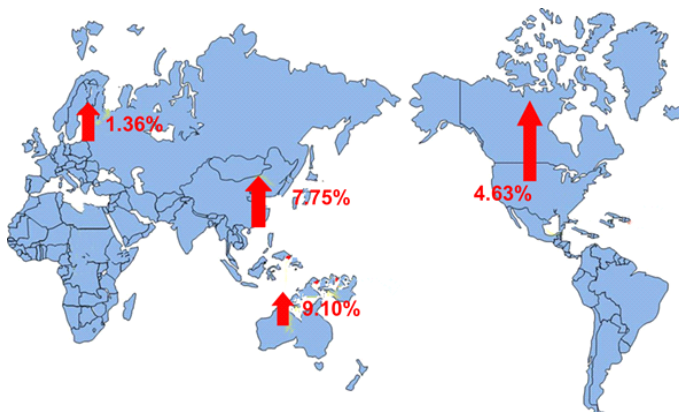


# Global Port Review

Quarter 2 · September 2018

—Global economy remained stable and port production increased sustainably.

## ✧ Growth Rates of Cargo Throughput of Major Ports

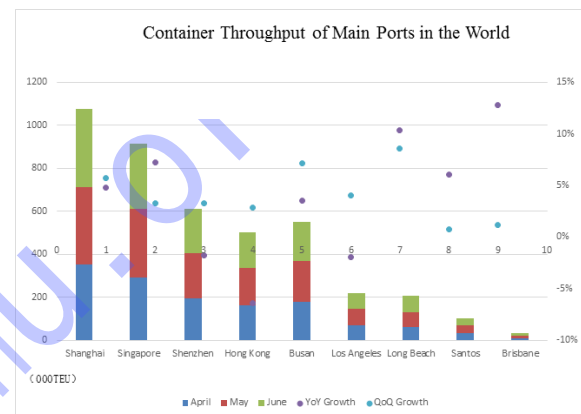


- **Production of global major ports constantly improved.** In the second quarter, the global economic and trade situation continued the good momentum of last year, and kept recovering. The cargo throughput of major ports in the world maintained a stable growth, with a cargo throughput of 3.02 billion tons, up 7.23% year on year. Specifically, the container throughput of global major ports increased 3.5%, which is slightly lower than that of last year.
- **Global terminal operators showed steady development.** In the second quarter, the overall operation of global terminal operators remained stable with a good prospect and the equity throughput of major terminal operators in the world all showed a positive growth trend in varying degrees. Specifically, Chinese terminal operators delivered a sound performance. The quarterly equity throughput of CMPort exceeded 10 million tons, ranking the first among Chinese terminal operators. Foreign terminal operators continued to witness growth, but the growth rate slowed down slightly.

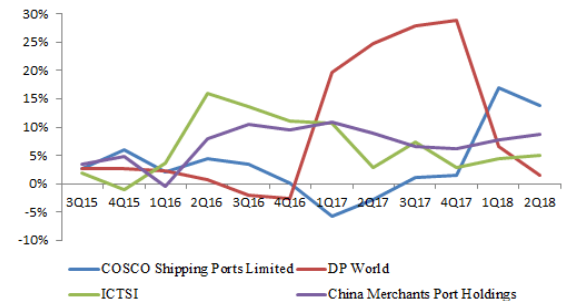
## Topics Inside ▶▶▶

- ‘Midlife Crisis’ of Global Container Port Development
- Pollution Control and Green Development of Ports

## Panorama on Global Ports ▶▶▶



The growth of equity throughputs of major terminal operators in the world



## Side Products ▶▶▶

- Rankings of Global Ports with Greatest Potential
- Comments on comprehensive services of coastal container ports in China

## Port Development Dept.▶▶▶

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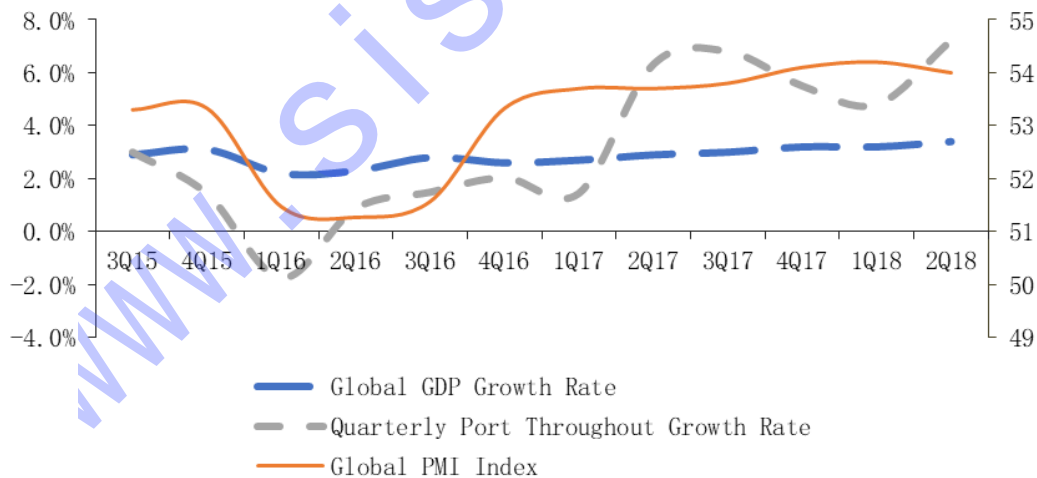
## I . Overview of Global Port Production in Q2

- Cargo throughput of major global ports constantly improved.
- Container throughput of major global ports remained increased.
- Dry bulk throughput of global ports showed an upward trend in general.
- Liquid bulk cargo throughput of global ports grew substantially.

### 1.1 Overview of global port operation

After the world economy pickup in 2017, the global economy continued to maintain a stable growth in the first half of 2018. Major international organizations, such as the International Monetary Fund (IMF) and the World Trade Organization (WTO), have all raised their forecasts of world economy and trade growth. The world economy is expected to grow 3.9% in 2018, and the trade volume 4.4%, which are generally higher than the growth rates in previous years. In this context, the production situation of global ports continued with the upward trend. In the second quarter of 2018, major ports around the world accomplished a cargo throughput of 3.02 billion tons, up 7.23% year on year.

In the second half of the year, the rising uncertainties, especially the intensifying Sino-US trade war, will deal a blow to the global economic development and freight transport demand to some extent. In addition, affected by such adverse factors as the rise of bunker fuel oil prices and Brexit, the global port production will experience great downward pressure.



Note: Left coordinate represents quarterly port throughput growth rate and global GDP growth rate. Right coordinate represents global PMI index.

Source: The website of The Ministry of Transport of People's Republic of China, JPMorgan and China Bank.

**Figure 1-1 Global Economy and Port Throughput Growth Rate in 2015.Q3-2018.Q2**

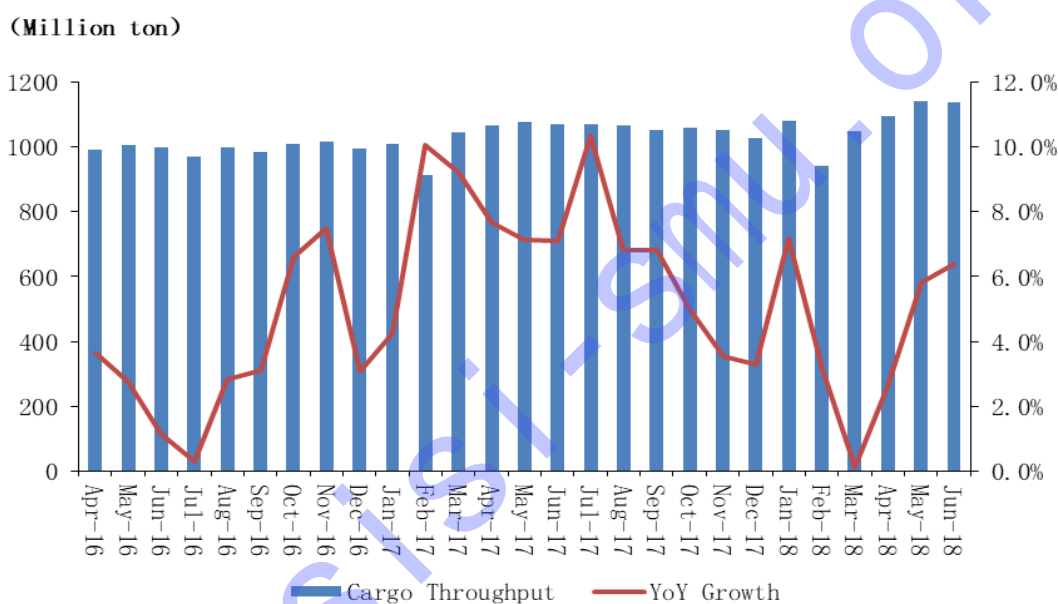
#### 1.1.1 Asian ports saw steady growth

In the second quarter of 2018, the Asian economy improved constantly. The major Asian countries,

such as China, Japan and South Korea, showed a trend of steady growth. The economy of emerging ASEAN countries also developed rapidly, creating new growth poles to the Asian economy. Benefiting from the steady economic growth, major ports in Asia accomplished a cargo throughput of 2.51 billion tons, up 7.75% year on year, maintaining a steady growth compared to the 7% of last year.

- **Growth of cargo throughput of Chinese ports ended higher after falling**

In the second quarter, China's national economy continued to maintain a good momentum amid steady growth. Its GDP went up 6.7% year on year, retail sales of consumer goods increased by 9.5% year on year, and its overall demand for domestic trade registered a growth. The stable development of economy and trade resulted in a steady growth in the overall port production, and the Chinese ports above designated size accomplished a cargo throughput of 3.45 billion tons, up 5.8% year on year.



Source: Websites of Port Authorities, sorted by SISI.

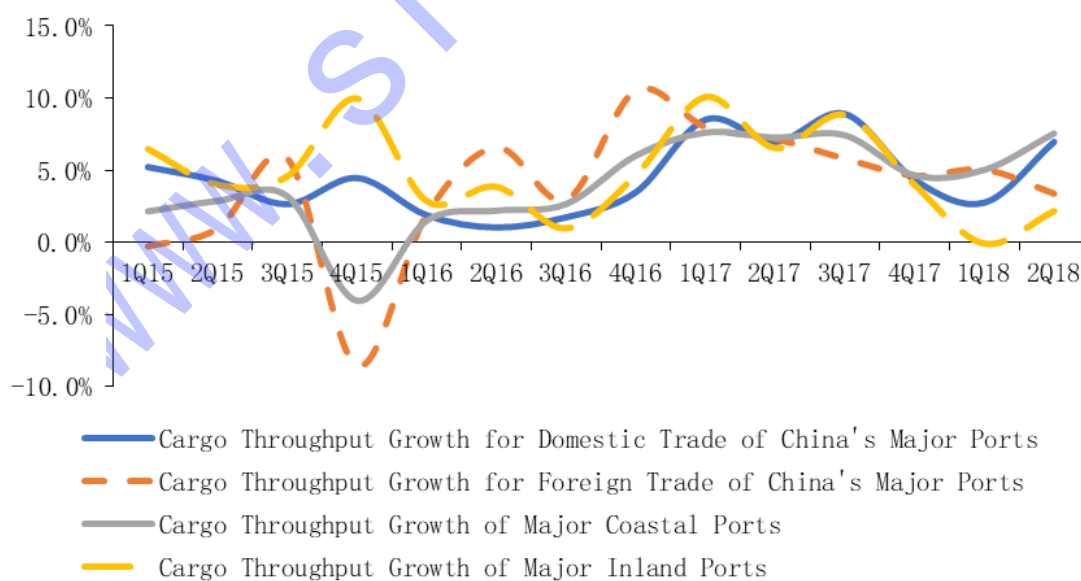
**Figure 1-2 Cargo Throughput and Growth Rate of China's Ports during Apr-16 to Jun-18**

Among major ports, Yantai Port was ahead of other major ports on the Chinese mainland with a growth of 54.2%, and it witness a substantial growth in the key sources of goods, such as bauxite, crude oil, commercial vehicles, containers, and Ro-Ro. In the first half of 2018, it accomplished a bauxite throughput of 55 million tons, maintaining its leading position among the Chinese coastal ports. Ningbo-Zhoushan Port kept developing new shipping routes, and its domestic feeder business grew significantly. It explored the import and export business along the Yangtze River route, which contributed to a steady growth in throughput. In the second quarter of 2018, Ningbo-Zhoushan Port accomplished a cargo throughput of 291.58 million tons, up 7.53% year on year. Its throughput in the first half of 2018 totaled 547.87 million tons, retaining its position as the largest port in the world in terms of cargo throughput. Guangzhou Port kept expanding shipping routes for foreign trade, and saw a strong growth in its foreign trade container business. Benefiting from this, its cargo throughput also maintained a strong momentum

of growth. In the second quarter, it accomplished a cargo throughput of 161.51 million tons, up 10.90% year on year.

