

Looking Ahead: The Port Industry

*How ASEAN ports respond to
the changing global maritime
trade trends?*

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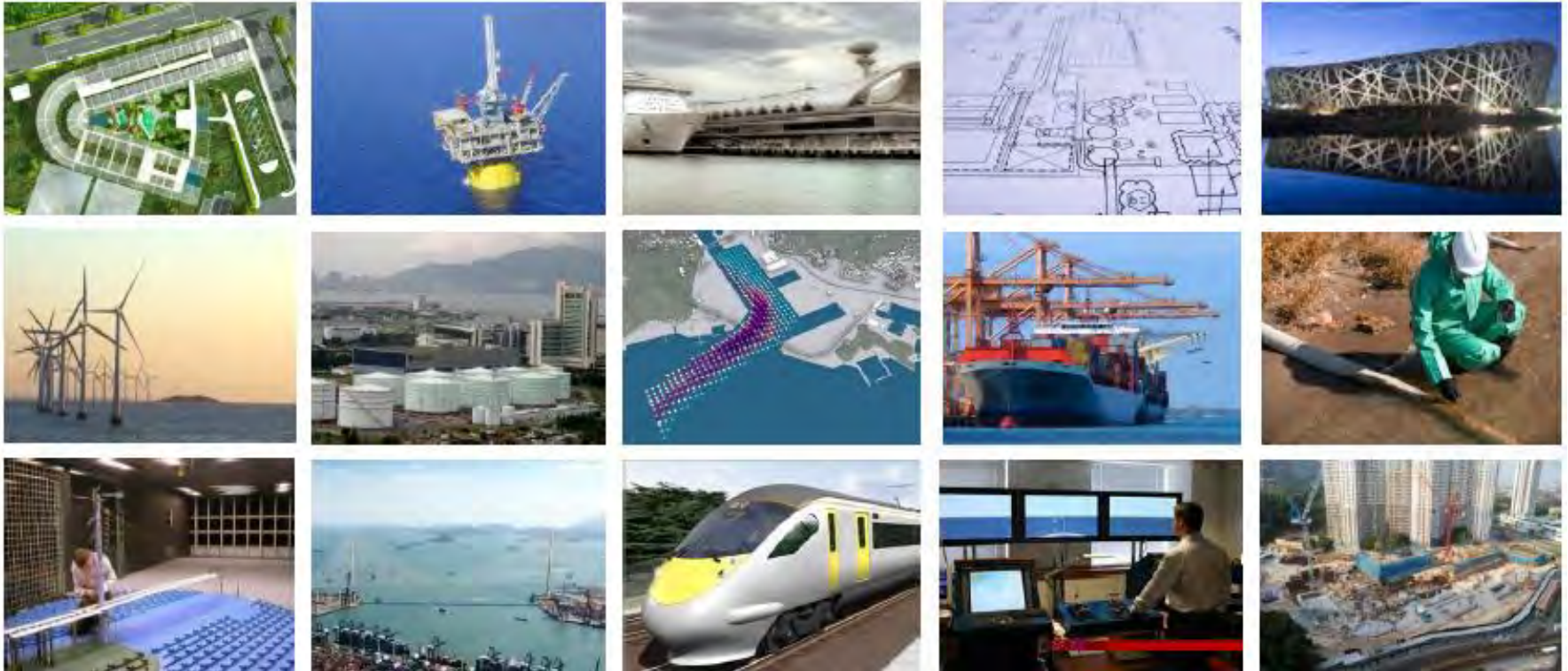


We are energy & infrastructure consultants

>> BMT helps clients make critical decisions at every stage of port development.

Our experts combine deep sector and regional knowledge with core strengths in specialist market and economic, masterplanning, engineering, risk management and environmental consulting to provide effective, reliable, real-world solutions and products to our clients.

BMT Asia Pacific



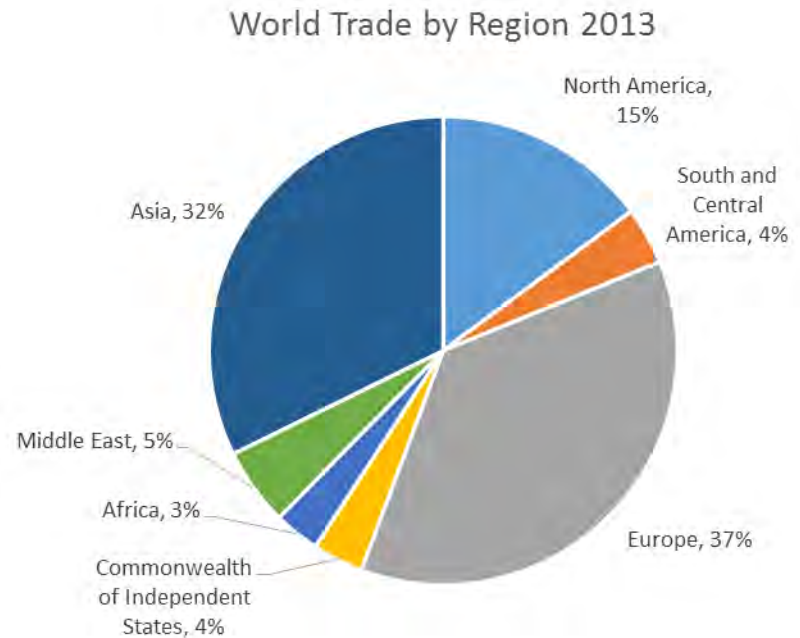
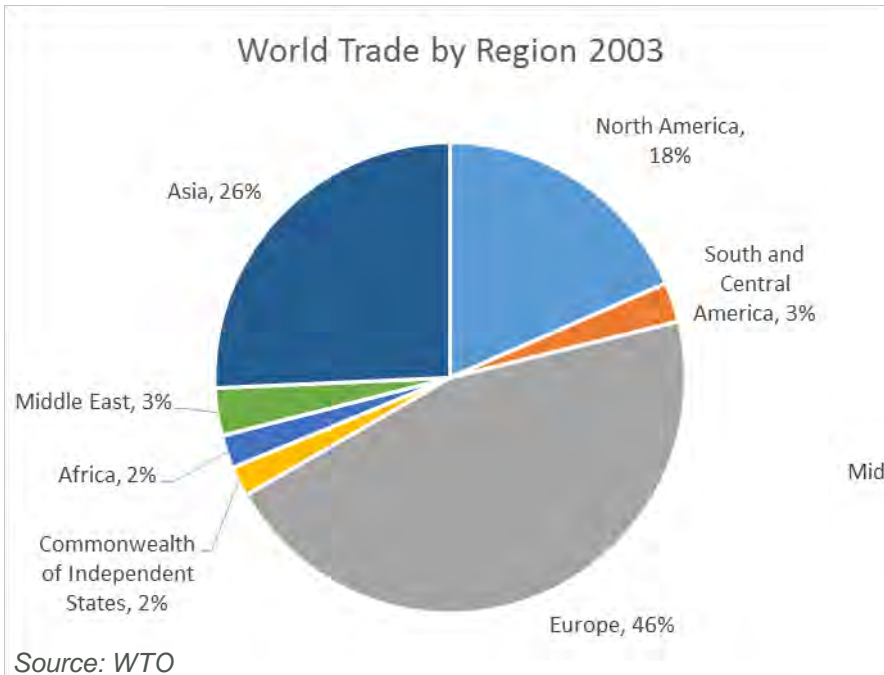
- Market, Industry and Cluster Analysis
- Regulatory Economics
- Investment Appraisal & Facilitation
- Socio-economic Assessment

