

2nd China-ASEAN Advanced Course on Ocean Law and Governance



Maritime Transportation

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8 November 2016

World Maritime Day

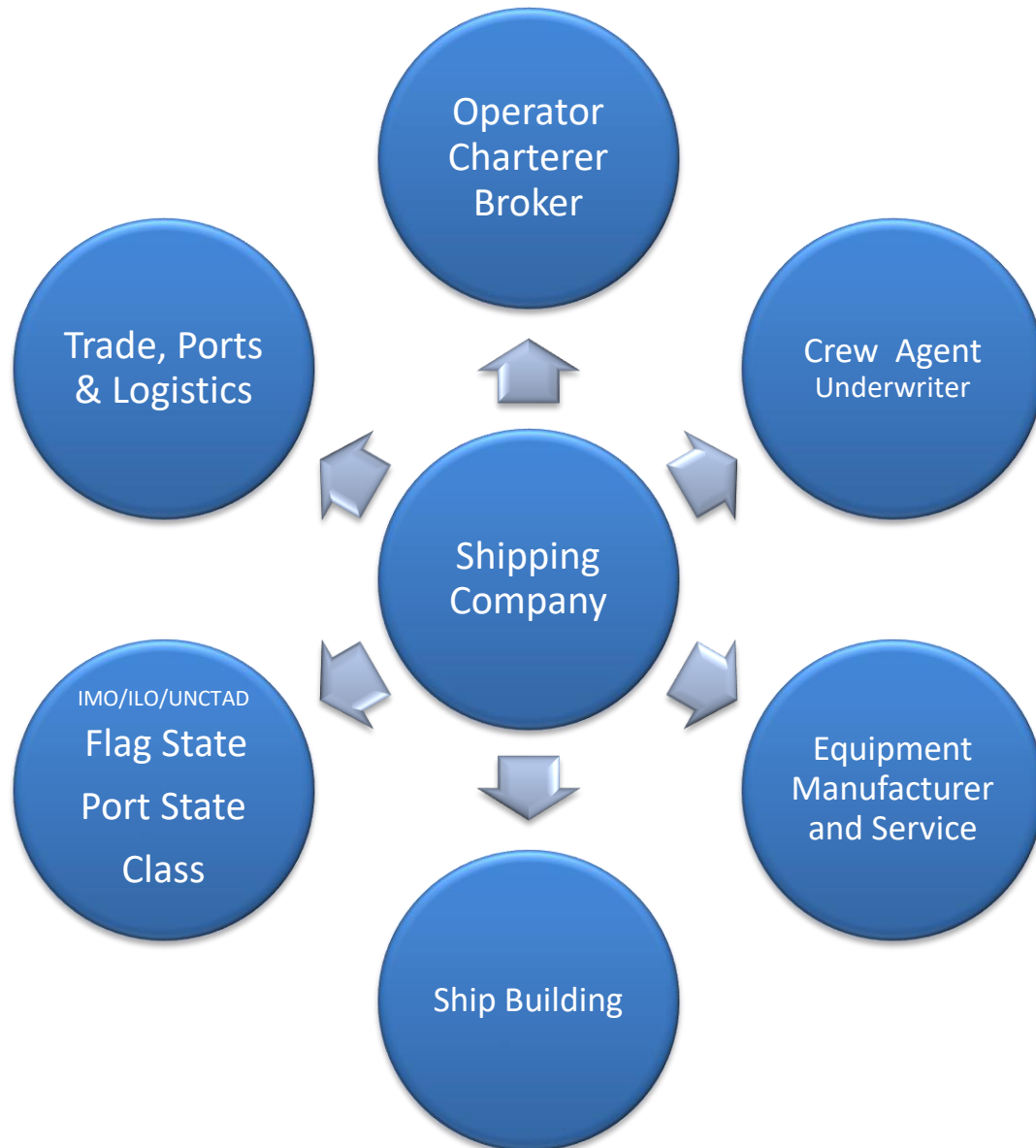
2017 World Maritime Day Theme

- *Connecting Ships, Ports, People*

2016 World Maritime Day Theme

- *Shipping, Indispensable to the World*

Players in Maritime Transport





Maritime Transportation

1. Overview
2. Maritime Transport
3. World Fleet and Operations
4. International Ports and Sustainability
5. Regulatory Development and Issues

1. Overview

1. Overview

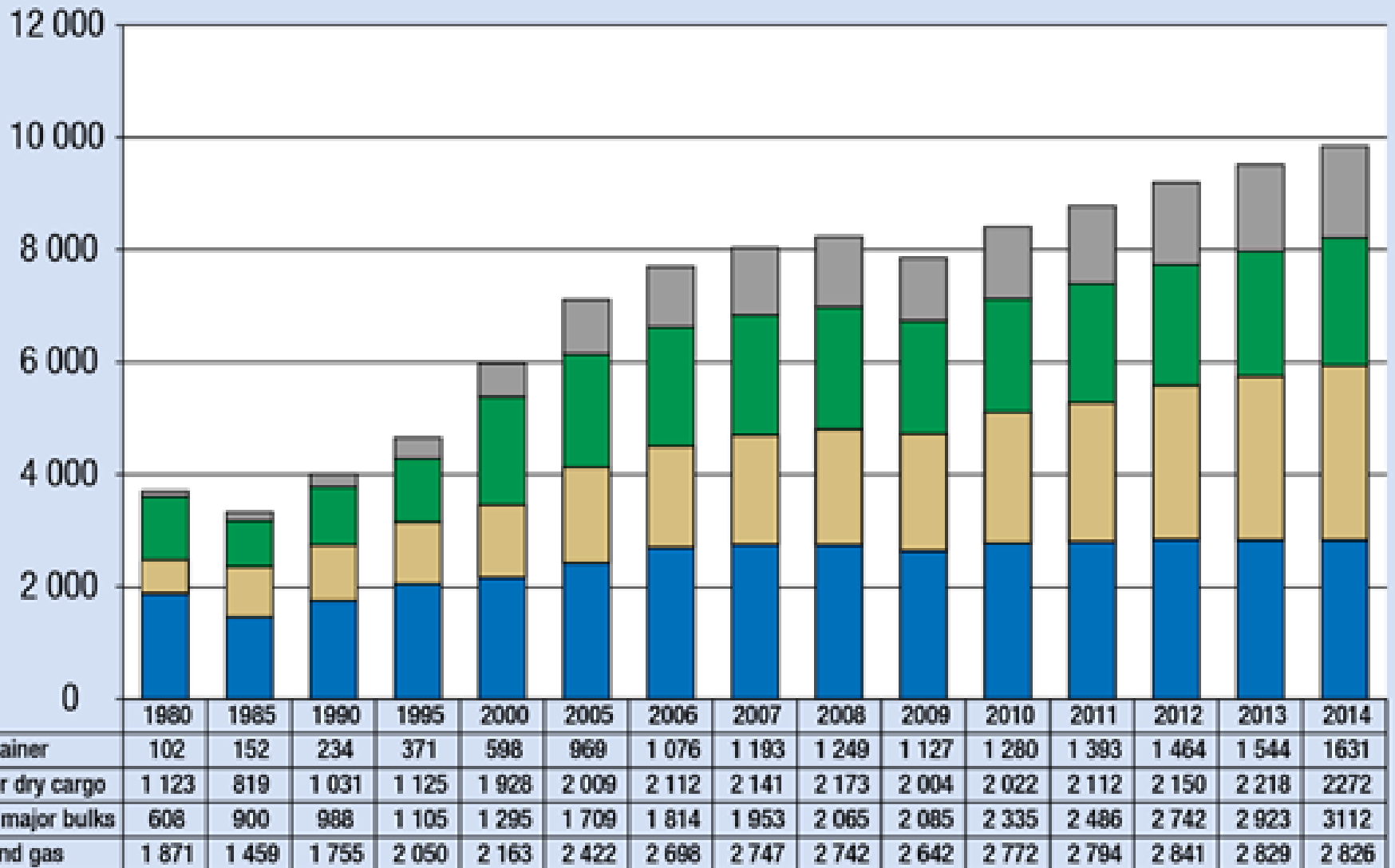
- Seaborne trade
- Global fleet and new regulations
- Ports
- Legal and regulatory framework

1. Overview

Seaborne Trade

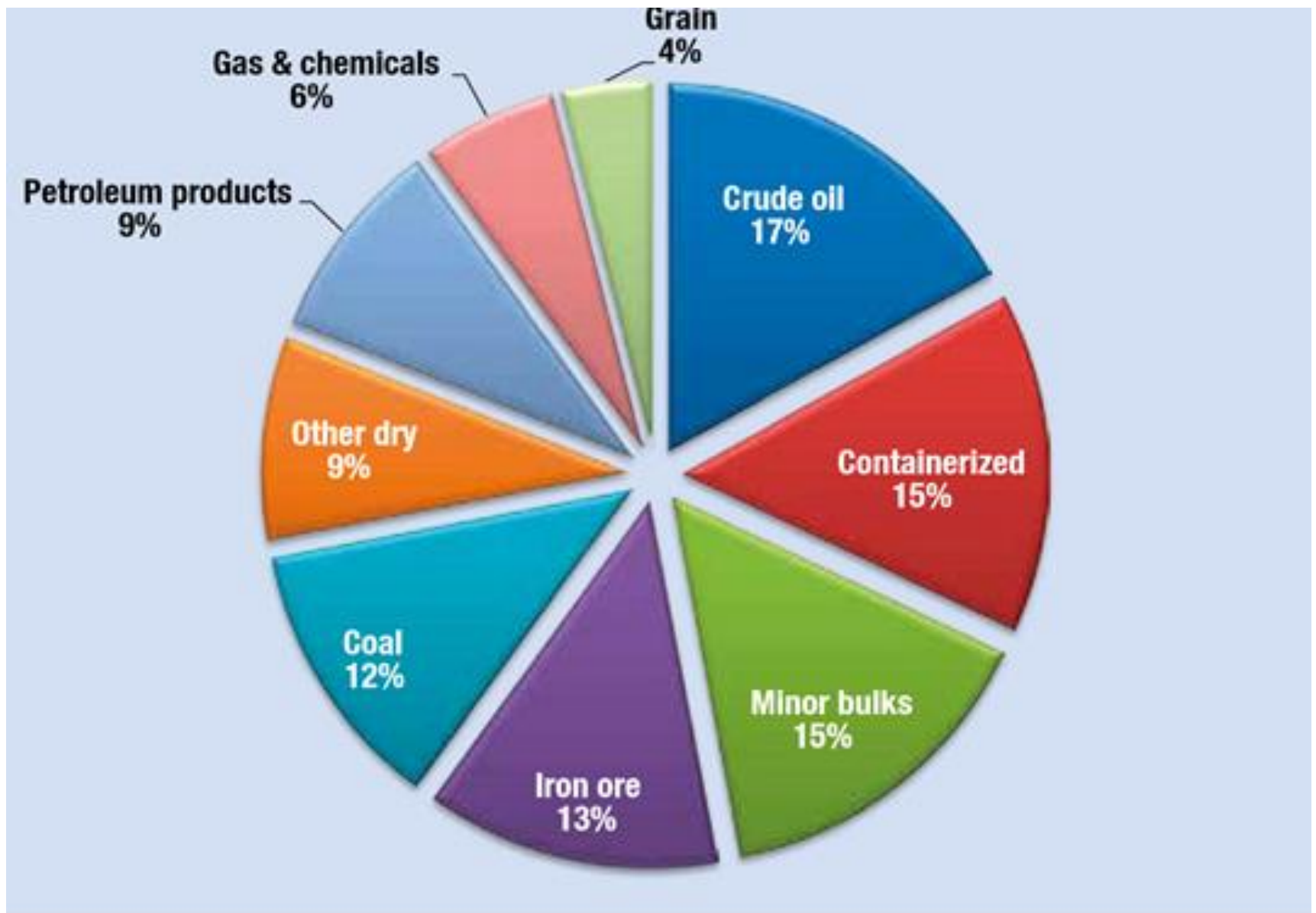
- World economy is on a slow-moving recovery,
- Growth slowdown in developing countries,
- Global GDP in 2015 was 2.9 %
- GDP in 2014 was 2.5%,
- GDP in 2013 was 2.4%,
- Global seaborne shipments increased by 3.4% in 2014, same as 2013.

International Seaborne Trade (selected years)



Source: UNCTAD Review of Maritime Transport 2015

Structure of International Seaborne Trade



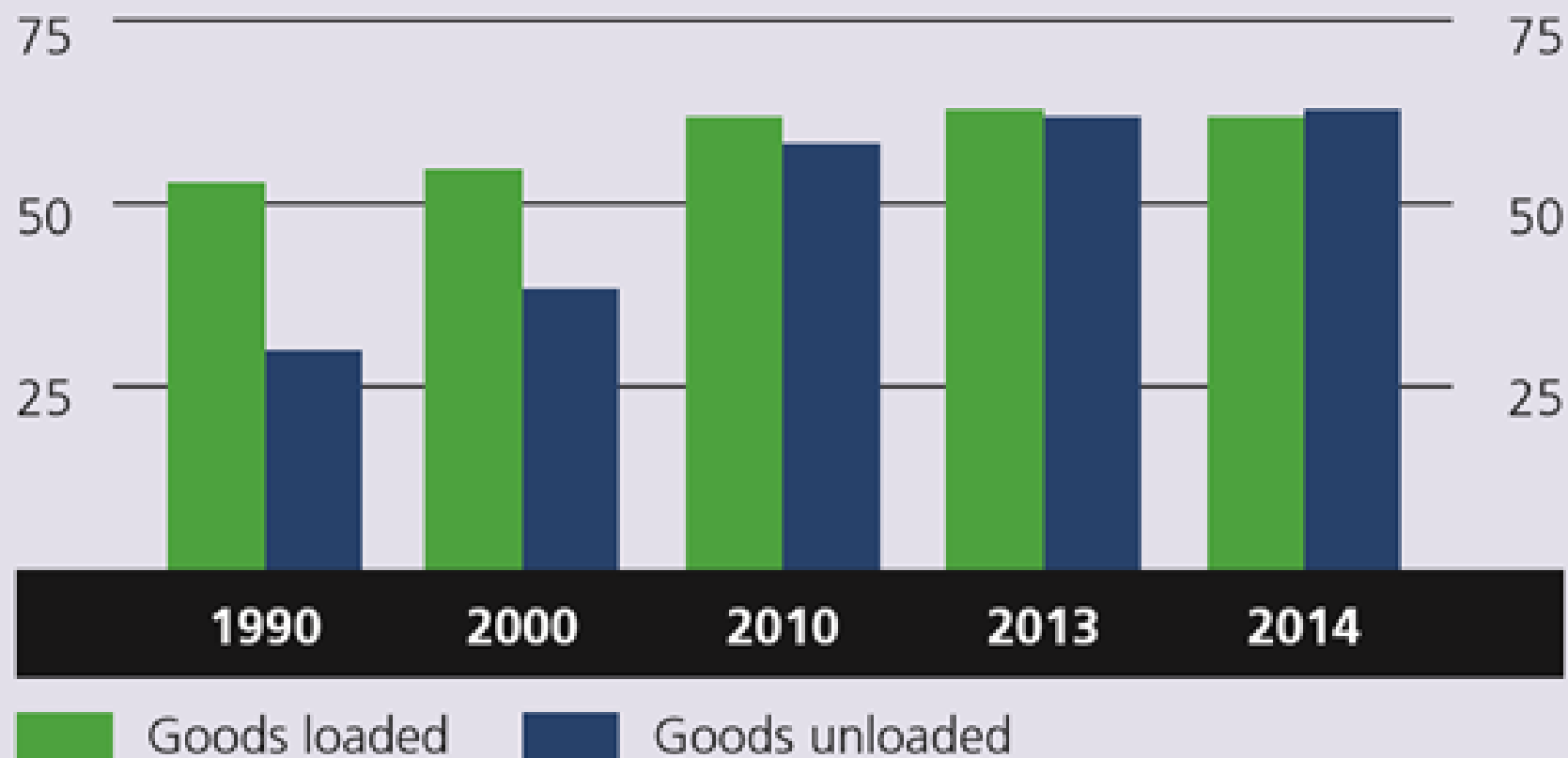
Overview

Fleet and new regulations

- World fleet grew by 3.5% in 2014, the lowest annual growth rate in over a decade.
- World's commercial fleet consisted of 89,464 vessels, by 2015
- Total tonnage is 1.75 billion dwt

DEVELOPING COUNTRIES' SHARE OF GLOBAL SEABORNE TRADE (BY VOLUME)

% of global goods loaded/unloaded at developing countries' sea ports



Overview

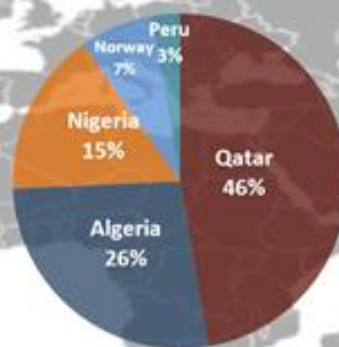
- Greece continues to be the largest ship-owning country, followed by Japan, China, Germany and Singapore.
- Top five ship-owning countries control more than half of the world tonnage,
- Five of top 10 ship-owning countries are from Asia, four are European, one is from the Americas.

Global LNG Imports in 2016

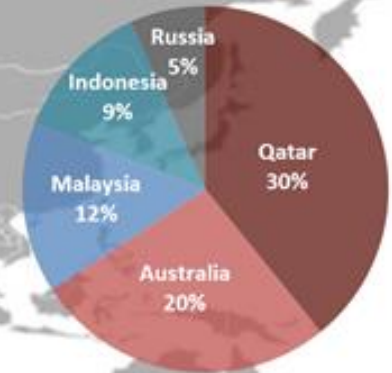
Americas - YTD imports:
13.96 MT



Europe - YTD imports:
31.30 MT



Asia - YTD imports:
152.78 MT



Overview

Global Shipping Giant Maersk in 2016

- profit in quarter 3 of 2016 is USD 438 millions,
- 44% fall as to Q3 of 2015

Overview

- Economic and regulatory incentives encourage individual owners to invest in modernizing their fleets;
- e.g. China COSCO and China Shipping merged, China COSCO Shipping;

Overview

Giant Shipping Merging

- China
 - China COSCO + China Shipping
 - Sinotrans CSC + China Merchant Holdings
- Japan
 - NYK + MOL + K-LINE

Overview

- New regulations require the shipping industry to invest in environmental technologies, covering issues such as emissions, waste, and ballast water treatment.