**Table 1-1 Rankings of major China's port in terms of cargo throughput in the first half of 2018**

Port Ranking		Port	Cargo Throughput ( Million ton )		YoY Growth
Jan. to Jun.			Jan. to Jun.		
2018	2017		2018	2017	
1	1	Ningbo-Zhoushan	547.87	514.12	6.60%
2	2	Shanghai	360.24	370.13	-2.70%
3	4	Tangshan	301.59	281.95	7.00%
4	5	Guangzhou	298.86	269.82	10.80%
5	3	Suzhou	262.33	310.13	15.40%
6	6	Qingdao	260.42	254.8	2.20%
7	7	Tianjin	240.83	253.03	-4.80%
8	8	Dalian	235.81	230.23	2.40%
9	10	Rizhao	222.79	182.67	22.00%
10	12	Yantai	219.68	142.47	54.20%
11	9	Yingkou	195.13	193.01	1.10%
12	11	Zhanjiang	163.5	154.76	5.60%
13	13	Huanghua	140.3	133.13	5.40%
14	15	Nanjing	124.08	120.24	3.20%
15	18	Nantong	122.77	113.04	8.60%
16	14	Qinghuangdao	122.41	121.05	1.10%
17	17	Shenzhen	120.71	113.12	6.70%
18	20	Beibuwan	118.55	101.62	16.70%
19	16	Lianyungang	117.42	115.98	1.20%
20	22	Taizhou	114.17	93	22.80%
<b>Total</b>			4289.46	4068.3	5.40%

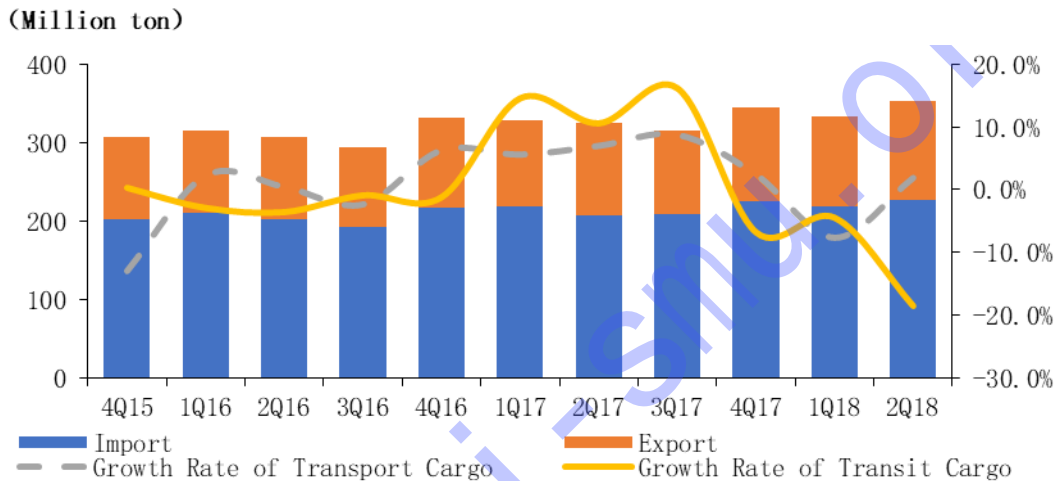


Source: The website of The Ministry of Transport of People's Republic of China

**Figure 1-3 Cargo Throughput Growth Rate of China's Major Ports in 2015.Q1-2018.Q2**

● **Throughput growth of South Korean ports slowed down**

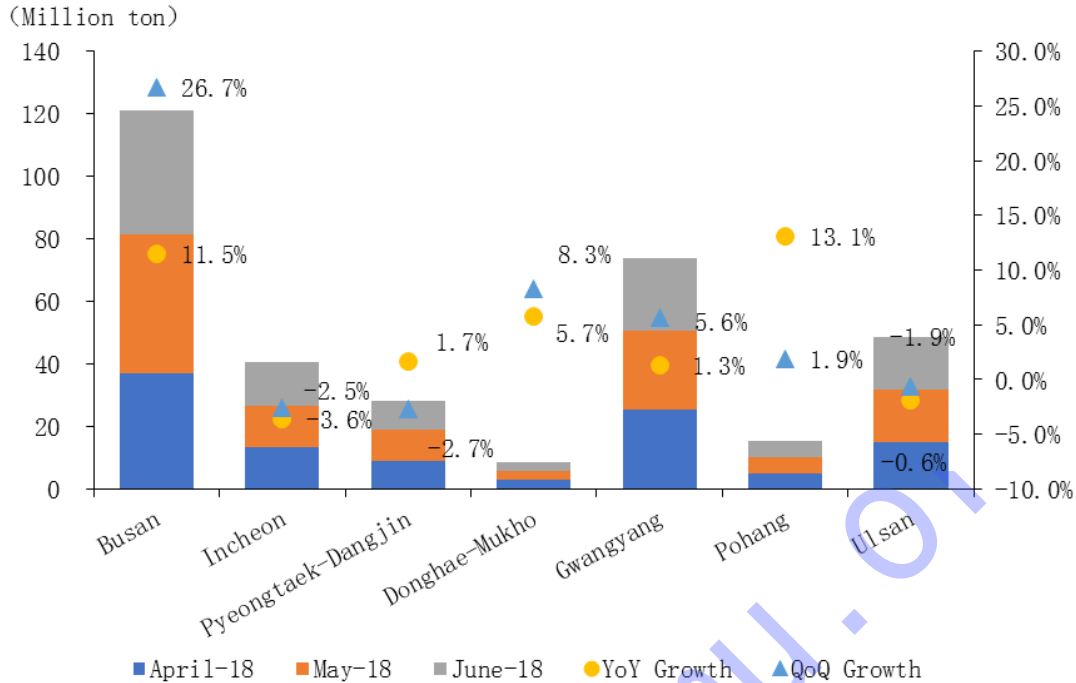
The robust exports cushioned up the economy of South Korea in the first half of 2018. The country’s total export volume reached a record high of US\$ 297.5 billion, rising 6.6% year on year. Benefiting from the strong exports, its cargo throughput reversed the declining trend of the previous quarter, and reached 409 million tons, slightly up 1.88% year on year, or 8.05% quarter on quarter. As for cargo throughput in the second quarter, the volumes of imported and exported cargoes rose 7.11% and 4.63% year on year, respectively, but the throughput of transit cargoes fell -18.57% year on year. As the China-South Korea relations recover and the situation of the Korean Peninsula gradually warms up, South Korean ports are expected to maintain the growing trend in the second half of the year.



Source: Websites of Port Authorities, sorted by SISI.

**Figure 1-4 Cargo Throughput and Growth Rate of Ports of South Korea in 2015.Q4-2018.Q2**

In the second quarter, the growth rates of cargo throughput picked up for major ports in South Korea. Thanks to the country’s booming exports, the cargo throughput of Port of Busan surged to 121 million tons, up 11.5% year on year and 26.7% quarter on quarter, and that of Port of Pohang ballooned 13.1% year on year and 1.9% quarter on quarter. Cargo throughput also rose slightly at the ports of Pyeongtaek, Dangjin, Donghae, Mukho and Kwangyang. However, the ports of Inchon and Ulsan witnessed a mild growth, registering a growth of 3.6% and 1.9%, respectively.



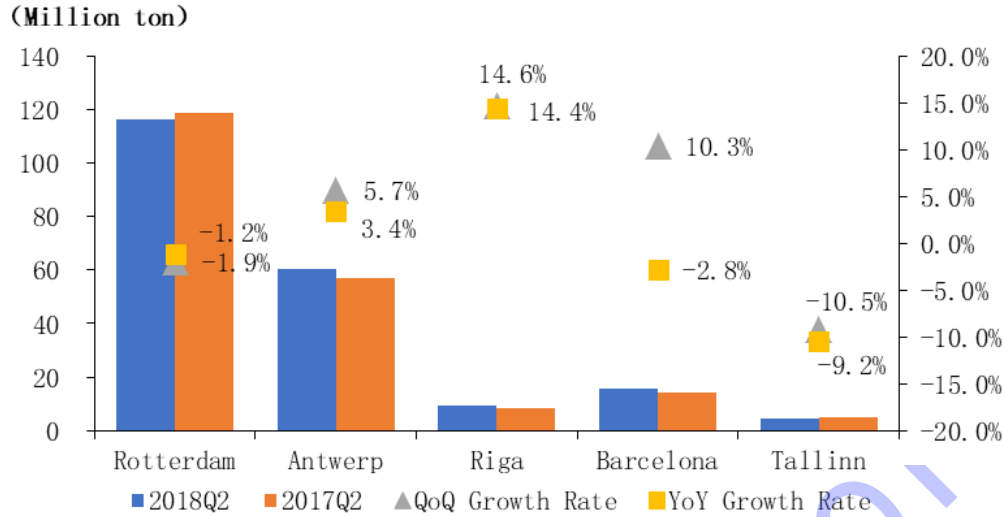
Source: Websites of Port Authorities, sorted by SISI.

**Figure 1-5 Cargo Throughput and Growth Rate of South Korea’s Major Ports in 2018.Q2**

**1.1.2 Growth of cargo throughput slowed down of European ports**

In the second quarter, the Eurozone economy continued to recover. Its GDP increased a seasonally adjusted 0.3% in Q2 from the previous quarter, up 0.8 percentage points quarter on quarter. Affected by the tightened environmental protection policy in the European region, the European ports headed by Port of Rotterdam have started to build green ports. For example, Port of Rotterdam shut down its coal-fired power plant in the first half of the year, bringing about a sharp decline in the coal throughput. Therefore, the growth of cargo throughput of major ports in Europe continued to slow down in the second quarter, up 1.6% year on year to 206 million tons, dropping by 2.8 percentage points over the same period of last year.

Specifically, the throughput of Port of Rotterdam dropped slightly by 1.9% year on year, mainly due to the throughput decline of crude oil (-7.6%) and coal (-11.9%). Benefiting from the construction of logistics gateway of Southern Europe and e-ports, Barcelona's throughput maintained annual growth rate above 10% from the first quarter of 2017, and its cargo throughput in this quarter rose by 10.3% year on year to 15.76 million tons. In addition, Antwerp and Riga saw a relatively robust cargo throughput growth of 5.7% and 14.6% year on year, respectively.

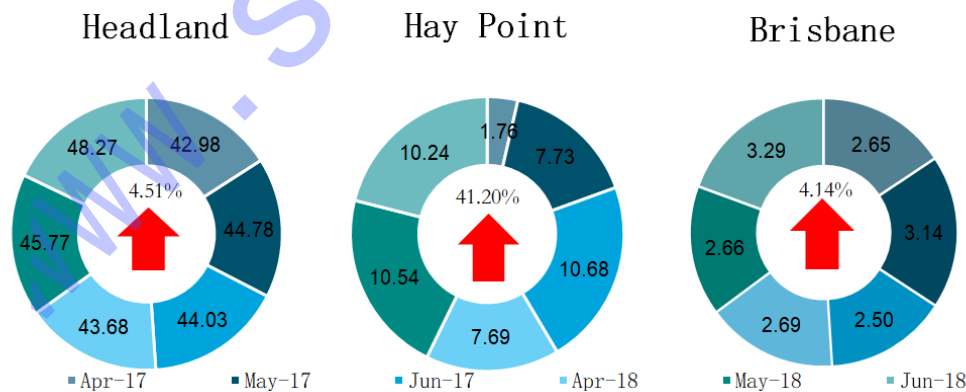


Source: Websites of Port Authorities, sorted by SISI.

**Figure 1-6 Cargo Throughput and Growth Rate of European Major Ports in 2018.Q2**

### 1.1.3 Growth rate of cargo throughput of Australian ports rebounded

In the second quarter, the Australian economy continued to grow steadily. BOC International Limited forecasted that Australia's GDP expanded by a seasonally adjusted 2.7% quarter on quarter in the quarter. The cargo throughput of major Australian ports rose 8.72% year on year to 174 million tons, thanks to the strong performance of Port Hedland in iron ores and Port of Hay Point in coal in the second quarter. Specifically, Port of Hay Point accomplished a throughput of 28.48 million tons, up 41.2% year on year. The tremendous growth rate came as a result of the sharp decline of coal throughput at the port in the same period of 2017. The throughput of Port Hedland continued to grow steadily, reaching 137.73 million tons in the second quarter, up 4.51% year on year. Brisbane accomplished a cargo throughput of 8.63 million tons, down 4.14% year on year.