- Port & Terminal Infrastructure Design
- Environmental Services
- Marine Access
- Risk Assessment

Industry Outlook



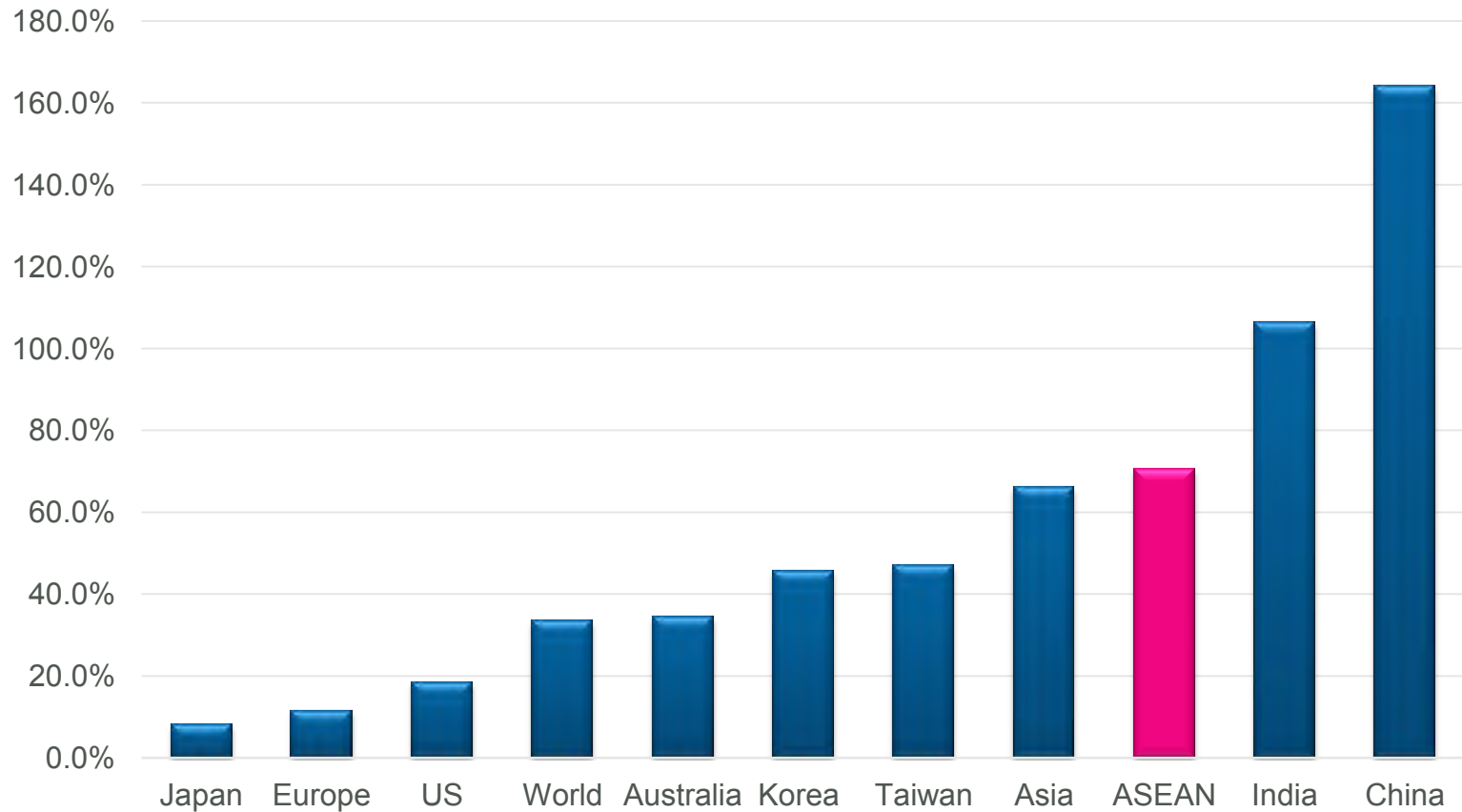
Trade in Asia Continues to Grow Rapidly



- Asian economies are an important component of world trade;
- Asia's rise have corresponded with declining shares for North America and Europe