Overview

- Some investments are not only beneficial for the environment, but also lead to longer-term cost savings, due to energy efficiency.

Overview

Ports

- The performance of ports and terminals is important because it affects a country's trade competitiveness,
- What are determinants to port performance?
labour relations,
 - number and type of cargo handling equipment,
 - quality of backhaul area,
 - port access channel,
 - land-side access and customs efficiency,

Overview

- World's largest terminal operator handled 65.4 million TEUs in 2014,
- In 2015, Shanghai remained top throughput of 36.53 million TEUs,

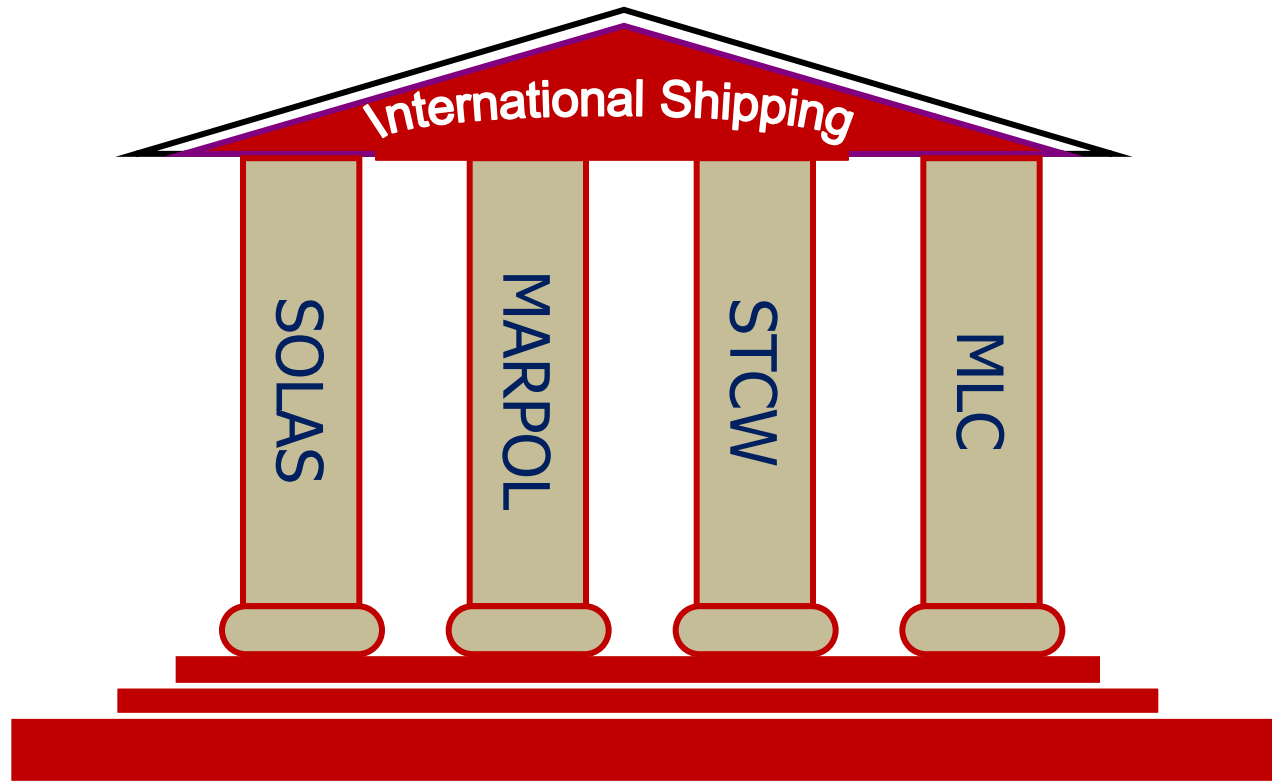
Overview

- Economic, environmental and social challenges facing ports include :
 - growing and concentrated traffic volumes brought about by ever-increasing ship size,
 - cost of adaptation of port and port hinterland infrastructure measures;

Overview

- a changing marketplace as a result of increased alliances between shipping lines;
- volatility in energy prices, the new energy landscape and the transition to alternative fuels;
- the entry into force of stricter sulphur limits;

International Regulatory Regime for Quality Shipping



Overview

- national budget constraints limiting the possibilities of public funding for transport infrastructure;
- increasing societal and environmental pressure;
- and potential changes in shipping routes from new or enlarged international passage ways.

Overview

Legal and regulatory framework

- In 2014, important regulatory developments in transport and trade included the adoption of the International Code for Ships Operating in Polar Waters (Polar Code), which is expected to enter into force on 1 January 2017,

Overview

- To further strengthen the legal framework relating to ship-source air pollution and the reduction of greenhouse gas (GHG) emissions from international shipping, several regulatory measures were adopted at IMO, and the third IMO GHG Study 2014 was finalised.

Overview

- Guidelines for the development of the Inventory of Hazardous Materials required under the 2010 International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS Convention), which however is not yet in force, were adopted,

Overview

- Further progress was made with respect to technical matters related to ballast water management, ship recycling, and measures helping to prevent and combat pollution of the sea from oil and other harmful substances.

Overview

- For suppression of maritime piracy and armed robbery, positive developments were noted in the waters off the coast of Somalia and the wider western Indian Ocean.

Overview

- Concern remains about the seafarers still being held hostage.
- A downward trend of attacks in the Gulf of Guinea was also observed, indicating that international, regional and national efforts are beginning to take effect.

Overview

- 2006 Maritime Labour Convention entered into force in 2013, (2006 MLC)
- In 2015, Nairobi International Convention of Wreck Removal has entered into force, (Nairobi Wreck Removal Convention);

Overview

- International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention) will enter into force on 8 September 2017.

Overview

- IMO MEPC 70:
 - New requirements for international shipping, IMO as UN body continues to address greenhouse gas emissions,
 - Adoption of Data Collection System, Approval of Roadmap, Voluntary data collection and submission to begin,
 - Adoption the revised G8 Type Approval Guidelines of BWM Convention

2. Maritime Transport

2. Maritime Transport

- Developing countries remained the engine of growth, contributing three quarters of global expansion in 2014 (International Monetary Fund, 2015),

Maritime Transport

- Slower GDP growth reflects weaker expansion in developing America and a slowdown in China,
- Economies of the least developed countries continued to expand at a rapid rate (5.3%).

Maritime Transport

	2012	2013	2014	2015
World	2.2	2.4	2.5	2.5
EU	-0.5	0.1	1.3	1.7
U.S	2.3	2.2	2.4	2.3
Asia	5.1	5.6	5.5	5.2
Russia	3.4	1.3	0.6	-3.5

World economic growth, 2012-2015
(annual percentage change)

(Sources: UNCTAD Trade and Development Report 2015)

Maritime Transport

- China's GDP:
 - 7.3 % in 2014
 - 6.8 % in 2015
 - 6.5 % in 2016
- ASEAN's GDP
 - 4.6 % in 2014,
 - 4.6 % in 2015
 - 4.9 % in 2016

(Source: OECD Economic Outlook for SE Asia, China and India 2016)

Maritime Transport

- World economy has embarked on a slow moving global recovery,
- on balance, GDP growth is expected to continue to moderate in 2015,
- outlook remains subject to many downside risks.

Maritime Transport

- World merchandise trade in 2014
 - volume of global merchandise trade increased at the slower rate of 2.3 %, down from 2.6 per cent in 2013.
 - reflect an uneven recovery in the developed economies,
 - slower growth in developing economies.

Maritime Transport

- Developing countries in 2014:
 - shared 45% world exports,
 - shared 42.2% world imports,
 - gained greater market share in world merchandise trade.

Maritime Transport

- A rebalancing of China's economy can significantly reshape the maritime transport landscape and alter shipping and seaborne trade patterns.

Maritime Transport

- General trends in seaborne trade
 - the volume of world seaborne shipments expanded by 3.4 per cent in 2014, that is, at the same rate as in 2013

Maritime Transport

- Additions to volumes exceeded 300 million tons, taking the total to 9.84 billion, or around four fifths of total world merchandise trade.
- Dry cargo has accounted for over two thirds of the total,
- Tanker trade slightly declined from nearly 30.0 % in 2013 to 28.7 % in 2014.

Maritime Transport

- Seaborne trade in ton–miles
 - the ton–mile unit offers a more accurate measure of demand for shipping services and tonnage as it takes into account distance, which determines ships' transportation capacity over time.

Maritime Transport

- In 2014, growth in ton–miles performed by maritime transportation was estimated to have increased by 4.4 %, up from 3.1 % in 2013

Maritime Transport

- Seaborne trade by cargo type
- Tanker trade
 - Crude oil
 - Refined petroleum products
 - Natural gas and liquefied gases
- Dry cargo trade:
 - Iron ore shipments
 - Coal shipments
 - Grain shipments
 - Containerized trade

Maritime Transport

- Crude Oil

- crude oil shipments were estimated at 1.7 billion tons in 2014, a drop of 1.7 % over previous year.
- while imports into China increased by 9.8 %, 5.6 million barrels per day.

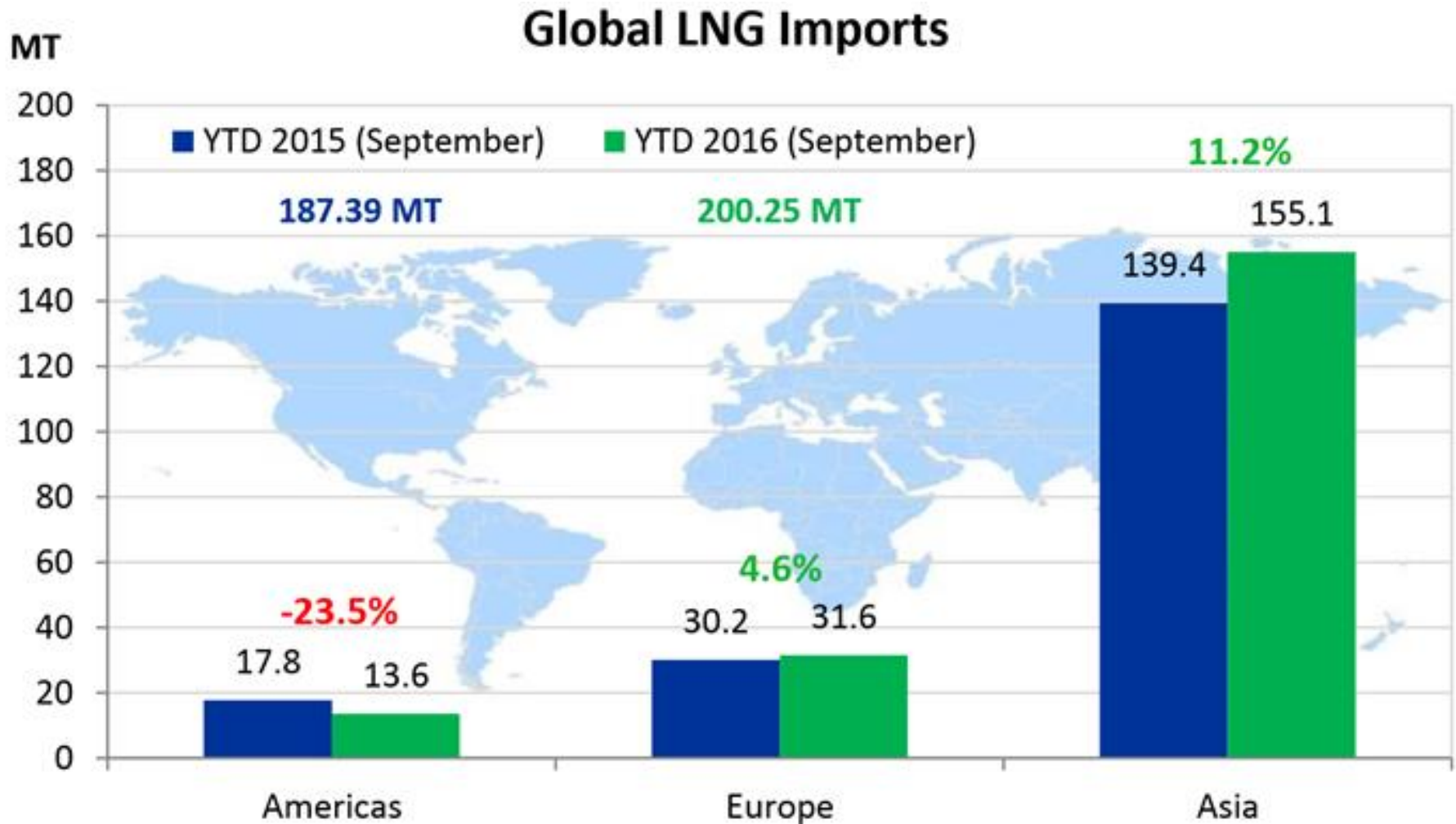
Maritime Transport

- Refined petroleum products in 2014,
 - Global refinery capacity increased by 1.4 %, driven mainly by growth in Brazil, China, Singapore and Western Asia.
 - Petroleum products are estimated to have increased by 1.7 % in 2014, reached 977 million tons,

Maritime Transport

- Global LNG trade carried by sea in 2014
 - Volumes increased by 2.5 %, 333.3 billion cubic metres.
 - Growth was driven by higher import demand in China, India, the UK, Brazil and Mexico,
 - Japan was the largest importer, increased imports by 1.4 %, Republic of Korea was the second largest importer, declined 5.7 %,
 - Rising import demand is from China and India.

Global Monthly LNG Imports



Source: Platts LNG Navigator, 2 Nov. 2016

Global Weekly LNG Imports

GLOBAL LNG IMPORTS (Bcf of gas)

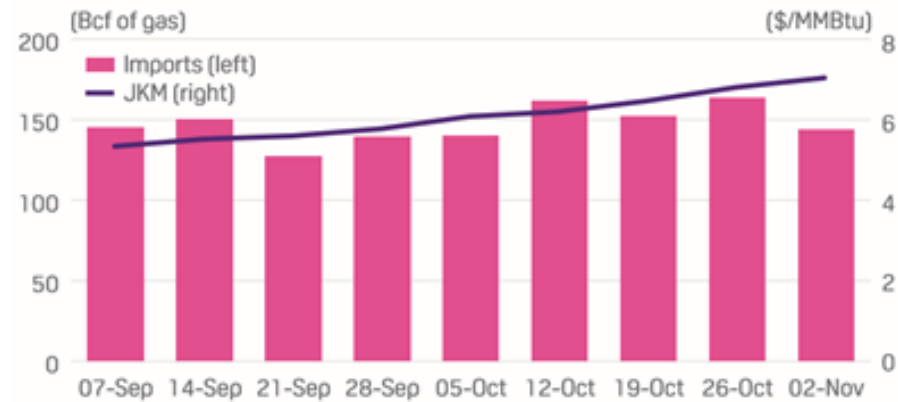


Source: Platts LNG Navigator, 2 Nov. 2016

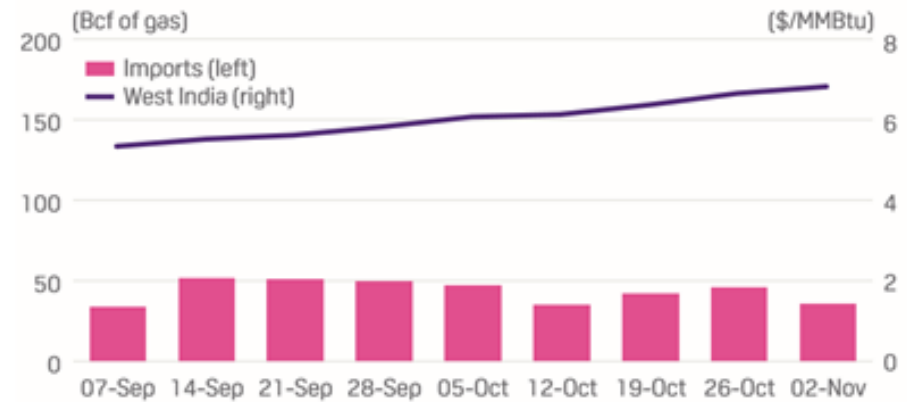
Global Weekly LNG Imports

LNG IMPORTS BY REGION

ASIA



MIDDLE EAST/INDIA



Global Weekly LNG Exports

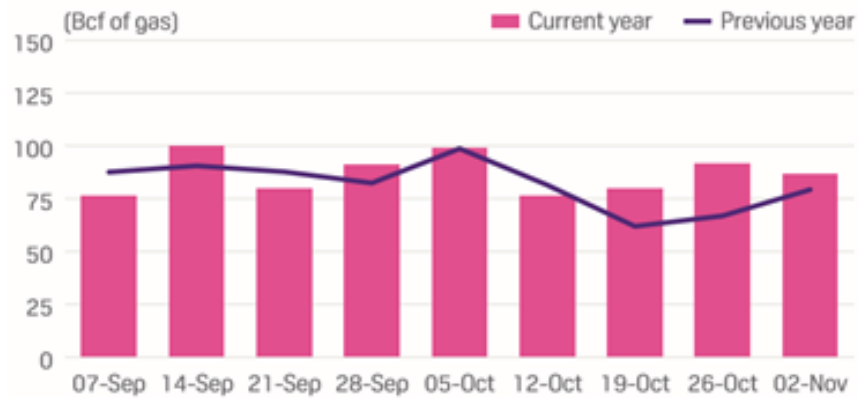
GLOBAL LNG EXPORTS (Bcf of gas)



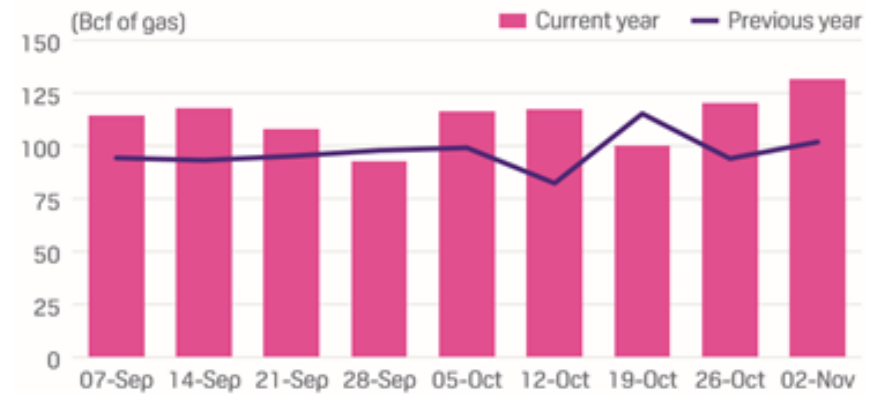
Global Weekly LNG Exports

LNG EXPORTS BY REGION

MIDDLE EAST



ASIA PACIFIC



NORTH AFRICA



WEST AFRICA



Maritime Transport

- Seaborne iron ore trade in 2014,
 - estimated to have grown by 12.4 %, to 1.34 billion tons,
 - India's iron ore imports were estimated to grow by 23 % in 2015,
 - Concerns relating to a slowdown of China's steel industry and import demand caused uncertainty.