Unit: million Tons

Note: The left semicircle represents the throughput in 2018, the right semicircle represents the throughput in 2017.

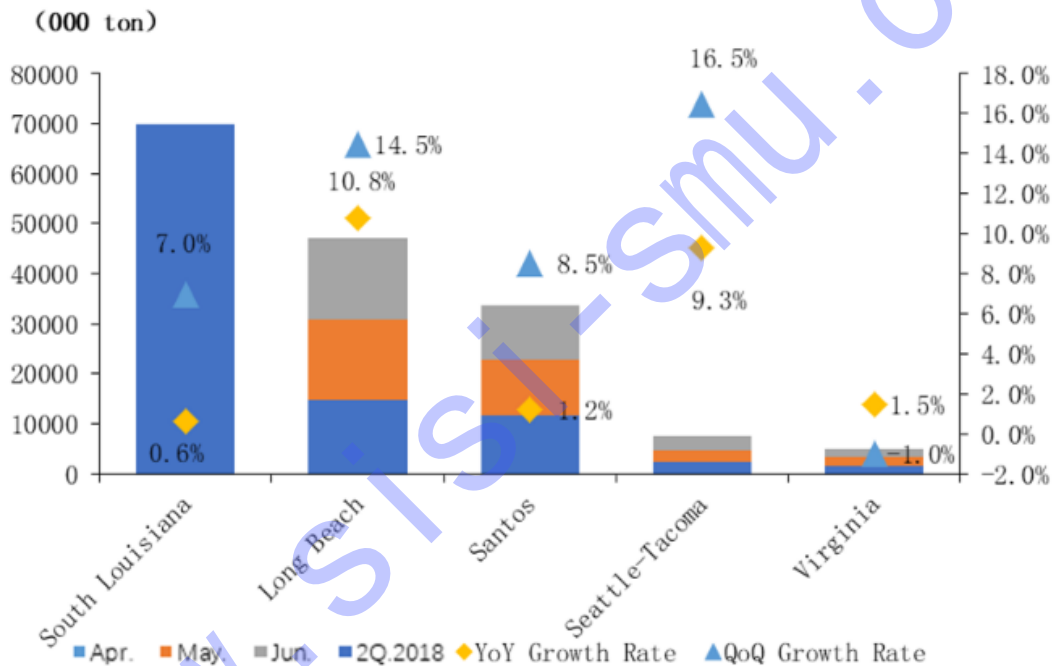
Source: Websites of Port Authorities, sorted by SISI.

**Figure 1-7 Cargo Throughput of Australian Major Ports in 2017.Q2 and 2018.Q2**

### 1.1.4 Throughput of American ports increased in different levels

The US economy picked up in the second quarter. Its unemployment rate dropped to 3.8% in May

2018, the lowest since the subprime crisis. The steady increase of employed population, wages and price index boosted the growth of the country’s household consumption expenditure. As a result, almost all major ports in the U.S. experienced an increase in cargo throughput, which went up 4.23% year on year to 164 million tons in total. The throughput at ports of South Louisiana, Long Beach, Seattle-Tacoma and Virginia registered increases at varying degrees, of 0.6%, 10.8%, 9.3% and 1.5% year on year, respectively. The surge in cargo throughput was mainly due to the escalation of the Sino-US trade friction, because cargo owners arranged their imports and exports ahead of agenda in order to avoid high tariffs. Statistics show that the Sino-US trade friction will involve almost 15% of cargos at major U.S. ports, and its deep impact on U.S. port throughput gradually reveal in the second half of the year. In addition, benefiting from Brazil's economic recovery, the Port of Santos in Brazil accomplished a cargo throughput of 33.55 million tons in this quarter, up 1.2% year on year.



Note: The throughput of South Louisiana is the second-quarter throughput

Source: Websites of Port Authorities, sorted by SISI.

**Figure 1-8 Cargo Throughput and Growth Rate of American Major Ports in 2018.Q2**

## 1.2 Analysis of Global Port Container Throughput

In the second quarter of 2018, the container throughput of major ports around the world was 82.69 million TEUs, up 3.52% year on year, showing a robust upward trend.

### 1.2.1 Growth of container throughput in Asia slowed down

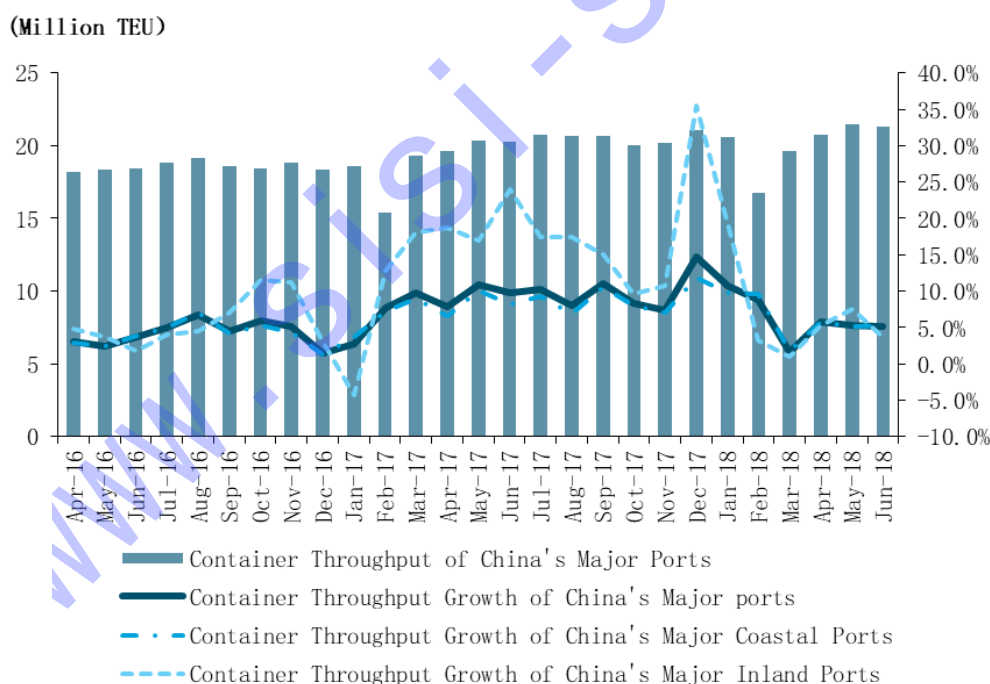
In the second quarter, the escalating global trade friction has threatened the economic growth and recovery of various economies in varying degrees. The impact could be reflected by the depreciation of



currencies in emerging markets, which were faced with the risks of market turmoil and capital outflow, with their economic development under pressure. As a result, the container throughput growth has slowed down. The container throughput of major ports in Asia rose 3.14% year on year, and the growth rate was 3.2 percentage points lower than that of the previous quarter.

● **Container throughput of ports on the Chinese mainland grows steadily**

Sino-US trade friction and uncertainties have slightly changed the flow of international trade flows and dampened China's export growth. In the second quarter, China's trade surplus narrowed by a larger margin, the growth of its fixed-asset investment and retail sales of consumer goods slowed down. The all-round decline in domestic and foreign demand made the country's economic growth 0.1 percentage points lower than that of the previous quarter. Against this background, the Chinese ports in general witnessed a stable production performance in the second quarter of 2018, inferior to that of the previous quarter. The ports above designated size of Mainland China accomplished a container throughput of 63.51 million TEUs in the second quarter, up 5.4% year on year, and the growth rate was 1.5 percentage points lower than that of the previous quarter. Specifically, the coastal ports accomplished a cargo throughput of 56.21 million TEUs, up 5.4% year on year, and the inland ports accomplished a cargo throughput of 7.30million TEUs, up 5.5% year on year.



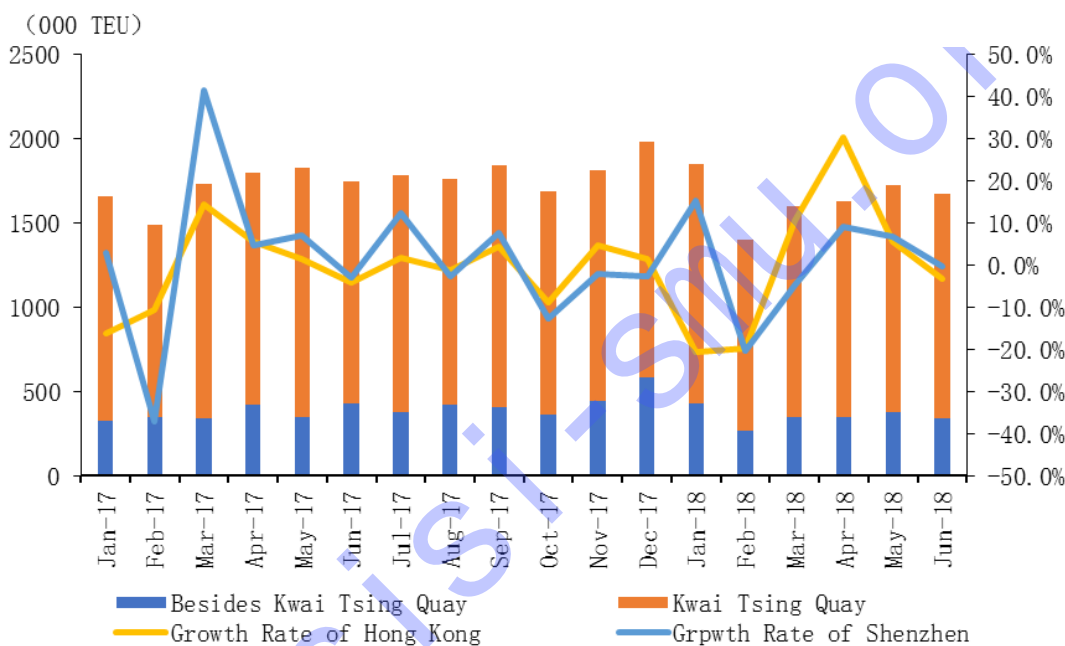
Source: The Ministry of Transport of People's Republic of China, sorted by SISI.

**Figure 1-9 Container Throughput and Growth Rate of China's Ports from Apr-16 to Jun-18**

● **Container throughput growth of Hong Kong lost steam**

In the second quarter, Hong Kong's export growth slowed down, and exporters were increasingly pessimistic about their future business. As the garment manufacturing bases transfer to Southeast Asian

countries with lower production costs, garments made on the Chinese mainland take a smaller share in the imported garment market in the U.S., and Hong Kong's garment exports continue to shrink. In addition, Hong Kong is confronted with competition from adjacent ports of Shenzhen and Guangzhou. Hong Kong's port distribution and terminal decentrality make it hard to handle large-sized ships, and the Hong Kong government sets very strict environment protection laws, all of which have driven some liners to other ports. Affected by a number of factors, Hong Kong struggled to maintain growth in container throughput, which fell slightly by 6.4% quarter on quarter in June. Specifically, the city's major terminal of Kwai Tsing registered a container throughput of 3.96 million TEUs, down 5.3% year on year. Container throughput at other terminals than Kwai Tsing fell 10.3% year on year.

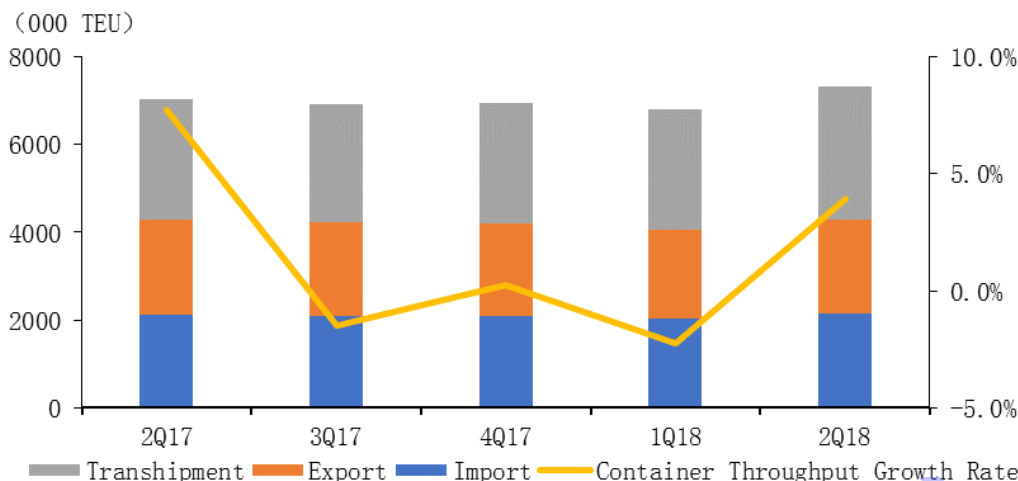


Source: The Ministry of Transport of People's Republic of China, Hong Kong Port Development Authority.