ASEAN Economies Outperformed the World Average

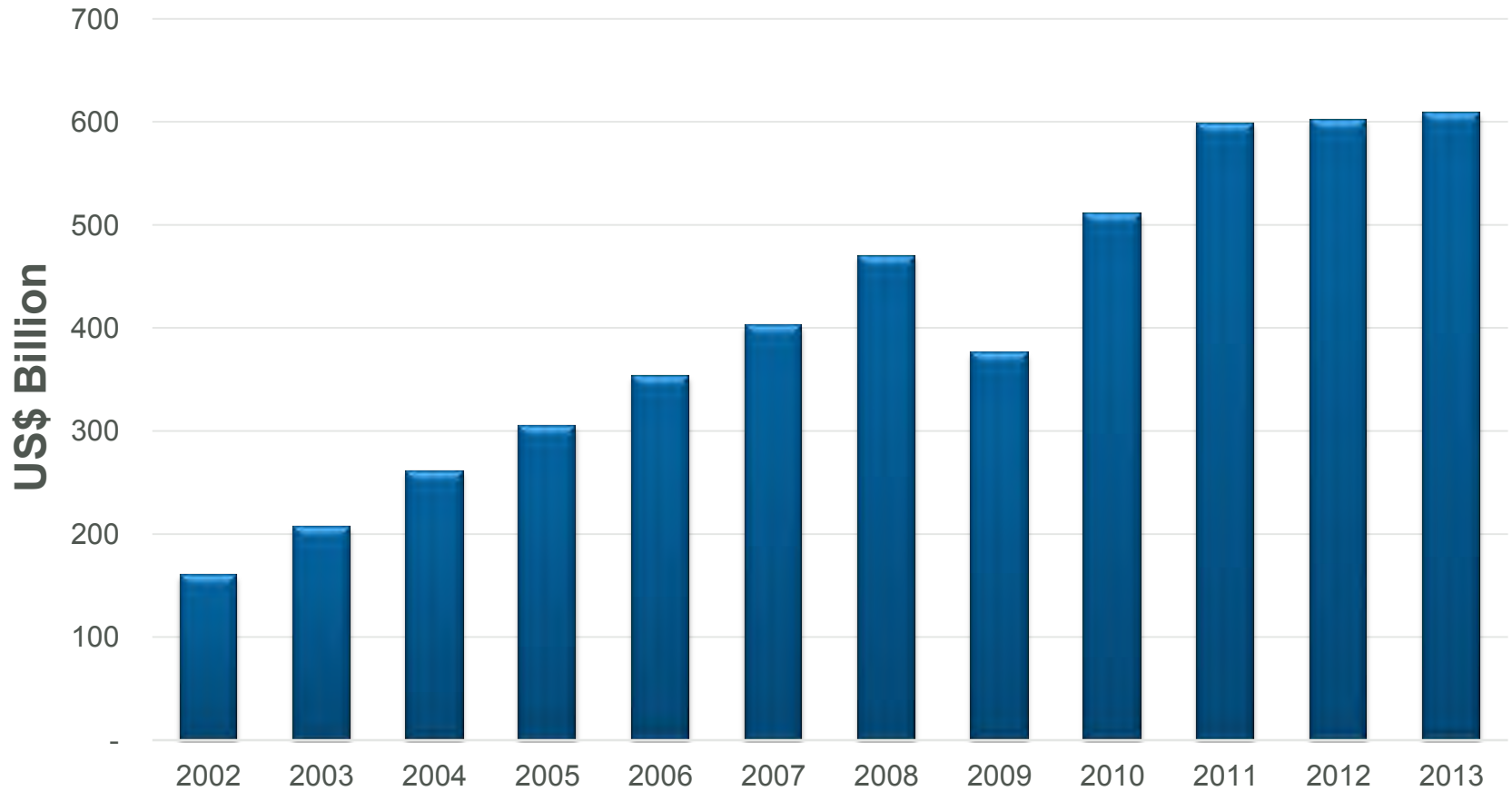
Real GDP Growth from 2003 to 2013



Source: Economic Research Service USDA

Intra-ASEAN Trade Growing Rapidly

Intra-ASEAN Trade



Source: Association of Southeast Asian Nations

World Top 30 Container Ports of 2014 (6 ports in ASEAN)

Rank	Port	Million TEUs
1	Shanghai	35.3
2	Singapore	33.9
3	Shenzhen	24.0
4	Hong Kong	22.2
5	Ningbo-Zhoushan	19.5
6	Busan	18.7
7	Qingdao	16.6
8	Guangzhou	16.6
9	Dubai	15.3
10	LA/LB	15.2
11	Tianjin	14.1
12	Rotterdam	12.3
13	Port Klang	11.0
14	Kaohsiung	10.6
15	Dalian	10.1

Rank	Port	Million TEUs
16	Hamburg	9.8
17	Antwerp	9.0
18	Xiamen	8.6
19	Tanjung Pelepas	8.5
20	Laem Chabang	6.6
21	Ho Chi Minh/Cai Mep	6.3
22	Bremerhaven	5.8
23	NY/NJ	5.8
24	Yingkou	5.8
25	Jakarta	5.7
26	Lianyungang	5.0
27	Colombo	4.9
28	Tokyo	4.9
29	Algeciras	4.6
30	Nhava Sheva	4.5

ASEAN

China

Other Asia

Profile of Top ASEAN Ports

Singapore

- Regional hub for transshipment at the heart of SE Asia. Plans to relocate to Tuas within 10 years.



Port Klang

- Malaysia's gateway port, serving needs of hinterland with a growing transshipment business.



Tanjung Pelepas

- Low cost competitor to Singapore's container transshipment dominance.



Profile of Top ASEAN Ports

Tanjung Priok

- Busiest port of Indonesia, already at capacity with plans to expand by constructing Kalibaru Port.

Laem Chabang

- Thailand's primary deep sea port; import/export gateway with virtually no transshipment volume.

Ho Chi Minh

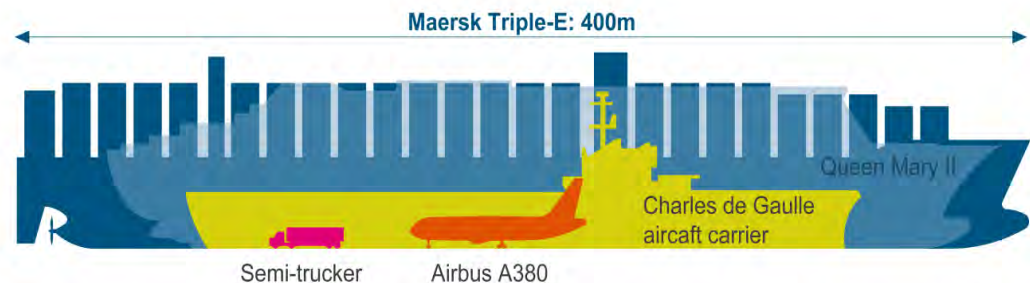
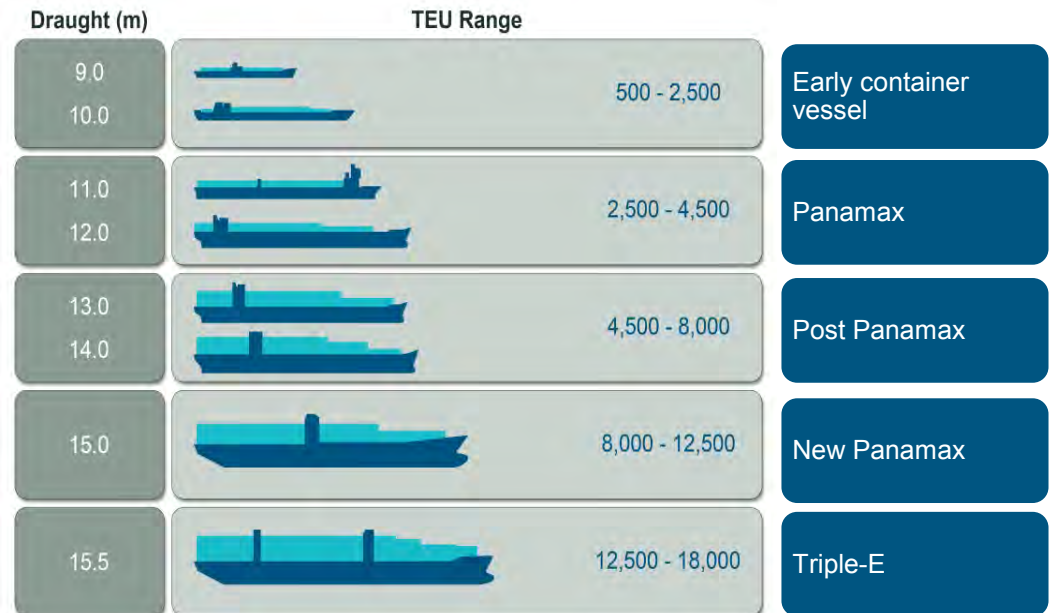
- Serving Vietnam's economic centre, it is the main port of Southern Vietnam.