Maritime Transport

- Global seaborne coal trade in 2014,
 - Growth in world coal decelerated to 2.8 % , 1.2 billion tons,
 - China was the main engine fuelling the rapid expansion of world seaborne coal trade over the past decade, its share of global coal shipments reached 20 %,

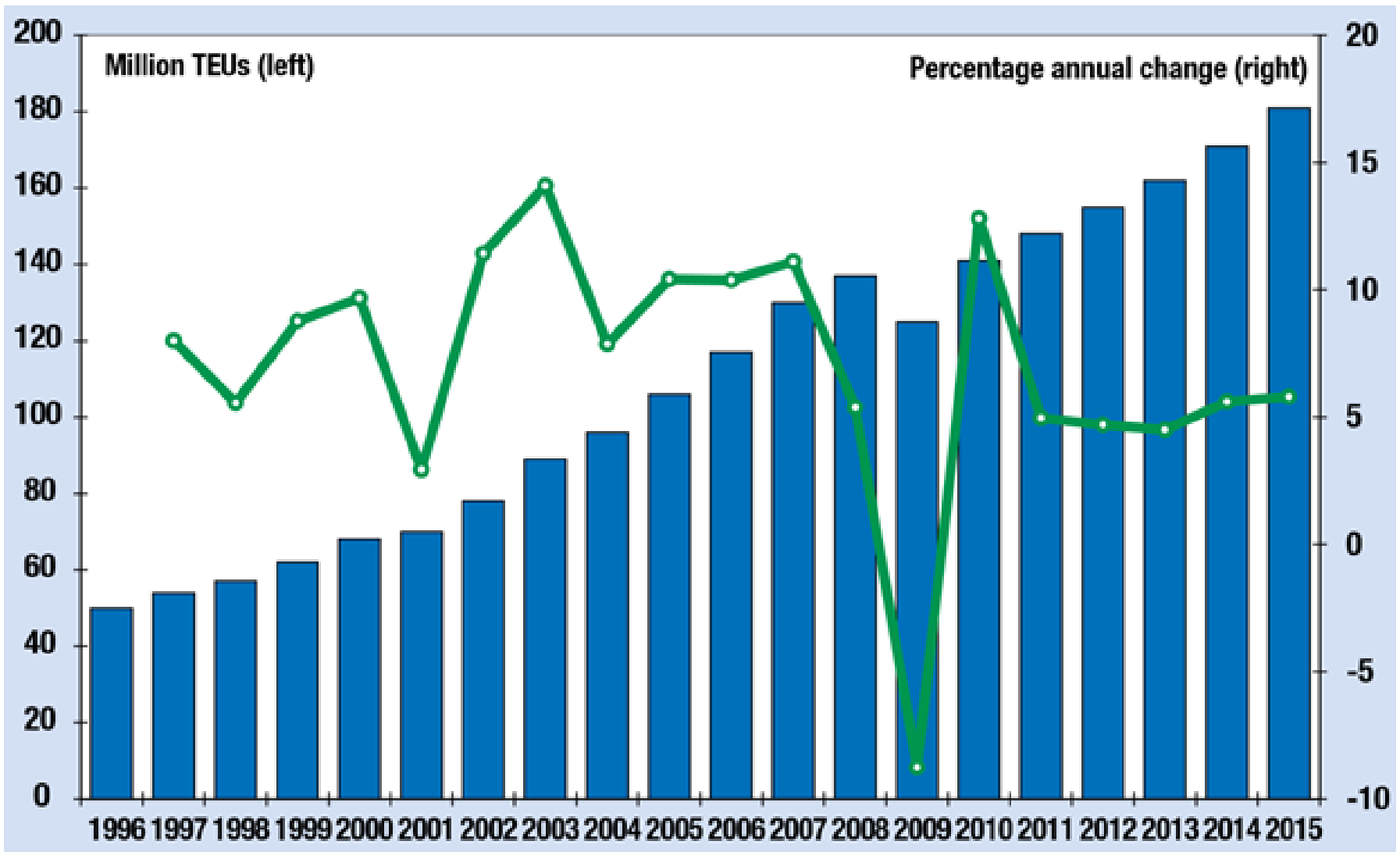
Maritime Transport

- Global seaborne grain trade in 2014,
 - Global grain shipments were estimated to have increased by 11.1 %, totalled 430 million tons,
 - Japan, the top world importer, imported less grain, -1.3 %,
 - China, the second world importer, increased its imports, + 16.4%

Maritime Transport

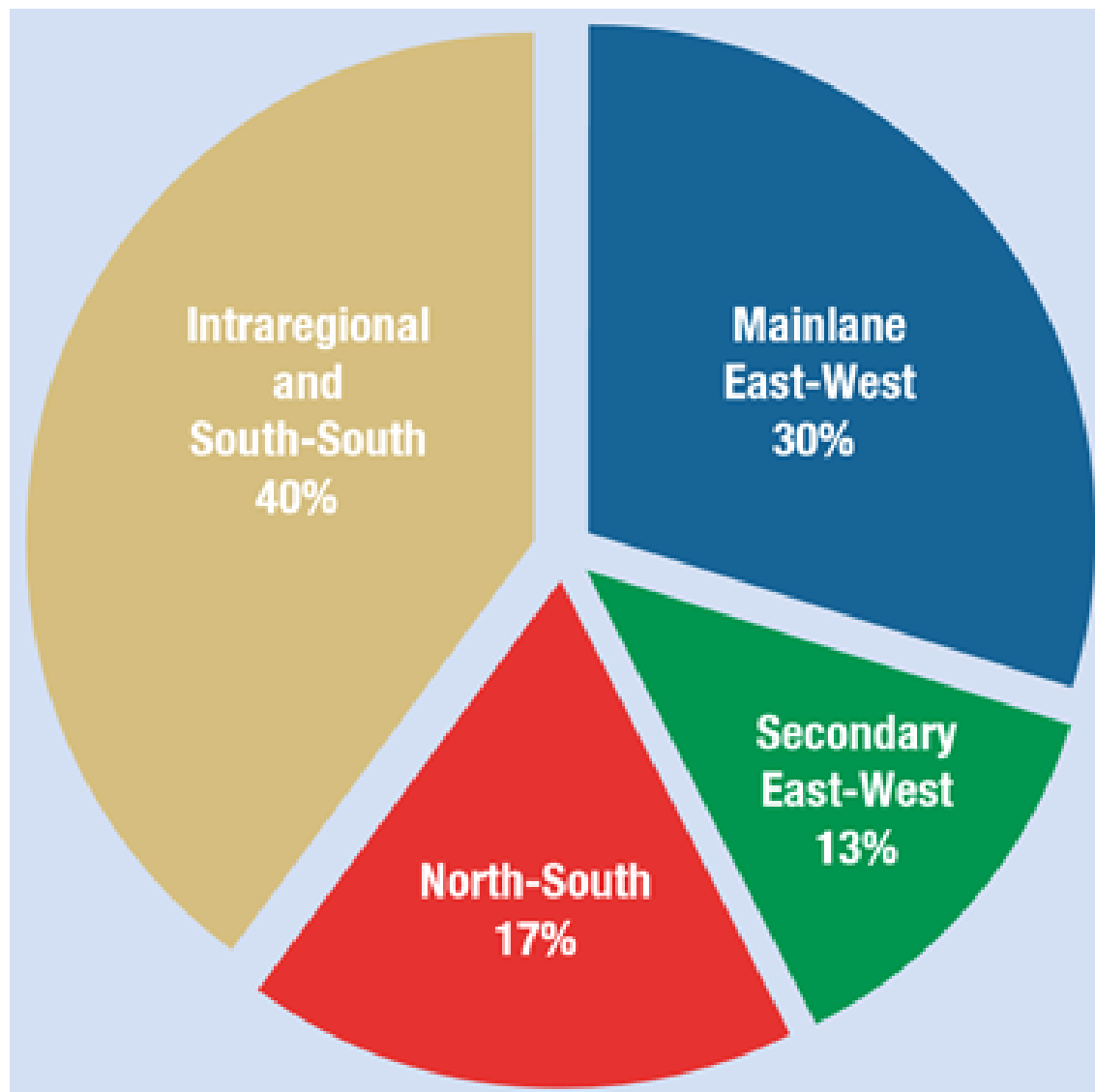
- Global containerised trade in 2014,
 - estimated to have increased by 5.3 %, reached 171 million TEUs,
 - intraregional, intra-Asian trade, South–South trade, accounted for 40 % of global containerised volumes.

Global Container Trade



Source: UNCTAD Secretariat, 2015

Global Container Trade by Route 2014



Source: UNCTAD Secretariat, 2015

Maritime Transport

- China in first 3 Qs of 2016,
 - maritime passenger transport reached 210 millions, - 0.4%,
 - maritime cargo transport totalled 4.6 billions tons, 1.6 % increase,
 - Port throughput, 8.8 billions tons, 2.2 % increase,
 - While crude oil and iron ore increase 7.3 % and 6.8 % respectively, container throughput 160 millions TEU, +3.5 %

Maritime Transport

- Maritime transport system
 - maritime transport remains the backbone of international trade and globalization, as over 80 % of world merchandise trade is carried by sea,

Maritime Transport

- Maritime transport enables other sectors:
 - marine equipment manufacture,
 - marine insurance,
 - banking and brokering,
 - classification and consultancy,
 - fisheries,
 - tourism
 - offshore energy sector,
 - shipbuilding and ship demolition

Maritime Transport

- Sustainable maritime transport systems entail transport infrastructure and services that are
 - safe,
 - socially acceptable,
 - universally accessible,
 - reliable,
 - affordable,
 - fuel-efficient,
 - environmentally friendly,
 - low carbon and climate-resilient.

Maritime Transport

- Factors driving sustainability in maritime transport?
- Efforts to improve environmental and social performance of maritime transport are driven by regulation, market requirements and customer demands, in global supply chain for:
 - greater corporate social responsibility,
 - transparency,
 - reliability,
 - lighter environmental footprints

Maritime Transport

- Regulations include
 - safety, accidents, SOLAS
 - security, piracy, SUA and ISPS Code
 - marine pollution, oil spills, MARPOL, ballast water
 - air pollution, SO_x and NO_x, GHG emissions, MARPOL Annex XI
 - labour conditions, seafarers' rights and decent working conditions, 2006 MLC

Maritime Transport

- Connectivity and infrastructure in maritime transport and services are of strategic importance in
 - market access,
 - globalised production,
 - trade competitiveness,
 - employment,
 - social progress

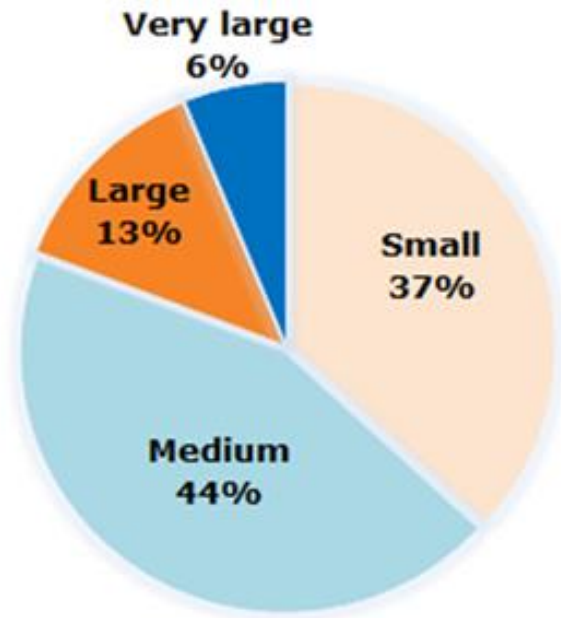
3. World Fleet and Operations

3. World Fleet and Operations

- World fleet grew by 3.5 % in 2014, the lowest annual growth rate over a decade
- World's commercial fleet consisted of
 - 89,464 vessels,
 - with a total tonnage of 1.75 billion dwt.