**Figure 1-10 Container Throughput and Growth Rate of the Ports in Hong Kong and Shenzhen**

● **Container throughput of South Korean ports turned up**

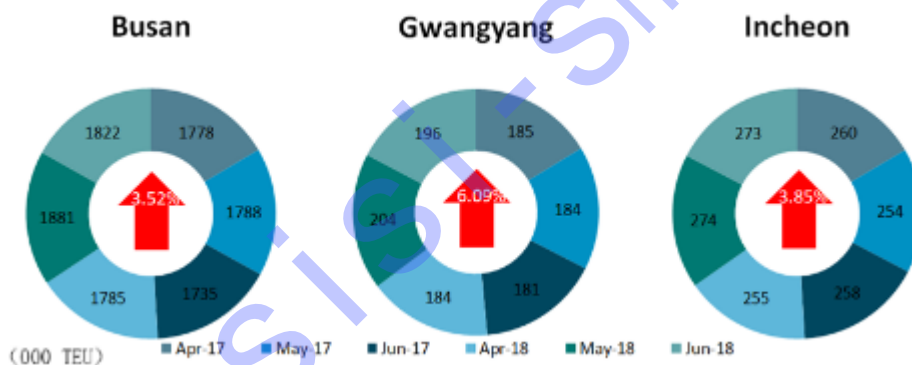
In the second quarter, external factors such as constant global economic expansion and strong demand for semiconductors, boosted South Korea imports and exports, and the country's port container throughput rose by 3.93% year on year to 7.32 million TEUs. Specifically, the container transfer throughput grew significantly to 3.02 million TEUs, up 9.5% year on year. The amount of imported and exported containers were almost the same with that of last year, and stopped falling but rose slightly from the previous quarter.



Source: Websites of Port Authorities, sorted by SISI.

**Figure 1-11 Container Throughput and Growth Rate of South Korea from 2017.Q2 to 2018.Q2**

In the second quarter, major ports in South Korea had outstanding production performance, with the container throughput growth rate rising. The container throughput rose by 6.09% year on year to 584,000 TEUs for Port of Kwangyang. The container throughput at Port of Incheon went up 3.52% year on year to 5.49 million TEUs, and that at Port of Incheon grew 3.85% year on year to 802,000 TEUs.



Note: The left semicircle represents the throughput in 2018, the right semicircle represents the throughput in 2017.

Source: Websites of Port Authorities.

**Figure 1-12 Container Throughput of South Korea's Major Ports in 2018.Q2**

### 1.2.2 Growth rate of container throughput of European container ports went up

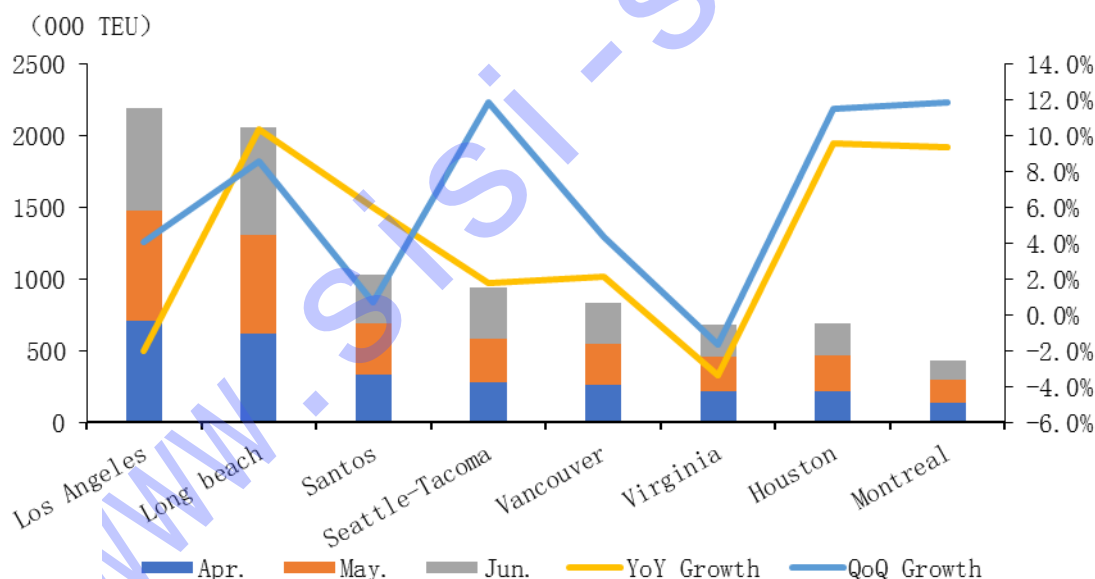
In the second quarter, the container throughput at major European ports rose by 2.94% quarter on quarter and 7.11% year on year, 0.53 percentage points lower than that of the same period of last year. Among major ports, Port of Rotterdam continued with the rising trend of the previous quarter, and handled 3.58 million TEUs of containers, up 5.5% year on year in the second quarter. The port's newly completed digital system shortened the time a ship spending in the port. As for Port of Antwerp, the rising quantity of container transferred in the port boosted its container throughput. The port recorded a robust growth in consumer goods, vehicles and chemicals in a favorable economic environment despite the geopolitical tension. Its container throughput rose by 6.07 year on year to 2.82 million TEUs in the second quarter of 2018, mainly due to the growth of its trade with Europe and North America, which

was 14.2 % and 10.3%, respectively. The Port of Barcelona handled 840,000 TEUs of containers, up 18.78% year on year, thanks to the growth of containers in foreign trade and transit.

### 1.2.3 Throughput of American container ports fluctuated

In the second quarter, the U.S. policies to lower taxes and expand spending further demonstrated their effects, revealing an optimistic prospect in the short term. However, as the trade disputes between the U.S. and other countries escalated, the uncertainty in the trade market will cast a shadow over the U.S. exports. Due to cargo owners' "jump-the-gun mentality" - that is to arrange shipment ahead of high tariff, the container throughput rose by 3.2% year on year for major ports in America.

Among the American ports, the Port of Long Beach in the U.S., following the rising trend from the previous quarter, continued to see a rapid growth in container throughput, which increased 10.35%. The Port of Los Angeles was confronted with rising trade uncertainties due to continued shuffling of alliance services in the San Pedro Bay, coupled with potential impacts from recently imposed tariffs. Its container throughput fell slightly by 1.99% year on year. Canada is mulling countermeasures against any possible tariffs imposed by the U.S. on Canada made automobiles. Affected by the market sentiment fluctuations, the throughput at the ports of Vancouver, Virginia and Montreal also fluctuated greatly, growing 2.16%, -3.38% and 9.34% year on year, respectively.



Source: Websites of Port Authorities, sorted by SISI.

**Figure 1-13 Container Throughput and Growth Rate of American Major Ports in 2018.Q2**

### 1.3 Analysis of Global Port Dry bulk Cargo Throughput

In the second quarter, the international dry bulk transport market recovered after fluctuations in this quarter. As of the end of June, the BDI exceeded 1400 points and showed a rising trend. Emerging economies such as the ASEAN showed an upward trend with further improved demand. Australia's

exports of dry bulk cargoes grew significantly, and its export of coal, in particular, showed a robust upward trend with the new driving engines including the Middle East. China's coal import grew substantially in this quarter due to the short supply of coal domestically, but its import of iron ores fell slightly under the "de-capacity" policy. The dry bulk throughput of major ports around the world showed an upward trend in general.

**Table 1-2 Dry Bulk Throughput of Global Major Ports in 2018.Q2**

Port	2Q2018 ( 000 Ton )	2Q2017 ( 000 Ton )	YoY Growth ( % )	1Q2018 ( 000 Ton )	QoQ Growth ( % )
Qinhuangdao	56736	78633	-27.85%	57600	-1.50%
Hedland	134870	129451	4.19%	121640	10.88%
Santos	16857	15531	8.54%	14620	15.30%
Antwerp	3064	2972	3.10%	3380	-9.35%
Rotterdam	18219	19632	-7.20%	18800	-3.09%
Hay Point	28480	20166	41.23%	30320	-6.07%

Source: Websites of Port Authorities, sorted by SISI.

### 1.3.1 Iron ore throughput of global ports rebounded

Thanks to the continuing recovery of the world economy, the prices of bulk commodities, especially high-quality iron ores, kept rising after falling for a short while in March. At the same time, investment in infrastructure construction in a number of countries pushed up the demand for iron ores, which boosted the rebound of the global iron ore throughput.

- **China's import of iron ores fell slightly**

The withering infrastructure demand and the high-level inventory of iron ore at Chinese ports resulted in a mild decline in China's import of iron ores. In the second quarter, China's import of iron ores was 260 million tons, down 3.03% year on year, or 3.72% quarter on quarter. The decline can be attributed to two main reasons. First, as of the end of June, China's inventory of iron ores at ports was 156 million tons, 40% higher than the annual average of 113 million in the last five years. Such a high-level inventory lowered China's demand for imported iron ores. Second, the month-long environmental protection supervision in 10 provinces and cities, including Hebei province, suppressed the resupply demand for iron ores in June. It is estimated that environmental protection measures will further suppress the demand for iron ores in the next few months.

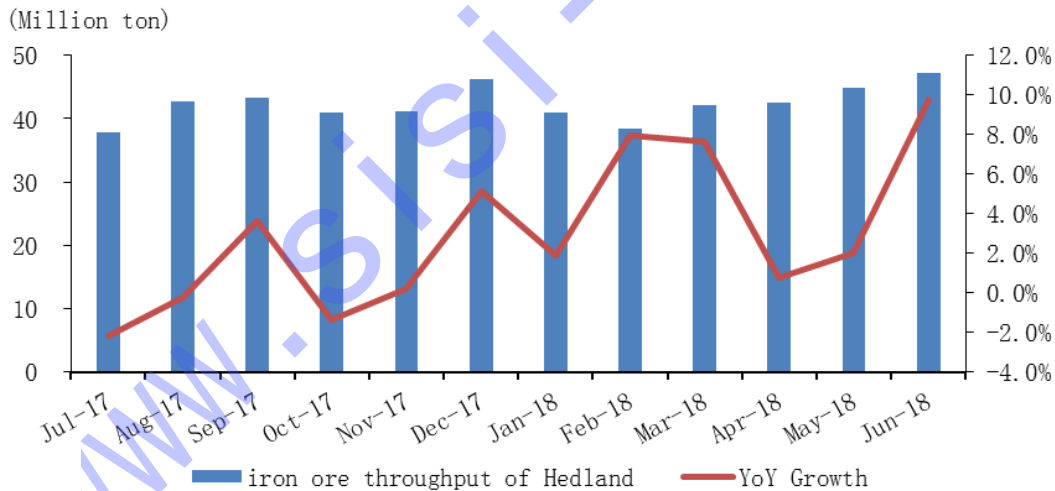


Source: Websites of China Customs, sorted by SISI.

**Figure 1-14 Iron Ore Imports and Growth rate of China from Jul.17 to Jun.18**

● **Iron ore throughput of Port Hedland rose steadily**

In this quarter, the iron ore exports of Port Hedland rose 4.19% year on year to 135 million tons. China is still the largest importer of iron ores for Australia. However, as China has reduced production of steel and turned to new energy, Australia's iron ore exports is expected to fall to some extent.



Source: Website of Headland Port Authority.