Key Port & Shipping Market Trends

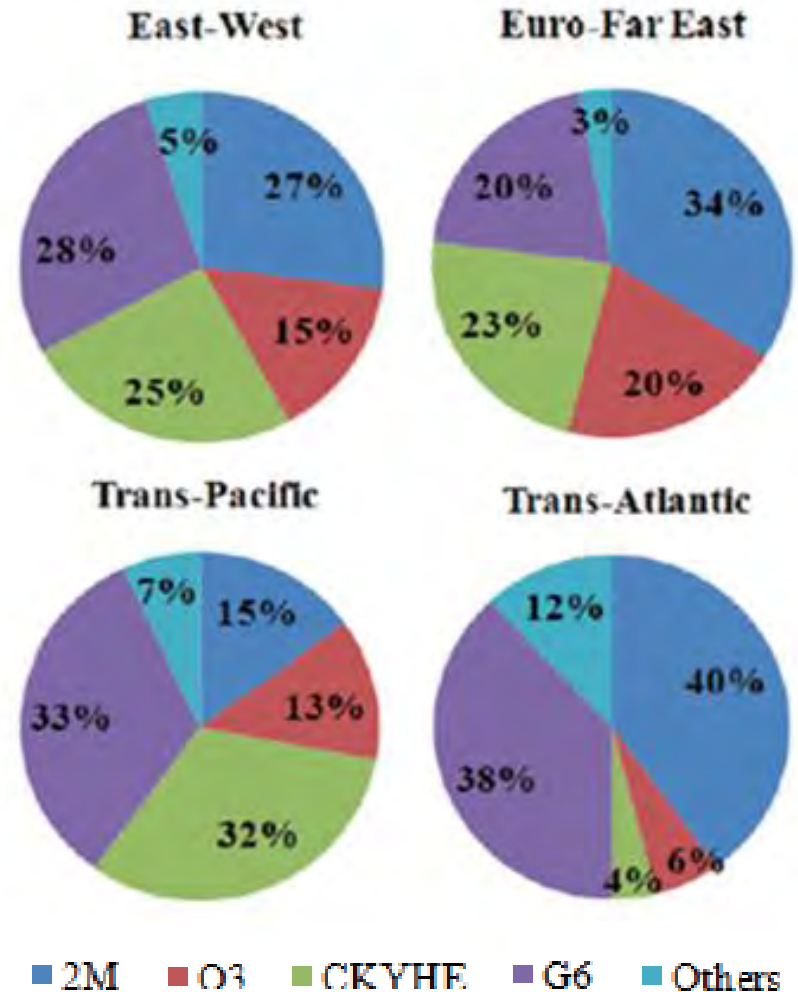
Increasing Size of Ocean Going Vessels

- Mega vessel size may rise to **22,000 TEUs** in the near future (21,100 TEUs of OOCL's order – end 2017)
- Key impacts from mega vessels include:
 - Fewer calls
 - Demand for **deeper draft** & port **facilities upgrade**
 - Preference on **higher performing ports**
 - Requirement on connectivity, whether the ports provides enough feeder routes → **Hub & Spoke Network**



Alliance of Major Shipping Lines

- Recently formed by **Maersk** and **MSC**, the **M2** Alliance is the world's largest container collaboration
- Another development is the **O3** container shipping alliance formed by **CMA CGM**, **China Shipping Container Lines** and **United Arab Shipping**
- Impact of increasing liner alliance:
 - Operate very **large vessels**, smaller ports will be cut off
 - Rationalise port calls to bring **cost advantage**
 - Better **resource allocation** will further streamline operations



Source: Maritime Insight

G6: OOCL , MOL, Hapag-Lloyd, NYK, Hyundai, & APL
 CKYHE: COSCO, "K" LINE, Yang Ming, Hanjin, & Evergreen

In the Global Port Industry

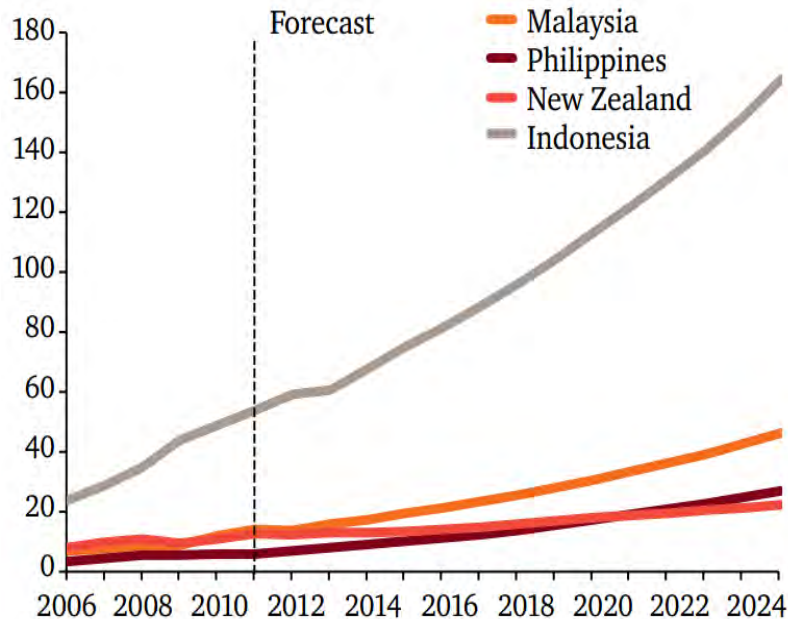
- The **globalisation** of trade and the growth in sea transport have resulted in **port traffic increases at an average of about 3% per year**.
- New port infrastructures have been planned, improvements in port services have been designed and **new technologies have been applied to increase port competitiveness**.
- Ports are **upgrading to accommodate the trend of mega vessels** currently approaching **20,000 TEUs**.
- Ports are also evolving rapidly from traditional land & sea interfaces to **providers of complete logistics networks**.

In the Asian Port Market

- **Intra-Asian trade** is growing rapidly and driving up demand for port services.
- More of Asia's port operators are **acquiring foreign ports** to gain control of international shipping routes and at the same time have direct access to raw materials.
- Competition among Asia Pacific ports are heating up, particularly for the **transshipment** business.
- **Hub and spoke** mode drives leading Asian ports to form close collaboration with major shipping lines and inland logistics operators.
- **Maritime services, offshore and freight forwarding** are expected to be the fastest growing areas.

Infrastructure Development in Emerging Asia

Total Infrastructure Spending Per Year
(USD Billion)



Source: Oxford Economics, PWC

- Migration of industrial activity into SE Asia will result in **huge export**.
 - Increasing demand from intra-Asian trade is putting **pressure on existing infrastructure**.
 - **Indonesia** and **Malaysia** initiated national plans for infrastructure development.
 - **Port expansion** and improvement of **inland connectivity** (e.g., road, barging and rail) are priorities.
- **Reducing the logistics cost of moving cargo in both domestic and international markets**

Major Policies & Infrastructures Developments

ASEAN - China Free Trade Area (ACFTA)



- Agreement activated in 2010.
- Trade between ASEAN and China grew rapidly due to **tariff cuts** and ease of trading.
- Trade between **Guangxi (main gateway in China)** and ASEAN reached US\$12 billion in 2012, almost doubled in just two years.
- Challenges to growth include:
 - Inadequate port / inland infrastructure
 - Cumbersome bureaucracy

New Policy: China's "One Belt One Road" Policy



- Announced in late 2013 as an economic development framework to **integrate Eurasia** and drive **regional cooperation**.
- It is one of the major policies in China with **heavy political backing**; many provincial governments formulate their plans based on the initiative.