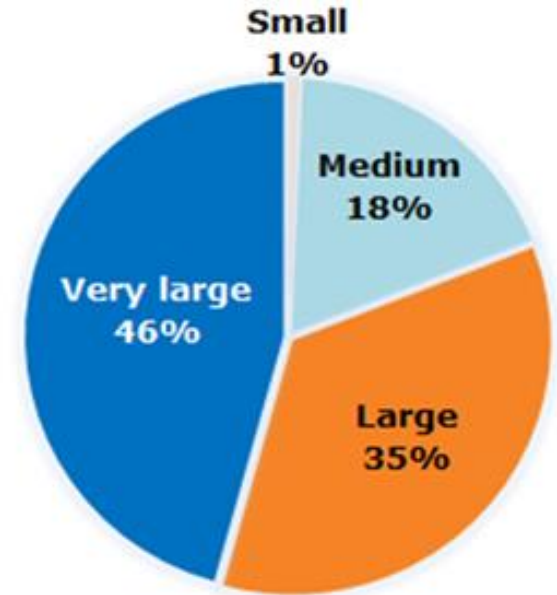
World Fleet and Operations

World fleet : total number of ships, by size



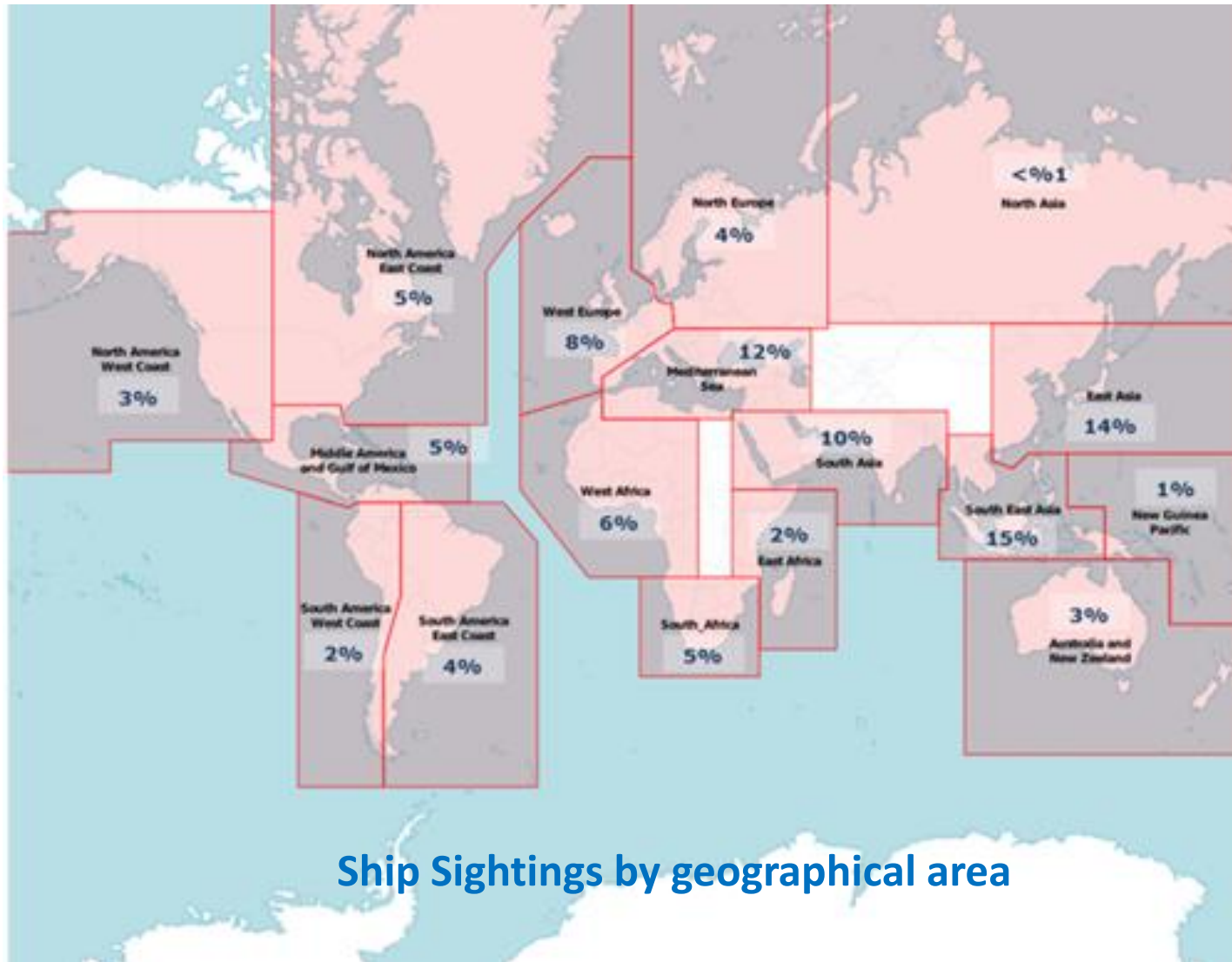
Total No. 87,233

Graph 2 - World fleet : gross tonnage, by size



Total 1000 gt 1,210,422

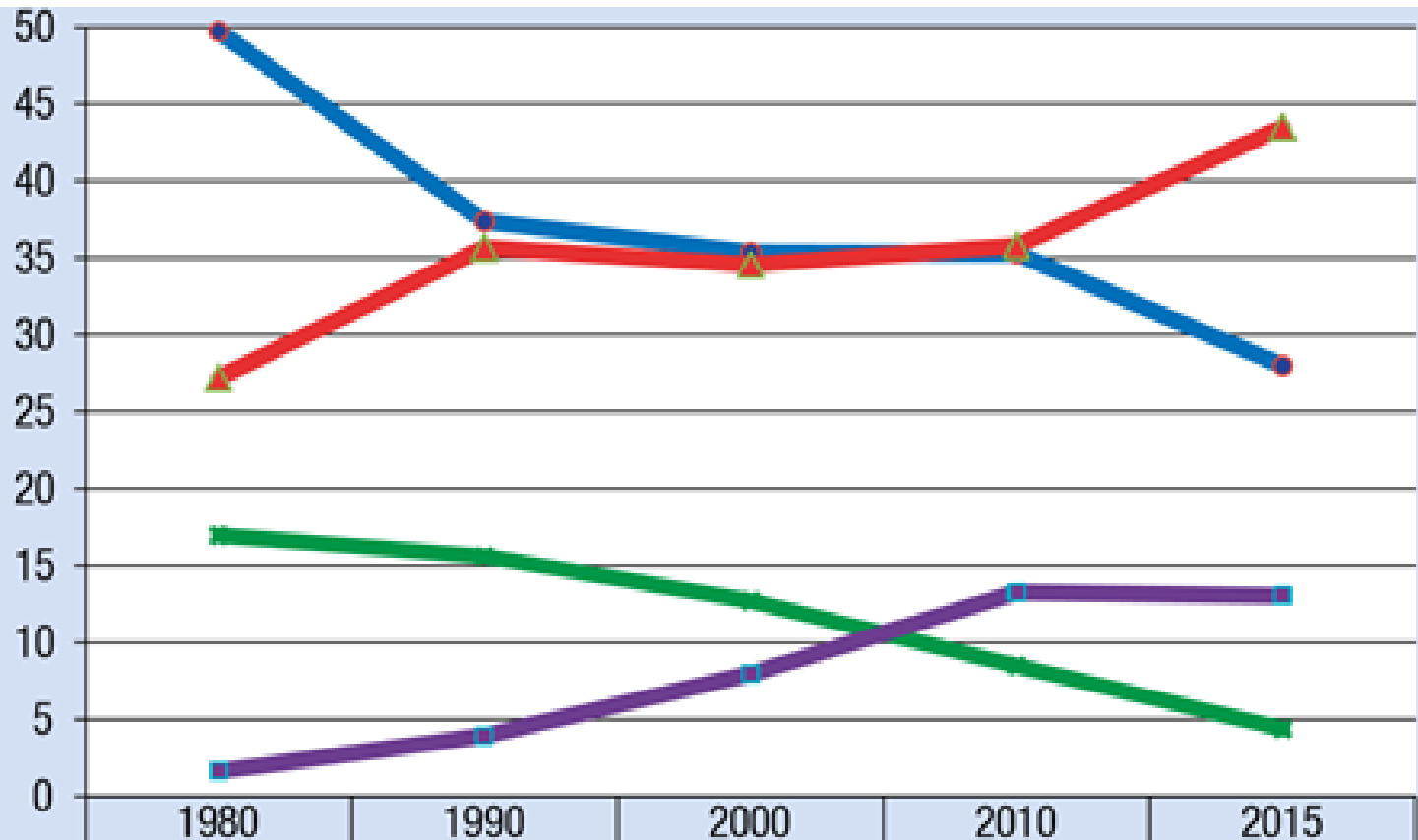
World Fleet and Operations



World Fleet and Operations

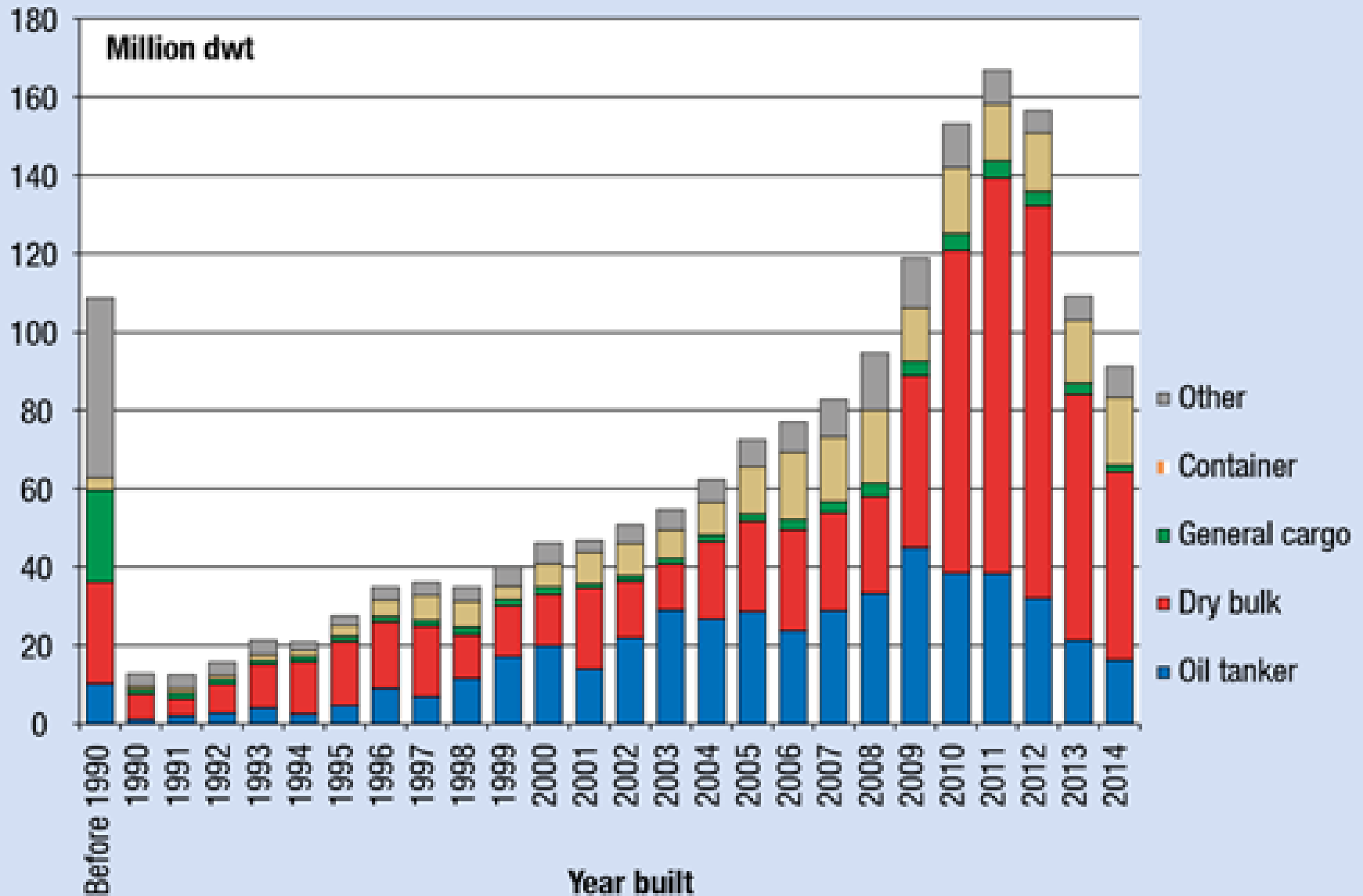
- Greece continues to be the largest ship-owning country, followed by
 - Japan,
 - China,
 - Germany
 - Singapore

Global Fleet by Ship Types

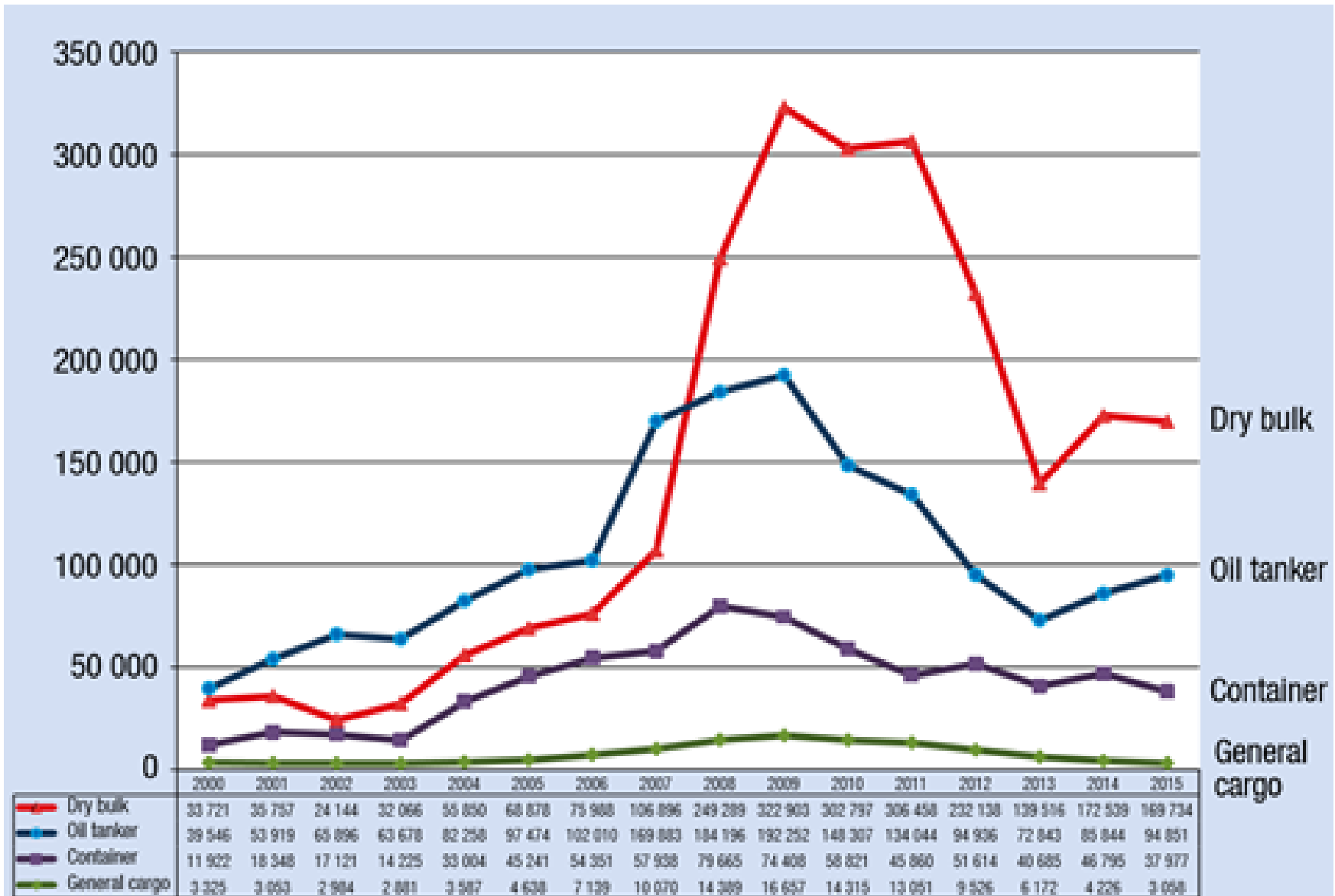


Oil tanker	49.7	37.4	35.4	35.3	28.0
Dry bulk	27.2	35.6	34.6	35.8	43.5
General cargo	17.0	15.6	12.7	8.5	4.4
Container	1.6	3.9	8.0	13.3	13.0

Global Fleet by Year of Building



Global Tonnage on Order (1000 dwt)



Source: UNCTAD Secretariat, 2016

World Fleet and Operations

- New regulations require the shipping industry to invest in environmental technologies, in emissions, waste, and ballast water treatment.
- Some investments are not only beneficial for the environment, but may also lead to longer-term cost savings, due to increased fuel efficiency.

World Fleet and Operations

- World Fleet in 2014,
 - World's commercial fleet consisted of 89,464 vessels, with a total tonnage of 1.75 billion dwt.
 - the greatest and expanding share in the global fleet are dry bulk carriers, which by the beginning of 2015 had reached a share of 43.5 % of total capacity.

World Fleet and Operations

- container ship fleet increased by 5.2 % in the same period and stands in contrast to the slowdown in global economic growth
- offshore and gas tanker growth surpassed all other vessel types and reflects the expansion of trade in gas and new offshore exploration,
- ferries and passenger vessels fleet expanded by 4.8 %, indicating positive expectations,

World Fleet and Operations

- World Fleet Ownership in 2014
 - Greece continues to be the largest ship-owning country, more than 16 % of the world total,
 - top five control more than half of the world dwt tonnage, of the top ten ship-owning countries,
 - 5 from Asia,
 - 4 from European,
 - 1 from the Americas (U.S).

World Fleet and Operations

Rank	Country / Territory	No. of Vessels	DWT	% of world total
1	Greece	4 017	279 429 790	16.11 %
2	Japan	3 986	230 675 179	13.30 %
3	China	4 966	157 557 210	9.80 %
4	Germany	3 532	122 035 632	7.04 %
5	Singapore	2 356	84 022 252	4.84 %
6	Republic of Korea	1 618	80 181 485	4.62 %
7	Hong Kong, China	1 258	75 321 271	4.34 %
8	United States	1 972	60 263 524	3.47 %
9	United Kingdom	1 227	48 381 899	2.79 %
10	Norway	1 857	46 370 542	2.67 %

Ownership of the World Fleet

(Source: UNCTAD Secretariat, as of 1 January 2015)

World Fleet and Operations

- China, Indonesia and the Russian Federation have a large number of nationally flagged and owned ships, which are largely employed in coastal or inter-island shipping.
- These markets tend to be protected from foreign competition and do not necessarily fall under global IMO regulations. Ships deployed on these services tend to be smaller and older than the fleet deployed on international routes.

World Fleet and Operations

- Container ship operators in 2014
 - three largest liner shipping companies have a share of almost 35 % of the world total container-carrying capacity.
 - top 10 container shipping companies operated over 61 % of global container fleet,
 - top 20 controlled 83 % of all liner capacity,
 - container vessels on order are larger than the current average container-carrying capacity,

World Fleet and Operations

	Operator	Share % (TEU)	No. of Vessels	TEU
1	Maersk Lines A/S	13.45	478	2 526 490
2	Mediterranean Shipping Company (MSC) SA	13.22	451	2 483 979
3	CMA CGM S.A	8.00	375	1 502 417
4	China COSCO Shipping*	8.55	292	1 580 000
5	Evergreen Marine	5.08	204	954 280

Leading liner companies, May 2015

Source: UNCTAD Secretariat,

*China COSCO Shipping homepage, Oct. 2016

World Fleet and Operations

- China has the highest liner shipping connectivity index (LSCI), followed by Singapore, Hong Kong (China), Republic of Korea, Malaysia, and Germany.
- Morocco, Egypt and South Africa are best connected countries in Africa, reflecting their geographical position.
- Panama has the highest LSCI in Latin America, benefiting from its canal and the location and routes, followed by Mexico, Colombia and Brazil.

World Fleet and Operations

- Registration of Ships in 2014
 - Panama, Liberia and the Marshall Islands are the largest vessel registries, together, they account for a 41.8 % share of the world tonnage,
 - more than three quarters (75 %) of the world fleet are registered in developing countries,
 - tonnage registered under a foreign flag is 71 % of the world total.

World Fleet and Operations

	Flag of Registration	No. of Vessels	Share world total vessels	Share of world total dwt
1	Panama	8 351	9.33	20.13
2	Liberia	3 142	3.51	11.65
3	Marshall Islands	2 580	2.88	10.02
4	Hong Kong, China	2 425	2.71	8.62
5	Singapore	3 689	4.12	6.58

Flag of registration, as of January 2015, (dwt)

Source: UNCTAD Secretariat

World Fleet and Operations

- Shipbuilding, Demolition and New Orders
- newbuildings
 - World fleet grew by 42 million GT in 2014,
 - newbuildings almost 64 million GT
 - demolitions about 22 million GT.

World Fleet and Operations

- 91 % GT delivered in 2014 was built in just three countries:
 - China (35.9 %);
 - Republic of Korea (34.4 %);
 - Japan (21.0 %),

World Fleet and Operations

- China mostly built
 - dry bulk carriers,
 - followed by container ships,
 - tankers;
- Republic of Korea built mostly
 - container ships,
 - oil tankers;
- Japan specialised fundamentally in
 - bulk carriers.

World Fleet and Operations

	Country	GT of delivery	Share %
1	World Total	63 662	
2	China	22 851	35.9
3	Republic of Korea	21 872	34.4
4	Japan	13 392	21.0

Deliveries of newbuildings, 2014, thousands of GT

Source: UNCTAD Secretariat

World Fleet and Operations

- Demolition of ships
- scrapping of ships helps reduce oversupply of tonnage, it encourages the modernization of the fleet,
- vessels demolished tend to be less fuel efficient, more pollution to the environment as far as emissions are concerned.

