



Developing India's ports

– From bottlenecks to engines of growth

10th Southern Asia Ports, Logistics and Shipping 2015

Roland Berger
Strategy Consultants

Mumbai, September 15 2015



Developing India's ports – *From bottlenecks to engines of growth*

10th Southern Asia Ports, Logistics and
Shipping 2015

Roland Berger
Strategy Consultants

Mumbai, September 15 2015

Roland Berger is a leading global strategy consulting firm with successful operations in all major international markets

Our global presence

50 offices in 36 countries,
with approx. 2,400 employees

Over 220 partners with specific
expertise organized in 14
competence centers

Serving over 1,000 international
clients

Clients

75% repeat clients

30% of top 1,000
global companies

40% of Europe's
leading companies



1) By revenues in the strategy consulting market, based on internal and available public reports

We have deep experience and expertise in supporting ports and maritime sector development around the world

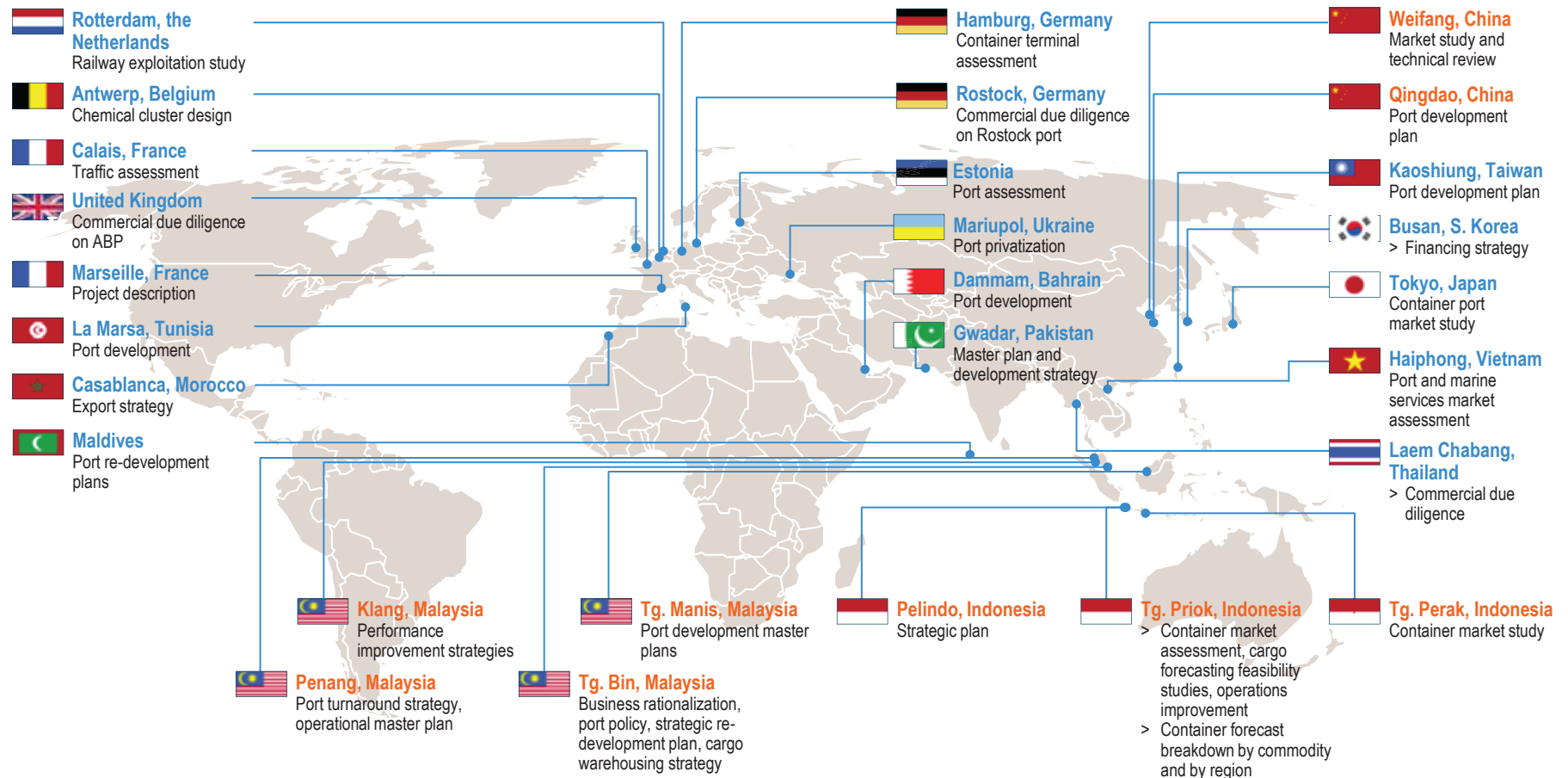
Selected clients – *samples only*

Ports 	Shipping 
	

-  We are proud to be a **top 5** player in the **global strategy** market
-  We have **deep global port** planning and development experience
-  Uniquely, we have a **Global Ports Practice**

We work on port development projects around the world

Recent port projects – selected samples only



In the ports sector, we offer an integrated approach and specialized services in **four** key areas

Our service offerings

1. Port Policy & Regulation



- > National port policy/ development planning
- > Regulation, reform, governance
- > Privatization
- > Business model design
- > Concession design

2. Port Planning & Development



- > Traffic studies
- > Demand forecasting
- > Feasibility studies
- > Port master planning
- > Re-development planning
- > Tender process management

3. Port Business



- > Due diligence, investor advisory
- > Pricing strategy, tariff studies
- > Pre-feasibility studies
- > Corporate strategy
- > Business strategy, business planning

4. Port Operations



- > Benchmarking
- > Operating performance improvement
- > Organizational transformation

For each assignment, we put together a dedicated and highly experienced team. We use specialized legal, financial, engineering and port planning partners where relevant

Contents	Page
A. Ports – global trends	9
B. India's trade overview	19
C. The way forward – how to develop ports smartly	28

This document shall be treated as confidential. It has been compiled for the exclusive, internal use by our client and is not complete without the underlying detail analyses and the oral presentation. It may not be passed on and/or may not be made available to third parties without prior written consent from Roland Berger Strategy Consultants. RBSC does not assume any responsibility for the completeness and accuracy of the statements made in this document.

A. Ports – global trends

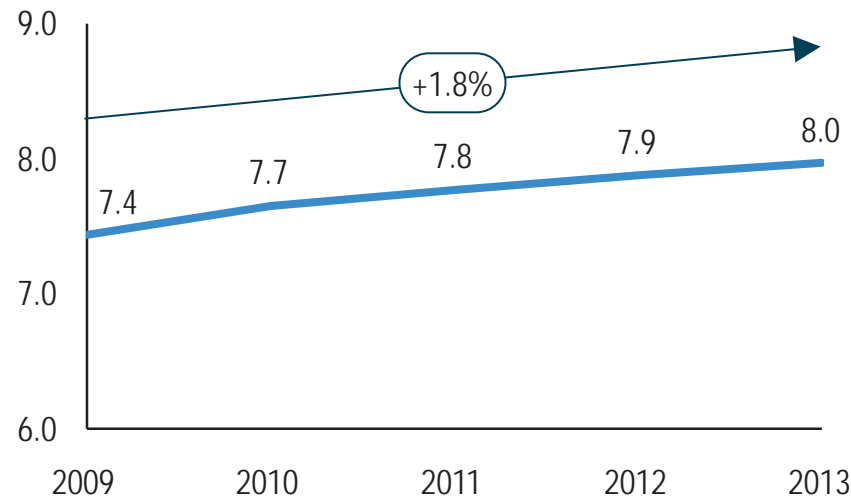
Roland Berger
Strategy Consultants



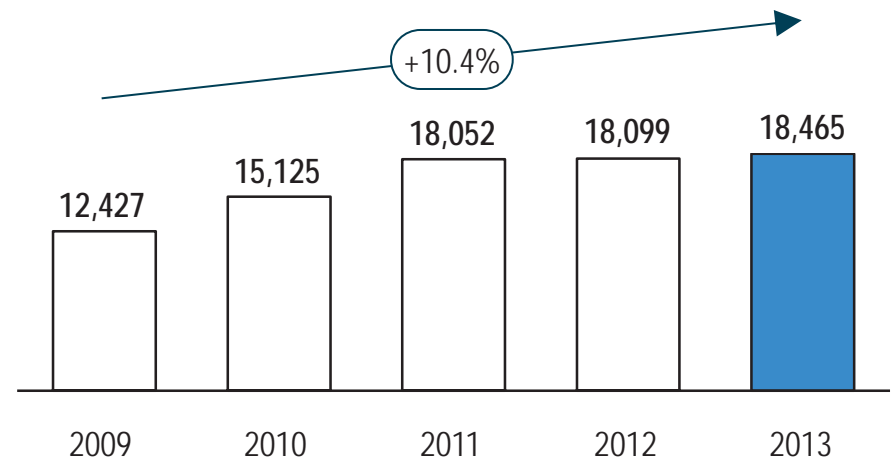
Global trade continues to grow strongly, pushing demand for growth in port and shipping capacities and performance

Growth figures – income vs trade

Global gross GNI/Capita
[Real, USD '000]