China's "One Belt One Road" Policy



21st Century Maritime Silk Road

- Foster collaboration between economies in Southeast Asia, Oceania, Middle East, North Africa and Europe.
- Spans several large bodies of water including the South China Sea, South Pacific Ocean and the wider Indian Ocean.
- Binds both prosperity and responsibility of the countries along the route. Providing mutual benefits and security.

China's "One Belt One Road" Policy - Financing



- To realise this vision, China set up the Asian Infrastructure Investment Bank (AIIB) a **multilateral development bank** in late 2014.
- AIIB will provide **financing** to the infrastructure developments necessary for Asia's regional integration.
- Seen as an **alternative** to institutions like the IMF, World Bank and the Asian Development Bank.

China's "One Belt One Road" Policy - Implications



- One Belt One Road is a **long term strategy** for integration; its effects may only be realised decades down the line.
- Availability of funding will help **accelerate port infrastructure projects**; efficient infrastructure will increase trade within and between the regions.
- Port operators will see **increasing volumes** as more economies participate in the global markets.
- **Industrial development** near the ports will provide additional **captive cargo**.

Future Infrastructure: Thailand's Kra Isthmus Canal



- Kra Isthmus is the **narrowest point on the Malaysian peninsula**; the idea for a canal has been considered for centuries.
- The proposed canal will be **2-ways, 20m deep, 102 km in length and 400m wide**.
- The canal will connect the **Gulf of Thailand** directly to **Andaman Sea** in the Indian ocean.
- The project is estimated to take **10 years** and **cost \$28 billion USD**.
- Discussion has been undergoing between **Thailand** and **China** to begin construction.

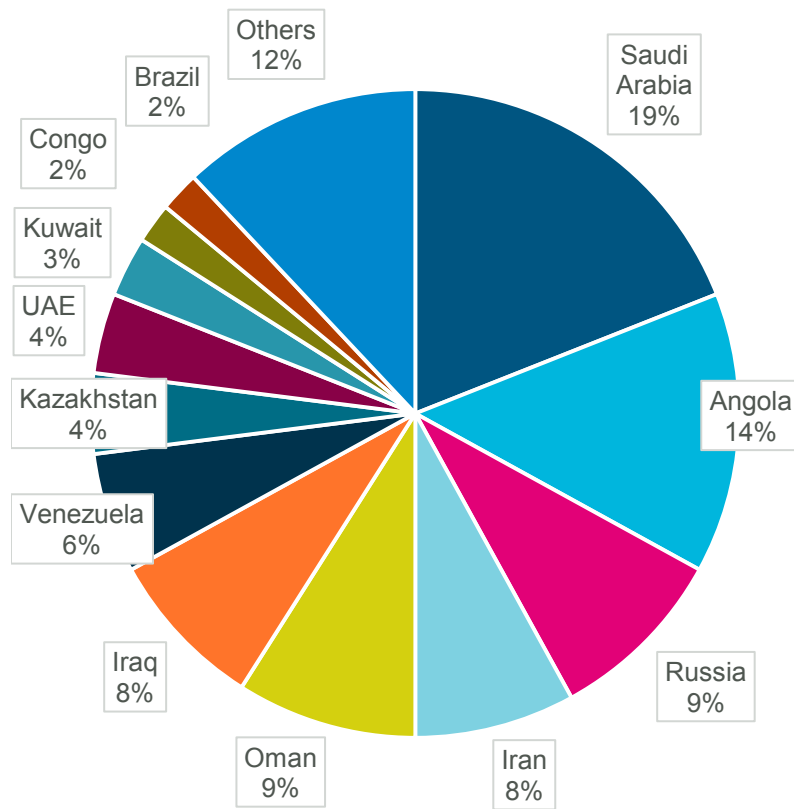
Thailand's Kra Isthmus Canal – Implications



- The canal will provide **an alternative route** to the congested Strait of Malacca.
- **Can shorten voyage distance by 1,200km and voyage time by 2-5 days**, allowing for higher vessel utilisation.
- Estimated **bunker savings** for a 100,000 DWT oil tanker to be \$350,000/ trip.
- **Bulk shipments** (e.g. oil tankers) that are chartered for **direct shore to shore** voyages will benefit most.
- **Large container ships** that must make frequent stops **may not benefit as much** – Vessel capacity may not be sufficiently utilised when skipping ports in Southeast Asia.

Thailand's Kra Isthmus Canal – Implications

China Crude Oil Imports by Source



Source: U.S. Energy Information Administration

- Thailand may benefit greatly from canal **toll fees, port facility charges** and development in the surrounding area.
- **80% of China's oil** goes through the Strait of Malacca; the Kra Canal may lower costs, reduce reliance on the Strait and minimise the threat of blockade.
- **Singapore's status** as a maritime transshipment hub may be negatively affected with vessels bypassing the Malacca Strait all together.
- Ports in Hong Kong and China stand to gain from **traffic diverted** from Singapore.
- However, **cost** of using the Canal will be a key factor.

Changes Adapted

Regional Port Clusters



Changes Adapted by Port in the Strait of Malacca

Port of Singapore

- To accommodate increasing transshipment cargo, PSA started to **relocate all its container operations to Tuas**.
- Full operation shall be resumed before 2027.
- Extensive infrastructure development and **upgrade plans**, aiming to improve **efficiencies** and keep the port status as the **regional hub** in Southeast Asia.



