, or for upgrades and maintenance.

Throughput at the top twenty busiest global ports reached almost 250 million TEU in 2008 and 73.5 million TEU at the 50 major ports in Europe. The global container fleet reached 17.8 million units and cost US\$ 80.1 billion. Investment in liner ports by port authorities and terminal operators are also substantial.

## **METHODOLOGY AND DATA SOURCES**

Fleet statistics are derived from databases compiled and maintained by Lloyd's Register - Fairplay Research (LRF). LRF maintains registry information for all ships with International Maritime Organization (IMO) numbers, which includes all seagoing trading ships of 100 gross tons and above as well as vessels that are on order. The nationalities of the operator as well as the owner are recorded for most - though not all - vessels in this database. The fleet and order book databases are primary data sources and do not pose any major limitations.

The expenditures and operations of the liner industry are not possible to fully quantify on a global scale for a variety of reasons. Many liner companies, equipment manufacturers, and terminal operators are privately held companies which disclose only minimal details pertaining to their finances and operations. Accounting requirements differ across countries for publicly held companies. There are thus no global or regional organizations that have aggregated any comprehensive financial or operating data on the liner industry. Instead, only piecemeal information can be gleaned from company reports and government agencies.

## **THE LINER FLEET**

For the purposes of this report, the liner fleet is defined as consisting of all container, vehicle, and Ro-Ro vessels. Some of these vessels could be used in short-sea or other non-liner service and while it is difficult to identify and exclude those vessels, their share of the overall vessel count is small. In addition, certain vessels such as combination vessels that operate on a scheduled liner service but are not container, vehicle or Ro-Ro vessels are excluded from the vessel count and capacity data in this report.

It is important to note that the exact number of ships in the liner fleet changes frequently as ships are decommissioned or new ships enter service. Likewise, the order book is frequently updated with new orders and changes to current orders.

### ***Fleet Size and Capacity***

As of July 2009, the global liner fleet consisted of 7,210 vessels with almost 185 million dead-weight tons of capacity. The container fleet of 4,684 vessels has capacity of just over 12.5 million TEU, and

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<sup>6</sup> A CEU or car-equivalent-unit is the standard unit of measure for roll-on/roll-off ships and car carriers.

the vehicle fleet of 773 vessels has the capacity of less than 3.2 million car equivalent units (CEU). The Ro-Ro fleet provides an additional 1.2 million CEU of capacity.

**Table 8: Global Liner Fleet, July 2009**

Vessel Type	Number of Vessels	Dwt
Container	4,684	165,774,103
Vehicle	773	11,375,69
Ro-Ro	1,753	7,423,240
<b>Total</b>	<b>7,210</b>	<b>184,573,034</b>

*Source: Lloyd's Register – Fairplay Research*

The total order book for liner vessels in July 2009 contained another 1,381 vessels to be added to the fleet. These vessels will account for another 68.1 million dwt in liner capacity. Container ships on-order will add 5.5 million TEU of capacity. The order book thus reflects the growing size of container vessels. The average container ship in the current fleet has the capacity of about 2,670 TEU where as the average container ship on-order will have the capacity of more than 5,000 TEU. A similar trend can be observed in vehicle vessels. The vehicle carrier vessels on-order will provide another 1.14 million CEU of capacity, or an average capacity of 5,300 CEU per vessel compared to an average capacity of 4,100 CEU per vessel in the current fleet.

**Table 9: Global Liner Fleet on Order**

Vessel Type	Number of Vessels	Dwt
Container	1,082	63,755,615
Vehicle	214	3,539,701
Ro-Ro	85	814,676
<b>Total</b>	<b>1,381</b>	<b>68,109,992</b>

*Source: Lloyd's Register – Fairplay Research*

Over the last five years, container shipping has been one of the fastest growing segments of seaborne shipping. The fleet has grown by an average annual of 13 percent over the last five years. This growth is driven primarily by vessels with a capacity of over 5,000 TEU, which added 3.1 million TEU of capacity between 2004 and 2008. In the next five years, the container fleet is expected to expand an average of 9.3 percent per year, with growth in vessels of more than 8,000 TEU topping 25 percent through 2013.

The growth in the vehicle carrier fleet has also been significant, averaging 9.3 percent per year between 2004 and 2008. This growth will slow to about five percent per year over the next five years.

Table 10 below presents the regional break-down of the current liner fleet as well as the liner fleet that is currently on-order. Regional fleet data are aggregated based on the nationality of the *operator* of each vessel and not the registry of the vessel as the operator is more in control of the operational deployment of vessels and therefore has a more important impact on the countries the vessels are used to serve than the owner of the vessel in cases where the owner and operator are different.

The regional break-down of the liner fleet demonstrates that with a total fleet of 2,112 vessels, or 29 percent of the global fleet, and an additional 654 vessels on order, the European Union dominates liner trade by this measure, especially for container vessels. Asia, particularly Greater China and Japan, also has a significant and expanding presence in container shipping. In fact, China alone, with 804 liner vessels, is the country with the highest number of liner vessels. Japan, however, is the leading country in seaborne vehicle shipping, with almost 48 percent of the total global vehicle carrier fleet.