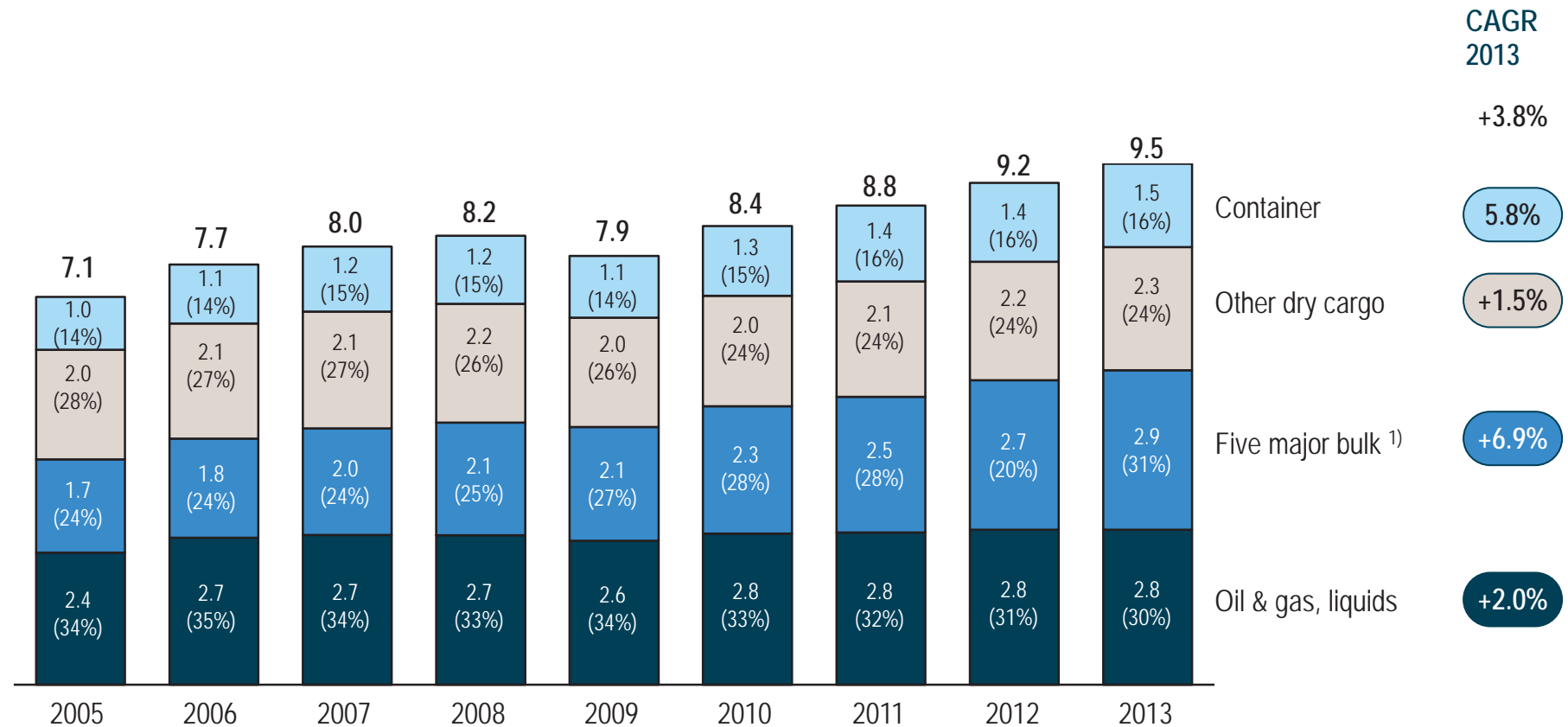
Global trade – value of exports in traded goods
[Real, USD bn]



In real terms the global economy is still growing at a rate of 2%, which combined with a 10.4% growth in global trade per annum will **increase the need for port and shipping capacity**

Global maritime trade – measured in tonnes - has grown around 4% over the past decade. Highest growth and largest share in dry bulk

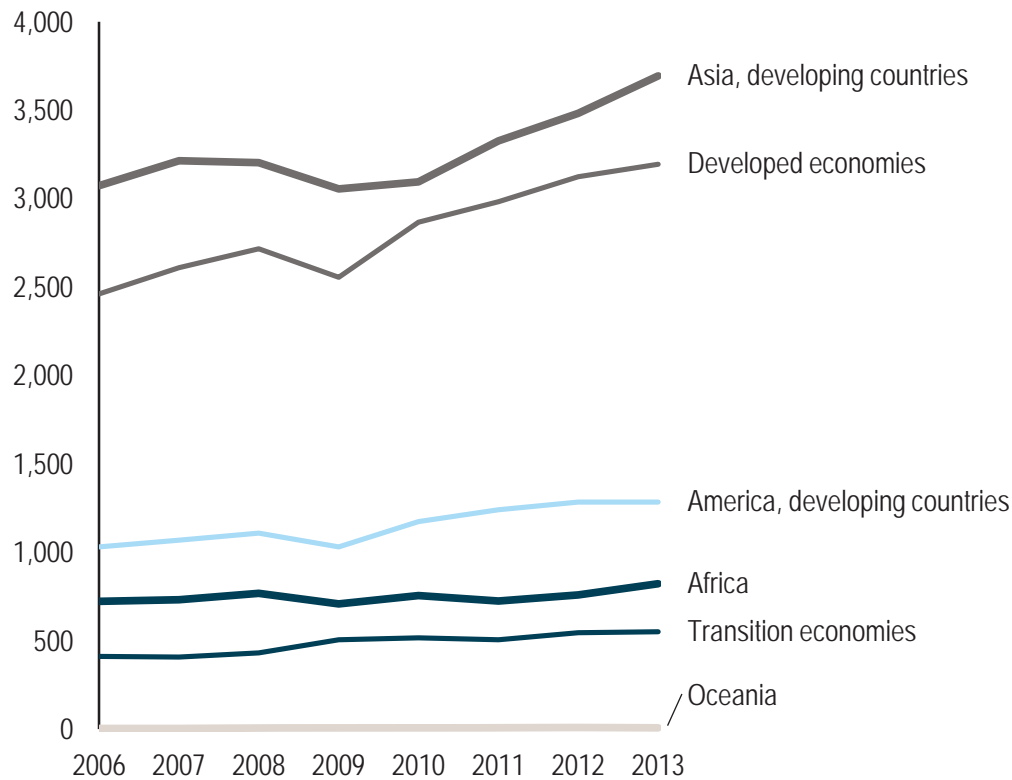
International seaborne trade [bn tonnes loaded]



1) Iron ore, coal, grains, bauxite & alumina, phosphate & rock

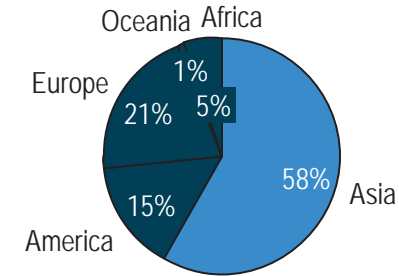
Asia remains the dominant region in the global maritime trade

Global maritime trade [2006-2013, m MT]

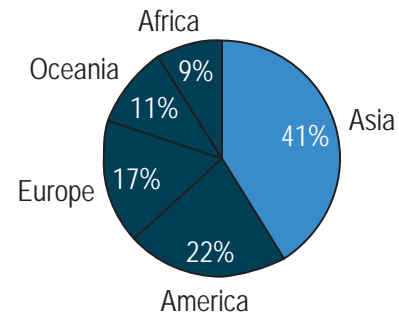


Share of world tonnage (2014)