World Fleet and Operations

- China has extended a subsidy programme that encourages shipping companies to scrap old vessels.
- The scheme, which began in 2013, provides financial incentives to shipowners to replace old vessels with newer, more environmentally friendly models

World Fleet and Operations

- Bangladesh, India and Pakistan and China together account for more than 90 % of global ship breaking.
- most container ships are demolished in India,
- Bangladesh and China purchased more dry bulk carriers,
- Pakistan mostly oil tankers.

World Fleet and Operations

	Country	Total	Share %
1	World total	22 394	
2	India	6 965	31
3	China	4 873	21
4	Bangladesh	4 269	19
5	Pakistan	4 127	18
6	Turkey	839	3

Tonnage sold for demolition, 2014, thousands of GT

Sources: UNCTAD Secretariat

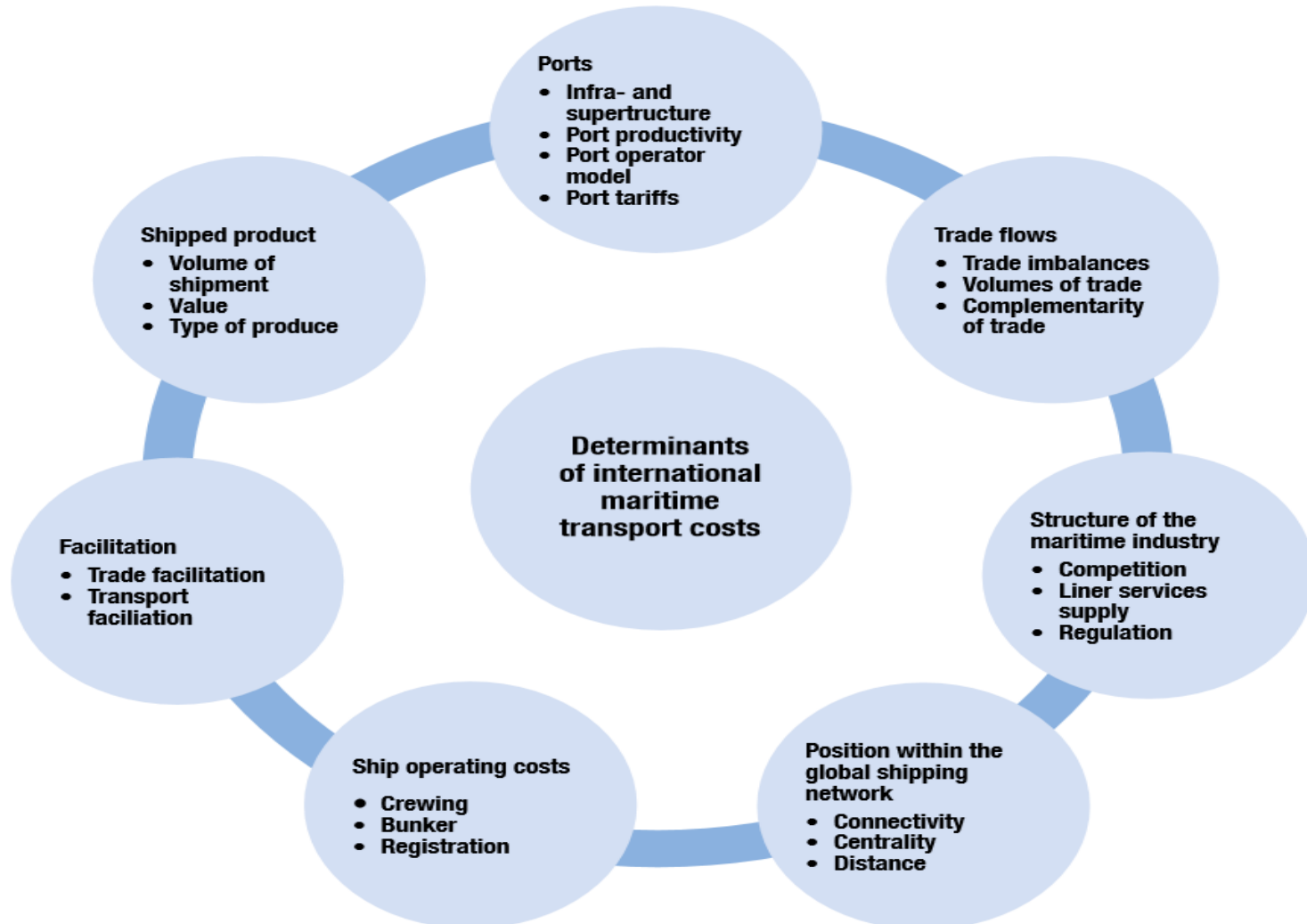
World Fleet and Operations

- Maritime Transport Cost
 - International maritime transport costs are a key component of trade costs and economic development,
 - seven main determinants of maritime transport costs are available to discuss possible reasons for the overall freight costs estimated,

World Fleet and Operations

1. trade and transport facilitation
2. operating costs
3. position within shipping networks
4. regulation and industry structure
5. shipped product
6. port characteristics and infrastructure
7. trade flows

World Fleet and Operations



Determinants of maritime transport costs

Sources: UNCTAD Secretariat

4. International Ports and Sustainability

4. International Ports and Sustainability

- The performance of ports and terminals is important because it affects a country's trade competitiveness,
- many determinants to port performance,
 - labour relations,
 - cargo handling equipment
 - port access channel,
 - customs efficiency,

International Ports and Sustainability

- Developing economies' share of world container port throughput increased marginally to approximately 71.9 %,
- economic, environmental and social challenges facing ports include growing and concentrated traffic volumes brought about by ever-increasing ship size,

International Ports and Sustainability

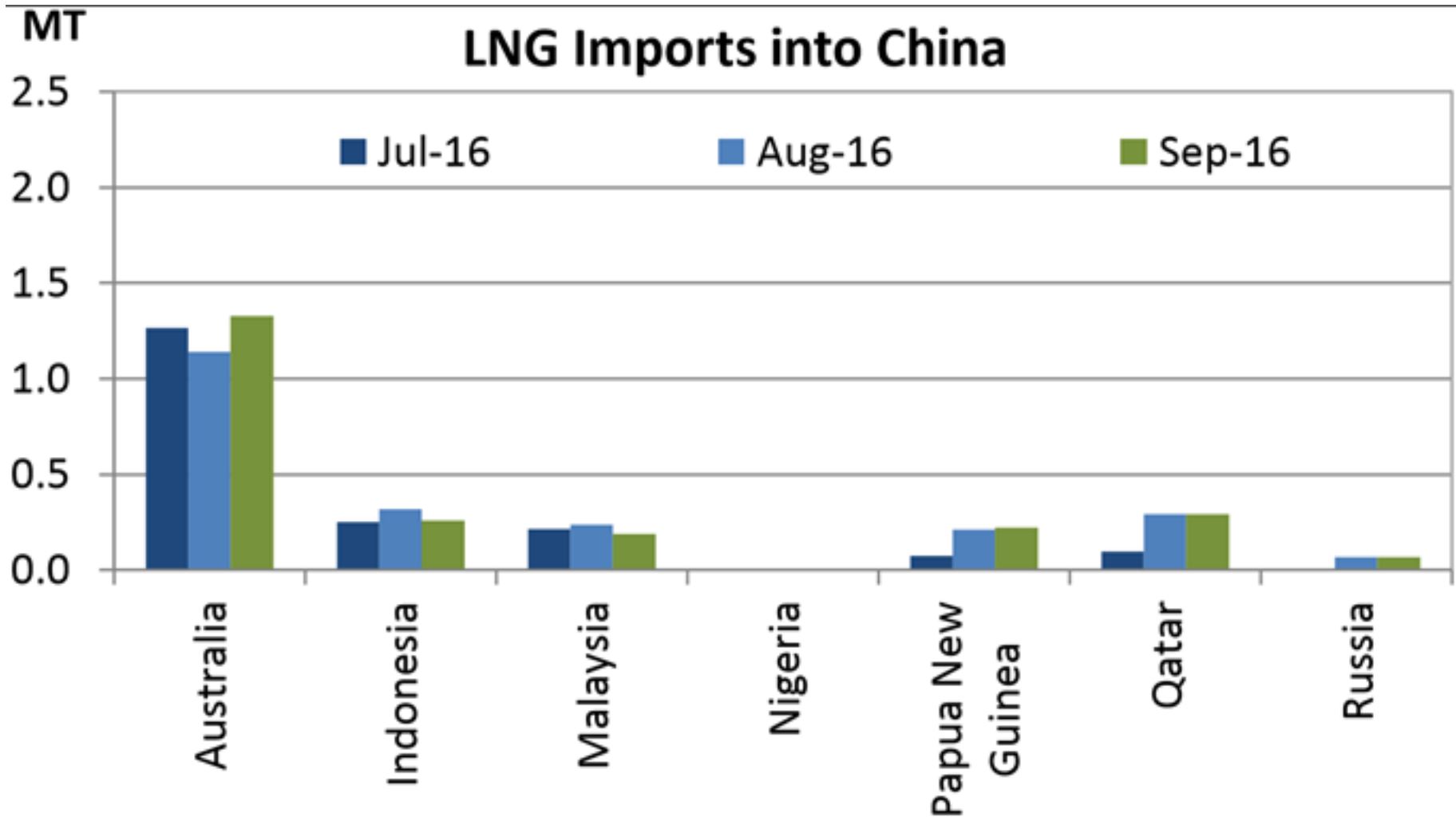
- Port Development
- Container ports
 - container port throughput is measured by the number of TEUs that are handled.
 - One FEU represents two TEU moves and the repositioning of containers to reach those stacked underneath/on top of others can also constitute a move.

LNG Terminals in China



Source: Platts LNG Navigator, October 2016

LNG Imports into China



Source: Platts LNG Navigator, October 2016

International Ports and Sustainability

- Chinese ports operate the largest number of berths (31,705) and handle more cargo both in terms of metric ton volume and number of TEUs than any other country.
- China's combined navigable rivers, at 126,300 kilometres, are also the longest of any single country.

International Ports and Sustainability

Container terminals

- Shanghai
- Singapore
- Shenzhen
- Hong Kong
- Ningbo
- Busan
- Guangzhou
- Qingdao
- Tianjin
- Rotterdam
- Dalian

International Ports and Sustainability

- Sustainability Challenges facing Ports
- economic, environmental and social challenges facing ports include:
 - growing traffic volumes by ever-increasing ship size;
 - cost of adaptation of port and port hinterland infrastructure measures;
 - changing marketplace
 - national budget constraints limiting the possibilities of public funding for transport infrastructure;
 - stricter sulphur limits in IMO ECA countries;
 - increasing environmental pressure

International Ports and Sustainability

- Environmental challenges
 - UNFCCC
 - Kyoto Protocol
 - Paris Agreement
 - Roadmap
 - IMO MARPOL Annex VI

International Ports and Sustainability

- Shipping emissions in ports are substantial, accounting for 18 million tons of CO₂, 0.4 million tons of NO_x, 0.2 million of SO_x,
- 85 % of ships' emissions are attributable to two ship types,
 - container ships
 - tankers.

International Ports and Sustainability

- Social challenges
- main social challenges facing ports today include safety, security and reliability:
 - safety, ensuring that employees or the general public are not injured;
 - security, preventing dangerous or illegal goods from being smuggled into or out of ports;
 - reliability, ensuring that the port is resilient enough to be able to continue at optimum performance levels.

5. Regulatory Development and Issues

5. Regulatory Development and Issues

- Polar Code
- HNS Protocol
- MLC
- BWM Convention
- GHG emission control and EEDI

Regulatory Development

- UNCLOS provisions also apply in polar areas, with respect to the jurisdictional status of polar waters and international straits, maritime boundaries, navigational rights and freedoms, as well as coastal and port State control.

Regulatory Development

- Article 234 of UNCLOS entitled “Ice-covered areas” provides that
 - Coastal States have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone.

Regulatory Development

- both IMO and ILO deal with a wide range of safety, environmental and seafarers' issues.
- Many of these legal instruments are widely accepted by States and their provisions are applicable generally, including in the polar areas,
- Main conventions that establish mandatory rules and regulations include
 - SOLAS
 - MARPOL
 - 2006 MLC

Regulatory Development

- several regulatory measures were adopted at IMO in legal framework of
 - ship-source air pollution,
 - reduction of greenhouse gas (GHG) emissions from international shipping,
- third IMO GHG Study 2014 was finalised.

Regulatory Development

- guidelines for the development of the Inventory of Hazardous Materials required under the 2010 HNS Convention were adopted,
- further progress was made relating to ballast water management, ship recycling, and measures to prevent and combat pollution of the sea from oil and other harmful substances.

Regulatory Development

- In 2014, important regulatory developments in maritime transport included the adoption of the International Code for Ships Operating in Polar Waters (Polar Code),
- Polar Code is expected to enter into force on 1 January 2017,

Regulatory Development

- Polar Code



SOLAS new chapter **XIV**

“Safety Measures for Ships Operating in Polar Waters”



- SOLAS amendments expected to enter into force **1 January 2017**,
- under tacit acceptance procedure,
- apply to new ships constructed after that date.



Polar Code Structure

Part I-A Safety Measures (Mandatory)

- General
- Polar Water Operational Manual
- Ship structure
- Stability & subdivision
- Watertight and weathertight integrity
- Machinery installations
- Operational safety
- Fire safety/protection
- LSA and arrangements
- Safety of navigation
- Communication
- Voyage planning
- Crewing/ manning/ training

Part I-B Additional Guidance (Recommendatory)

Polar Code Structure

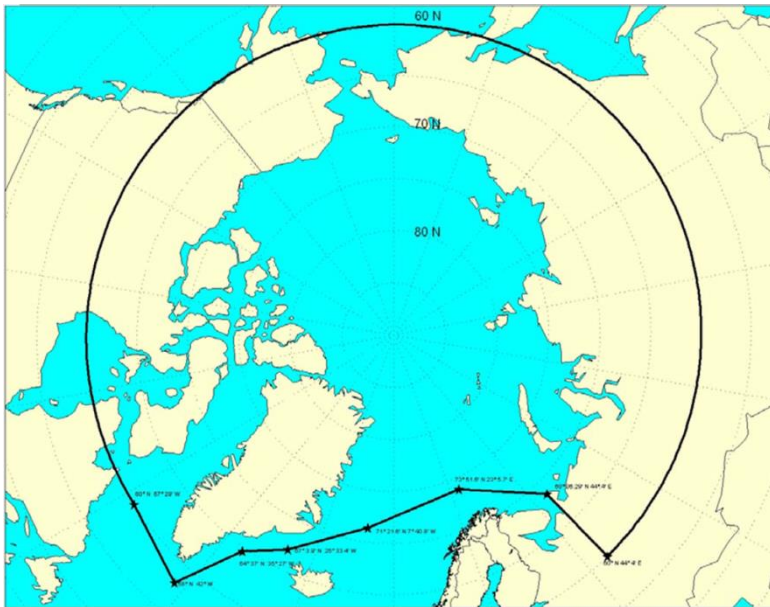
Part II-A Pollution Prevention Measures (Mandatory)

- Prevention of oil pollution
- Prevention of pollution from noxious liquid substances
- Prevention of pollution by harmful substances in packaged form
- Prevention of pollution by sewage from ships
- Prevention of pollution by garbage

Part II-B Information and additional guidance (Recommendatory)

- BWM management
- Anti-fouling
- Bio-fouling

Current Geographical
Boundary of the Arctic

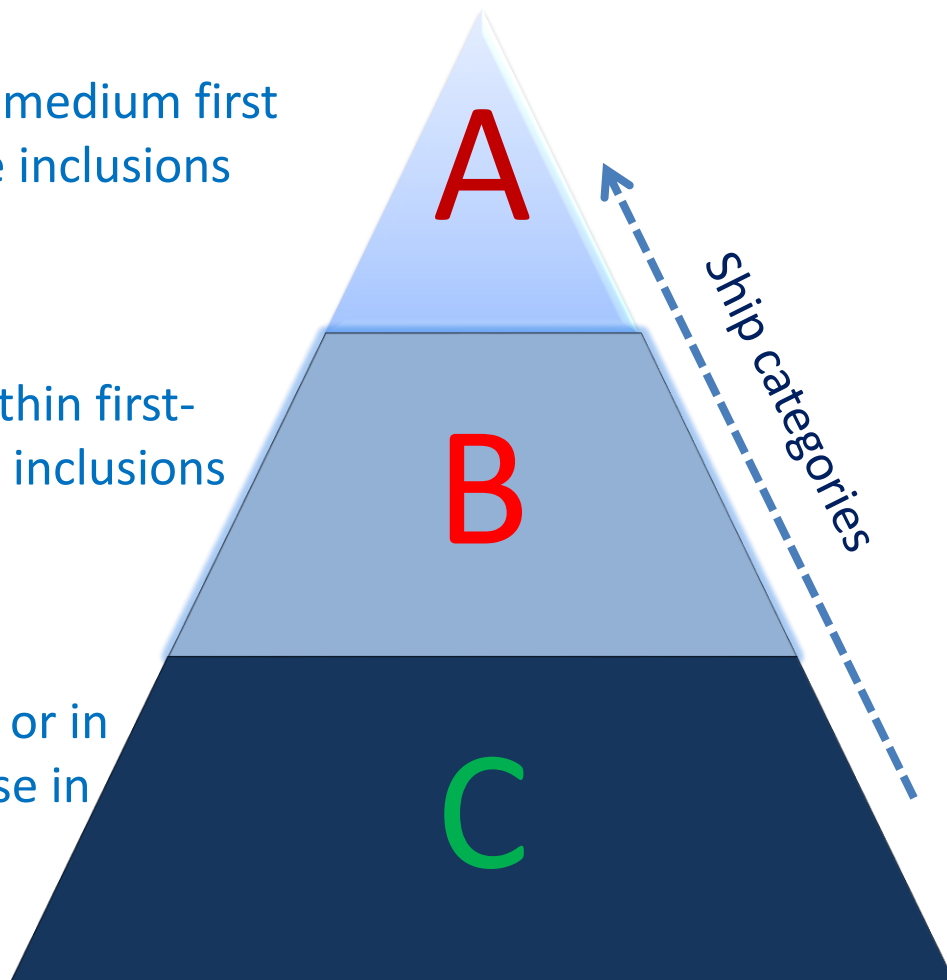


Polar Class Categories

- PC1** Year-round operation in **all** ice-covered waters
- PC2** Year-round operation in **moderate multiyear** ice conditions
- PC3** Year-round operation in **second-year** ice which may include multi-year ice inclusions
- PC4** Year-round operation in **thick first-year** ice which may include old ice inclusions
- PC5** Year-round operation in medium first-year ice which may include old ice inclusions
- PC6** **Summer/autumn** operation in **medium first year** ice which may include old ice inclusions
- PC7** **Summer/autumn** operation in **thin first-year** ice which may include old ice inclusions