**Table 10: Current and On-Order Liner Fleet by Region, July 2009**

Vessel Type	Operator Region	Existing Fleet			On-Order		
		Vessels	Dwt	TEU/CEU	Vessels	Dwt	TEU/CEU
<b>Container</b>	European Union	1,641	58,749,877	4,414,581	546	27,074,606	2,277,276
	Other Europe	508	21,191,551	1,568,753	68	7,335,173	648,447
	Greater China	857	32,271,290	2,498,311	131	9,843,666	866,764
	Japan	326	14,451,324	1,110,661	84	4,981,250	451,196
	South Korea	245	9,881,359	762,819	39	3,483,674	316,568
	Other Asia	529	13,084,849	961,141	45	2,060,360	184,538
	United States	89	1,977,114	145,363	1	63,300	4,860
	Canada	2	16,657	1,342	0	0	0
	Latin America & Caribbean	146	5,151,926	388,334	20	1,462,096	132,724
	Middle East & Africa	229	7,851,031	576,010	63	5,216,203	449,032
	Unknown	112	1,147,125	83,505	85	2,235,287	174,715
<b>Total Container</b>		<b>4,684</b>	<b>165,774,103</b>	<b>12,510,820</b>	<b>1,082</b>	<b>63,755,615</b>	<b>5,506,120</b>
<b>Vehicle</b>	European Union	119	2,461,381	571,640	78	1,404,885	420,201
	Other Europe	164	2,653,173	764,238	29	399,520	153,827
	Greater China	49	484,134	143,341	33	537,726	162,924
	Japan	368	5,063,649	1,497,799	34	481,450	165,678
	South Korea	16	168,908	31,567	5	61,420	31,670
	Other Asia	10	52,466	10,531	1	17,250	5,309
	United States	10	183,887	49,788	2	42,400	12,000
	Canada	0	0	0	0	0	0
	Latin America & Caribbean	3	43,475	14,006	0	0	0
	Middle East & Africa	12	100,242	29,298	0	0	0
	Unknown	22	164,376	56,348	32	595,050	183,738
<b>Total Vehicle</b>		<b>773</b>	<b>11,375,691</b>	<b>3,168,556</b>	<b>214</b>	<b>3,539,701</b>	<b>1,135,347</b>
<b>Ro-Ro</b>	European Union	352	3,429,781	595,003	30	450,528	98,274
	Other Europe	107	640,984	126,979	12	89,444	22,090
	Greater China	25	165,381	25,214	6	68,144	22,626
	Japan	94	610,843	90,298	0	0	0
	South Korea	11	74,909	10,227	0	0	0
	Other Asia	230	288,091	36,300	10	29,797	8,066
	United States	80	846,057	152,911	0	0	0
	Canada	8	62,693	9,226	0	0	0
	Latin America & Caribbean	33	104,264	20,106	5	26,325	10,780
	Middle East & Africa	169	499,640	75,966	3	13,270	2,159
	Unknown	644	700,597	93,452	19	137,168	13,004
<b>Total Ro-Ro</b>		<b>1,753</b>	<b>7,423,240</b>	<b>1,235,682</b>	<b>85</b>	<b>814,676</b>	<b>176,999</b>
<b>Total Liner</b>	European Union	2,112	64,641,039		654	28,930,019	
	Other Europe	779	24,485,708		109	7,824,137	
	Greater China	931	32,920,805		170	10,449,536	
	Japan	788	20,125,816		118	5,462,700	
	South Korea	272	10,125,176		44	3,545,094	
	Other Asia	769	13,425,406		56	2,107,407	
	United States	179	3,007,058		3	105,700	
	Canada	10	79,350		0	0	
	Latin America & Caribbean	182	5,299,665		25	1,488,421	
	Middle East & Africa	410	8,450,913		66	5,229,473	
	Unknown	778	2,012,098		136	2,967,505	
<b>Total Liner</b>		<b>7,210</b>	<b>184,573,034</b>		<b>1,381</b>	<b>68,109,992</b>	

Note: Unknown refers to liner vessels the nationality of whose operator is not recorded in the registry.

Source: Lloyd's Register – Fairplay Research

Table 11 provides an overview of the current fleet size for countries in the European Union – the largest regional participant in the liner industry. With almost 600 liner vessels each, Denmark and Germany are the leading participants in the European Union liner industry and account for 55 percent of the Union's liner fleet. France operates more than 300 liner vessels; where as all other member states operate less than 100 vessels. Sweden is the major operator of vehicle vessels, accounting for more than 55 percent of the total European Union vehicle fleet. However, the European Union operates much fewer vehicle vessels than Japan does alone. Ro-Ro operations are spread fairly evenly through out the European Union.

**Table 11: European Union Liner Fleet, July 2009**

Operator Country	Container			Vehicle			Ro-Ro			Total	
	Vessels	Dwt	TEU	Vessels	Dwt	CEU	Vessels	Dwt	CEU	Vessels	Dwt
Austria	1	12,167	754							1	12,167
Belgium	44	431,422	34,921				28	245,588	56,775	72	677,010
Bulgaria	3	42,713	2,280				2	20,871	2,178	5	63,584
Cyprus	37	738,066	53,088				2	17,684	2,975	39	755,750
Denmark	529	25,873,255	1,902,981	1	15,880	6,545	39	375,452	86,856	569	26,264,587
Estonia	3	14,954	1,262				3	6,565	925	6	21,519
Finland	11	112,803	8,748				30	231,100	47,487	41	343,903
France	296	12,011,547	938,591				17	213,155	33,732	313	12,224,702
Germany	553	17,177,137	1,302,190				30	251,013	23,383	583	17,428,150
Greece	30	605,565	42,526	15	123,524	38,818	38	203,600	38,212	83	932,689
Irish Republic	9	52,801	4,491	1	1,275	568	2	13,511	2,925	12	67,587
Italy	18	359,898	23,385	28	587,341	109,594	41	749,663	90,630	87	1,696,902
Latvia							2	6,332	1,449	2	6,332
Lithuania	1	13,729	1,080							1	13,729
Netherlands	43	628,658	48,784	2	36,074	10,378	37	418,600	77,118	82	1,083,332
Poland	1	9,238	750				6	44,766	8,127	7	54,004
Portugal	3	31,246	2,123				1	3,570	870	4	34,816
Romania	4	21,740	1,133				2	8,065	1,776	6	29,805
Spain	17	236,242	15,076	6	21,773	7,005	14	80,121	19,750	37	338,136
Sweden	2	19,071	1,618	66	1,675,514	398,732	28	345,762	59,052	96	2,040,347
United Kingdom	36	357,625	28,800				30	194,363	40,783	66	551,988
<b>Total</b>	<b>1,641</b>	<b>58,749,877</b>	<b>4,414,581</b>	<b>119</b>	<b>2,461,381</b>	<b>571,640</b>	<b>352</b>	<b>3,429,781</b>	<b>595,003</b>	<b>2,112</b>	<b>64,641,039</b>

Source: Lloyd's Register – Fairplay Research

Note: The table captures countries in the European Union that have a registered operator of a liner vessel. Countries not listed have no liner vessel operators registered in them.

Table 12 ranks the top twenty countries by the size of their current liner fleet and by the number of vessels they have on order. China is currently the leading operator of liner vessels with 11 percent of the global liner fleet and 15 percent of its capacity. It is followed closely by Japan, with 788 liner vessels. Denmark, which ranks fifth by the fleet count, operates the second largest fleet by capacity. Germany is the largest European Union operator of liner vessels and the country with the most vessels on-order world-wide. By the current order-book, Germany will operate only two fewer vessels than China by the time the orders are completed.