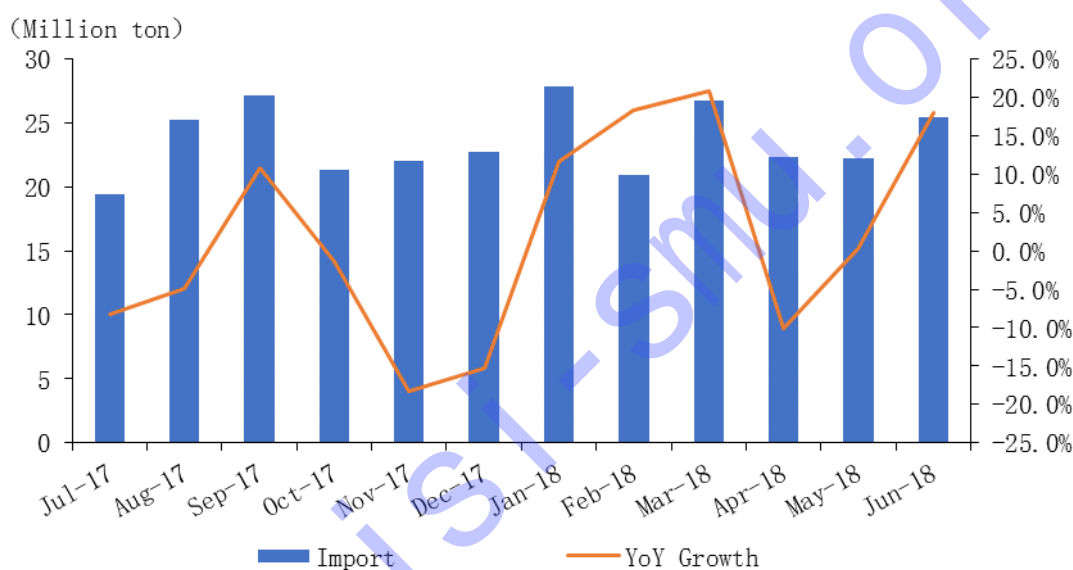
**Figure 1-15 Iron Ore Throughput and Growth Rate of Hedland from Jul.17 to Jun.18**

**1.3.2 Coal throughput of global ports declined**

As energy saving and emission cut gains more and more attention, coal-fired power generation has been gradually phased out worldwide. Major coal importers, such as China, the U.S. and the Asia Pacific countries, are gradually reducing coal imports, but the Middle East and surrounding regions started tune up coal demand from last year. The overall coal shipment in the second quarter showed a downward trend.

- **China's coal imports rebounded slightly**

In the second quarter, China continued to push forward the supply-side reform on the domestic coal market, which was coupled with the continuous de-capacity, the transformation to new energy, and the policy that prohibits the berthing of coal carriers at some ports. As a result, the withering domestic coal supply boosted the coal prices, which propelled the lift over restrictions on imported coal as appropriate to control the coal price. In the second quarter, China imported 69.98 million tons of coal, up 2.06% year on year. The growth mainly came from the imports of low-sulphur coal from Indonesia. China only temporarily relaxed control over coal imports to maintain price stability, and it is yet to loosen its policy in this regard. Therefore, China's reliance on imported coal may decline to some extent after some coal mines resume production in the future.

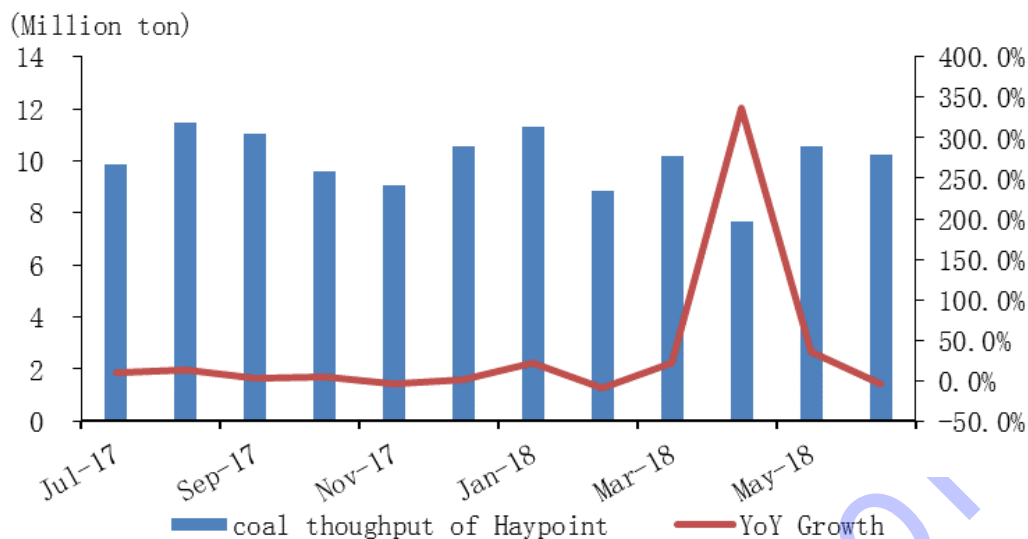


Source: Websites of China Customs, sorted by SISI.

**Figure 1-16 Coal Imports and Growth rate of China from Jul.17 to Jun.18**

- **Coal throughput of Port of Hay Point increased substantially**

In the second quarter, Australia's economic growth was better than expected, resulting in an upward trend of Australia's dry bulk throughput. The coal throughput of Port of Hay Point rose by 41.23% year on year to 28.47 million tons. The surge mainly came as a result of the low basis of the same period of last year, when the bad weather affected the coal production of Port of Hay Point, which caused the sharp decline of the coal throughput. However, despite the downward trend in coal imports, big coal importers represented by China with their massive import volume, relieved the decline in coal imports. Moreover, countries that used to rely on oil-fired power plants, such as those in the Middle East, increased their coal imports, creating new growth drivers.



Source: Websites of China Customs, sorted by SISI.

**Figure 1-17 Coal Throughput and Growth rate of China from Jul.17 to Jun.18**

## 1.4 Analysis of Global Port Liquid bulk Cargo Throughput

Driven by the joint production reduction of OPEC, growing global demand and increasing geopolitical risks in the Middle East since 2018, international oil prices in general have showed an upward trend, and reached the peak in May, the highest level since the end of 2014. The global oil market is gradually rebalancing as it got rid of the serious oversupply since the second half of 2014, with a shrinking global crude oil inventory. As a result, there was brisk supply and demand of crude oil in the world in the second quarter. The oil throughput grew substantially for most of the major liquid bulk terminals in the world, especially for the South Korean ports, as the ports of Gwangyang, Taesan and Incheon all saw a growth of at least 20% year-on-year.

**Table 1-3 Liquid Bulk Throughput of Global Major Ports in 2018.Q2**

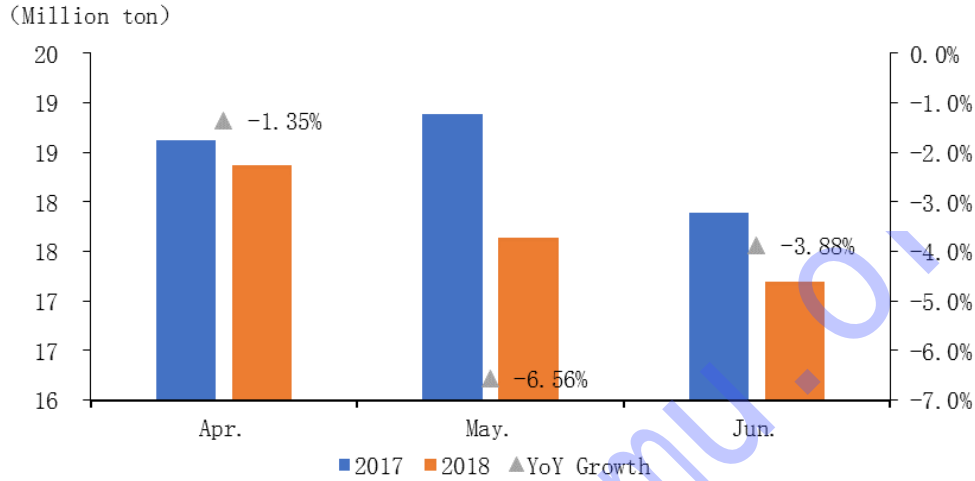
Port	2Q2018 (000 Ton)	2Q2017 (000 Ton)	YoY Growth (%)	1Q2018 (000 Ton)	QoQ Growth (%)
<b>Rotterdam</b>	51130	56200	-9.02%	55900	-8.54%
<b>Singapore</b>	53210	55270	-3.73%	55550	-4.22%
<b>Ulsan</b>	32180	29570	8.83%	29960	7.42%
<b>Kwangyang</b>	33600	27440	22.47%	28630	17.37%
<b>Taishan</b>	16890	13700	23.24%	15120	11.70%
<b>Incheon</b>	12840	9960	28.89%	13120	-2.17%
<b>Antwerp</b>	19740	18420	7.19%	18550	6.44%
<b>Santos</b>	4330	3970	9.19%	3990	8.64%
<b>Barcelona</b>	3760	3140	19.78%	4090	-8.07%

Source: Websites of ports authorities, sorted by SISI.



● **Oil product throughput of Singapore port decreased**

In the second quarter, Singapore's oil market remained the declining trend. In addition, bunker oil suffered from the seasonal decline and the international crude oil trading market tended to be saturated. As a result, Singapore's bulk oil throughput kept falling, down 3.73% year on year or 5% quarter on quarter to 53.2 million tons.

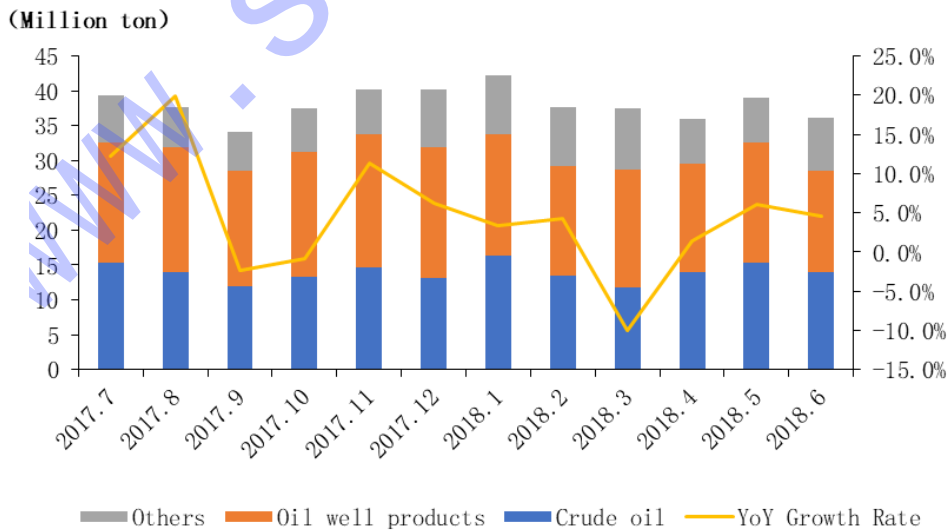


Source: Singapore Port Group.

**Figure 1-18 Oil Bulk Throughput and Growth Rate of Singapore in 2018.Q2**

● **Oil cargo throughput of South Korea grows steadily**

In the second quarter, the liquid bulk throughput of South Korean ports grew steadily by 4.04% year on year, reaching a total of 110 million tons. Specifically, the crude oil throughput surged by 14.76 percentage points year on year to 43.31 million tons. The natural gas throughput surged by 17.04% year on year, and the growth rate was 7.6 percentage points higher than that of the same period of last year. The throughput of oil well products declined 8.19% to a total of 47.37 million tons.



Source: Website of Korean Port Authority.

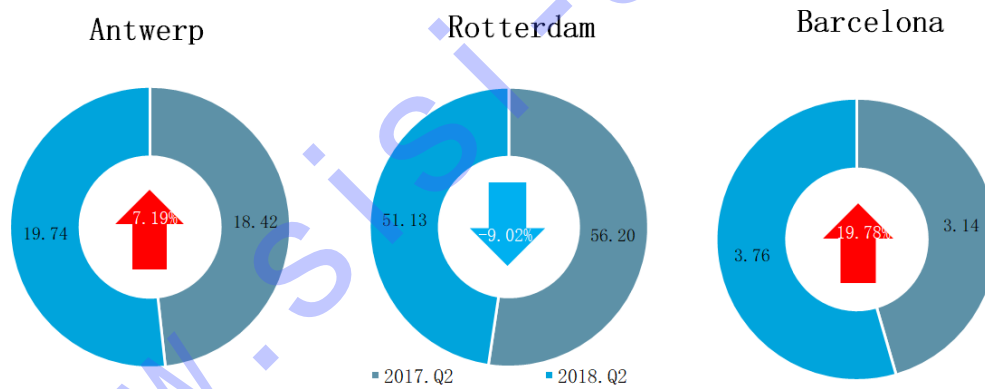
**Figure 1-19 Liquid Bulk Throughput of Korea Ports in Cargo Type**

● **Oil product throughput of China grew constantly**

Chinese refineries’ production capacity expanded in the second quarter, thanks to the decline of international oil prices, and China's policy allowing local refineries to import and use crude oil. Benefiting from this, China's import and export of crude oil and refined oil grew 9% to a total of 138 million tons in the second quarter. It is worth mentioning that since early 2018, China steadily increased imports of natural gas due to the transformation and upgrading of its energy structure, especially after the introduction of "coal-to-gas transformation" policy. In the second quarter, China imported 21.53 million tons of natural gas, up 33.89% year on year. Specifically, its imports of natural gas reached 7.41 million tons in May, hitting a record high.