Imports



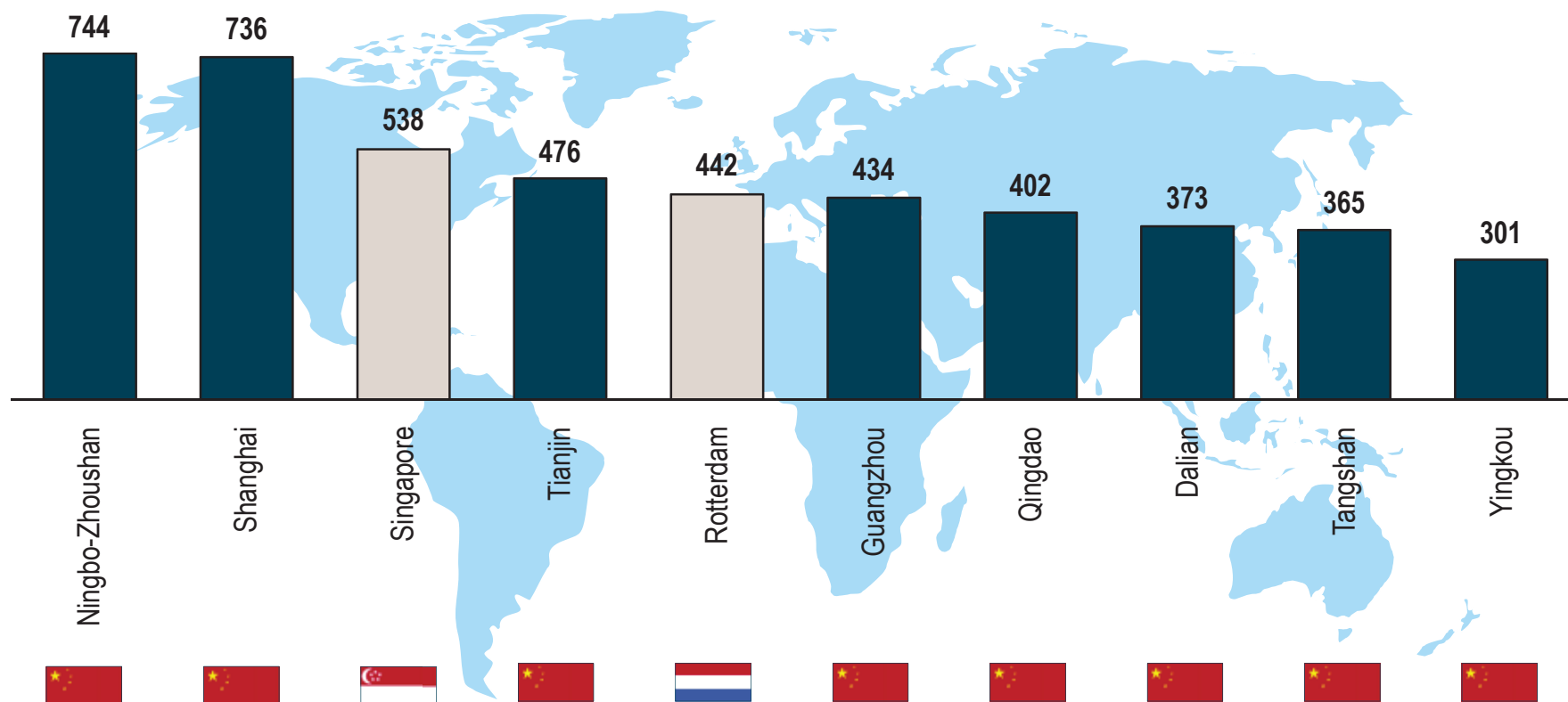
Exports



Eight of the ten largest ports in the world are now located in China

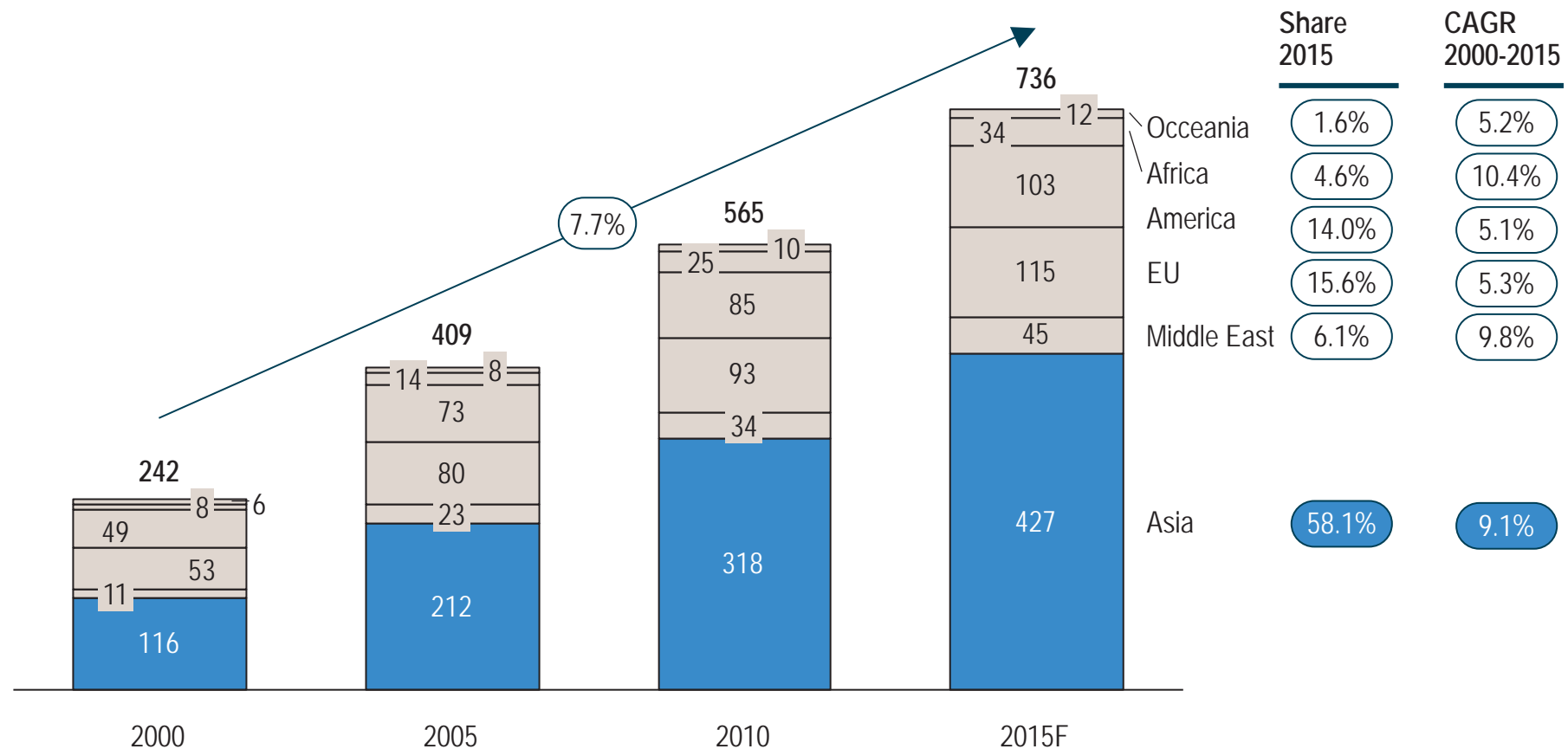
Top ten largest ports by cargo throughput in the world

Total cargo throughput, 2012 [m MT]



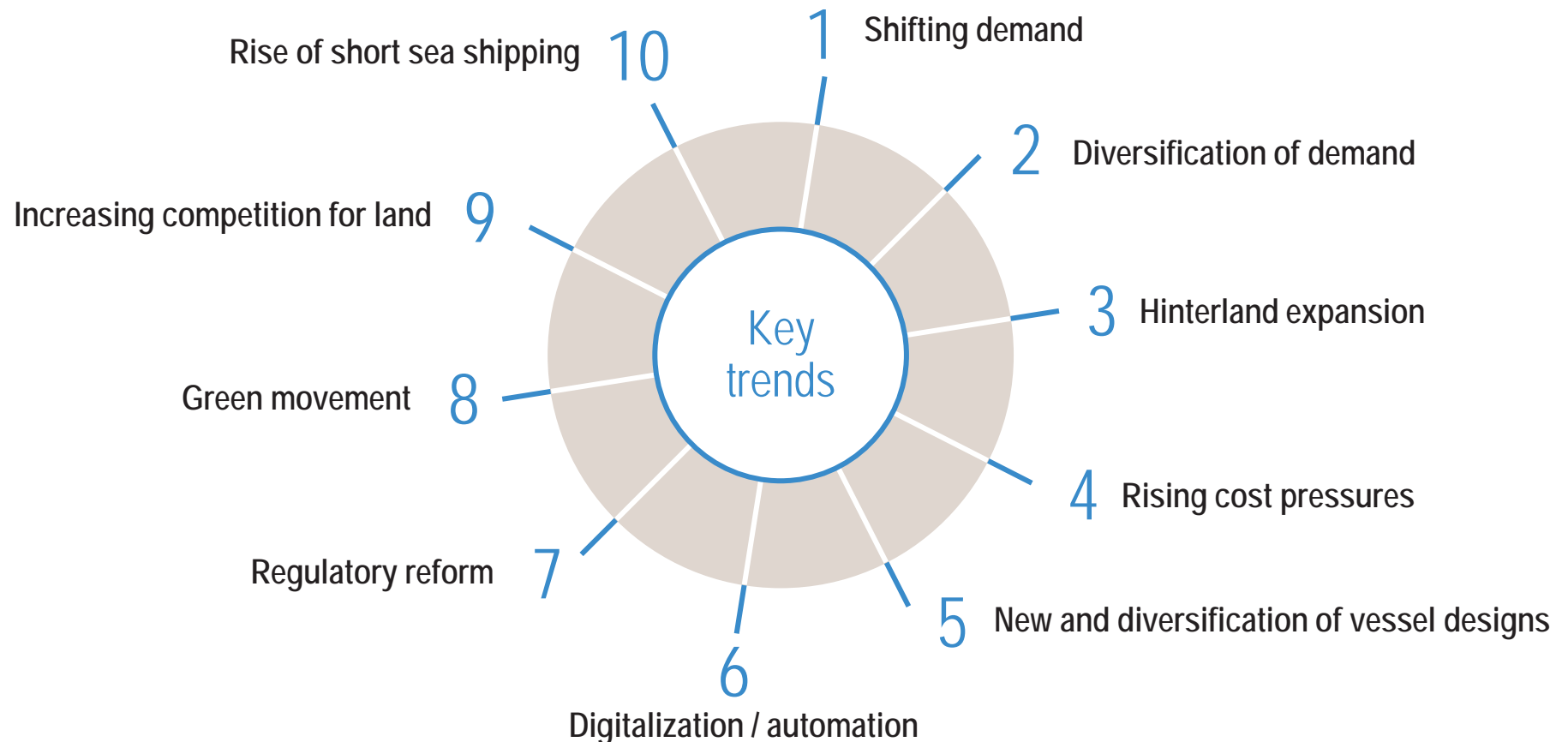
Asia dominates in particular in the container segment, with now 58% of all containers moving through Asian ports

Global containerized trade [2000-2015, m teu]



Presently, we see TEN main trends / challenges affecting port development and operations around the world

Ten mega trends & challenges



Ports operate in complex, dynamic and ever-changing environments, forcing them to adapt continuously (1/2)

Key global trends in the port sector

Key trends	Description	Main implications for ports
Shifting demand	Stagnating demand in some of Europe, growth in most parts of the rest of the world. Regionalization	Smart forecasting, planning, development or re-development to remain relevant and viable
Diversification of demand	Emergence of new segments: cruise ships, mega yachts, LNG, CNG, car carriers, unitized cargo shipping, ro-ro etc	Need to strategize, plan, develop facilities where relevant and viable
Hinterland expansion	"Unlocking" of land-locked countries and regional economic integration, widening hinterland for many	Need to anticipate and re-tune marketing strategies
Rising cost pressures	Competition between shipping lines - transferring pressures to ports to improve performance and reduce turn around times. Emergence of "port competition"	Need to continuously improve operating performance, productivity, turn-around times
New ship types	Emergence of ultra-large vessels in dry bulk and container shipping. Rapid widening of ship designs and types, increasing specialization, new ship types	Need to continuously plan, upgrade/enlarge /diversify port facilities where relevant and viable
Digitalization	Driven by technological developments as well as regulatory changes, both local and global. E-logistics	Need to stay current. And utilize these trends to drive performance improvement

Ports operate in complex, dynamic and ever-changing environments, forcing them to adapt continuously (2/2)

Key global trends in the port sector

Key trends	Description	Main implications for ports
Regulatory reform	Many countries are in the process of moving towards "landlord model" type set-up. Most reforms are driven by international organizations	Implementation is challenging: need for institutional changes, new SOP's, legal changes etc.
Green shipping	Outphasing of heavy fuels, new rules on bilge water management, cleaner fuel technologies, emergence of LNG as bunker fuel for shipping	Need to invest: ship waste processing facilities, monitoring equipment, enforcement machinery, LNG facilities where relevant
Green ports	Move towards reduction of carbon emissions, water pollution and noise from ships in ports and port operations	Heavy investments needed in shore power facilities, electrification of heavy equipment (where relevant) and other greening actions
Competition for land	Old ports are typically forced to move out of inner cities. Available space to expand in growing ports is almost always constrained. Trend towards off-shore development of new ports	Need to plan for port development smartly with a long term orientation and with an eye to potential competition for land
Short sea shipping	Is being aggressively promoted by many regions around the world, often in combination with shipping modes (eg. ro-ro). Changes in national cabotage regulations	Need to continue to accommodate small vessels and diversified cargo handling facilities

B. India's maritime trade overview

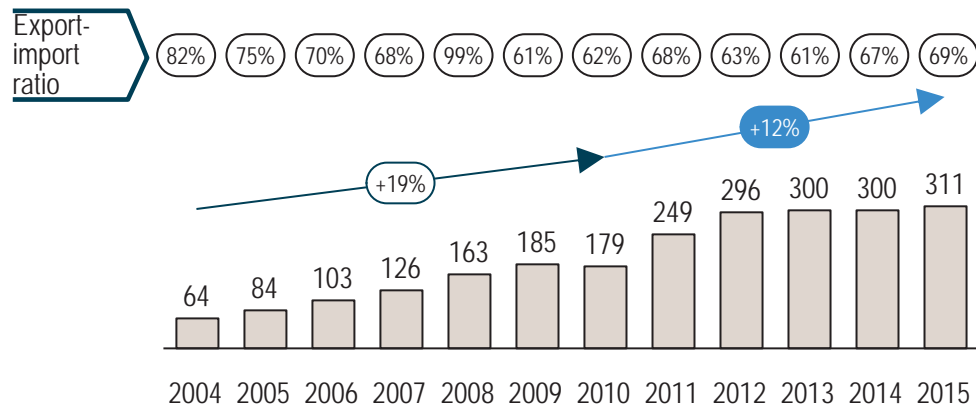
Roland Berger
Strategy Consultants



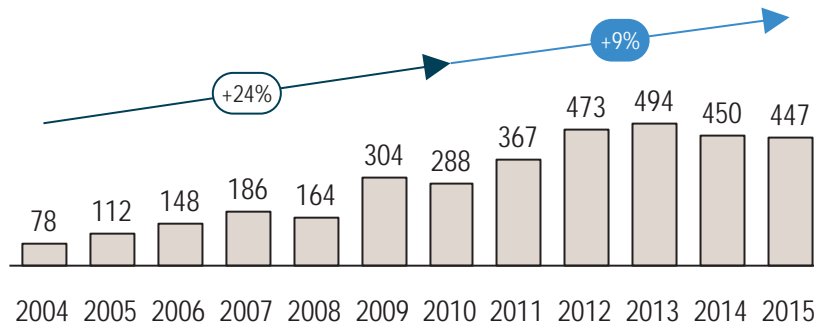
After a period of significant boom, India's trade volume has slowed down in recent years. Its net import gap remains large