**Table 12: Top Twenty Countries by Existing Fleet and Vessels On-Order, July 2009**

Rank	Existing Fleet			On-Order		
	Operator Country	Vessels	Dwt	Operator Country	Vessels	Dwt
1	China	804	27,906,667	Germany	355	14,103,350
2	Japan	788	20,125,816	Unknown*	136	2,967,505
3	Unknown*	778	2,012,098	China	126	8,626,542
4	Germany	583	17,428,150	Japan	118	5,462,700
5	Denmark	569	26,264,587	Denmark	63	4,609,064
6	Switzerland	387	19,617,726	France	59	5,338,548
7	France	313	12,224,702	Greece	56	2,252,062
8	Singapore	291	9,409,744	Switzerland	46	6,780,960
9	South Korea	272	10,125,176	Hong Kong S.A.R., China	44	1,822,994
10	Indonesia	196	999,769	South Korea	44	3,545,094
11	Norway	186	2,783,435	Netherlands	37	564,490
12	United States	179	3,007,058	Norway	37	442,420
13	Hong Kong S.A.R., China	127	5,014,138	Singapore	37	1,887,087
14	Chile	119	4,515,680	Israel	30	2,873,349
15	United Arab Emirates	106	1,001,431	Cyprus	27	720,900
16	Israel	104	3,739,350	Turkey	22	452,144
17	Sweden	96	2,040,347	Belgium	18	550,771
18	Turkey	94	1,088,073	Italy	18	334,497
19	Malaysia	89	1,088,152	Kuwait	17	1,781,100
20	Italy	87	1,696,902	Sweden	12	289,120
	Other	1,042	12,484,033	Other	79	2,705,295
	<b>Total</b>	<b>7,210</b>	<b>184,573,034</b>		<b>1,381</b>	<b>68,109,992</b>

Source: Lloyd's Register – Fairplay Research

\* Note: The identity of an operator is unknown because the vessel is on the order book without an assigned operator or the vessel is not currently in service. In addition, operator data is incomplete on operators with small fleets of one or two ships and on some operators from select developing countries.

### Shipbuilding

Many maritime nations participate in liner vessel operations, with larger nations tending to operate larger fleets. Shipbuilding, however, is more concentrated among a few countries - particularly South Korea and Japan - with highly developed shipyards. Shipbuilding is an important component of the liner industry, and it generates many skilled jobs and revenues.

A total of 532 container and Ro-Ro vessels were delivered in 2007. In Table 13 below are the details. South Korea delivered approximately 48 percent of new liner capacity in 2007 and Japan delivered

another 18 percent. The table also demonstrates that South Korea's dominance in shipbuilding has slowly eroded over the last three years, as its market share declined from 54 percent to 43 percent between 2006 and 2008. The main beneficiary has been China, whose market share increased from less than 10 to more than 20 percent in the same time period. Indonesia and Malaysia deliver dozens of smaller vessels, with less than one thousand gross-tons of capacity.

**Table 13: Deliveries of Container and Ro-Ro Vessels by Builder Country, 2006-2008**

Builder Country	2006			2007			2008		
	No.	1,000gt	%	No.	1,000gt	%	No.	1,000gt	%
South Korea	149	9,378	54.3%	151	8,314	47.5%	148	8,794	43.4%
Japan	63	2,776	16.1%	72	3,179	18.2%	86	4,137	20.4%
China	95	1,690	9.8%	124	2,262	12.9%	164	3,676	18.1%
Germany	47	991	5.7%	53	1,085	6.2%	52	1,015	5.0%
Denmark	4	537	3.1%	5	854	4.9%	6	572	2.8%
Taiwan, China	13	467	2.7%	14	462	2.6%	14	614	3.0%
Poland	24	784	4.5%	13	460	2.6%	13	516	2.5%
Croatia	5	138	0.8%	6	273	1.6%	5	211	1.0%
Romania	7	181	1.0%	7	203	1.2%	7	307	1.5%
Philippines	1	1	0.0%	3	155	0.9%	6	146	0.7%
Turkey	4	41	0.2%	7	70	0.4%	9	120	0.6%
Singapore	4	112	0.6%	3	48	0.3%	5	92	0.5%
Spain				3	36	0.2%	4	54	0.3%
Netherlands	6	47	0.3%	3	32	0.2%			0.0%
Indonesia	36	18	0.1%	33	18	0.1%	21	11	0.1%
Malaysia	10	7	0.0%	11	10	0.1%	7	7	0.0%
Iran	7	4	0.0%	13	7	0.0%	3	1	0.0%
Egypt				1	7	0.0%			
Ukraine	3	27	0.2%	1	6	0.0%			
Thailand				1	3	0.0%			
United Arab Emirates				3	2	0.0%			
North Korea	2	1	0.0%	2	1	0.0%			
India				1	1	0.0%	1	1	0.0%
United States	4	31	0.2%	2	1	0.0%	1	0	
Finland	1	23	0.1%						
Italy	1	28	0.2%						
Norway							1	3	0.0%
United Kingdom	1	2	0.0%						
<b>Total</b>	<b>487</b>	<b>17,284</b>	<b>100%</b>	<b>532</b>	<b>17,489</b>	<b>100%</b>	<b>553</b>	<b>20,277</b>	<b>100%</b>

Source: Lloyd's Register – Fairplay Research

### **Vessel Purchase Prices**

While it is not possible to determine the current book value of the liner fleet from available sources, one can measure the amount of capital originally invested in liner vessels. Cumulatively, more than US\$ 236 billion has been spent on the purchase of new liner vessels through July of 2009. This number does not include the amount spent on second-hand sales and or on vessel upgrades or necessary maintenance and repair. Cumulatively, European operators have spent the most on liner vessels, more than US\$ 105 billion or 45 percent of total purchases of liner vessels, as shown in

Table 14. This reflects the historical dominance and a continued strong presence of Europe in liner shipping. Greater China however is the second largest cumulative spender on liner vessels, with 15 percent of total spending, although most of its purchases have been more recent than Europe's.