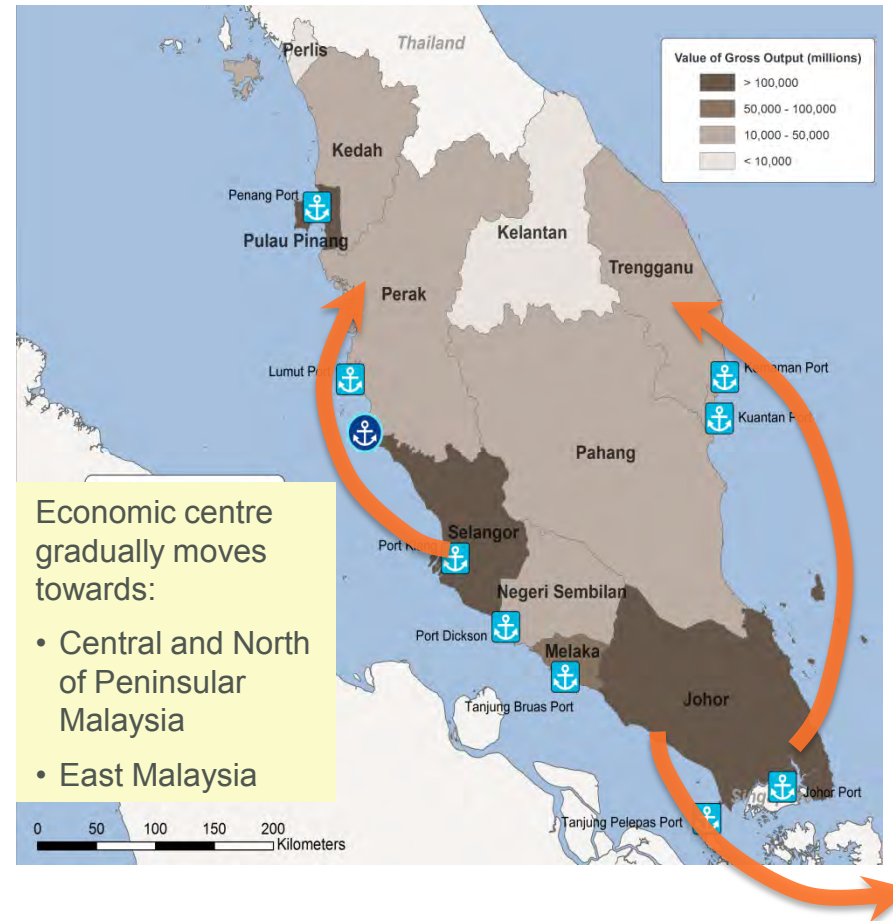
Land Use Plan 2030



Changes Adapted by Port in the Strait of Malacca

Malaysian Ports

- Capitalise on **regional growth** by positioning to be **a hub for intra-Asian trade**.
- **Diversify cargo mix by growing hinterland cargo base** instead of solely relying on international transhipments.
- Improve **inland connectivity network** to reduce overall logistics cost and increase competitiveness.
- Develop **free trade zones** and **high tech parks** to **increase value** of locally produced goods.



Changes Adapted by Indonesian Ports

- Actively attract **foreign investors** to boost industrial development
- **National strategy** for accelerating infrastructure development across Indonesian islands (**marine-highway programme**), incl.:
 - Improvement and expansion of Tj. Priok – Kalibaru Terminal
 - Establishment of new gateway ports in **Kalimantan**, **Sumatra** and **Papua**
- Aim to build an extensive **inland and barging network** to facilitate cargo consolidation and distribution



Changes Adapted by Vietnam Ports

- Government has made series of **Laws to ensure fair environment** for both foreign and domestic investors.
- From 2010 – 2014, \$140 billion of new investment was proposed in Transport, Energy, and Environment, incl.:
 - Establishment of new container ports in **Cai Mep**.
 - Building **North-south highway** along Vietnam's coastline (3,041km).



Changes Adapted by Thailand Ports

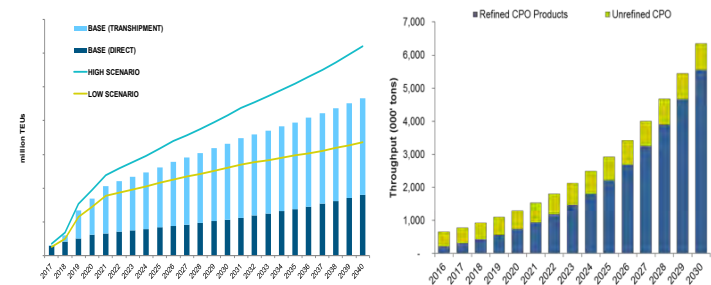
- Provide various **trade liberalisation policies** to attract direct investment, incl.:
 - Possible to own a company with **100% of foreign ownership**
 - **Tax exemptions** on raw materials
- **National strategy** for enhancing infrastructure development, incl.:
 - Planning to upgrade the national **railway** system
 - A **new terminal** at Laem Chabang with **rail** connection



Risks & Uncertainties

Typical Risks & Uncertainties

- **Market** risk – stable economic development (e.g., **industrialisation & urbanisation**) to sustain a healthy growth of cargo volume to/from the economic hinterlands;
- **Political** risks – policy implementation & sustainability; change in law; terrorism, etc.
- **Commercial** Risks:
 - Financial risk – FX, inflation, interest rate, etc.
 - Technical, operation & maintenance
 - Construction risks / completion risk
- **Environmental** risk
- **Inadequate planning** of infrastructures may result in high inland logistics costs
- Lack of **expertise or skilled workforce**



Thank You

BMT Project Experience

Strategic Development Plan for Hong Kong Port 2030

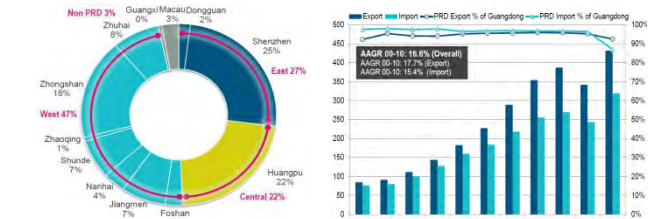
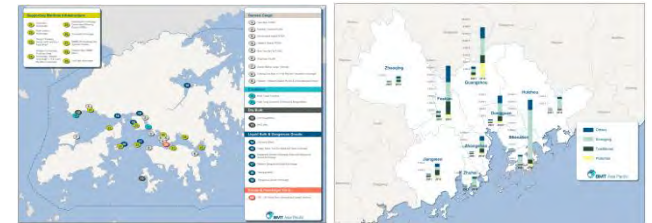
Client: Hong Kong SAR Government

Background:

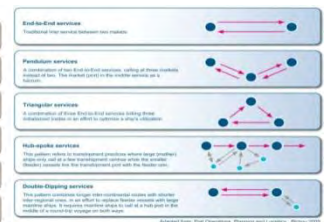
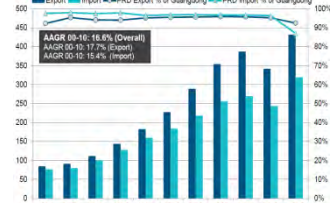
- The Hong Kong Government as a long term client of BMT sought a masterplan to maintain Hong Kong's position as a **international maritime center** for the next **20 years**.
- Industry trends** for cargo output in South China and the increasing importance of **international transhipments** as a component of throughput were identified.
- BMT performed regional **competitors analysis** and long term **throughput forecast**.
- Recommendations to overcome **barriers to growth** and **operational challenges** were provided.

What it delivered:

- Forecast throughput, bulk cargo volume (incl. liquid bulk);
- Analyse hinterland market and competition landscape, assess port's capabilities, forecast market shares;
- Devise transport and development strategy;
- Assess economic impact, financial feasibility and etc.



Draught (m)	Generations	TEU Range
9.7 9.9 9.5	1st	500 - 1,500
10.8 10.3 11.4	2nd	1,500 - 2,500
11.5 11.8 12.8	3rd	2,500 - 4,000
11.8 13.2	4th	4,000 - 5,000
14.9 14.3	5th	5,000 - 8,500
15.2 16.2	6th	8,500 - 15,000