Trade development of India, 2004-2015

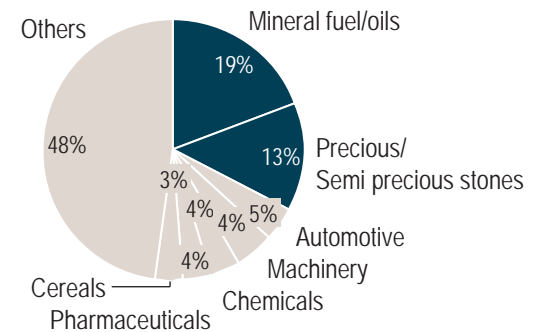
Export volume development [USD bn]



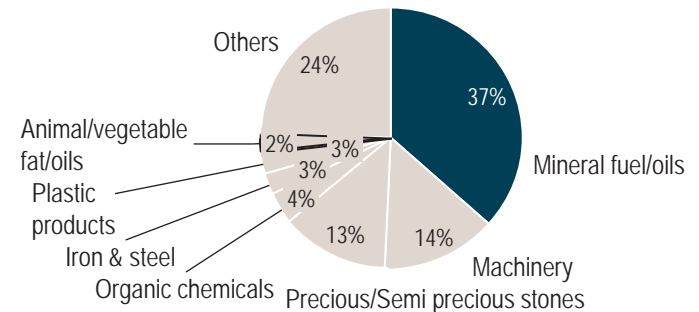
Import volume development [USD bn]



Exports by sector, 2015

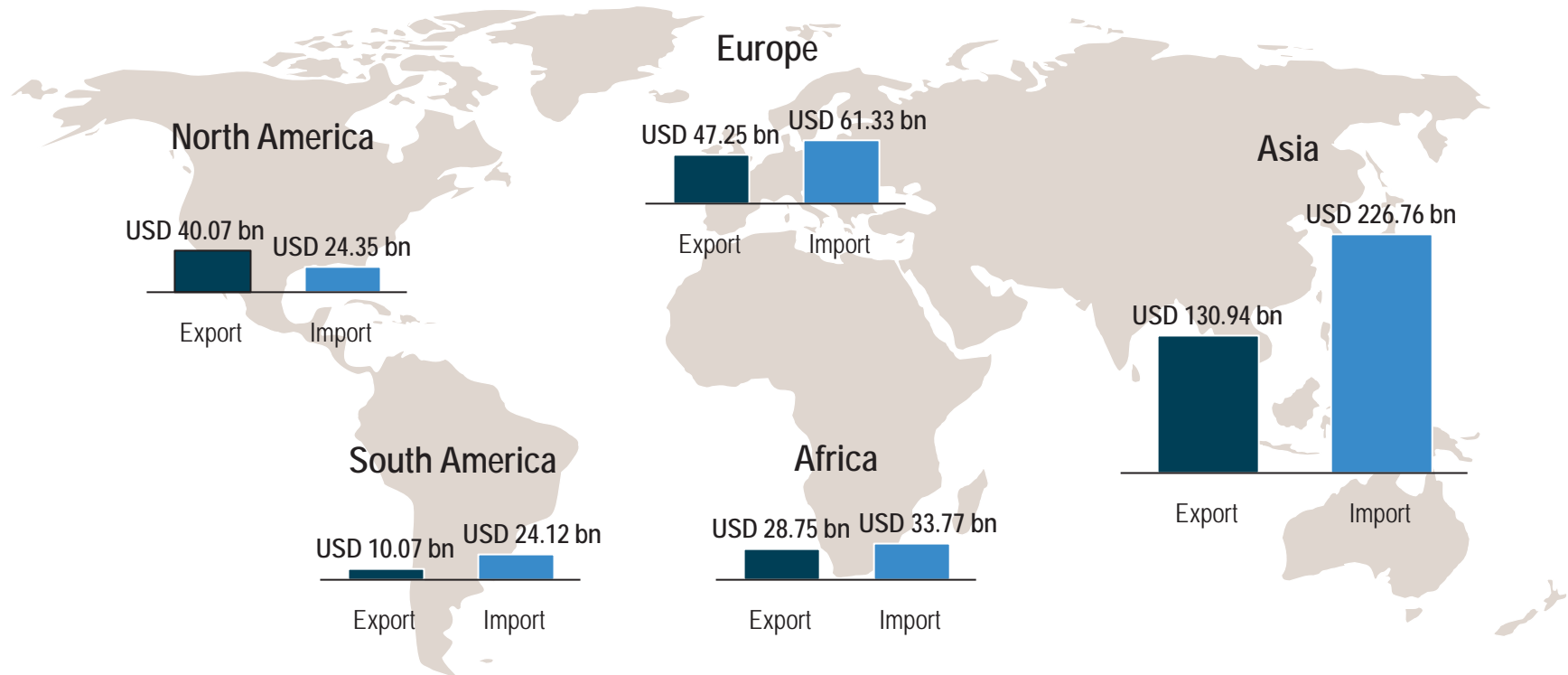


Imports by sector, 2015



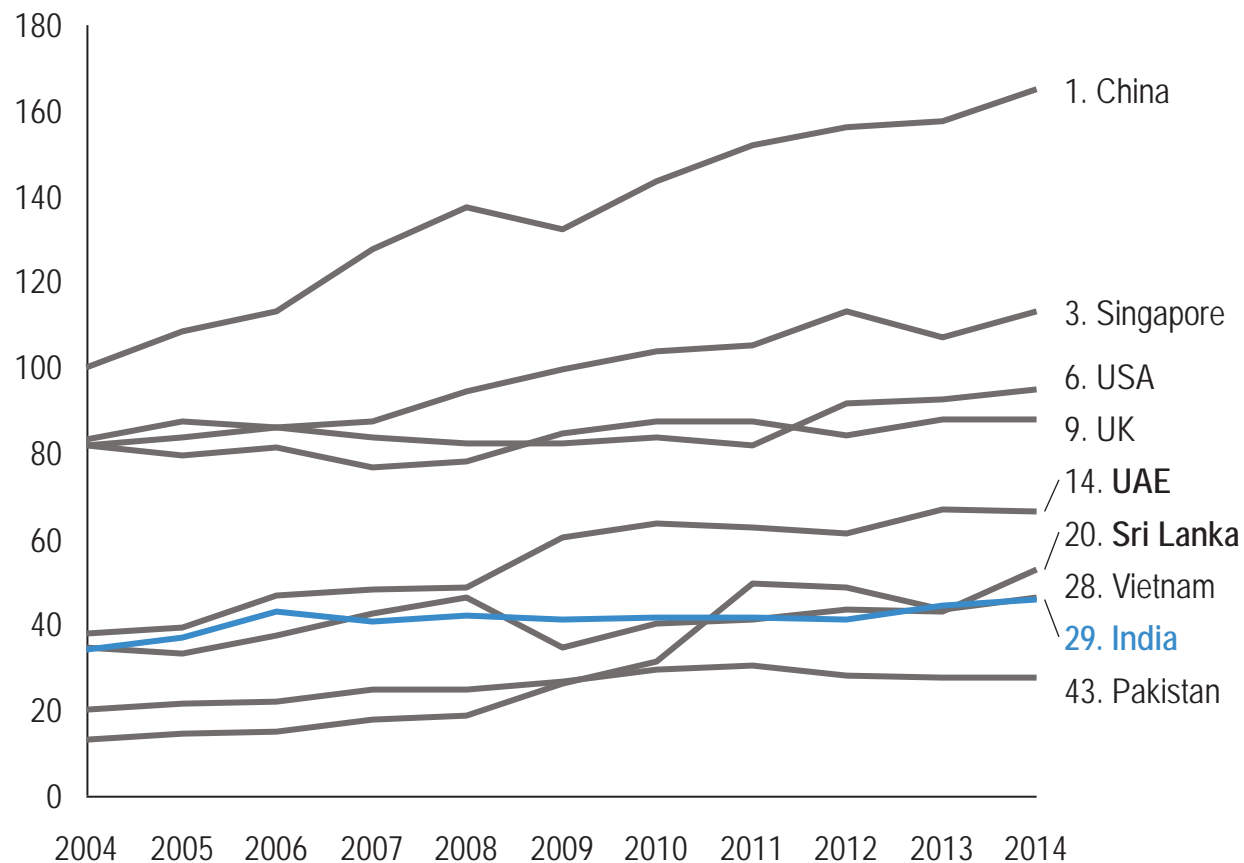
Asia is India's largest trading partner both in exports and imports, followed by Europe

Regional trade flow between India and rest of the world [USD bn, FY15 (Apr-Jan)]



India is ranked 29th (out of 155) on the Liner Shipping Connectivity Index

Liner shipping connectivity index (selected countries) [max. value in 2004 = 100]



- > LSCI captures how strong countries are connected to and wired in with global container shipping liner networks
- > Provides an indication of the extent to which the country is wired in with global trade in goods that are shipped by containers, in particular manufactured consumer goods

There are 12 major sea ports in India, plus another 180 non-major ports. Coastline is long compared to land-mass

Major sea ports in India



Major ports:

- > Governed by the Central Government; tariffs regulated by the Tariff Authority for Major Ports (TAMP)
- > India has 12 major sea ports with 6 ports each on each coast
 - Kandla Port in Gujarat handles the largest traffic, by tonnage, in India
 - Coastal metropolitan cities, Mumbai, Chennai & Kolkata, have 2 ports each
 - Ennore Port is a corporate port

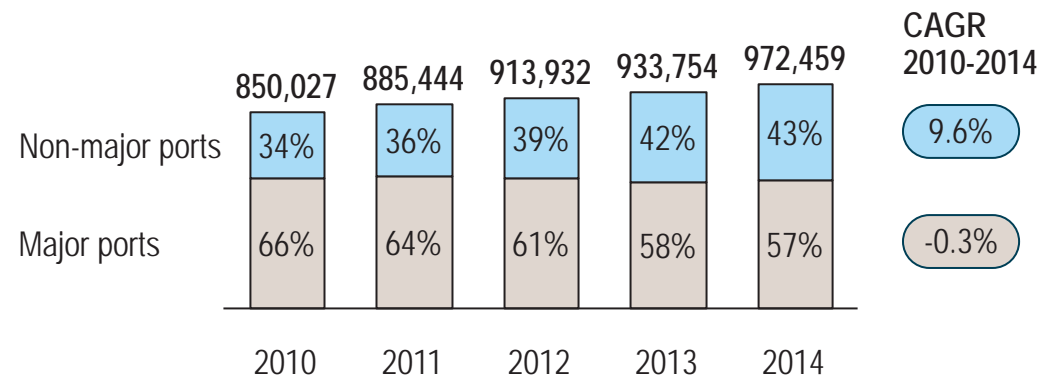
Non-major ports:

- > Under the jurisdiction of respective State Government
- > Total of 187 minor & intermediate ports
- > Determine their own tariffs