**Table 14: Cumulative Spending on Liner Vessels by Operating Region through 2009**  
(Million US Dollars)

Operating Region	Container	Vehicle	Other Ro-Ro	Total
South Korea	11,309	299	224	11,832
Japan	15,300	16,760	2,206	34,266
Greater China	33,981	2,351	334	36,665
Other Asia	648	0	164	812
Middle East	8,913	179	1,009	10,101
South East Asia	14,969	164	918	16,050
Europe	82,365	13,882	9,433	105,681
Russia	980	15	365	1,360
Turkey	1,165	14	1,295	2,474
North America	3,298	497	1,938	5,733
South America	5,591	203	59	5,854
Rest of World	68	8	309	386
Unknown	2,083	498	2,268	4,849
<b>Total</b>	<b>180,671</b>	<b>34,869</b>	<b>20,523</b>	<b>236,062</b>

Source: Lloyd's Register – Fairplay Research

Note: Europe in Tables 14 and 15 includes all European countries, as listed in Appendix B, except Russia and Turkey, which are listed separately. .

Table 15 combines the cumulative recipients of spending on liner vessels. As expected, South Korea, the leading shipbuilding country, has received more than US\$ 76 billion or 32 percent of the total. Europe is ranked next at 27 percent, reflecting its historic presence in shipbuilding, although many of its yards have been losing competitiveness and market share. Japan does not lag far behind Europe, with a cumulative market share of 25 percent. The United States no longer has a major international commercial liner vessel building industry.

**Table 15: Cumulative Receipts from Sales of Liner Vessels by Region of Build as of July, 2009**  
(Million US Dollars)

Building Region	Container	Vehicle	Other Ro-Ro	Total
South Korea	69,781	6,087	377	76,244
Japan	34,033	21,061	4,326	59,421
Greater China	26,513	996	974	28,483
Other Asia	10	0	80	90
Middle East	0	0	278	278
South East Asia	1,567	426	1,857	3,850
Europe	45,771	6,221	11,151	63,144
Russia	26	0	298	323
Turkey	1,124	0	79	1,203
North America	1,597	78	773	2,447
South America	202	0	223	425
Rest of World	46	0	107	153
<b>Total</b>	<b>180,671</b>	<b>34,869</b>	<b>20,523</b>	<b>236,062</b>

Source: Lloyd's Register – Fairplay Research

## LINER FLEET OPERATIONS

This section of the report provides information on the operations of the liner industry. These statistics are useful for understanding the scope of liner operations. For example, over 200 services, most weekly, were provided to connect Europe, including the Mediterranean, with the rest of the world.

### Liner Services

The liner industry offers transport between all major container ports world-wide. Inland countries in turn utilize the container ports of their maritime neighbors in order to participate in international trade.

Table 16 demonstrates the number of services, or unique ship schedules and routes, provided by the liner industry as of July 1, 2007. There were 409 services provided by the industry in mid-2007. It is important to note that the industry frequently modifies its services in order to respond to changing market forces and the needs of its customers. Together, the 209 liner services covering North Europe and the Mediterranean make up more than half of all liner services, with services on Europe's routes with Asia accounting for 78 services alone.

**Table 16: Number of Service and Annual Capacity Deployed by Route, as of July 1, 2007**

Route	Services
West Coast of North America – Asia	74
East Coast of North America – Asia	24
North America - Northern Europe	36
North America – Mediterranean	23
Asia - North Europe	35
Asia – Mediterranean	43
North America - East Coast of South America	11
North America - West Coast of South America	16
North America - North Coast of South America	22
Europe - East Coast of South America	14
Europe - West Coast of South America	6
Europe - North Coast of South America	13
Asia - East Coast of South America	6
Asia - West Coast of South America	7
South Africa – Europe	6
South Africa - North America	3
South Africa – Asia	21
West Africa – Europe	33
West Africa - North America	3
West Africa – Asia	13
<b>Total</b>	<b>409</b>

*Notes: Services may be counted on more than one route.*

*"Asia" includes Australia and New Zealand.*

*Sources: ComPair Data, World Line Supply Report Summary, July 2007; Drewry Annual Container Market Review and Forecast - 2007/08.*

## PORT EXPENDITURES AND OPERATIONS

The on-shore portion of the liner industry includes container and Ro-Ro terminals, container handling equipment such as cranes and chassis, as well as all the workers needed to load and unload containers and vehicles and to deliver goods to their final destinations. All this equipment, as well as containers themselves, require constant expenditure to manufacture, maintain and operate. The liner industry thus generates economic activity and employment not just from vessel construction and operations but also from the thousands of companies that participate in equipping and operating ports and the inland portion of the distribution of liner goods.

This section of the report thus quantifies the available data on expenditures at ports and on liner industry equipment. Only limited data was available on an aggregated global or regional basis. Company and port annual reports were also reviewed in order to highlight activity for select ports, equipment types and companies.

Throughput at the top twenty global liner ports reached nearly 236 million TEU in 2007. Globally, there were more than 17.8 million containers in the world fleet in mid-2008, costing about US\$ 80.1 billion.

### **Throughput at Liner Ports**

Throughput at liner ports is another important indicator of liner industry activity. Though it was not possible to estimate the throughput at every liner port, throughput at the top 20 global ports is presented in Table 17 below. By definition however, global port volumes must exceed the sum of import and export TEU, since both the exporting and importing port will count the containers.

Table 17 has the top 20 world container ports ranked by 2008 TEU. Throughput at the top 20 ports reached almost 250 million TEU in 2008, compared to nearly 236 million TEU in 2007. These rankings demonstrate the dominance of Asian ports in container trade. In particular, the throughput at the ports of Ningbo and Guangzhou in China has been growing rapidly. These ports now rank seventh and eighth and have overtaken Rotterdam. Kaohsiung and the ports of Los Angeles and Long Beach in the United States were particularly affected by the global downturn that started in 2008.