● **Liquid bulk throughput of European ports polarized**

In the second quarter, the liquid bulk throughput of European ports declined slightly on the whole. The liquid bulk throughput of the major European liquid bulk ports fell 4.01% year on year to 74.63 million tons. Specifically, Port of Rotterdam shut down some oil refineries in order to implement its green transformation program. Its liquid bulk throughput plunged 9.02% year on year to 51.13 million tons in this quarter. Port of Antwerp and Port of Barcelona maintained an upward trend since 2017. Specifically, the liquid bulk throughput of Antwerp in the second quarter went up 7.19% year on year to 19.74 million tons, and that of Barcelona surged by 19.78% year on year to 3.76 million tons.



Unit: million Tons  
 Source: Websites of Port Authorities.

**Figure 1-20 Liquid Bulk Throughput of Major European Ports in 2018.Q2**

## II . Global Port Operation and Management in Q2

### 2.1 Overall development of global terminal operators

In the second quarter of 2018, the overall market operation of global terminal operators remained stable and positive, and the equity throughput of major terminal operators in the world all showed a positive trend of growth, but in varying degrees. As major overseas terminal operators changed their investment strategies, with fewer new assets and incremental effects, their growth in equity throughput was inferior to that of major Chinese terminal operators.

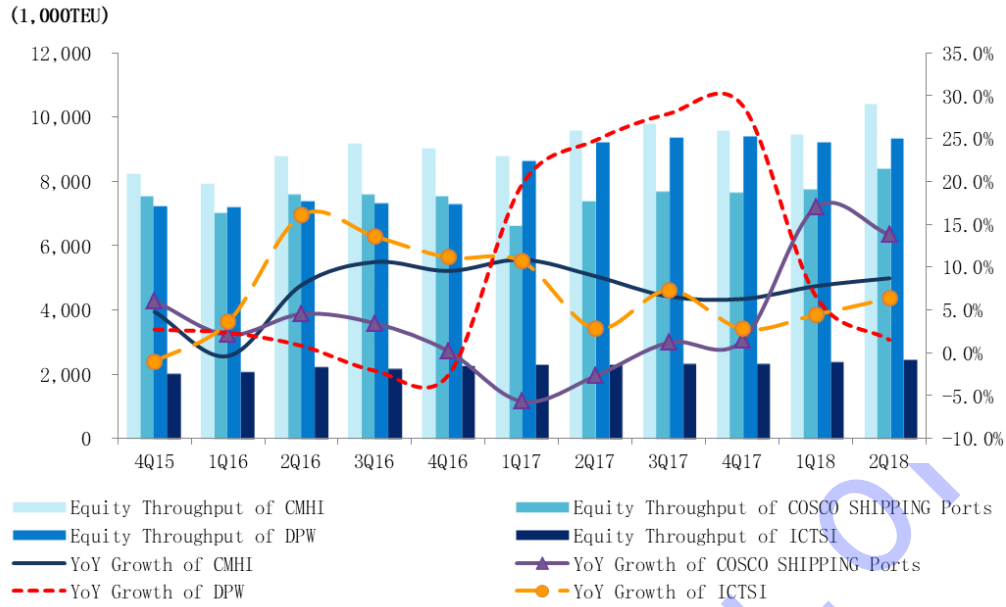
**Table 2-1 Equity Throughput of Major Global Terminal Operators in 2018.Q2**

Rank	Operator	2018.Q2 (,000TEU )	YoY Growth/%	2017.Q2 (,000TEU)	YoY Growth/%
1	CMport	10427	8.70	9592	8.94
2	APMT	10311	5.21	9800	4.26
3	DP World	9350	1.51	9211	24.79
4	COSCO SHIPPING Ports	8415	13.77	7396	-2.71
5	ICTSI	2389	5.10	2273	2.79

Source: various terminal operators' websites.

Note: there is no statistical data of PSA and HPH whose equity throughputs are ranked in top 5.

In this quarter, terminal operators continued the robust momentum of equity throughput of the previous quarter. Specifically, COSCO SHIPPING Ports Limited saw a rapid growth of its equity throughput, up 13.77%, thanks to the increased berthing volume of the Ocean Alliance and its new terminal assets. Expanding its overseas port deployment to cover the six continents, CMPort saw its quarterly equity throughput exceeding 10 million TEUs. A.P.Moller continued to strengthen cooperation with shipping companies and investment in inland logistics, with its equity throughput rising by 5.21% year on year. Philippines International kept making investment in terminal facilities and technology upgrade, and actively expanded overseas markets, which boost its equity throughput by 5.10% year on year. The growth rate of DP World's equity throughput plunged to 1.51%, due to the shrinking incremental effect from its increased stake in Port of Busan, and the switch in its development strategies among other factors.

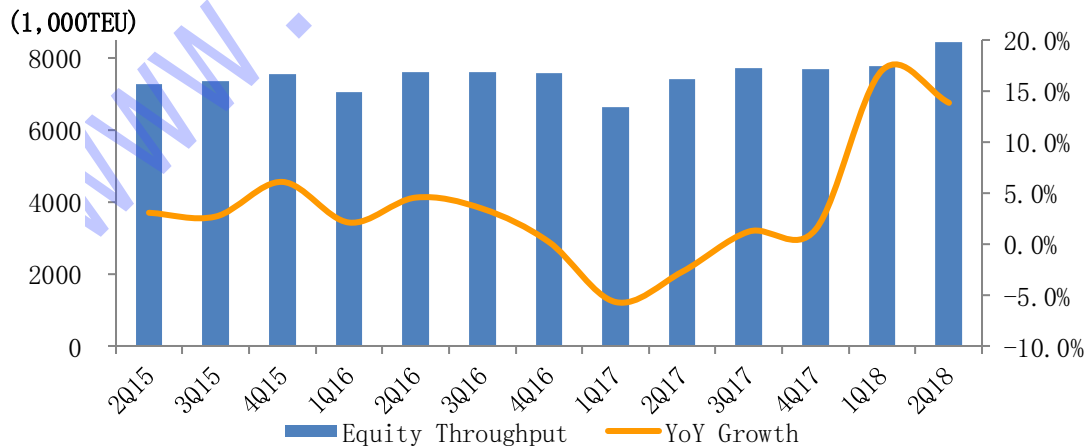


Source: Websies of Port Authorities.

**Figure 2-1 Equity Throughput and Growth Rate of Global Major Terminal Operators from 2015.Q4 to 2018.Q2**

## 2.2 Throughput analysis of COSCO Shipping

In the second quarter of 2018, COSCO SHIPPING Ports Limited accomplished a container throughput of 24.67 million TEUs, up 12.00% year on year. It also realized an equity throughput of 8.42 million TEUs, up 13.77% year on year. The rapid growth came as a result of its continued global terminal deployment and the gradual change in its development strategy from traditional endogenous growth to innovative extensional growth, and from the control of terminal resources to comprehensive allocation of port resources.



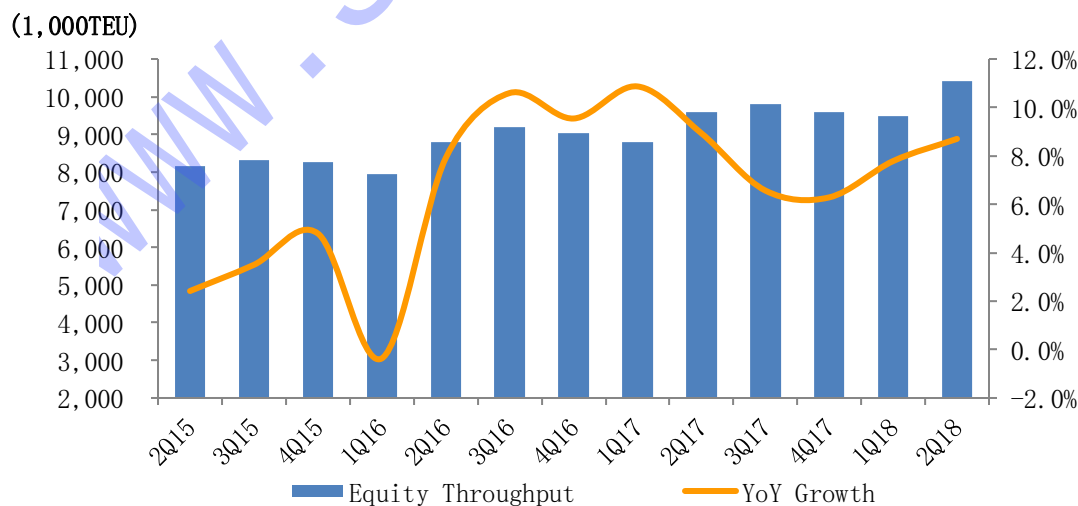
Source: Website of COSCO SHIPPING Port, sorted by SISI.

**Figure 2-2 Equity Throughput and Growth Rate of COSCO SHIPPING port in 2015.Q2-2018.Q2**

By region, business on the Chinese mainland accounted for 67.69% of the company's equity throughput of containers, which increased 1.69% year on year. Specifically, the Bohai Sea Rim region accomplished an equity throughput of containers of 1.24 million TEUs, down 1.38% year on year, due to sluggish development of Dalian Dagang CSCL Container Terminal and Yingkou Container Terminal. The ports in the Yangtze River Delta region accomplished an equity throughput of 1.46 million TEUs, down 0.35 percentage points year on year, as the continuous foggy days in April caused a large amount of containers overstocked at the terminals and resulted in port congestion. In the southeast coastal region of China, the increased berthing volume from the Ocean Alliance pushed up throughput of Xiamen Ocean Gate Container Terminal Co., Ltd. by 38.9%, and boosted the equity throughput of the entire region by 19.90% year on year. In the overseas market, COSCO Shipping actively increased its stakes in terminals. It acquired 51% of NPH Group, and increased its holding of Port of Zeebrugge to 76% in 2017. As a result, the company's equity throughput of containers in the overseas market reached 2.72 million TEUs, up 51.48% on the whole, making the overseas market a main growth engine for its equity throughput.

### 2.3 Throughput analysis of China Merchants International

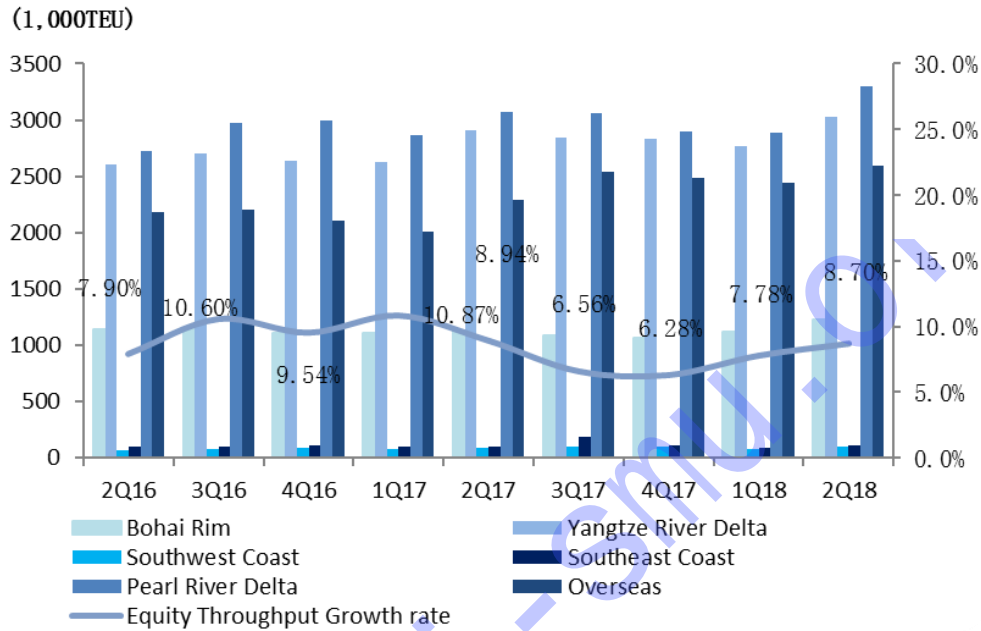
In the second quarter, CMPort accomplished a container throughput of 28.18 million TEUs, up 9.41% year on year. Its equity throughput rose 8.70 percentage points year on year to 10.43 million TEUs. The growth rate of its equity throughput growth steadily picked up after falling in the fourth quarter last year. In the second quarter, CMPort declared that it would continue to base itself on Hong Kong, promote the development pattern featuring "port-community-city", and increase the operation efficiency of terminals. The company's performance is expected to improve steadily in the future.



Source: China Merchants port Website.