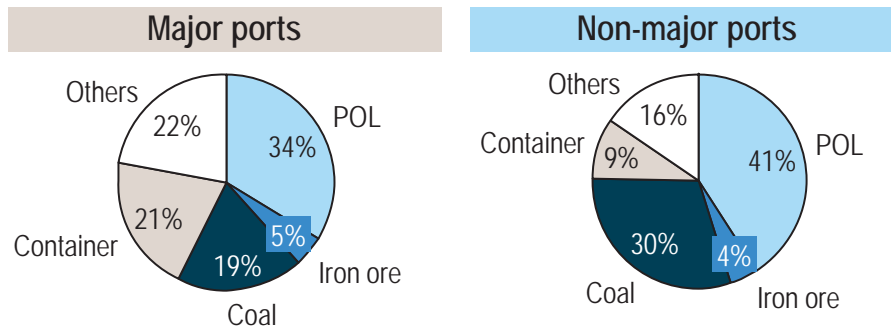
Private non-major ports have strongly out-grown the major ports in the last few years

Traffic volume by type of ports, 2014

Traffic handled by type of ports, 2010-2014 [k tonnes]



Share of cargo types in major/non-major ports [%]

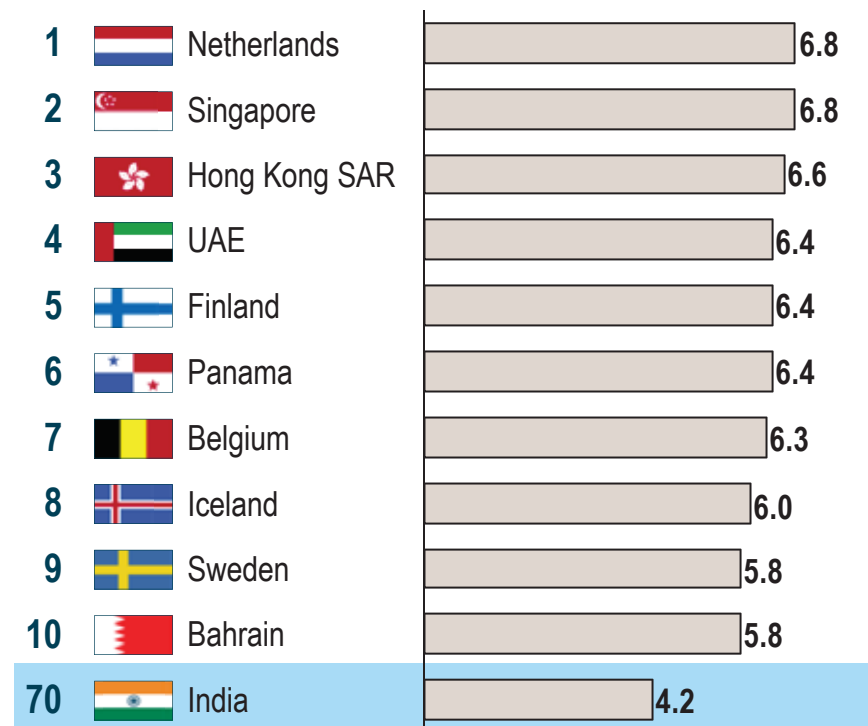


- > Major ports are steadily losing "market share" to private ports
- > Existing private non-major ports continue to witness significant growth in traffic volumes, supposedly owing to:
 - Diversified cargo portfolio
 - Better operational efficiency
 - Better infrastructure
 - Presence of captive cargo streams
- > POL (Petroleum-Oil-Lubricants) has highest share of total traffic across all ports, though this share is declining, in tandem with diversification

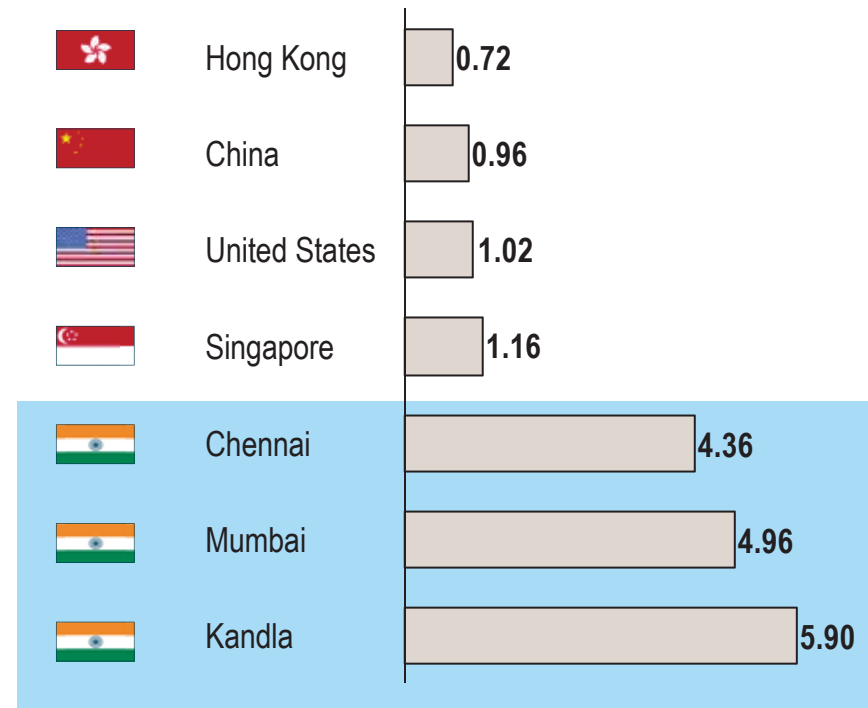
India's quality of port infrastructure severely lags behind world class ports and this has curbed port performance and efficiency

India port infrastructure and operating performance

Quality of ports - WEF ranking (2013-2014, 155 countries)



Ship turn-around times, 2011 (days)



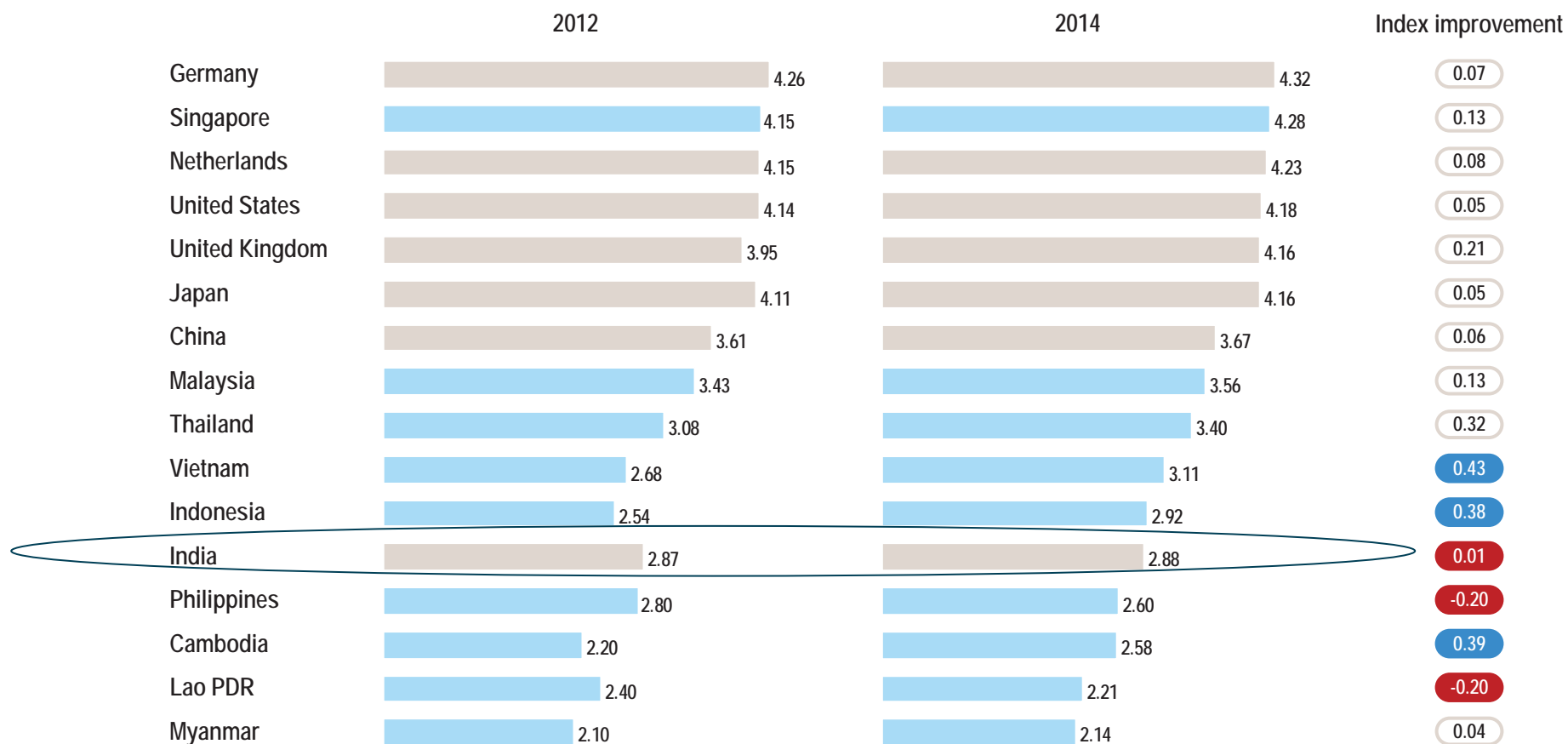
Logistics performance and infrastructure performance compares with ASEAN, but both are far behind most developed economies

Logistics performance and infrastructure assessment



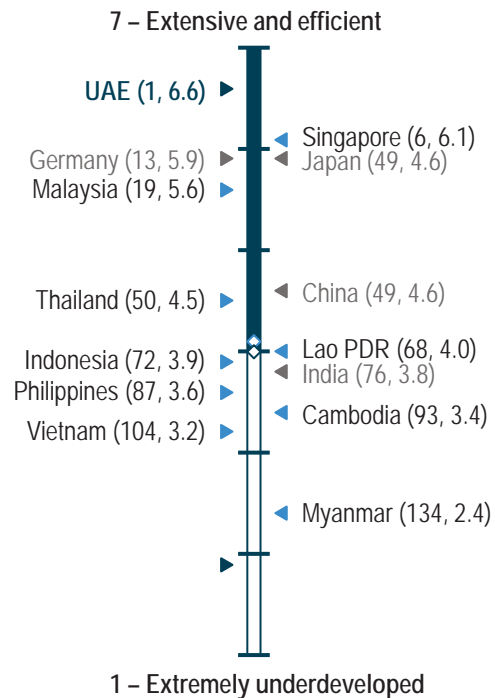
Infrastructure and inland connectivity is a major hurdle

Overall infrastructure assessment index, [5 = High, 1 = Low]