**Table 17: Top 20 World Ports by 2008 Throughput**

Rank	Port Name	Country	2007 TEU	2008 TEU
1	Singapore	Singapore	27,932,000	29,918,200
2	Shanghai	China	26,168,000	27,980,000
3	Hong Kong	China	23,881,000	24,248,000
4	Shenzhen	China	21,099,000	21,413,888
5	Busan	South Korea	13,270,000	13,425,000
6	Dubai	United Arab Emirates	10,653,026	11,827,299
7	Ningbo	China	9,349,000	11,226,000
8	Guangzhou	China	9,200,000	11,001,300
9	Rotterdam	Netherlands	10,790,604	10,783,825
10	Qingdao	China	9,462,000	10,320,000
11	Hamburg	Germany	9,889,792	9,737,110
12	Kaohsiung	Taiwan, China	10,256,829	9,676,554
13	Antwerp	Belgium	8,175,951	8,662,890
14	Tianjin	China	7,103,000	8,500,000
15	Port Kelang	Malaysia	7,120,000	7,970,000
16	Los Angeles	United States	8,355,039	7,849,985
17	Long Beach	United States	7,312,465	6,487,816
18	Tanjung Pelepas	Malaysia	5,500,000	5,600,000
19	Bremerhaven	Germany	4,912,177	5,529,159
20	New York & New Jersey	United States	5,299,105	5,265,053

Source: Lloyd Register-Fairplay Research

Table 18 presents data for container ports in the European Union that publicly report data. The port of Rotterdam is the largest container port in Europe, with more than 10 million TEU handled in 2008. It is closely followed by the ports of Hamburg and Antwerp.

**Table 18: Throughput at Select Container Ports in the European Union, 2007- 2008**

Country	Port Name	2007 TEU	2008 TEU
Belgium	Antwerp	8,175,951	8,662,890
Belgium	Zeebrugge	2,020,723	2,209,665
Denmark	Aarhus	504,000	458,000
Denmark	Copenhagen	192,000	n/a
Estonia	Tallinn	180,911	180,927
Finland	Helsinki	435,000	428,000
Finland	Kotka	570,881	627,765
Finland	Hamina	195,292	178,804
Finland	Rauma	174,531	172,155
Finland	Pori	34,415	n/a
Finland	Turku	21,983	22,736
France	Le Havre	2,638,000	2,500,000
France	Marseilles	1,001,957	847,651
France	Dunkirk	197,000	215,000
Germany	Hamburg	9,889,792	9,737,110
Germany	Bremerhaven	4,912,177	5,529,159
Germany	Lubeck	205,338	n/a
Germany	Cuxhaven	63,808	63,271
Germany	Kiel	20,064	12,860
Germany	Emden	51	n/a
Greece	Piraeus	1,373,138	431,000
Italy	Gioia Tauro	3,445,337	3,467,772
Italy	Genoa	1,855,026	1,766,605
Italy	La Spezia	1,187,040	1,246,139
Italy	Livorno	745,557	n/a
Italy	Naples	460,812	481,521
Italy	Taranto	756,000	786,655
Italy	Venice	328,000	379,072
Italy	Trieste	267,854	335,943
Latvia	Riga	211,840	207,122
Latvia	Ventspils	16,846	14,148
Latvia	Liepaja	7,665	4,227
Lithuania	Klaipeda	321,432	373,263
Malta	Marsaxlokk	1,887,405	2,300,000
Netherlands	Rotterdam	10,790,604	10,783,825
Netherlands	Amsterdam	370,000	435,129
Poland	Gdynia	614,373	610,767
Poland	Szczecin	47,976	62,913
Poland	Gdansk	96,873	163,704
Portugal	Lisbon	554,774	556,062
Romania	Constantza	1,411,370	1,380,935
Slovenia	Koper	305,648	350,000
Spain	Algeciras	3,414,345	3,324,310
Spain	Valencia	2,771,851	3,593,000
Spain	Barcelona	2,610,099	2,569,547
Sweden	Gothenburg	840,550	862,500

Continued...

Country	Port Name	2007 TEU	2008 TEU
Sweden	Helsingborg	300,000	240,000
Sweden	Stockholm	44,563	41,000
United Kingdom	Felixstowe	3,300,000	3,200,000
United Kingdom	Southampton	1,900,000	1,710,000
United Kingdom	Tilbury	843,808	n/a
United Kingdom	Liverpool (United Kingdom)	727,363	n/a
United Kingdom	Thamesport	800,000	n/a

Source: Lloyd's Register- Fairplay Research

### Expenditures by Terminal Operators

Although it is not possible to determine the precise amount of the total investment in liner ports worldwide, we know that the investment levels are on the order of several billion dollars per year. Example investment levels of the top private terminal operating companies (see Table 19) have been over US\$ 2.6 billion to almost US\$ 4 billion per year for the last two years. In 2007, these terminal operators held a market share of about 37 percent so their investment of approximately US \$2.6 billion in property, plant, equipment and other capital, if extended to the rest of the liner market would have been over US\$ 7 billion in 2007 and over US\$ 10.5 in 2008 alone. Although a portion of these investments are in non-liner terminal facilities, it is a conservative assumption that most of the billions of dollars are invested annually in liner port facilities worldwide.

**Table 19: Investment by Terminal Operators, 2007-2008**  
(Million US Dollars)

Operator	Cash Flow Use	2007 Market Share	2007	2008
APM Terminals	Capital Expenditures	12.1%	853	723
PSA	Property, Plant, Equipment	11.0%	1,086	1,313
DP World	Expansions, Maintenance, New Projects	8.7%	N.A.	1,397
COSCO Pacific	Property, Plant, Equipment	5.5%	683	522
<b>Total</b>		<b>37.3%</b>	<b>2,622</b>	<b>3,955</b>

Sources: Company Annual Reports; Drewry Shipping Consultant Limited, 2008.

### Container Fleet

Globally, in mid-2008 there were 17.8 million containers in the world fleet providing 27.3 million TEU of capacity, and which cost the industry almost \$81 billion. This was an increase from about 24.8 million TEU of capacity the previous year. Europe accounts for the largest container fleet at 6.9 million units or nearly 39 percent of the total fleet. North East Asian and North American owners account for nearly the rest of the global fleet, reflecting the location of company headquarters that own the containers, not the deployment of the containers which move throughout the world.

**Table 20: Container Fleet by Region, Mid-2008**

Region	TEU	TEU Share	Units	Unit Share	Cost (US\$ million)	Cost Share
Europe	10,427,987	38.1%	6,917,319	38.7%	36,365	44.9%
North East Asia	7,674,963	28.1%	4,990,588	28.0%	19,588	24.2%
North America	7,648,952	28.0%	4,823,997	27.0%	20,698	25.6%
Middle-East & Indian Sub-Continent	926,730	3.4%	609,693	3.4%	2,285	2.8%
South East Asia	477,371	1.7%	362,561	2.0%	1,267	1.6%
Australia & New Zealand	86,210	0.3%	73,751	0.4%	383	0.5%
Central & South America & Caribbean	64,670	0.2%	41,987	0.2%	232	0.3%
Africa	36,834	0.1%	32,656	0.2%	98	0.1%
<b>Total</b>	<b>27,343,717</b>	<b>100.0%</b>	<b>17,852,552</b>	<b>100.0%</b>	<b>80,916</b>	<b>100.0%</b>

Note: Includes containers specific to regional standards.