Commercial Feasibility Study for a Deep Water Port in Malaysia

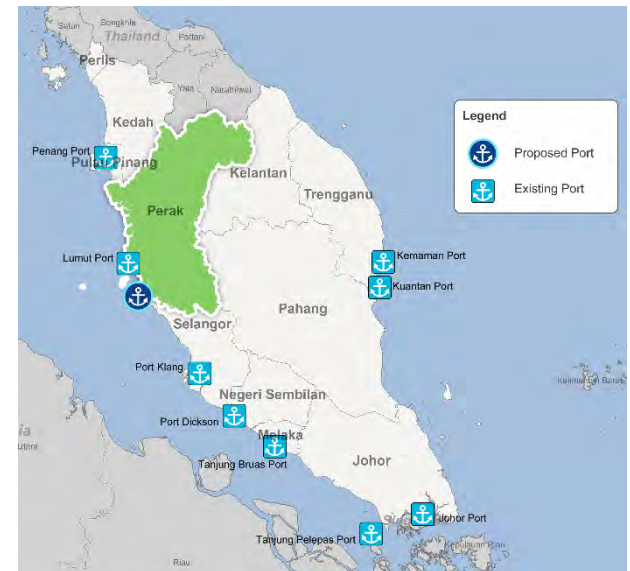
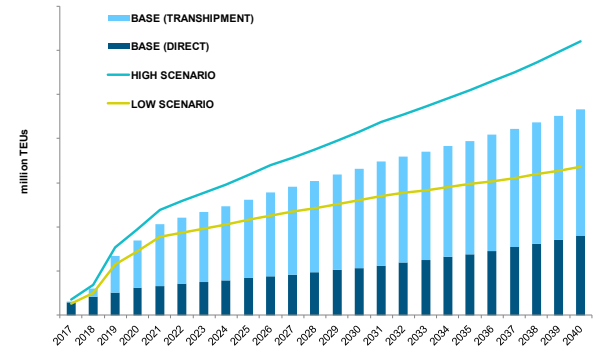
Client: PKNP

Background:

- BMT has been appointed to conduct a commercial feasibility study for the client's plans of a new **deep water port** in Bagan Datoh. The port aims to capitalise on growing **industrial developments** by acting as a **gateway** and servicing **international transshipment cargo** in the Malacca Strait.

What it delivered:

- Analysis of regional cargo market and its growth drivers;
- Potential partnership identification;
- Analysis of infrastructure and inland connectivity;
- Port success factors and regional competition landscape;
- Optimisation of ICT / depot establishments;
- Port cargo forecast, pricing strategy and financial evaluation.



Review of Bojonegara Port Masterplan

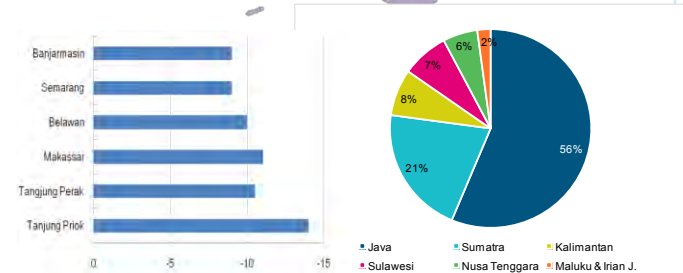
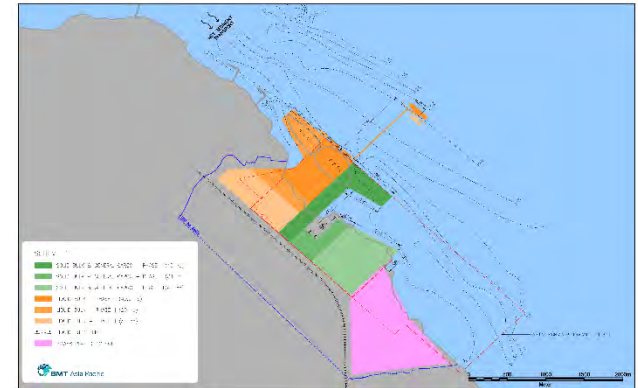
Client: Indonesia Port Corporation

Background:

- BMT was commissioned to review and update the previous masterplan for Bojonegara Port. The study analysed its cargo hinterland for key commodities (incl. oil and coal) and port facility requirements. Detailing the optimal market position for Bojonegara Port as well as providing layout design options and development planning advice.

What it delivered:

- Market analysis of hinterland economy and its demand for port facilities;
- Port positioning to maximise regional growth;
- Cargo volume forecast for every major commodity;
- Port layout options and development planning;
- Environmental and socio-economic assessment;
- Site physical characteristics (e.g. met-ocean / bathymetry);
- Assessment of financial sustainability.



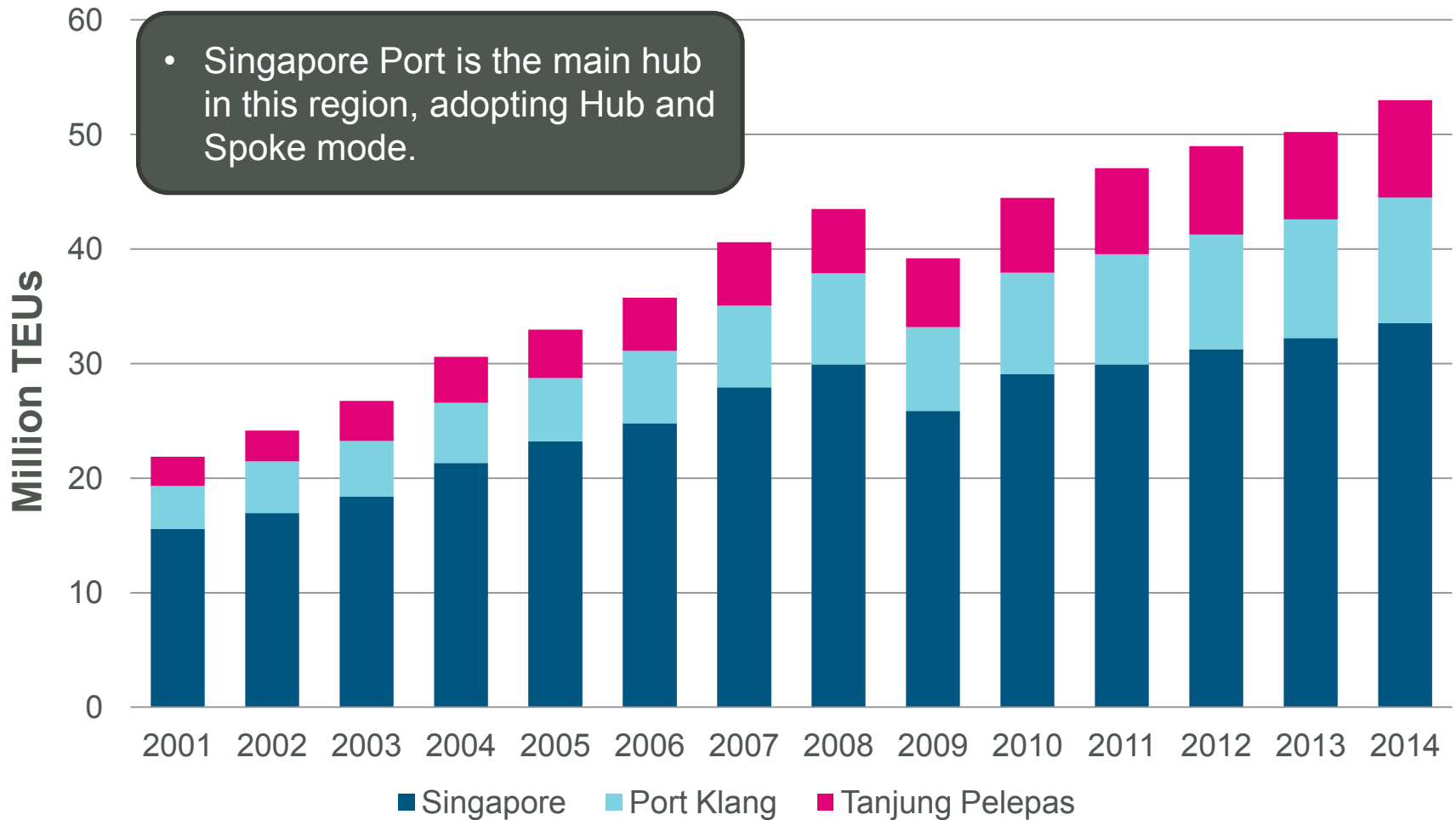
Major Container Ports in the Strait of Malacca