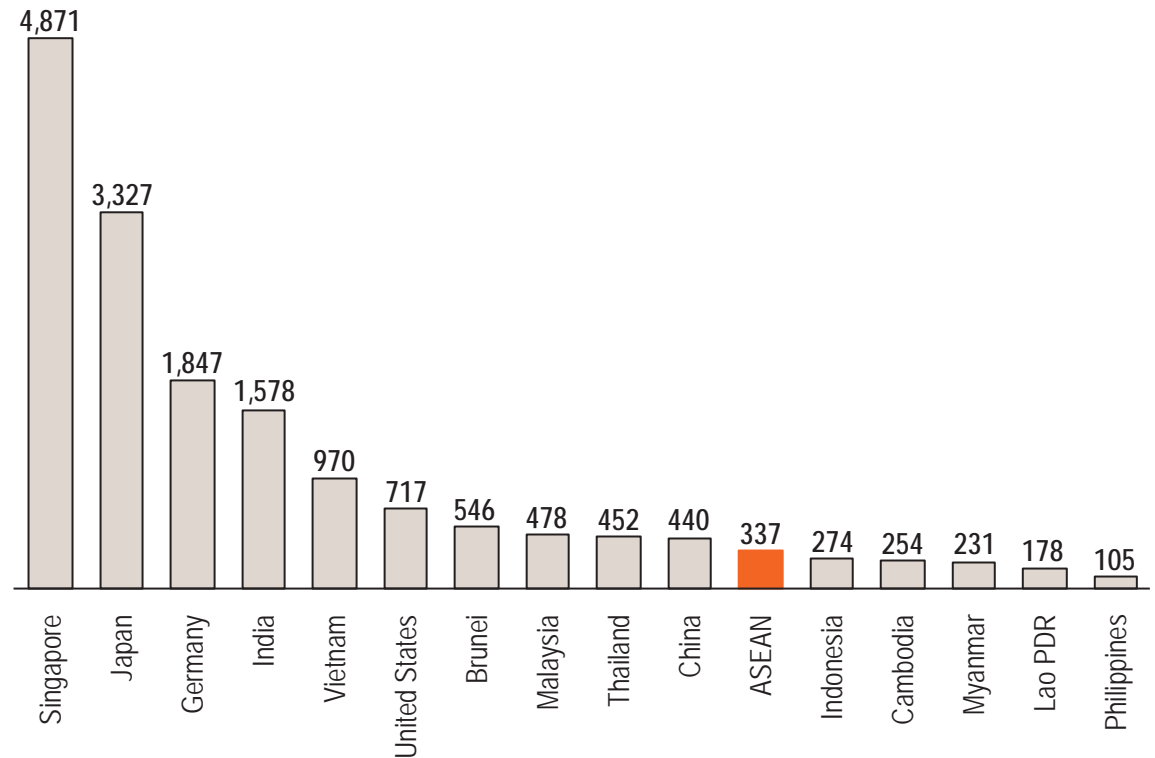


Though India's road density is already relatively high, the quality of its roads has some way to go to catch up

Quality of roads (rank, value)



Road network density, 2011 (km/ 1,000 sq. km)



▶ Best and worst countries ▶ non-SEA countries ▶ SEA countries ◇ World¹⁾ average ◇ SEA average

1) Information was collected from 144 countries worldwide.

India's port industry will need to address significant challenges in order to help drive economic development

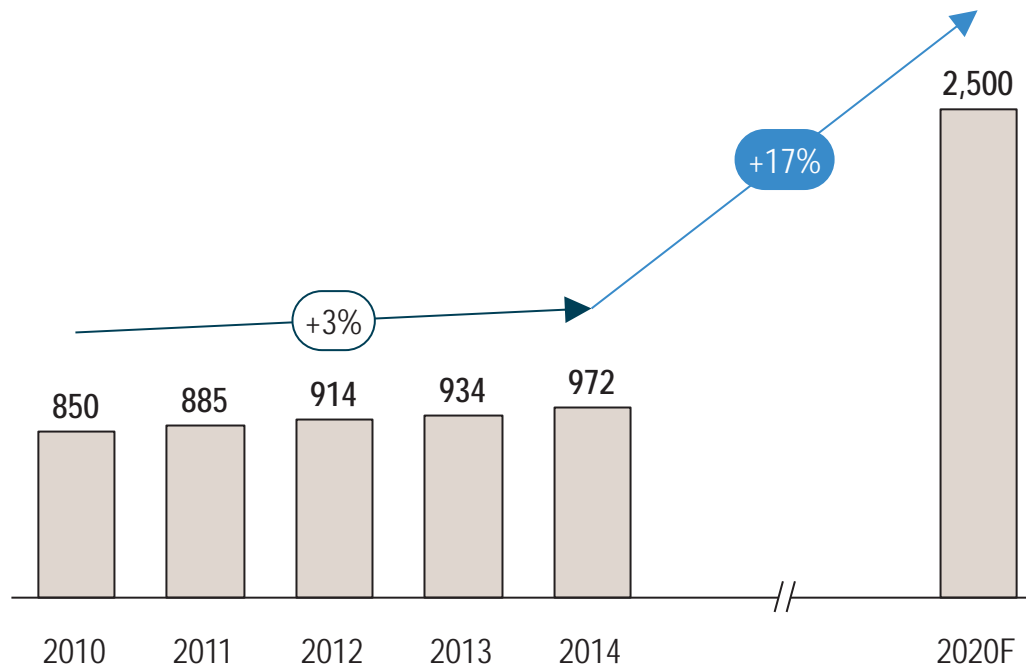
India's port industry challenges

Institutional 	1	Port governance structure and reform Different governing principles for major and non-major ports has led to advantage for non-major ports in the form of operational and pricing freedom, contributing to their growth
	2	Bureaucracy reform Policies, rigid regulations and bureaucracy in administrative procedures, red tape, illegal charges etc
Infrastructure and connectivity 	3	Connectivity to hinterland – roads, rail, rivers India lacks capacity and adequate transport linkages to hinterland allowing quick and efficient transport of goods at competitive prices
	4	Port infrastructure and facilities Majority of major Indian ports lack adequate draft levels to handle larger vessels. Many need to grow capacities in response to specific demands
	5	Service levels in comparison to peers India's port facilities and operating practices can not yet match those of global port hubs / world-class ports

India's Maritime Agenda aims to achieve port throughput of 2.5 bnT by 2020 – 150% increase, CAGR of 17%, from 2014 level

India's Maritime Agenda 2010-2020

Throughput targets 2014-2020 [m tonnes]



- > The Agenda includes plans for:
 - Full mechanization of cargo handling, including dry bulk
 - Increasing port draft levels
 - Multi-modal connectivity improvement projects
 - Corporatization of major ports
- > The private sector is expected to play a significant role in port investments

C. The way forward –
how to develop ports
smartly

Roland Berger
Strategy Consultants

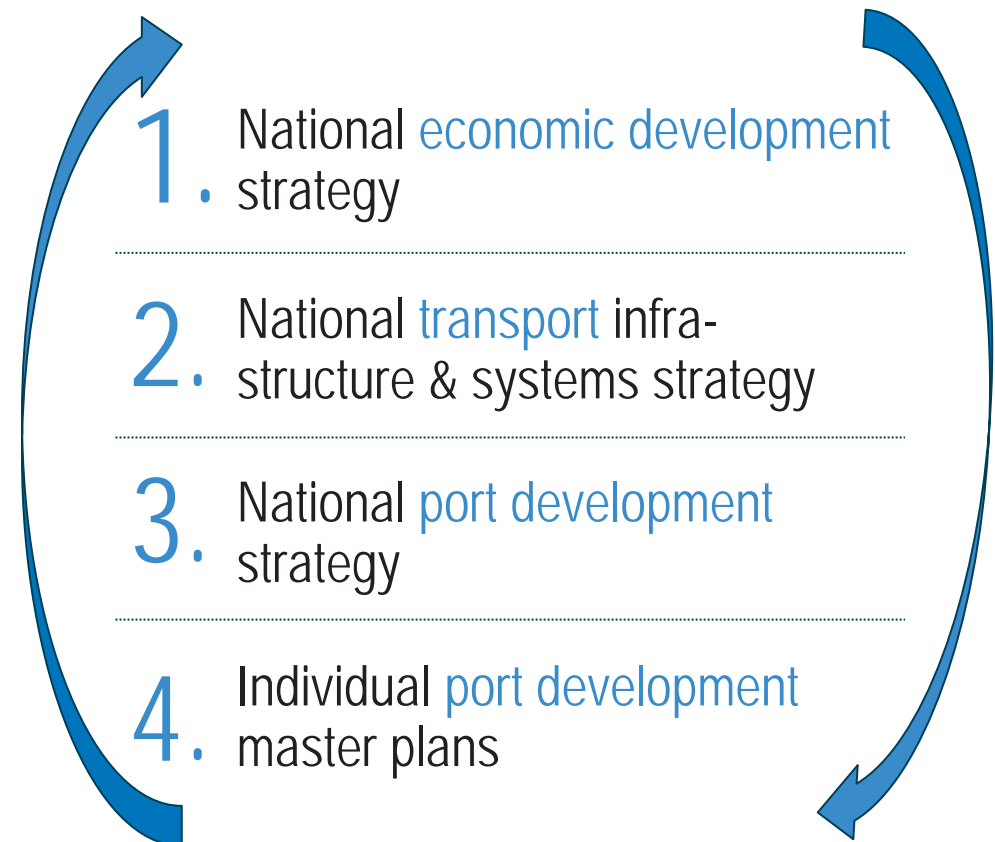


An integrated approach to port development strategy formulation is required if the aim is to maximize its national economic impact...

National logistics strategies

Key challenges/issues for ports






- > Which is the best **port management model**, taking national, policy, local and regional factors into account?
- > What is the best way to **finance ports** (re-) development?
- > How to plan, manage and **integrate** ports, inland infrastructure, industry, transport systems, logistics?
- > What are the best locations for **port development**?
- > How to do **port master planning**?
- > How to ensure and improve operating **port performance**?