Source: Containerisation International Market Analysis: World Container Census 2009, Table 8.

The volume of container handling world-wide is measured from several perspectives. When all measures of container handling are combined, the total world container handling activity in 2007 was almost half a billion twenty-foot equivalent units (497 million TEU). This included movements of over 224 million loaded and empty TEU between the ports of the world, and 137 million TEU of transshipment activity.<sup>7</sup> This type of container handling at ports can be considered essential to the efficient operations of the industry and it takes resources at the terminals to provide, so ports appropriately count this activity as well.

**Table 21: Container Handling and Transshipment, Million TEU, 2007**

	PORT TO PORT	TRANSHIPMENT	PORT HANDLING	TOTAL
<b>Loaded</b>	120.3	108.4	86.0	314.7
<b>Empty</b>	104.2	28.6	49.9	182.7
<b>Total</b>	224.5	137.0	135.9	497.4

Source: IHS Global Insight Analysis and the IHS Global Insight World Trade Service.

<sup>7</sup> The three metrics each have their purpose for measurement of container handling activity. Most fundamentally is the port-to-port movement of loaded containers carrying goods that shippers are paying to have moved. This is from the perspective of a shipper or customs authorities who are concerned with the ultimate origin and destination for the delivery of the goods. Operational efficiency of the liner system is improved through the use of transshipment where containers are transferred during their journey between vessels at an intermediate port. The transshipment activity is valuable to the operators and ports that provide this service and counting this activity is another measure of container handling provided by the liner industry. At container port terminals there are often operational needs to move containers on and off ships and within terminals not just one time at the original port of loading or discharge for each leg of a container's journey. This can include when containers need to be unloaded temporarily from a ship in order for other containers to be accessible or for reloading of containers onboard vessels for stability or access at a subsequent port call. This can be thought of as additional port handling of containers.

**Table 22: Empty Container Handling and Transshipment in Western Europe (Million TEU) 2007**

	EMPTY	TRANSHIPMENT	LOADED	TOTAL PORT HANDLING
North Europe	11.090	13.276	31.374	55.740
South Europe	8.224	15.525	11.569	35.318
<b>Total</b>	19.314	28.801	42.943	91.058

*Source: Drewry Shipping Consultants Ltd, Annual Container Market Review and Forecast – 2009/10, October 2009*

Almost one-third of the total port handling in Western Europe is attributable to transshipment. Globally, approximately 6 percent of empty movements are empty-transshipment movements. Applying that ratio to Western Europe results in an estimated 1.15 million TEU of empty containers that are transhipped.

### **Other Liner Industry Equipment**

Aside from containers, the industry relies on numerous types of on-board and port terminal equipment to handle liner cargo. One of the most complex and expensive types of equipment are the ship-to-shore gantry cranes. Comprehensive public data on the world inventory of port cranes and their associated costs is unavailable, but ports do invest millions of dollars in cranes in most years. The largest container port alone, the Port of Singapore, has 190 cranes. The port of Shanghai and the port of Rotterdam each have just over 100 cranes. The ports of Los Angeles and Long Beach each have about 70 cranes. A typical new state-of-the-art crane cost about US\$ 10 million in 2007 to provide some perspective on the value of these equipment investments. As the containerization of cargo continues to spread world-wide, investment in such equipment is sure to accelerate.

## **Summary**

The liner industry has been essential to the facilitation and expansion of world trade, contributing to global economic growth and improvements in the standard of living in both developed and developing countries. This report provides an overview of various economic, trade, and operating metrics that demonstrate the value of the liner industry to specific regional and individual country economies as well as the world as a whole.

This report confirms the industry's profound global economic impact and its particular importance in the European Union. Globally, the full value of the liner industry operations and shipbuilding in 2007 is estimated to be US\$ 436.3 billion, and generated 13.5 million direct and related jobs. In the European Union, the liner industry is directly producing US \$65.2 billion in gross output and almost one-quarter million jobs.

The liner industry is the largest sector of the maritime industry when measuring the value of world trade transported, moving about 60 percent of global seaborne trade. This was over US\$ 4.3 trillion of goods in 2007 alone. In the European Union, the liner industry transported more than 65 percent of the EU's seaborne trade by value worth over US\$ 1.6 trillion and representing just less than 16 percent of all EU trade by value. The liner industry draws significant investment in capacity, using over 7,000 vessels that cost the industry initially over US\$ 235 billion to acquire, almost half of which was invested by European companies. Additionally, another US\$ 80 billion was spent to equip the vessels with containers in which to move cargo. Europe accounts for the largest container fleet at 6.9 million units or nearly 39 percent of the total fleet. Landside terminals represent additional billions of capital

investment from the industry. The liner industry incurs operating costs that produce output valued at US\$ 142 billion annually which makes the extensive capital investments available and useful to shippers worldwide for the transportation services they need.

Using the existing metrics available to economists, the estimates of the value of the industry to the world economy understate the importance of the liner industry to the daily lives of most of the world's population. Without the efficient facilitation of trade provided by the liner industry, the standard of living of most families and the financial health of most retail, wholesale, manufacturing and services businesses would be reduced.

## Appendix A: World Industry Service Methodology

IHS Global Insight's World Industry Service (WIS) includes both historic and forecast economic data covering 95 industries in 75 countries.

### DATA SOURCES

The basic data in World Industry Service is taken from public sources; but is then processed extensively and filled out using established techniques.

The initial set of industry-based data is drawn from complementary primary public sources:

- *Industrial Structure Statistics*, from the OECD-STAN database;
- *International Yearbook of Industrial Statistics*, from the United Nations Industrial Development Organization (UNIDO) ;
- *National Accounts Statistics: Main Aggregates and Detailed Tables*, from the United Nations System of National Accounts (UNSNA) ;
- *Yearbook of Labour Statistics*, from the International Labour Organization (ILO) ;
- *Structural Business Statistics*, from Eurostat database.