Categories of Ships Operating in Polar Waters

- Designed for operation in at least medium first year ice which may include old ice inclusions
- PC 1 to 5 or equivalent
- Designed for operation in at least thin first-year ice which may include old ice inclusions
- PC 6 and 7 or equivalent
- Designed to operate in open water or in ice conditions less severe than those in categories A and B

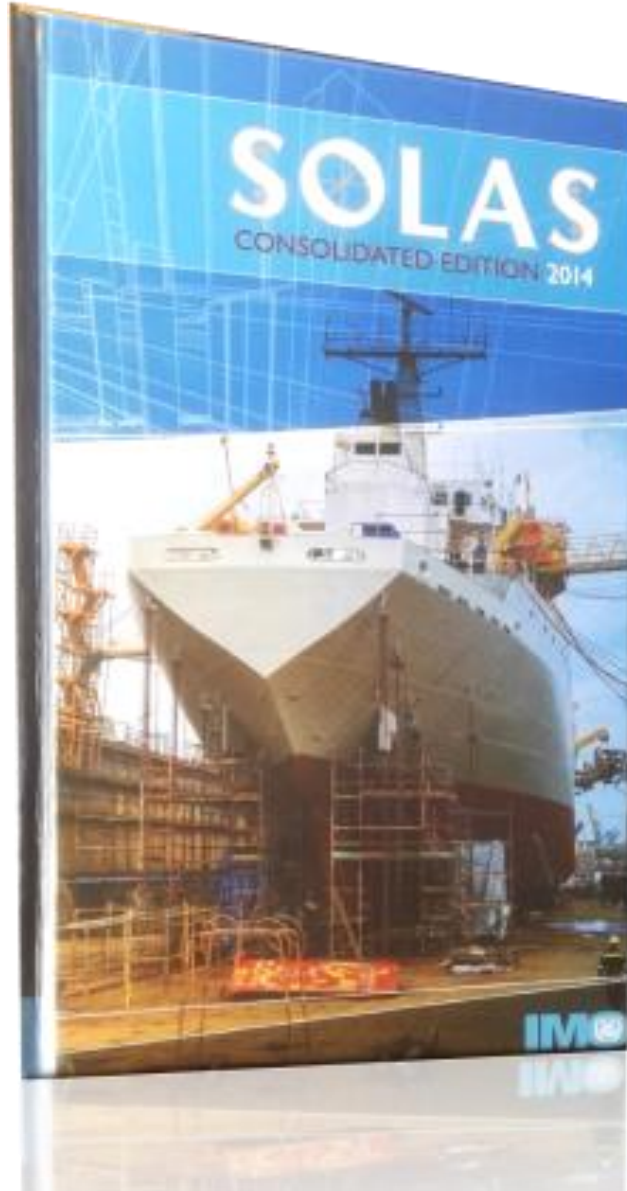


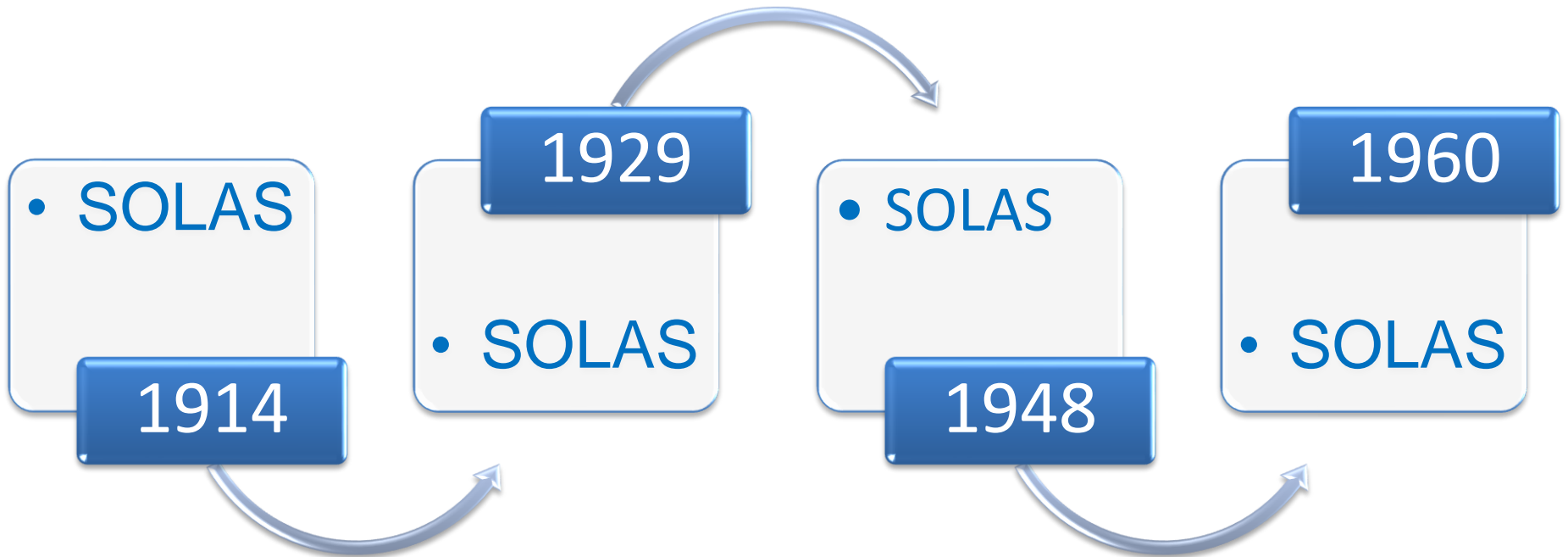
Arctic Shipping



Regulatory Development

- SOLAS





Chapter I

- Chapter II
- Chapter III
- Chapter IV
- Chapter V
- Chapter VI

Chapter VII

- Chapter VIII
- Chapter IX
- Chapter X
- Chapter XI
- Chapter XII

New

- Chapter XIII
- Chapter XIV

SOLAS Amendments



AMOCO CADIZ, 1978



Herald of Free Enterprise, 1987

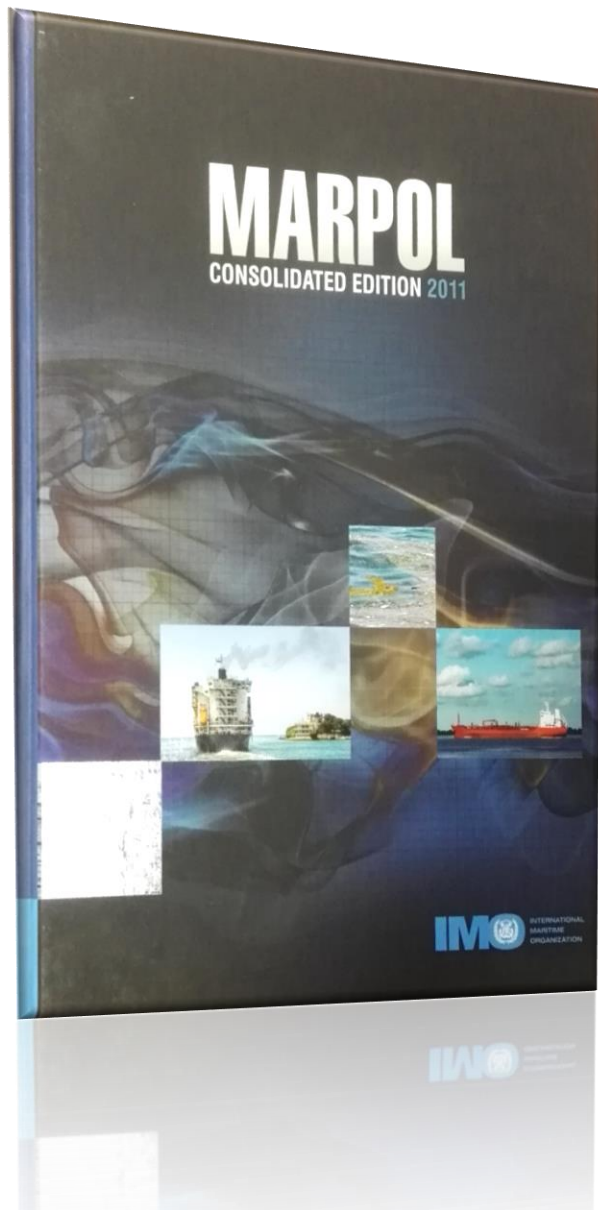


Estonia, 1994



Scandinavian Star, 1990

Regulatory Development



MARPOL

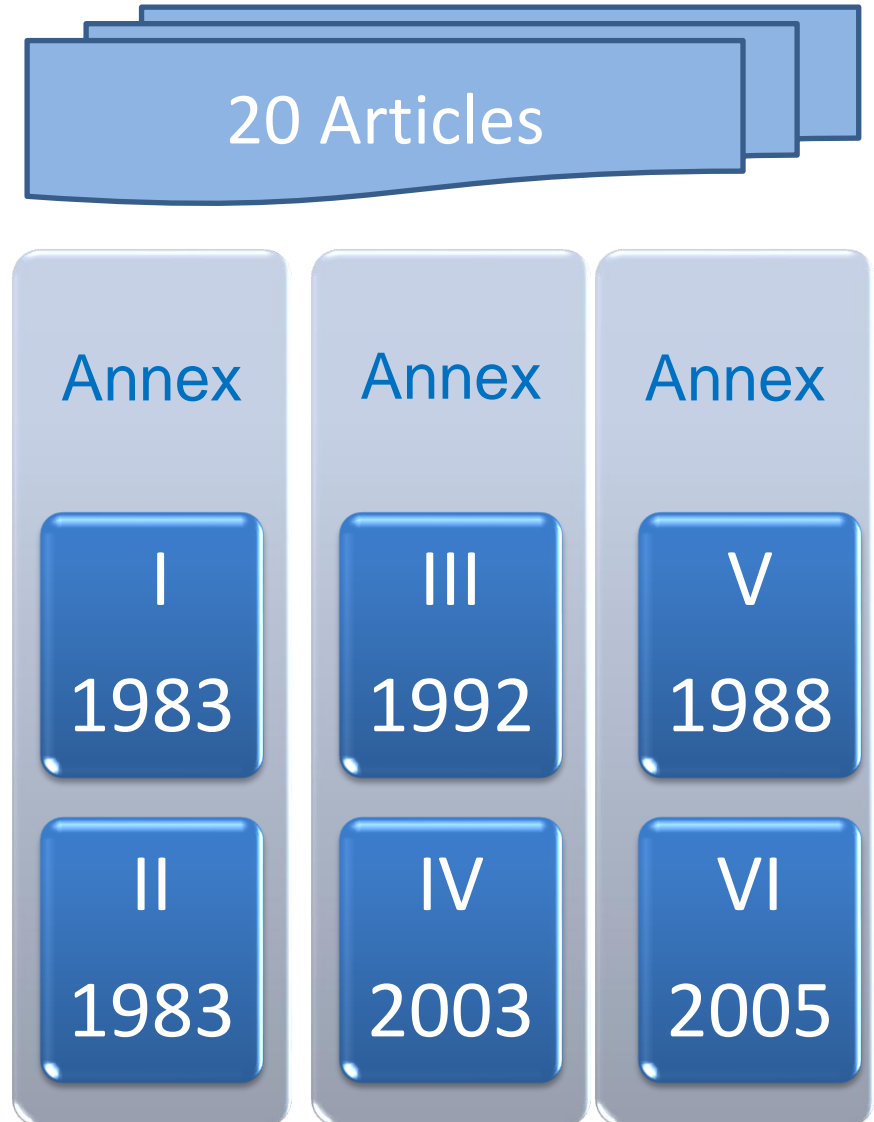
Consolidated Edition 2011

MARPOL is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes.

Regulatory Development

MARPOL 73/78:

- Entry into force 2 Oct. 1983 (Annexes I & II).
- Annex III, entered into force 1 Jul. 1992,
- Annex IV, entered into force 27 Sept. 2003,
- Annex V, entered into force 31 Dec. 1988
- Annex VI, entered into force on 19 May 2005.