...while also utilizing ALL potential opportunities for maximizing the contribution of its ports to national economic growth

Turning ports into engines of growth

Non-exhaustive

Potential growth driver	Description/impact	Examples
1  Port related industries	Develop & attract "heavy" industries, that are directly port-dependent (steel mills, refineries etc)	<ul style="list-style-type: none"> > Rotterdam > Tanger Med
2  Value addition of exports/commodities	Centre for processing of raw materials/manufactured goods for exports. EPZs	<ul style="list-style-type: none"> > Newcastle Coal Terminal > Penang
3  Distribution/warehousing and logistics hub	Provision of full logistics services (storage, packaging, 3PL, 4PL) to optimize global supply chains	<ul style="list-style-type: none"> > Dubai > Rotterdam
4  Transshipment and transit trade development	Global hub for transfer of goods en route between origin & destination	<ul style="list-style-type: none"> > Singapore > Rotterdam
5  Exim gateway for regional/national hinterlands	Key gateway for export & imports for region/nation	<ul style="list-style-type: none"> > Tanger Med > Rotterdam

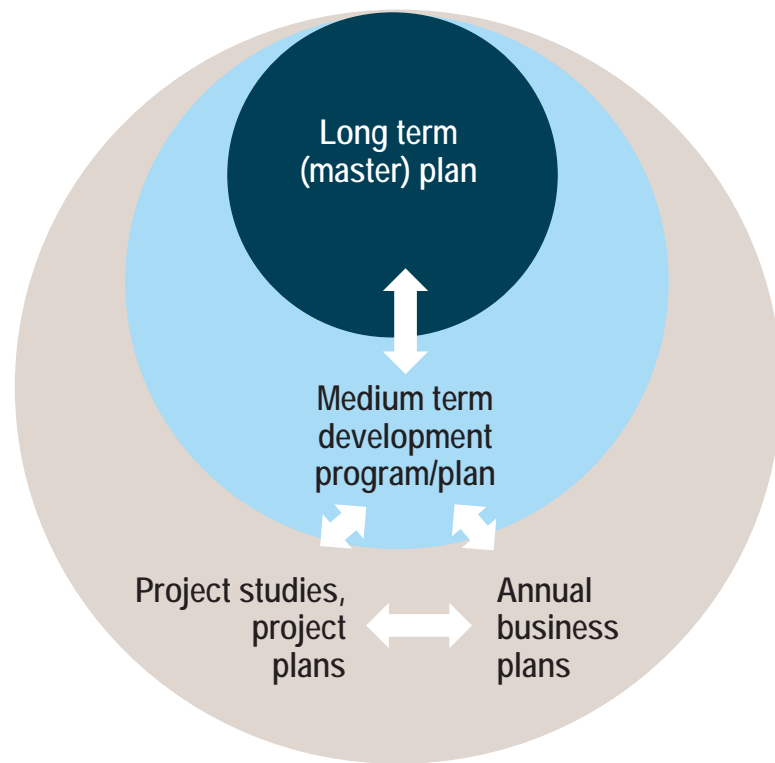


Ports should assess and exploit every potential economic growth driver to maximize impact

The key success factor of the most successful ports is their ability to balance & link long term, medium term & short term planning

Port planning approach – Best practice

Illustrative

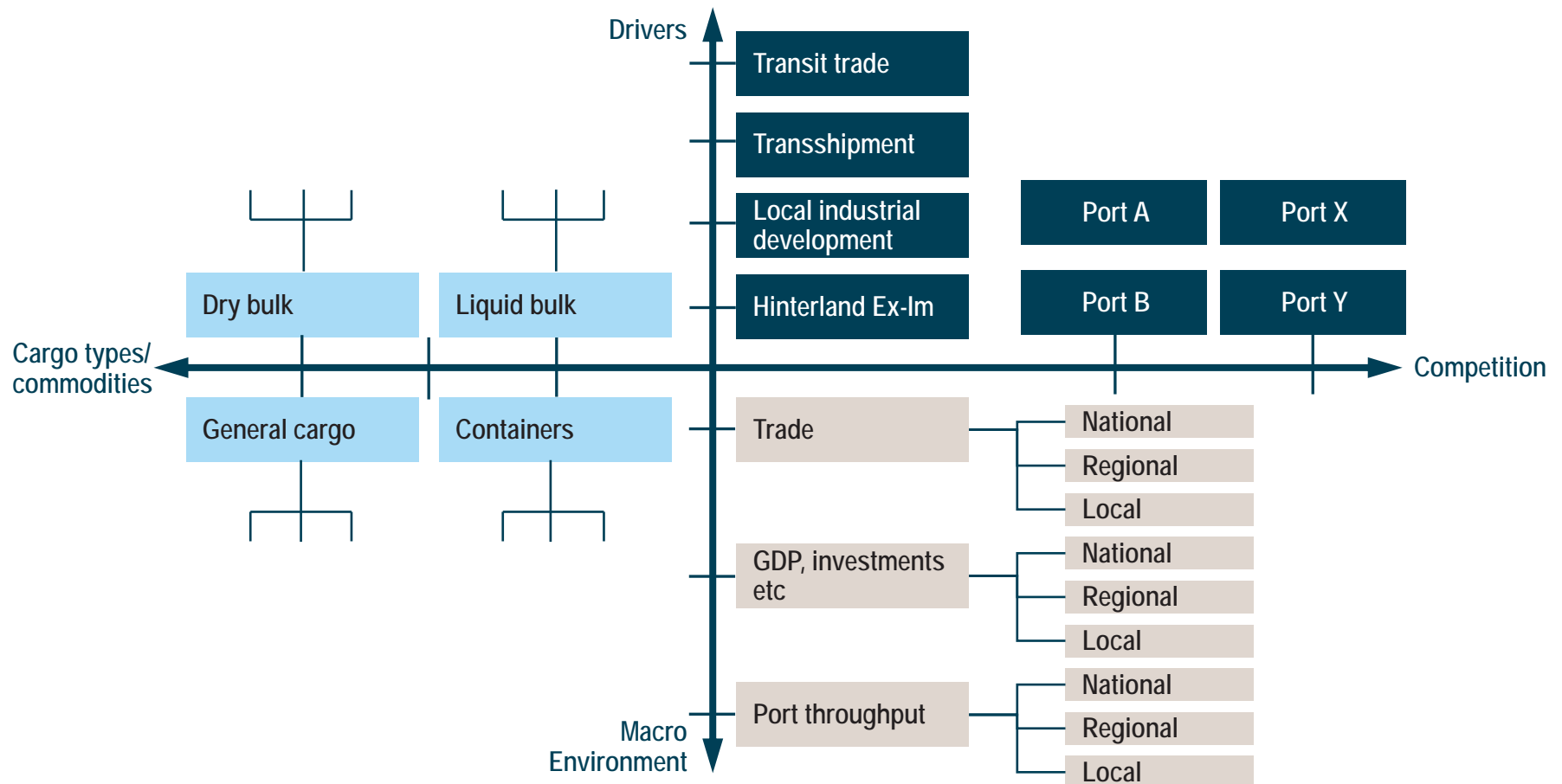


Planning horizon	Nature	Updating
20-40 years	<ul style="list-style-type: none"> > Strategic > Encompassing > Locations > Zoning > Land bank 	Every 5-8 years, rolling basis
8-15 years	<ul style="list-style-type: none"> > Strategic > Development program > Scheduling > Common infrastructure development planning > Operating models > Funding programming 	Every 2-3 years, rolling basis
5-8 years	<ul style="list-style-type: none"> > Strategic > All aspects of operations & development > Management tool for port management 	Every year, rolling basis

Good forecasting is the foundation of sound port planning – it should take into account a broad range of drivers and factors

Framework for port demand forecasting

Illustrative

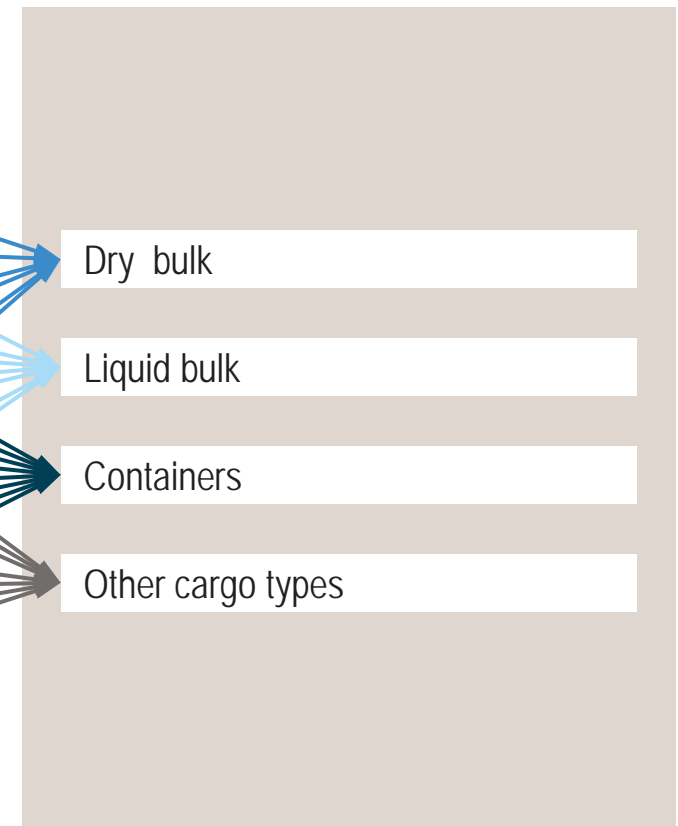


In formulating specific port development plans, all potential demand drivers may require attention and evaluation

Port demand drivers



Port handling capacities





Anthonie Versluis
Partner

Tel: +603 22038610
anthonie.versluis@rolandberger.com
www.rolandberger.com



Wilfred Albur
Partner

Tel: +91 9920630131
wilfred.albur@rolandberger.com
www.rolandberger.com



Rahul Gangal
Partner

Tel: +91 1243882911
Rahul.Gangal@rolandberger.com
www.rolandberger.com

We have deep experience and expertise in supporting ports and maritime sector development around the world