The number of countries whose industry data is included in the OECD database is restricted to members of the OECD organization. Fortunately, these countries are also the largest countries economically in the world and include the United States, Japan, Germany, France, and others. For those countries whose data is not included in the OECD database, and also for those industries whose coverage in STAN is not detailed enough, WIS uses a combination of UNSNA and UNIDO databases. The data from these organizations have the desirable attributes of fine detail, consistency, and comparability. ILO and Eurostat are also used as specific complementary sources of data. Finally, both the UN- and OECD-supplied data are supplemented by individual country sources.

Thus, the historical dataset in World Industry Service is built like a pyramid with three layers:

- The bottom layer is the UNSNA and UNIDO data, which provides the baseline for data for all countries and all sectors;
- The next layer up is the OECD data, which replaces UN data in those countries/industries where there is overlap ;
- Finally, the top layer represents data that comes from individual country sources, or from global trade associations and other specific data sources. These “specific-sourced” data are used to bring the OECD and UN data forward in time to provide a timely “now-cast” snapshot of the latest available measures of industry-level business activity.

Note that employment and labor compensation data is taken directly from UNIDO statistics, and is not processed or modified in any way.

## WATER TRANSPORT AND SHIPBUILDING SECTORS

In order to determine appropriate economic values for the liner industry, this report concentrated on two industries within WIS: water transport and shipbuilding.

- **Water Transport:** defined as International Standard of Industrial Classification (ISIC) code 61 (Water Transport). This category includes sea, coastal and inland water transport. Included is transport of passengers or freight over water, whether in scheduled service or not. Also included are the operation of towing or pushing boats, excursion, cruise or sightseeing boats, ferries, and water taxis. The category requires transport service be provided to be included by definition. Therefore excluded are restaurant and bar activities on board ships, except when delivered as an integral part of transportation. Also excluded are landside cargo handling, storage of freight, plus harbor operation and other auxiliary maritime activities such as docking, lightage and vessel salvage that are not directly transportation services.
- **Shipbuilding:** defined as ISIC code 351 (Building and Repairing of Ships and Boats). This category includes the manufacturing, repairing, overhaul and the manufacturing of sections for the following type of commercial vessels and floating structures: vessels used in commerce, in pursuits related to commerce or in the carriage of passengers including multi-purpose vessels; vessels designed for ocean, coastal or inland waters; passenger vessels, fishing boats and fish processing factory vessels; tugs and pusher craft; non-motorized vessels such as barges, stationary vessels such as light-ships; non-navigational vessels such as dredgers, floating docks, and floating or submersible drilling platforms; hovercraft; boats with hulls resembling pleasure boats but specially equipped for commercial service or services related to commerce; warships and auxiliary naval vessels; vessels for scientific investigation; floating structures such as pontoons, non-recreational inflatable rafts; cofferdams, landing stages, buoys, floating tanks and others.

Also included are the manufacturing, maintenance and repair of the following types of non-commercial vessels: yachts, rowing boats, canoes, dories, skiffs, oared life-boats, cutters, kayaks, racing shells, pedalos, rafts, inflatable boats and other pleasure and sporting vessels; pleasure boats designed to accept inboard or outboard motors or to be propelled by wind, paddles or oars; larger boats such as cabin cruisers and sport fisherman.

Excluded are: manufacture of parts of vessels such iron or steel anchors and sails and other parts that are not major hull assemblies; navigational and other instruments used aboard ships; and amphibian motor vehicles.

## LINER INDUSTRY SHARE

The following methodologies were used to extract the liner portion of these industries:

- **Water Transport:** A trade ratio was applied to each country with data in the WIS. The ratio for a given country is the value of liner trade relative to its total seaborne trade. This ratio does not account for passenger and inland water transport that is included in the WIS data, and thus somewhat overstating the liner portion of the water transport industry. At the same time, the water transport industry within WIS excludes important liner industry elements such as cargo handling, storage of freight, docking and other harbor and terminal operations. This means the estimate understates the liner industry because of the other operations it excludes. At this level of detail it is not possible to tell which effect is larger, the inclusion of inland and passenger transport, or the exclusion of port and related land-side operations, though they clearly largely offset each other.

- **Shipbuilding:** Countries that have a shipyard that delivered a liner vessel (container, Ro-Ro or vehicle) in 2007 were identified first. Next, for each country we determined the ratio of the gross-ton capacity of the liner vessels relative to the gross-ton capacity of all shipping vessels delivered by the country in the same year. This ratio was then applied to estimate the liner portion of shipbuilding from the WIS data.

## DEFINITION OF WIS METRICS

WIS was used to derive the amount of Capital Expenditures, Gross Output, Labor Compensation and the number of Employees attributable to the liner industry's shipping services as well as the liner portion of shipbuilding. The following are the definitions of these four metrics:

- **Capital Expenditures:** refers to investments made by establishments operating in the industry during the reference year (2007), net of fixed assets sales. The investments covered are those (whether new or used) with a productive life of one year or more. These assets are intended for the use of the establishments' own labor forces. Major additions, alterations, and improvements to existing assets that extend their normal economic life or raise their productivity are also included.

Capital Expenditures in the liner industry would thus include investment in any type of equipment and vessels used by liner operators. The category would also include machinery and equipment purchased by shipbuilders in order to construct liner vessels. Sales of any equipment are subtracted from the totals.

- **Gross Output:** also called *total sales* or *total production*. This measures the total revenue that is earned by a sector's operating activities. It includes the domestic production that is exported abroad, but excludes imports that are produced abroad. Gross output thus includes all operating expenditures, wages and benefits and company profits.
- **Labor Compensation:** includes both wages and fringe benefits.
- **Number of Employees:** the number of people directly employed by the sector. For this report, this includes employees in liner services and in the construction of liner vessels.

## Appendix B:

### Data Source and Regional Definitions for Liner Trade Data

#### **WORLD TRADE SERVICE (WTS)**

The primary sources for trade data in the WTS database are the United Nations (UN), International Merchandise Trade Statistics, as well as the U.S. Census Bureau, and Port Trade Statistics for all U.S. trade routes. The UN database has data as reported by 160 countries for their trade with over 240 country trade partners. Each reporting country submits both imports and exports data by trade partner country and by commodity. In WTS this data is further analyzed to address inconsistencies in trade reported in opposite directions between trading countries according to a mirror trade ranking system for data quality and reliability by reporting country. The trade data does not include transshipments, nor does it account for military cargo, re-stows, movements of empty equipment or double handling of cargo at ports. The data is defined in terms of the origin country and final destination of the merchandise without regard to routing.