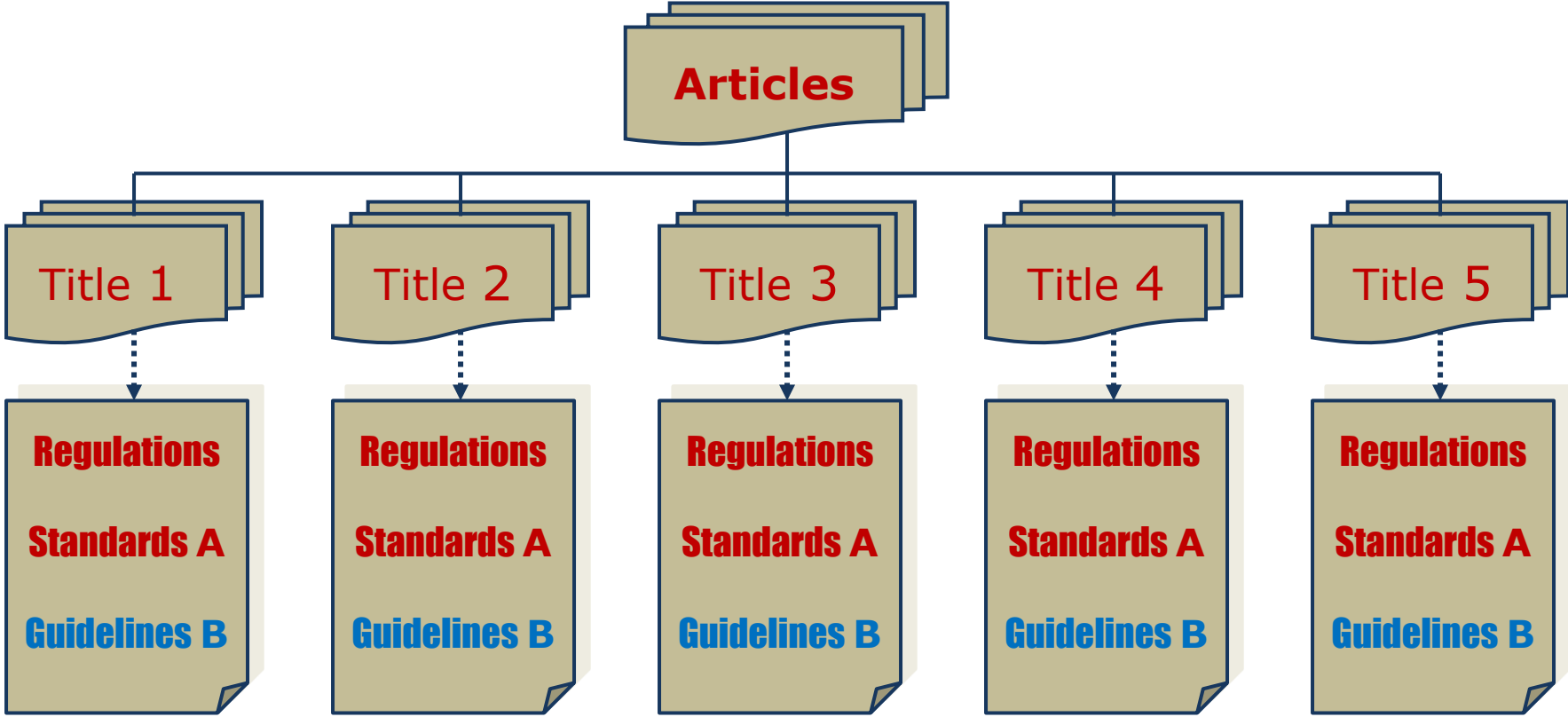


Regulatory Development

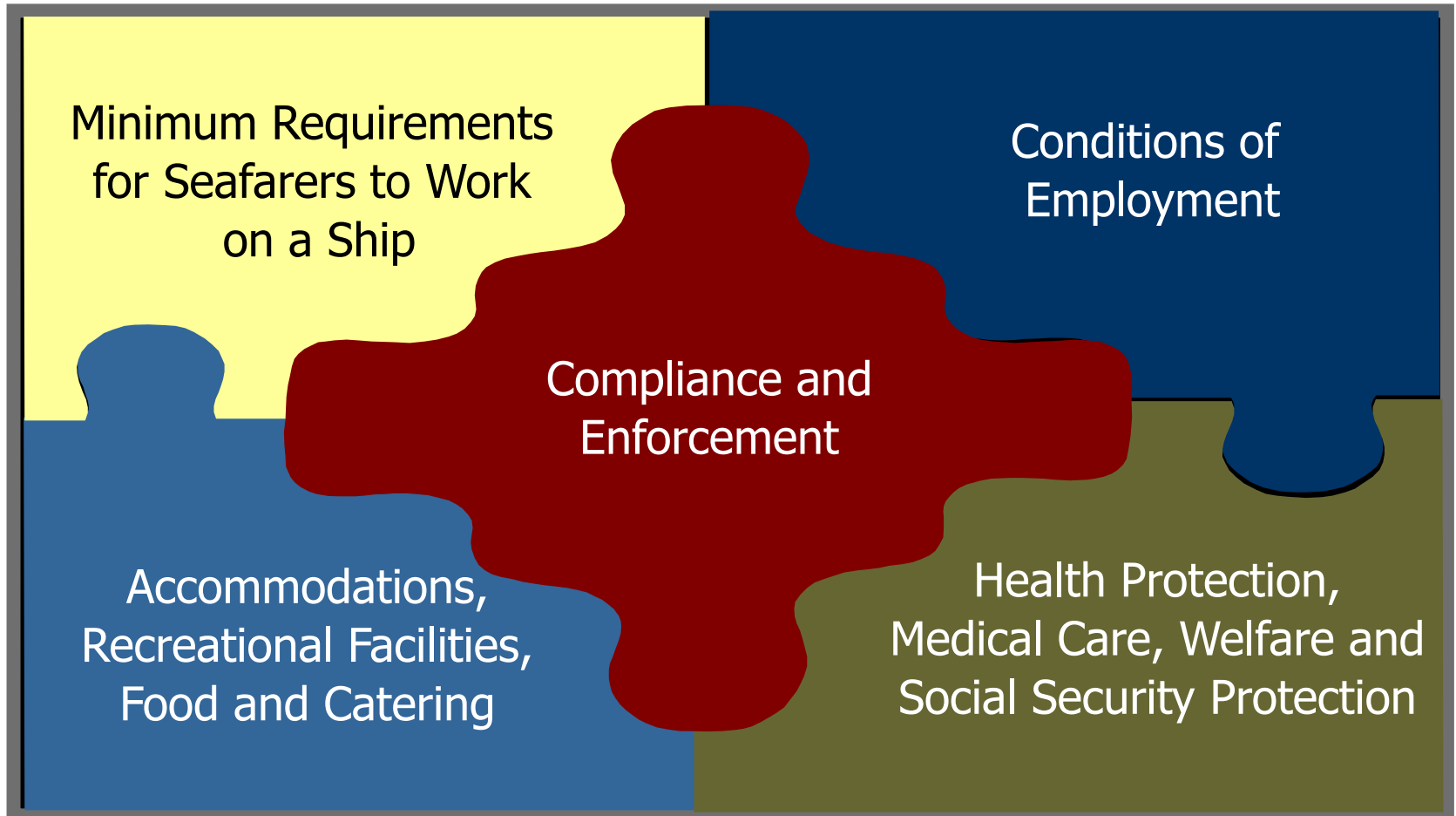
- 2006 MLC

International Maritime Labour Convention

Structure of the MLC 2006



2006 MLC



Regulatory Development

- MEPC 70 – held 24-28 October 2016 at IMO
 - Reduction of GHG from international shipping
 - Energy efficiency
 - Further measures to enhance EE

Regulatory Development

- Air pollution from ships
 - 2015 Guidelines for exhaust gas cleaning systems
 - SO_x and NO_x control
 - black carbon and its impact on polar areas

Regulatory Development

- Maritime piracy and armed robbery



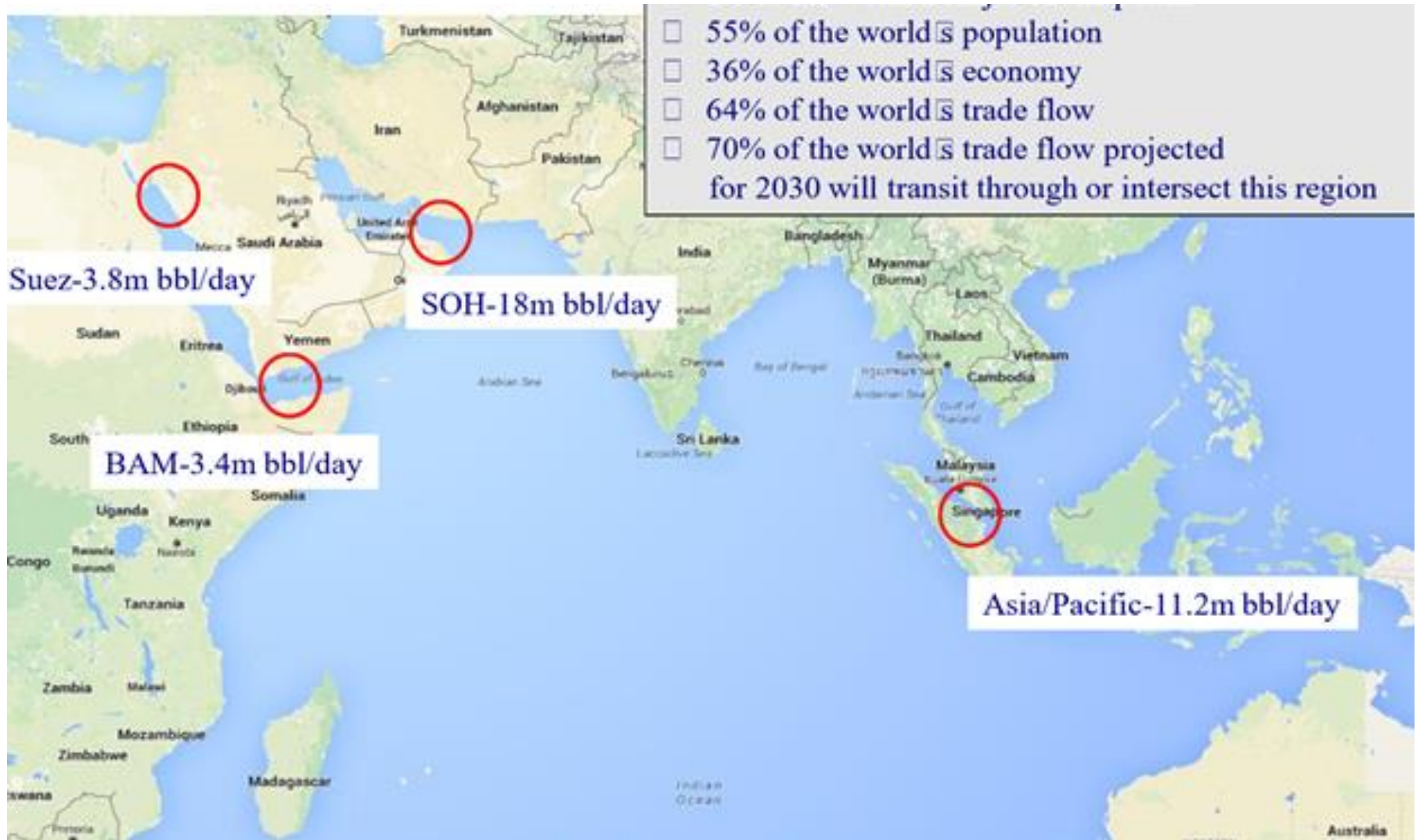
Regulatory Development



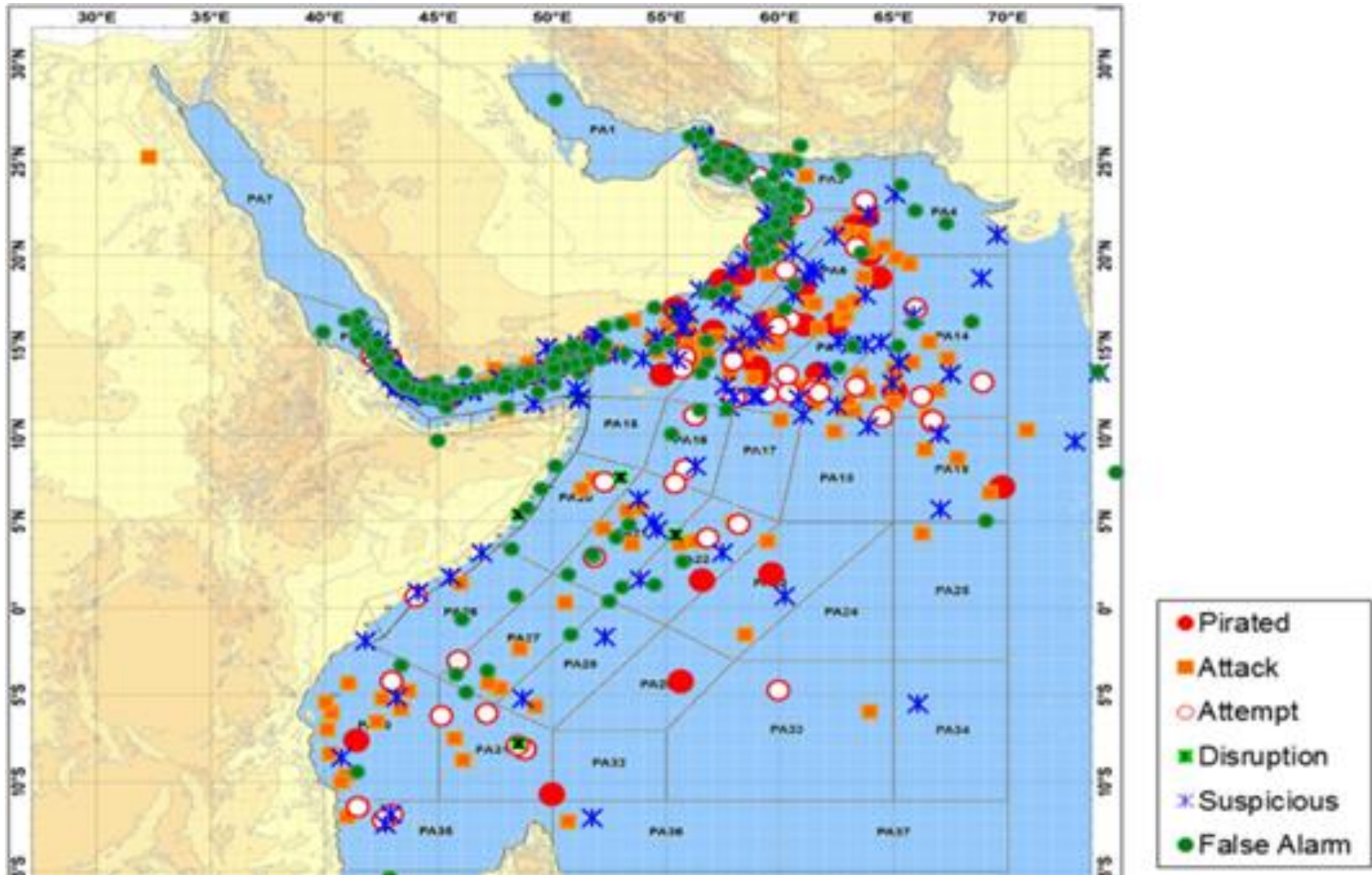
Regulatory Development



Importance of Indian Ocean



Piracy Trends 2011-2015



Regulatory Development

- Seafarers Issues
 - ILO Convention on seafarers identity documents
 - ILO 2006 MLC
 - Fair treatment of seafarers

Regulatory Development

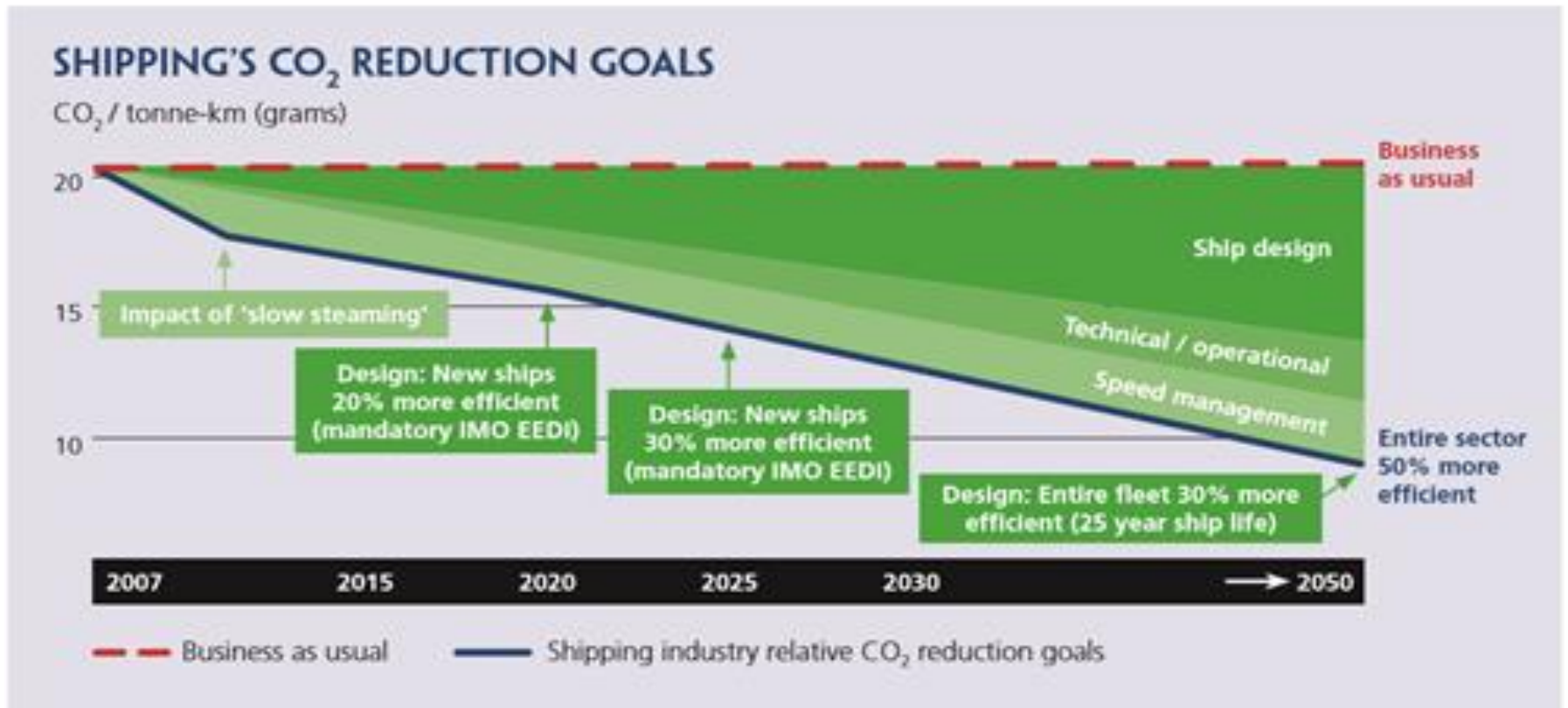
- Seafarers Supply:
 - 1.18 millions in 2005
 - 1.37 millions in 2010
 - 1.65 millions in 2015

Regulatory Development

- Top Five Seafarers Supply Countries
 - China
 - Philippines
 - Indonesia
 - Russian Federation
 - Ukraine

Issues

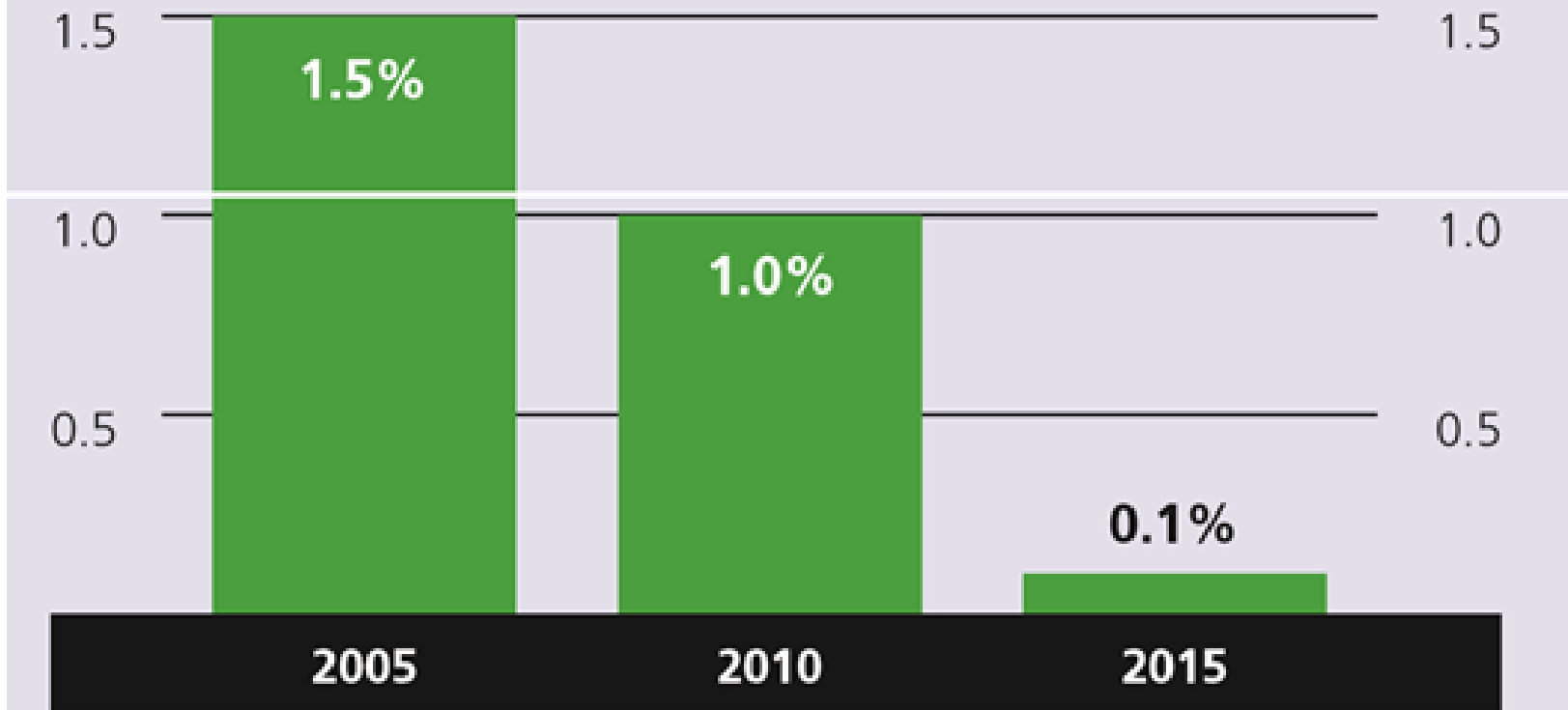
REDUCING CO₂ ACTING ON THE PARIS AGREEMENT