**Figure 2-3 Equity Throughput and Growth Rate of CMport in 2015.Q2-2018.Q2**

By region, CMPort continued to acquire terminals overseas in the second quarter, bringing long-term benefits to the company. In June 2018, the company officially acquired 50% of the Port of Newcastle, the biggest port in the East Coast of Australia. The acquisition completed the company's port deployment in the six continents, which will be complementary to the existing port network, and produce synergistic effects.



**Figure 2-4 Equity Throughput and Growth Rate of Various Regions of CMPort in 2018.Q2**

Domestically, CMPort followed the development concept of "regional integration and collaboration enhancement", and saw a positive year-on-year growth in the second quarter. In the Pearl River Delta region, Shenzhen Chiwan A planned to acquire 38.72% of CMPort in June, which would solve the horizontal competition between the two, and help CMPort to optimize assets structure, lower costs and improve efficiency. In the second quarter, the equity throughput in this region went up 7.25% year on year, or 6.68 percentage points quarter on quarter. In the Bohai Sea Rim region, the group cooperated with the provincial government of Liaoning to set up the unified port operation platform in Liaoning, played a leading role in port resource integration in the province, and improved quality and efficiency. As a result, the company's equity throughput in this region rose by 8.30% in the second quarter. In the southeast coastal region of China, the company continued to benefit from its 60% acquisition of Shantou Port Group in the second half of 2017, accomplishing a throughput growth of 2.62% year on year. In the southwest coastal region of China, Port of Zhanjiang launched a new liner route linking Zhanjiang, Rizhao, Tangshan and Jinzhou, and took measures to turn bulk cargoes into container cargoes. As a result, the equity throughput of the region grew substantially from the same period of last year and rose 11.18 percentage points quarter on quarter. However, its equity throughput growth in the Yangtze River Delta region slowed to 4.08%, due to the container overstocking during the continuous foggy days in April which caused serious congestion at ports.

**Table 2-2 Total Throughput of Investment Regions and Subordinate Companies of Chinese Terminal Operators in 2018.Q2**

(Unit:1,000TEU)

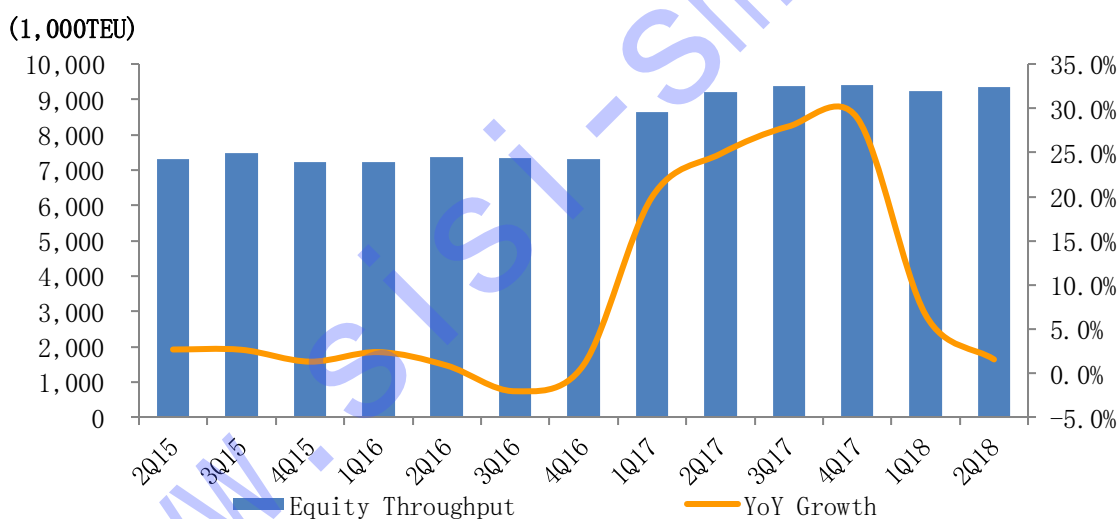
Investment Region and its Subsidiaries	COSCO SHIPPING Ports		Investment Region and its Subsidiaries	CMHI	
	2Q	YoY Growth (%)		2Q	YoY Growth (%)
Bohai Rim	4,980.20	22.10%	Bohai Rim	5,424.00	5.34%
Qingdao Qianwan Container Terminal	—	—	Tianjin Port	689.00	-2.68%
Dalian Container Terminal	2537.40	49.40%	Qingdao Port	1,759.00	10.91%
Dalian Dagang Container Terminal	4.50	-20.40%	Dalian Port	2,976.00	4.24%
Tianjin Port Eurasia Terminal	709.10	7.00%			
Tianjin Five Continents Terminal	707.20	-0.10%			
Yingkou Terminal	662.50	-8.70%			
Jinzhou New Era Container Terminal	196.90	32.70%			
Qinhuangdao New Harbor Container Terminal	162.60	25.50%			
Yangtze River Delta	5022.90	-0.90%	Yangtze River Delta	11,628.00	4.62%
Shanghai Pudong Container Terminal	673.40	-0.40%	Shanghai Port	10,764.00	5.37%
Shanghai Mingdong Container Terminal	1643.30	-3.40%	Ningbo Daxie	864.00	-3.89%
Ningbo Yuandong Terminal	774.80	0.00%			
Lianyungang Container Terminal	728.80	0.60%			
Zhangjiagang Yongjia Terminal	195.00	3.00%			
Yangzhou Yuanyang Terminal	125.10	-5.80%			
Nanjing Port Longtan Terminal	726.50	-0.30%			
Taicang International Terminal	156.00	11.20%			
Southwest Coast	368.00	9.50%	Southwest Coast	257.00	14.73%
Guangxi Qinzhou International Container Terminal	368.00	9.50%	Zhanjiang	257.00	14.73%
Southeast Coast	1457.70	15.50%	Southeast Coast	953.00	13.45%
Xiamen Yuanhai Container Terminal	500.80	38.90%	Kaohsiung Port	415.00	-0.72%
Quanzhou Pacific Terminal	428.70	22.40%	Zhangzhou	107.00	4.90%
Jinjiang Pacific Terminal	113.40	-15.40%	Shantou	431.00	—
Kao Ming Container Terminal	414.80	-0.70%			
Pearl River Delta	6553.40	-2.20%	Pearl River Delta	5,374.00	12.86%
Yantian International Container Terminal	2950.20	-4.10%	West Shenzhen	2,737.00	-4.23%
Guangzhou Terminal	2783.90	1.40%	CKRTT	743.00	100.81%
Hong Kong Terminal	819.30	-7.20%	Hong Kong	1,539.00	1.99%
			Shunde Terminal	355.00	—
Overseas	6288.00	37.50%	Overseas	5,037.00	9.41%
Piraeus Container Terminal S.A.	1074.10	16.80%	Colombo	658.00	14.24%
Suez Canal Container Terminal S.A.E.	649.90	5.00%	Lagos	130.00	20.37%
Kumport Liman Hizmetleri ve Lojistik Sanayi ve Ticaret A.Ş.	341.10	42.00%	Djibouti	219.00	-12.40%
Antwerp Gateway NV	593.30	4.90%	Terminal Link	3,435.00	11.24%
APM Terminals Zeebrugge N.V.	86.20	5.50%	Togo- Lome	254.00	26.37%
COSCO-Xingang Terminal	804.70	59.90%	Turkey-Kumport	341.00	42.08%
Busan Port Terminal Co, Ltd	951.00	5.90%			
SSA Terminals (Seattle), LLC	50.30	6.50%			
Euromax Terminal Rotterdam B.V.	785.70	14.90%			
Reefer Terminal S.P.A.	18.80	36.90%			
Noatum Port Holdings	932.90	n.a.			
Total Throughput	24670.10	12.00%	Total Throughput	28182.00	7.55%
Equity Throughput	8415.36	13.77%	Equity Throughput	1042.70	8.70%

Source: Websites of Port Authorities.

## 2.4 Throughput analysis of Dubai World

In the second quarter of 2018, the terminals under DP World accomplished a container throughput of 18.03 million TEUs, up 2.46% year on year. Meanwhile, the equity throughput of containers jumped 1.51% year on year to 9.35 million TEUs. DP World's overall growth continued to slow down after a free fall in the first quarter.

In the second quarter, DP World's investment continued to focus on inland logistics services. On the one hand, DP World cooperated with Virgin Hyperloop One to build a superfast freight transport system worldwide. On the other hand, it cooperated with the Egyptian government and the Suez Canal Administration to develop new inland container terminals in Giza province near Cairo. In addition, the company also successfully acquired 100% of the shares of Cosmos Agencia Maritima SAC (CAM), a Peruvian comprehensive logistics provider. Meanwhile, DP World strengthened its global deployment by foraying into new investment fields and terminal projects. In the second quarter, DP World announced to expand its container terminals at the Port of Prince Rupert Fairview, the second largest port in Canada, in order to expand business in the American region.



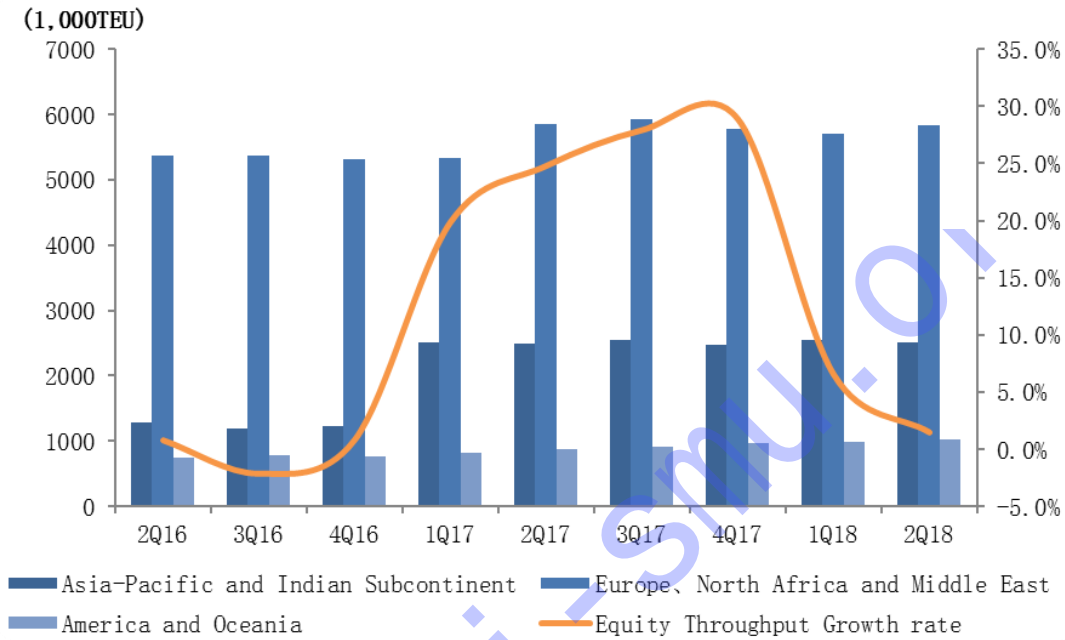
Source: DP world Website.

**Figure 2-5 Equity Throughput and Growth Rate of DP world in 2015.Q2-2018.Q2**

By region, it had outstanding performance in the region of America and Oceania, with a year-on-year growth of 16.88%. Its growth impetus, on the one hand, originated from the completion of the expansion project at the Port of Prince Rupert in Canada, as well as its full acquisition of Embraport Terminal of Santos in Brazil in 2017. On the other hand, the long-term cooperation extension agreement between DP World (Australia) and the CMA CGM Group, also stabilized DP World's footing in the Australian market. However, the world economy encountered increasing risks and difficulties in the first half of 2018, and major economies suffered from slower growth and rising inflation and adopted prudent monetary policies. Meanwhile, Europe lost steam in economic recovery. DP World's equity throughput



fell 0.46% year on year in Europe, North Africa and Middle East. In addition, for the Asia Pacific and Indian sub-continent region, its equity throughput grew only 0.72% year on year, and the growth rate was 94.49 percentage points lower than that of the same period of last year. The slowdown came as a result of the shrinking incremental effects in the terminal resource integration of Port of Busan in South Korea, plus the increasing saturation of the Chinese market.