Eurostat<sup>8</sup> data covering the trade of European countries supplements the UN data for trade trends in the current year. A limitation of the Eurostat data is that the trade is reported by country of consignment, where as UN data is organized by country of trade or final destination.

The liner commodities identified in the World Trade Service data consist primarily of container trade. Additionally, trade in detailed commodity categories covering goods shipped in Ro-Ro vessels were analyzed for the liner share of trade. Given the classifications used in reporting we were able to identify the goods shipped by the liner industry.

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<sup>8</sup> Eurostat databases are official merchandise trade statistics of the European Commission.

**Region - European Union**

Austria  
Belgium  
Bulgaria  
Cyprus  
Czech Republic  
Denmark  
Estonia  
Finland  
France  
Germany  
Greece  
Hungary  
Ireland  
Italy  
Latvia  
Lithuania  
Luxembourg  
Malta  
Netherlands  
Poland  
Portugal  
Romania  
Slovak Republic  
Slovenia  
Spain  
Sweden  
United Kingdom

**Region - Greater China**

China, People's Republic of  
Hong Kong, Special  
Administrative Region  
Taiwan, China

**Region - Latin America  
and Caribbean**

Anguilla  
Antigua and Barbuda  
Argentina  
Aruba  
Bahamas  
Barbados  
Belize  
Bermuda  
Bolivia

Brazil  
Caribbean Not Elsewhere  
Specified  
Cayman Islands  
Chile  
Colombia  
Costa Rica  
Cuba  
Dominica  
Dominican Republic  
Ecuador  
El Salvador  
Falkland Islands  
(Malvinas)  
French Southern and  
Antarctic Territories  
Granada  
Guadeloupe  
Guatemala  
Guyana  
Haiti  
Honduras  
Jamaica  
Martinique  
Mexico  
Montserrat  
Netherland Antilles  
Nicaragua  
Other Central America  
Panama  
Paraguay  
Peru  
Rest of South America  
Not  
Elsewhere Specified  
Saint Kitts and Nevis  
Saint Lucia  
Saint Vincent and the  
Grenadines  
Surinam  
Trinidad and Tobago  
Turks and Caicos Islands  
Uruguay  
Venezuela  
Virgin Islands (British)

**Region - Middle East  
and Africa**

Algeria  
Angola  
Bahrain  
Benin  
Burkina Faso  
Burundi  
Cameroon  
Cape Verde  
Central African Republic  
Chad  
Comoros  
Congo  
Congo, Democratic  
Republic of  
Côte d'Ivoire  
Djibouti  
Egypt  
Ethiopia  
Equatorial Guinea  
Gabon  
Gambia  
Gaza (strip)  
Ghana  
Guinea  
Guinea-Bissau  
Israel  
Iran  
Iraq  
Kenya  
Kuwait  
Liberia  
Libyan Arab Jamahiriya  
Madagascar  
Malawi  
Mali  
Mauritania  
Mauritius  
Mayotte  
Morocco  
Mozambique  
Niger  
Nigeria  
North Africa Not Elsewhere  
Specified  
Oman  
Other Africa Not Elsewhere  
Specified  
Qatar

Reunion  
Rwanda  
Saint Helena  
Sao Tome and Principe  
Saudi Arabia  
Senegal  
Seychelles  
Sierra Leone  
Somalia  
South Africa  
Sudan  
Tanzania, United Republic  
of  
Togo  
Tunisia  
Uganda  
United Arab Emirates  
Western Sahara  
Yemen  
Zambia  
Zimbabwe

**Region - Other Asia**

Afghanistan  
Areas Not Elsewhere  
Specified  
Australia  
Bangladesh  
Bhutan  
British Antarctic Territory  
British Indian Ocean  
Territory  
Brunei Darussalam  
Cambodia  
India  
Indonesia  
Fiji  
Free Zones  
French Polynesia  
Kiribati  
Korea, Democratic People's  
Republic of  
Lao People's Democratic  
Republic  
Malaysia  
Maldives  
Micronesia, Federated  
States of

Mongolia  
Myanmar  
Nepal  
Neutral Zone  
New Caledonia  
New Zealand  
Pakistan  
Papua New Guinea  
Philippines  
Pitcairn  
Samoa  
Singapore  
Solomon Islands  
Sri Lanka  
Thailand  
Tuvalu  
Vanuatu  
Vietnam  
Wallis and Futuna Islands

**Region - Other Europe**

Albania  
Andorra  
Armenia  
Azerbaijan  
Belarus  
Bosnia and Herzegovina  
Croatia  
Georgia  
Gibraltar  
Greenland  
Iceland  
Jordan  
Kazakhstan  
Kyrgyzstan  
Lebanon  
Macedonia, Republic of  
Moldova, Republic of  
Montenegro  
Norway  
Other Europe Not  
Elsewhere  
Specified  
Russia  
Serbia  
Switzerland  
Syrian Arab Republic

Tajikistan  
Tonga  
Turkey  
Turkmenistan  
Ukraine  
Uzbekistan

## Appendix C: Data Sources

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### **Port Crane Manufacturers**

Hyundai  
IMPESA  
Kalmar Industries  
Konecranes  
Liebherr Container Cranes  
Mitsubishi Heavy Industries,  
Mitsui  
Paceco  
Samsung  
TCM Corporation  
Zhenhua Port Machinery Company (ZPMC)

***Terminal Operator Websites and 2007 Annual Reports (if Public)***

APM Terminals  
COSCO Pacific, Limited  
DP World  
Eurogate  
Hutchinson Whampoa, Limited  
International Container Terminal Services, Inc.  
Port America  
PSA International  
SSA Marine

***Top 20 Port Websites***

Port of Singapore, Singapore  
Port of Shanghai, China  
Port of Hong Kong, China  
Port of Shenzhen, China  
Port of Yingkou, China  
Port of Busan, South Korea  
Port of Rotterdam, Netherlands  
Port of Dubai, United Arab Emirates  
Port of Koahsiung, Taiwan, China  
Port of Hamburg, Germany  
Port of Qingdao, China  
Port of Ningbo, China  
Port of Guangzhou, China  
Port of Los Angeles, United States  
Port of Antwerp, Belgium  
Port of Long Beach, United States  
Port of Keland, Malaysia  
Port of Tianjin, China  
Port of Tanjung Pelepas, Malaysia  
Port of New York/New Jersey, United States