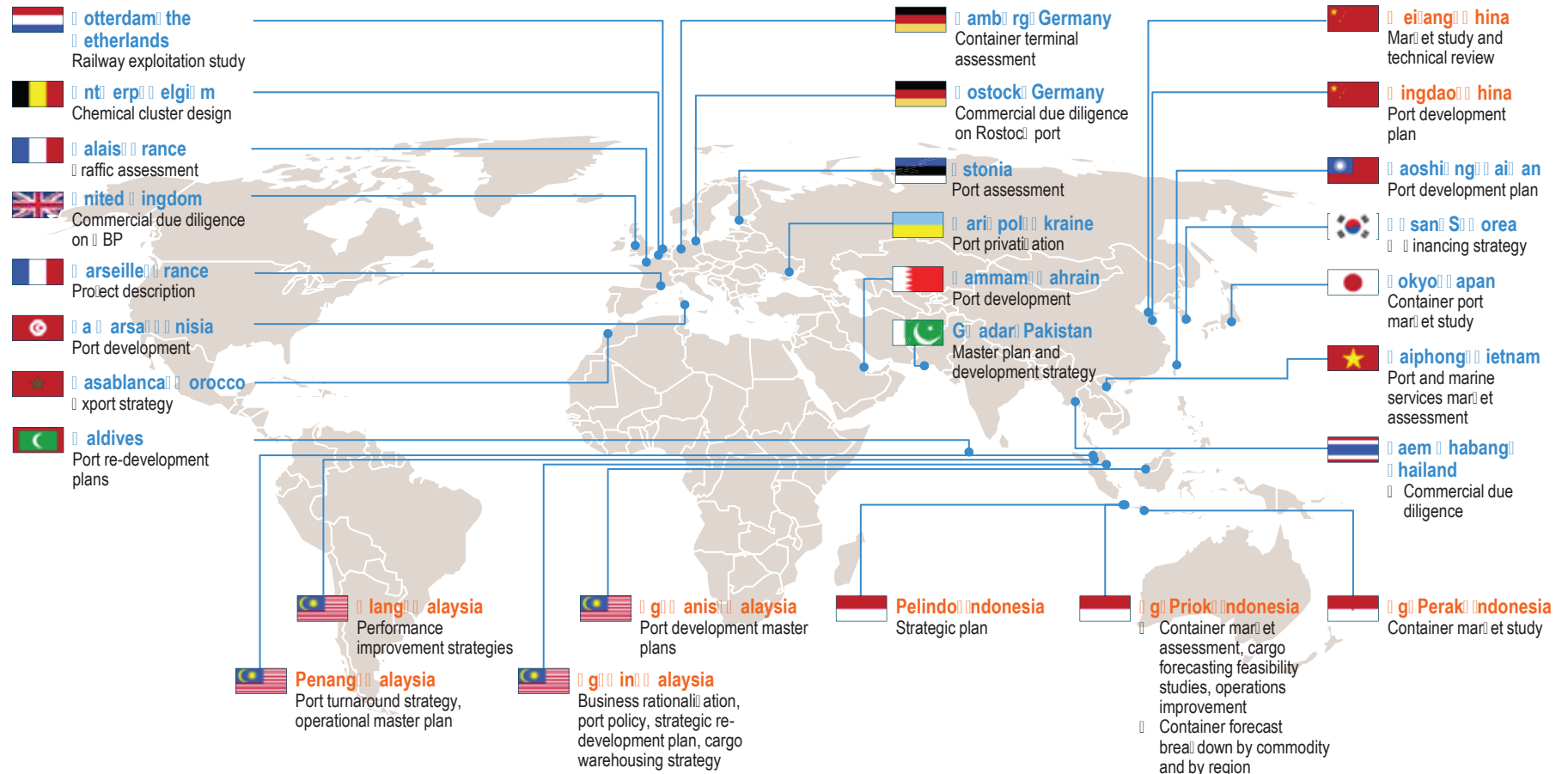
Selected clients – *samples only*

Ports 	Shipping 
	

-  We are proud to be a **top 5** player in the **global strategy** market
-  We have **deep global port** planning and development experience
-  Uniquely, we have a **Global Ports Practice**

We work on port development projects around the world

Recent port projects – selected samples only



A large container ship is docked at a port. The ship's deck is filled with stacks of colorful shipping containers in shades of white, red, orange, and yellow. A massive gantry crane with a complex steel lattice structure is positioned over the ship, ready for loading or unloading. The sky is clear and blue. The image is split vertically, with the left side being a faded, semi-transparent version of the same scene.

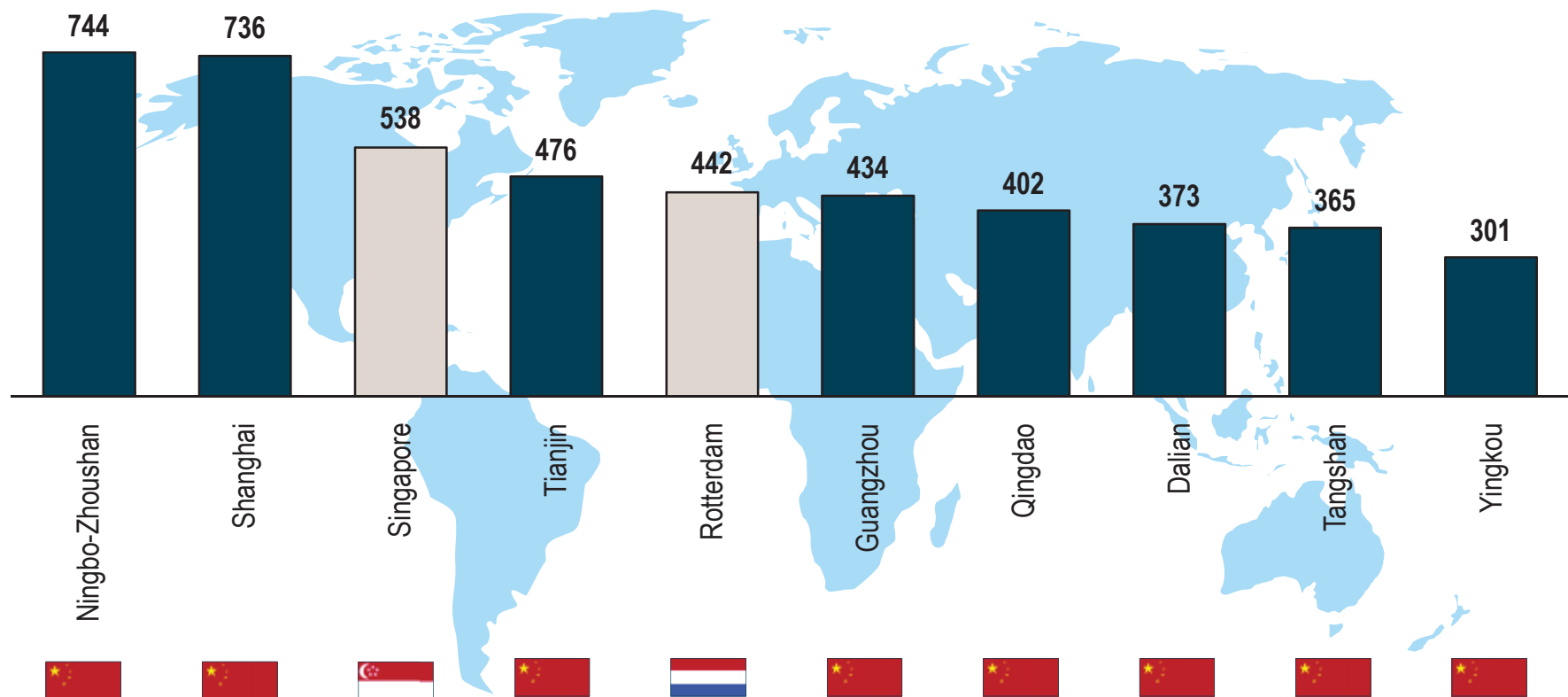
Ports – global trends

Roland Berger
Strategy Consultants

Eight of the ten largest ports in the world are now located in China

Top ten largest ports by cargo throughput in the world

Total cargo throughput, 2012 [m MT]



India's maritime trade corridor

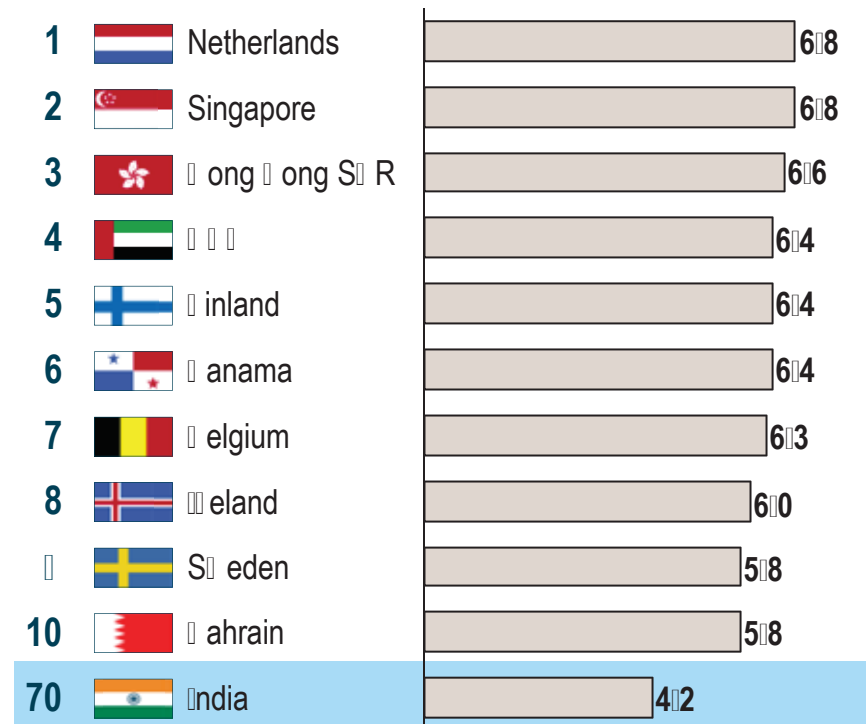
Roland Berger
Strategy Consultants



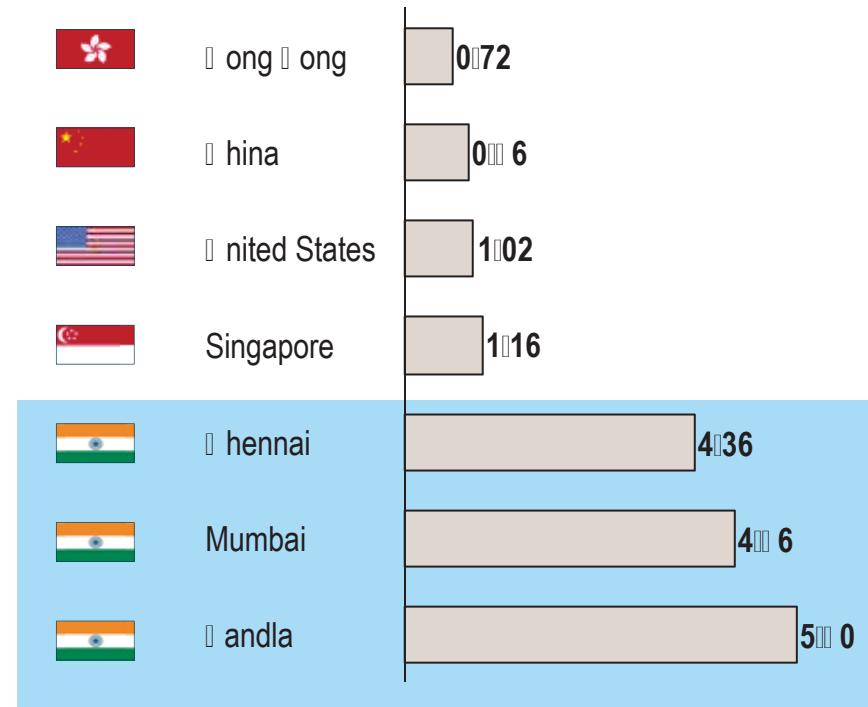
India's quality of port infrastructure severely lags behind world class ports and this has inhibited port performance and efficiency

India port infrastructure and operating performance

Quality of port infrastructure - top 10 countries



Top 5 ports around the world, 2011 average



□ □ The □ a□ □or□ ard –
ho□ to de□ elop ports
smartl□

Roland Berger
Strategy Consultants





Thore van der Loo

Partner

Tel: +31 (0) 20 674 4000

anthonie.ersluis@rolandberger.com

www.rolandberger.com



Iredalbur

Partner

Tel: +31 (0) 20 674 4000

ilredalbur@rolandberger.com

www.rolandberger.com



Rahul Ganga

Partner

Tel: +31 (0) 20 674 4000

Rahul.Ganga@rolandberger.com

www.rolandberger.com