Issues

IMO AGREEMENT TO REDUCE ATMOSPHERIC POLLUTION FROM SHIPS

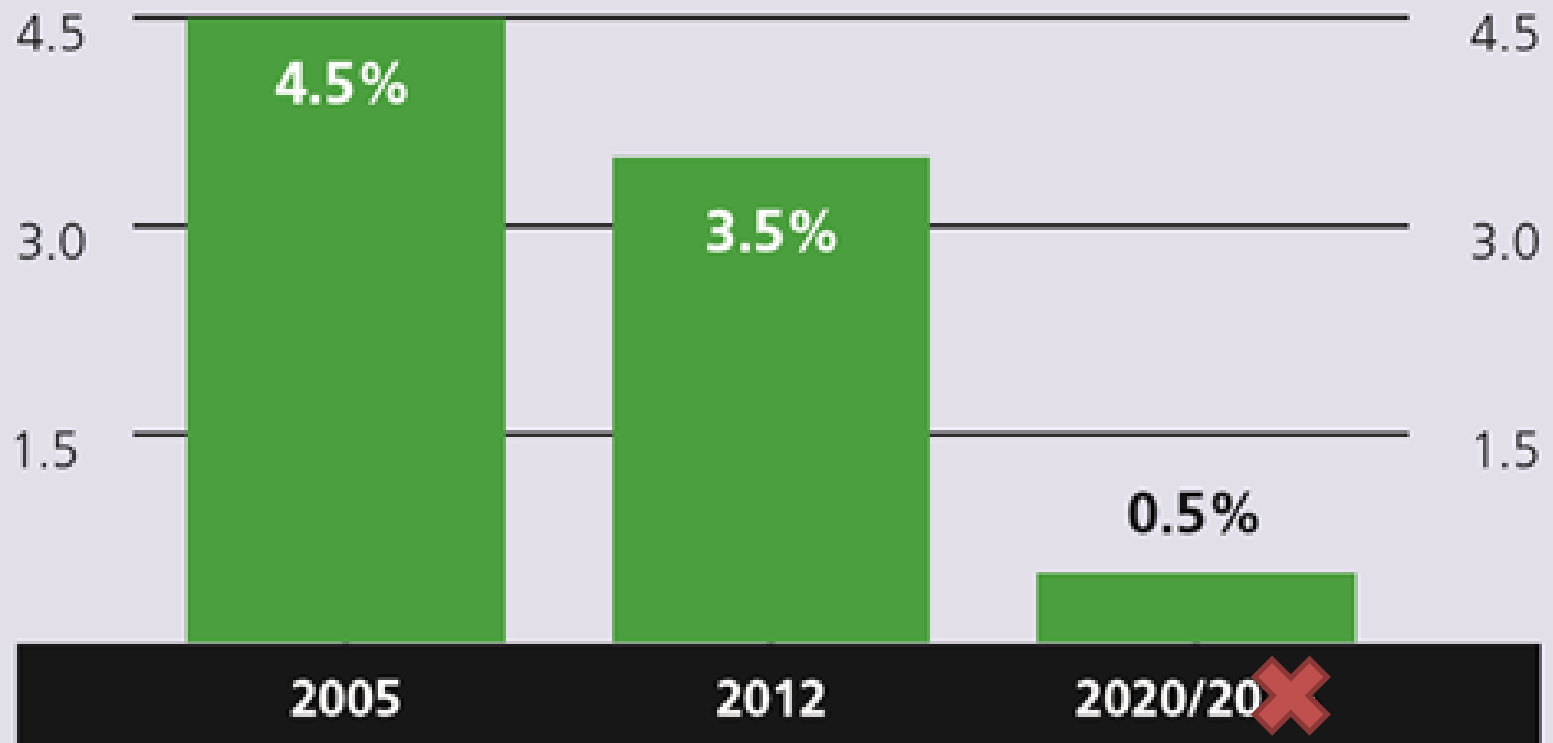
Sulphur content of fuel permitted in Emission Control Areas



Issues

GLOBAL SULPHUR CAP

Sulphur content of fuel permitted outside Emission Control Areas

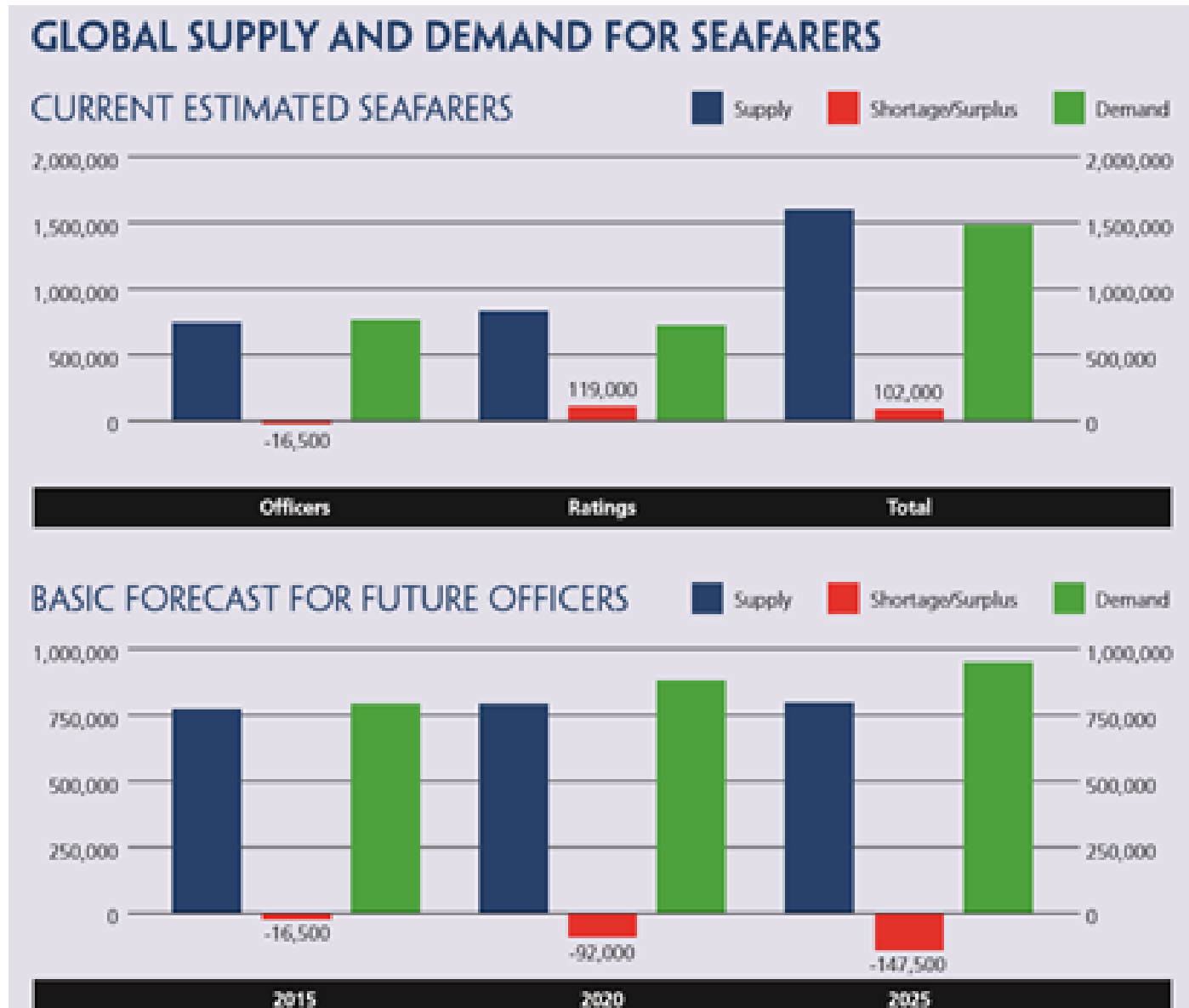


Issues

Ballast Water Management



Issues



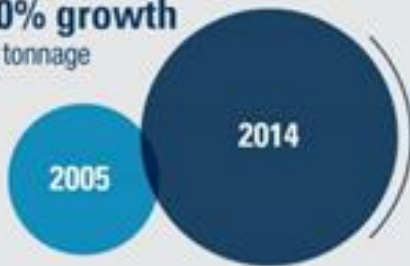
Future

- Global economic downturn
- Global maritime transport
- Marine environmental concerns
- Slow steaming or slow speed
- Less fuel consumption
- Safe and clean shipping
- Maritime cyber security and maritime cyber risk management

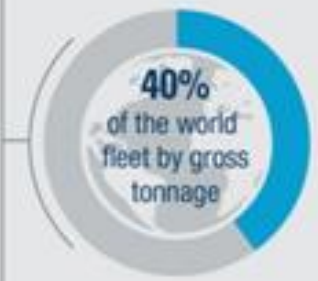
Economic Value of EU Shipping Industry

The EU controlled shipping fleet in numbers

70% growth
in tonnage



660 million deadweight tonnes
450 million gross tonnes
23,000 vessels



*By gross tonnage

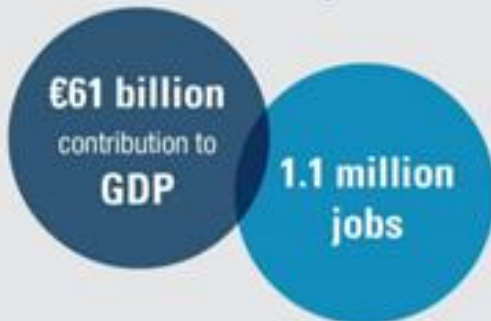
Direct economic impact



Sea based jobs
Land based jobs



Indirect impacts



Induced impacts



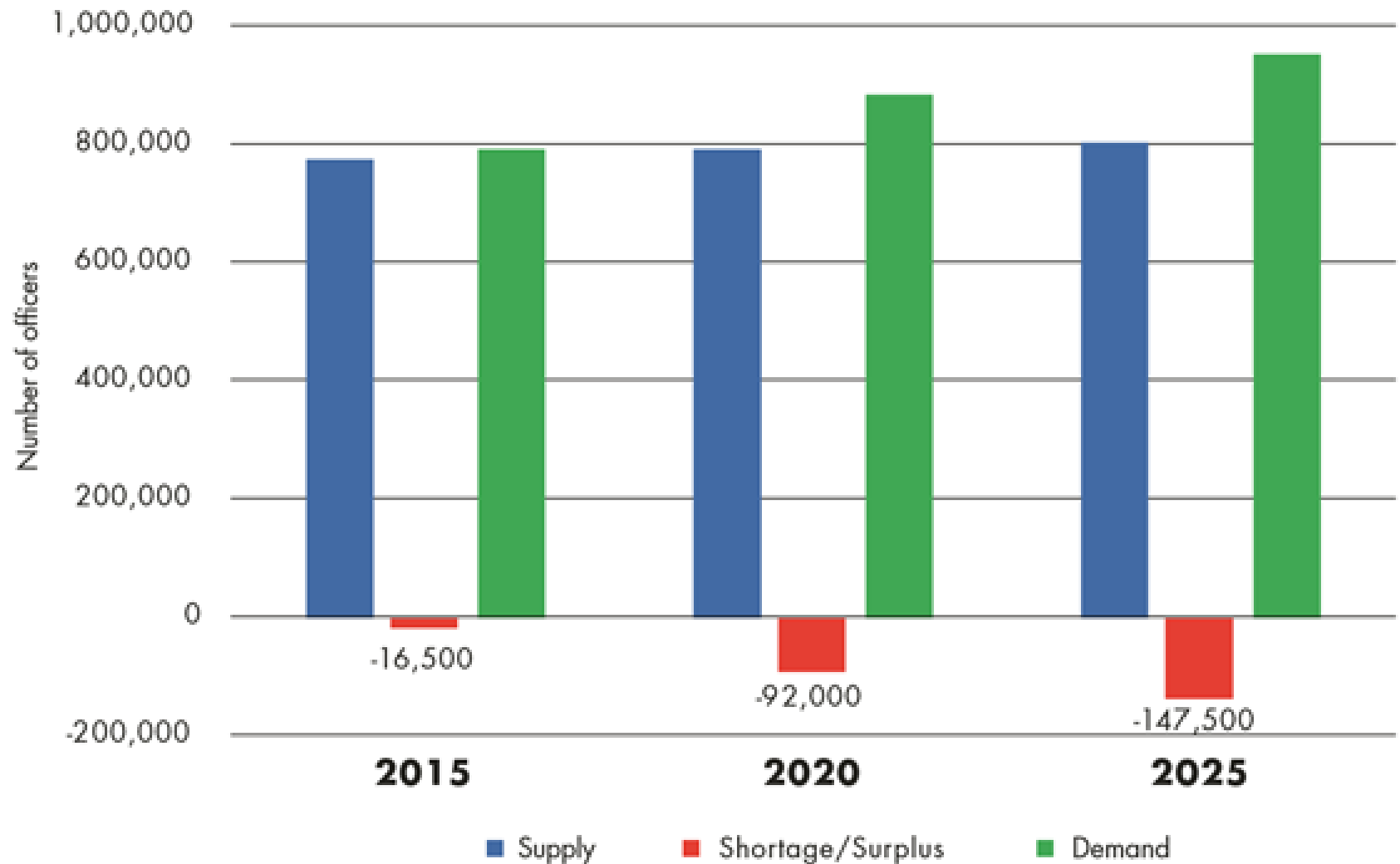
Total economic impact



For every **€1 million** of GDP the shipping industry creates, another **€1.6 million** is created elsewhere in the EU economy

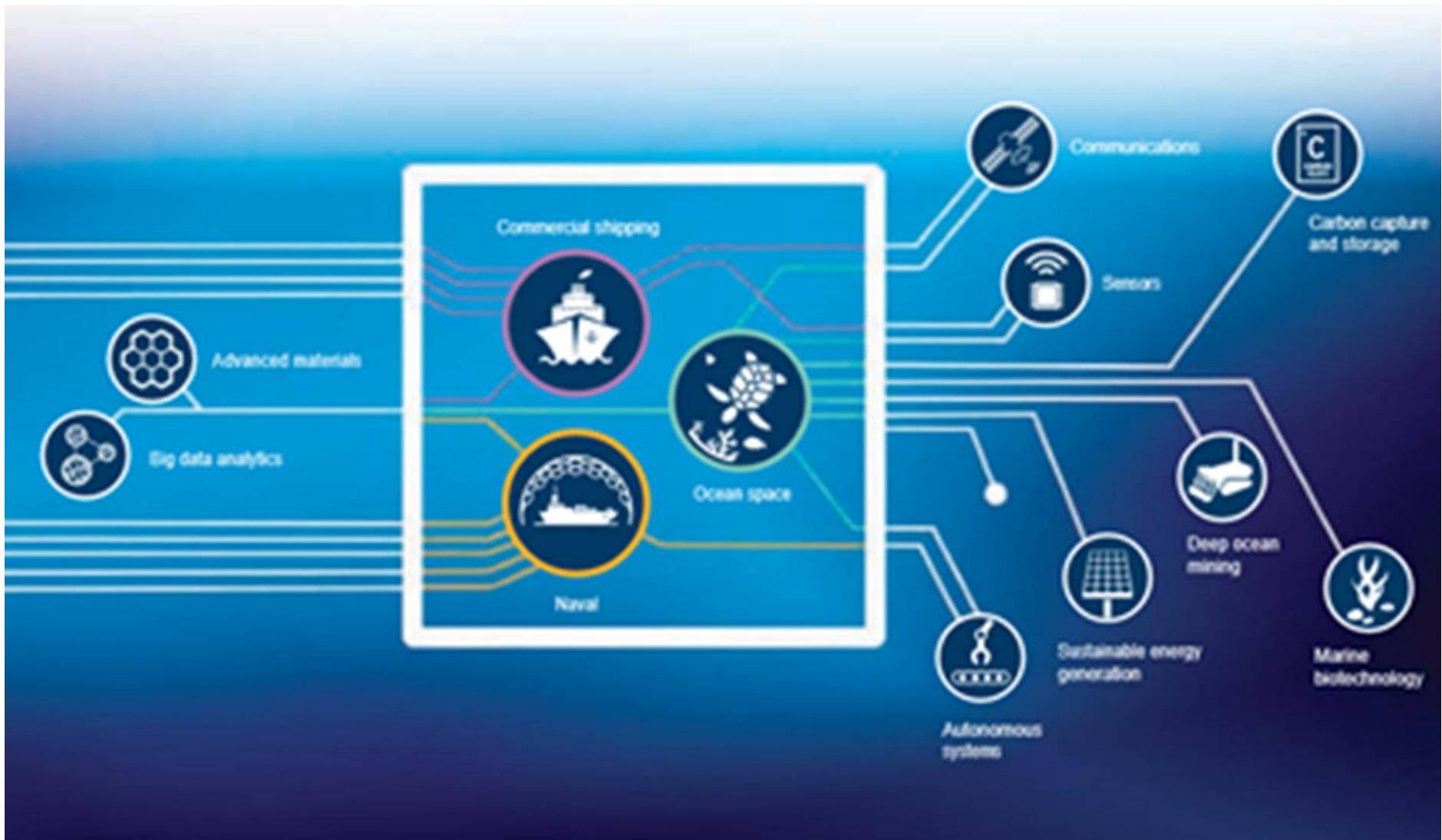
50% Amount by which the total economic contribution of the EU shipping industry could have been reduced in the absence of EU-approved state aid measures.¹

Future Supply Demand Balance for Officers



Global Maritime Trends in 2030





Thank You !

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