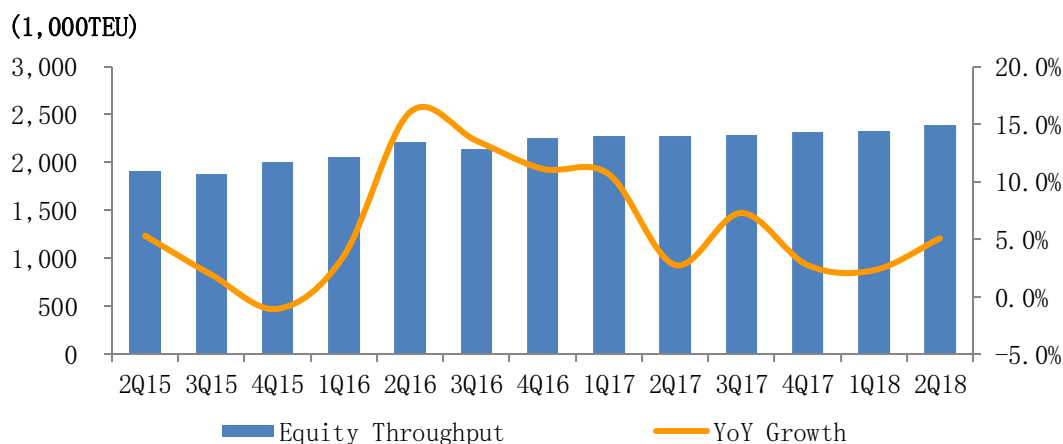


**Figure 2-6 Equity Throughput and Growth Rate of Various Regions of DP World in 2018.Q2**

## 2.5 Throughput analysis of ICTSI

In the second quarter of 2018, the terminals under Philippines International accomplished an equity throughput of containers of 2.39 million TEUs, up 5.10% year on year, or 2.77 percentage points quarter on quarter.

The good momentum of Philippines International mainly benefited from its efforts to seek new development opportunities and expand overseas terminal deployment while continuously push forward its terminal expansion and upgrading strategy. Philippines International has invested US\$80 million on perfecting the infrastructure and technology of Port of Manila in Philippines, so as to increase the port's turnaround efficiency and services, and help it keep up with the development trend of large-size ships. In addition, ICTSI South Pacific, a subsidiary under Philippines International, obtained the 25-year operating concessions of MOTUKEA Terminal of Port Moresby, which officially started operation in May. It not only injected new impetus into the total business volume growth, but also will help the Group achieve long-term stable development.



Source: ICTSI Website.

**Figure 2-7 Equity Throughput and Growth Rate of ICTSI in 2015.Q2-2018.Q2**

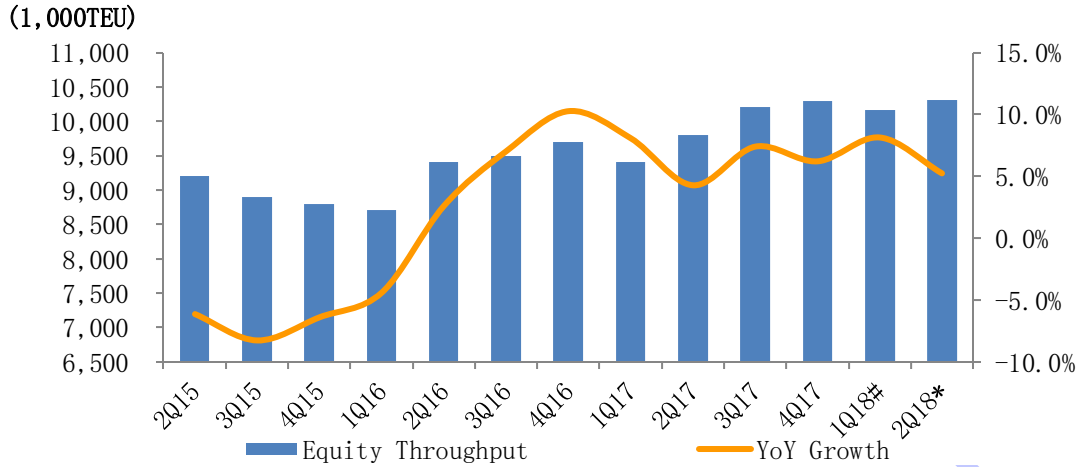
## 2.6 Throughput analysis of APMT

In the second quarter of 2018, A.P.Moller accomplished an equity throughput of containers of 10.31 million TEUs, up 5.21% year on year, slightly slowing down due to the weaker momentum of the world economic recovery and changes in international trade situation. In the second quarter, A.P.Moller strengthened cooperation with and APM Terminals and Hamburg Sud and finished network adjustment for the Latin America region, which further boosted the increase of the terminal's equity throughput. Meanwhile, the company kept optimizing its logistics scheme in India after it set up a new reefer container stations in the country in the previous quarter. It also obtained certification from Indian Customs (AEO), which greatly facilitate its customs clearance. In addition, the company also strived to upgrade terminal facilities and technology, and improved the electronic operating system for arrivals of container trucks at Port of Pipavav in India. It also upgraded its terminal facilities at Port Elizabeth in the U.S. These measures have not only increased the operation efficiency of the terminals and cut operation costs, but also created good incremental benefits.

**Table 2-3 Terminal Performance of APMT in 2017.Q1 and 2018.Q1 (Million Moves)**

Area	1Q2018	1Q2017	YoY Growth
America	1.0	0.9	15.4%
Europe, Russia and the Baltic Sea	0.8	0.7	11.9%
Asia	1.7	1.7	2.8%
Africa and the Middle East	0.5	0.4	18.0%
Total	4.0	3.7	9.3%

Source: APMT Website.



Source: APMT Website.

Note: In the first quarter of 2018, APMT used moves as the statistical unit, # is the converted value, and \* is the predicted value.

**Figure 2-8 Equity Throughput and Growth Rate of APMT in 2015.Q2-2018.Q2**

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# Special Report I: ‘Midlife Crisis’ of Global Container Port Development

Global container ports are still in a healthy financial position at present. However, as the industry enters the mature stage, it is confronted with rising risks and shrinking profit margins, and could drive container port operators into "midlife crisis".

## I. ‘Domestic strife and foreign aggression’ in development of global port industry

In the next few years, the global port industry is likely to face a plunge in operating income. From the perspectives of industrial development, the following factors are speeding up the pace of the container port industry into a mature period of development. First, the international trade scale has grown slowly, and the global economy had maintained a moderate growth since the financial crisis broke out a decade ago. The growth of containerized trade in general is slightly better than the economic growth, but the industry is drawing close to the peak, leaving little room for market supply and demand to support the robust development of the port industry. Second, despite the overcapacity of terminals and intensifying competition, countries in the world have invested heavily in infrastructure, such as ports. Their first moves are often to expand port capacity, making it difficult for a former regional monopoly to give play to its advantages in the regional port cluster. Third, large-size ships and centralized logistics have greatly increased port operation costs, and the increase of the per-vessel operating efficiency is at the cost of the decrease of single machine utilization rate. Fourth, shipping alliances are bringing more commercial risks to ports. With the evolution of international liner company alliances and the continued adjustment of shipping network, port enterprises will face greater uncertainty while adapting to the route changes of shipping alliances. Fifth, even those ports favored by shipping alliances will face the pressure of the low-price strategy of shipping companies. As shipping enterprises gain more discourse power, cost centers will play a bigger role in port development. Therefore, it is foreseeable that in the next three to five years, the global port performance will be as sluggish as today's port throughput.

## II. Returns disproportionate to risks

Normally, operating income grows with operating risks, the higher risks, the higher returns. After a booming trade period, the port industry is accumulating operating risks due to overcapacity and the expansion of shipping and logistics enterprises in the upstream and downstream industries. However, the operating income of the port industry has not grown with the risks. On the contrary, as industrial competition intensifies, the profits of port operators may even decrease year by year.

An analysis on the trend of the return on invested capital ( ROIC) for the major container port enterprises around the world shows that the current ROIC on average is already lower than that in 2009, the year affected most by the financial crisis, and follows a downward trend. Currently, the global container port industry has stepped into a low-profit era with the ROIC of 5%.

### **III. Life-saving policies amid competitions between port and shipping enterprises**

Ports compete with not only intra-regional peers, but also with shipping and logistics enterprises in the upstream and downstream industries. The efficient and inexpensive logistics, the common desire of cargo owners and the government, can only be realized by squeezing down costs in each step of entire logistics chain. However, who shall bear the burden of cost cut, shipping companies, port enterprises, logistics enterprises or intermediary service providers such as shipping agents? It is a question determined by the actual market situations.

Take Chinese ports as an example. From 2017 to 2018, ports in Shanghai, Ningbo, Tianjin, Dalian, Guangzhou, and Shenzhen were all under the national anti-monopoly investigation, which required ports to reduce charges and fees. Specifically, at the Port of Dalian, the handling charges for 20-foot loaded containers dropped 20.6% from 642 yuan/container as publicized to 510 yuan/container. At the Port of Guangzhou, it fell 26.7% from 668 yuan/container to 490 yuan/container. At Port of Shenzhen, the container handling charges plunged 30% from 1400 yuan/container to 980 yuan/container. Most international ports are landlord ports, which are also restricted by local governments or franchised agents in terms of handling charges and additional service fees.

The golden age is gone for global container port enterprises to receive high profits and high yields. Affected by both internal and external problems, the port industry is gradually entering a mature period featuring stable development, and is about to face or has faced the "midlife crisis" in its development.

## Special Report II: Pollution Control and Green Development of Ports

As converging points of land and water transportation, ports play an increasingly important role in economic and social development. It has become an inevitable trend to prevent port pollution, construct conservation-minded ecological and green ports, and promote the development of efficient, energy-saving, low-carbon, environmentally friendly and sustainable new ports in the future.

### I. Air pollution control

Environmental pollution at ports can be divided into two major categories, air pollution and water pollution. Specifically, air pollution is mainly caused by sulfur dioxides, nitrogen oxides and particles and other pollutants emitted by ships berthing at ports.

In order to control emissions of air pollutants by ships at ports, the IMO, the EU, the U.S. and China etc. have formulated and issued a series of policies and measures:

#### 1. Setting up emission control areas

Setting up ship emission control areas (ECAs) can effectively improve the ambient air quality of in port cities, promote air pollution control over ships on international routes. It is also one of the effective means to decrease sulfur oxides and nitric oxides caused by sea transport.

A total of six ECAs have been set up overseas, namely the ECAs for the Baltic Sea waters, North Sea waters, North America waters, and American Caribbean Sea waters set up by the International Maritime Organization (IMO), and those for the Europe waters and American California set up by the EU and the U.S. respectively. China also set up three ECAs, which still lag behind in terms of emission control, as China follows different standards in this regard.

#### 2. Making port emission inventories

By making port emission inventories, some big ports around the world are able to understand the total pollutant emissions and sharing ratio, make the cost-benefit analysis of the emission reduction measures, and provide data support for policy making and scientific assessment.

#### 3. Building shore power infrastructure

At present, green port construction in the world, is mainly achieved by requiring ships berthing in the ports or dry docks to shut down auxiliary engines and use shore power as power supply. It can ensure the normal operation of illumination, ventilation, communication, cargo pumps and other key equipment, and thus realize substantial emission reduction.

#### 4. Launching economic incentive measures

The green port construction and energy saving and emission cut are associated with the economic

benefits of ship owners. Therefore, some ports have launched incentive measures, such as rate relief based on the environment ship index (ESI), collection of emission taxes, and subsidies, to urge anchored ships to use low-sulfur fuel and clean technologies, and thus to reduce emission of sulfides and greenhouse gases, etc.

## **II. Water pollution control at ports**

In addition to air pollution, ports are also faced with water pollution that is mainly linked with berthing ships' waste water treatment, port dredging, and oil spill among other factors. Specifically, the ballast water, domestic wastewater and waste oil discharge of anchored ships constitute the primary sources of pollutants.

Currently the main international regulation on the control of pollutants from ships is the International Convention for the Prevention of Pollution from Ships (MARPOL) set by the IMO. The Convention is composed of 20 articles, two protocols and six supplementary articles. Its Supplementary Article V-2016 Amendment entered into force on March 1, 2018.

In order to further control water pollutants from ships, China's Emission Control Standard for Water Pollutants from Ships (GB 3552-2018) came into force on July 1, 2018. The Chinese standards, based on Supplementary Article V-2016 Amendment of the MARPOL, keep up with the MARPOL in terms of stringency.

## **III. Suggestions on port pollution control**

In general, China is putting more efforts to control port pollution, and its green port construction has achieved initial success. The Ministry of Transport of China is enhancing supervision over the use of low-sulfure fuel, shore power, LNG clean energy, exhaust-after-treatment devices, and sewage discharge devices at domestic ports. However, China is also faced with problems in its port pollution control. For example, the current ship emission control areas are yet to cover some key ports, the control measures have not involved emissions of nitric oxides and greenhouse gases, and supervision over water pollutant emission remains to be improved. Therefore, China should actively draw international experience in its construction of green and low-carbon ports, and adopt stricter standards to build a green port system.

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