- One of the **busiest trade lanes** in the world - an ideal transshipment stop for Far East / Europe and Intra-Asia routes
- **Transshipment** ratio is particularly high in the region (avg. over 80%)

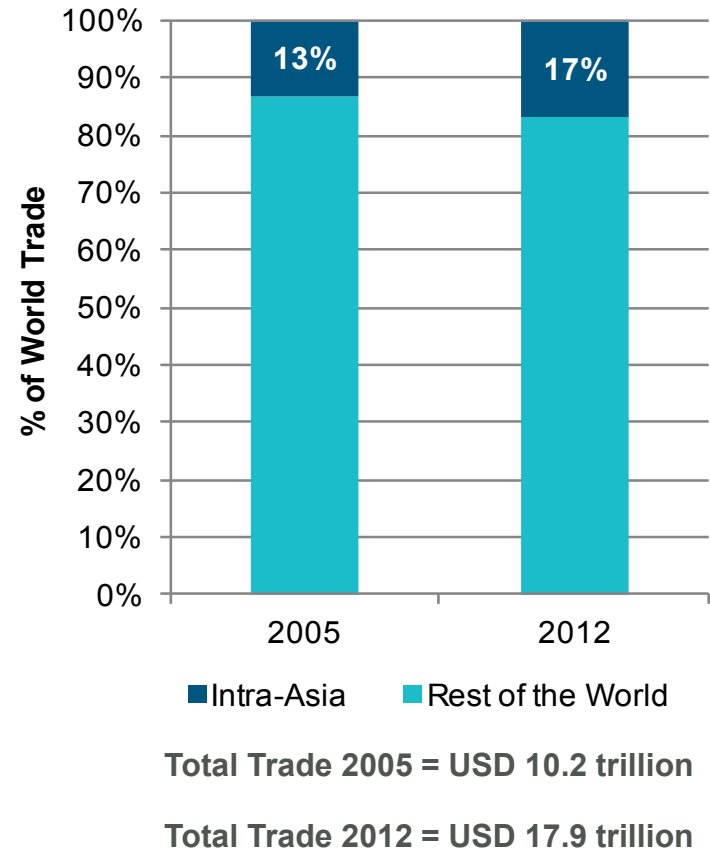


Historical Throughput of Ports in the Strait of Malacca

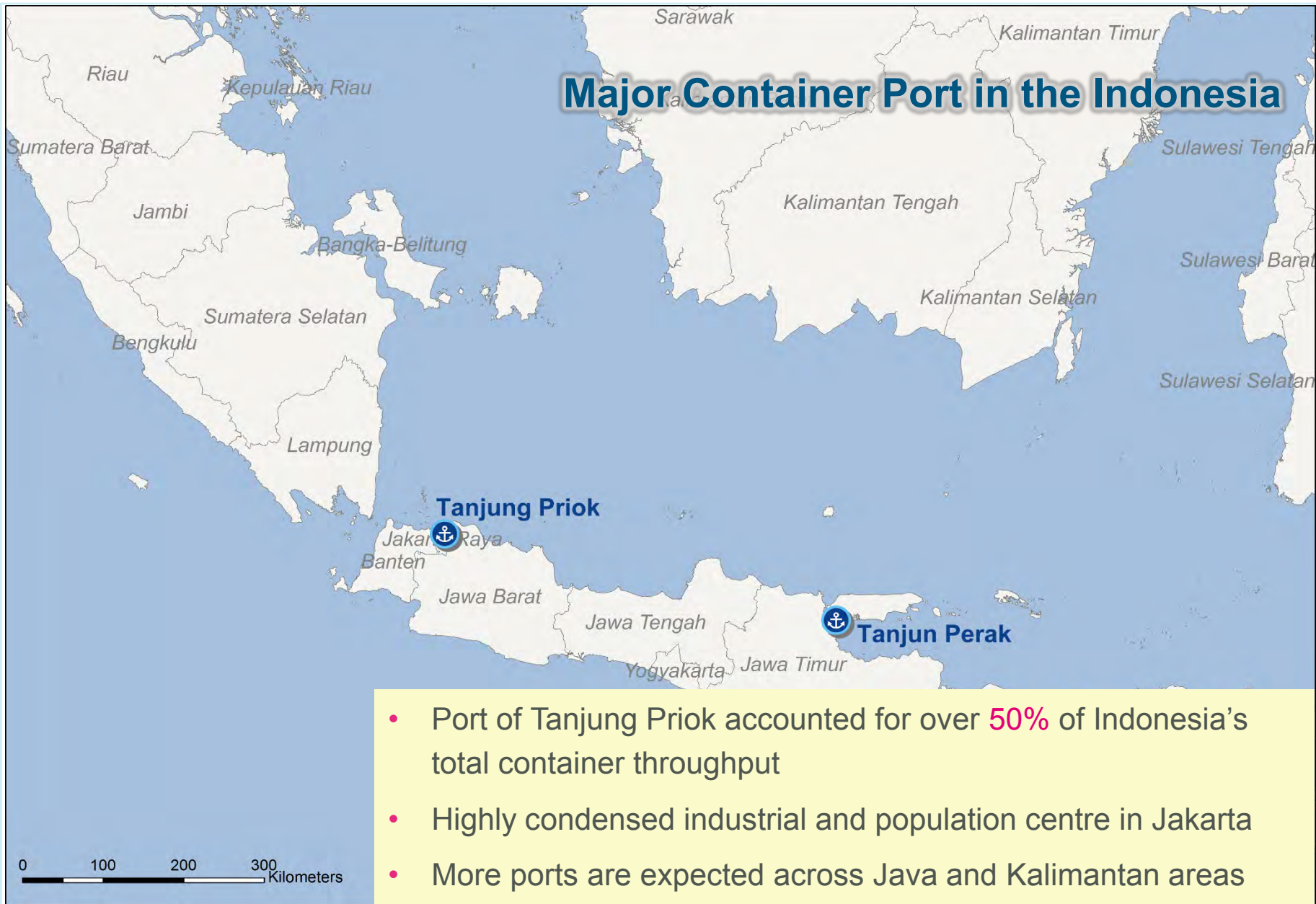


Market Trend Faced by Ports in the Strait of Malacca

- **Intra-Asia trade has grown rapidly** and expected to surpass Europe as the largest regional trading area by 2016
- Increasing foreign investors and **infrastructure development** projects
- Intense competition among ports to become **a transshipment hub**, leading to **intensive price competition** for transshipment cargo
- **Inland logistics costs** are high due to **inadequate infrastructure**, increasing overall logistics cost of moving cargo, esp. road haulage costs

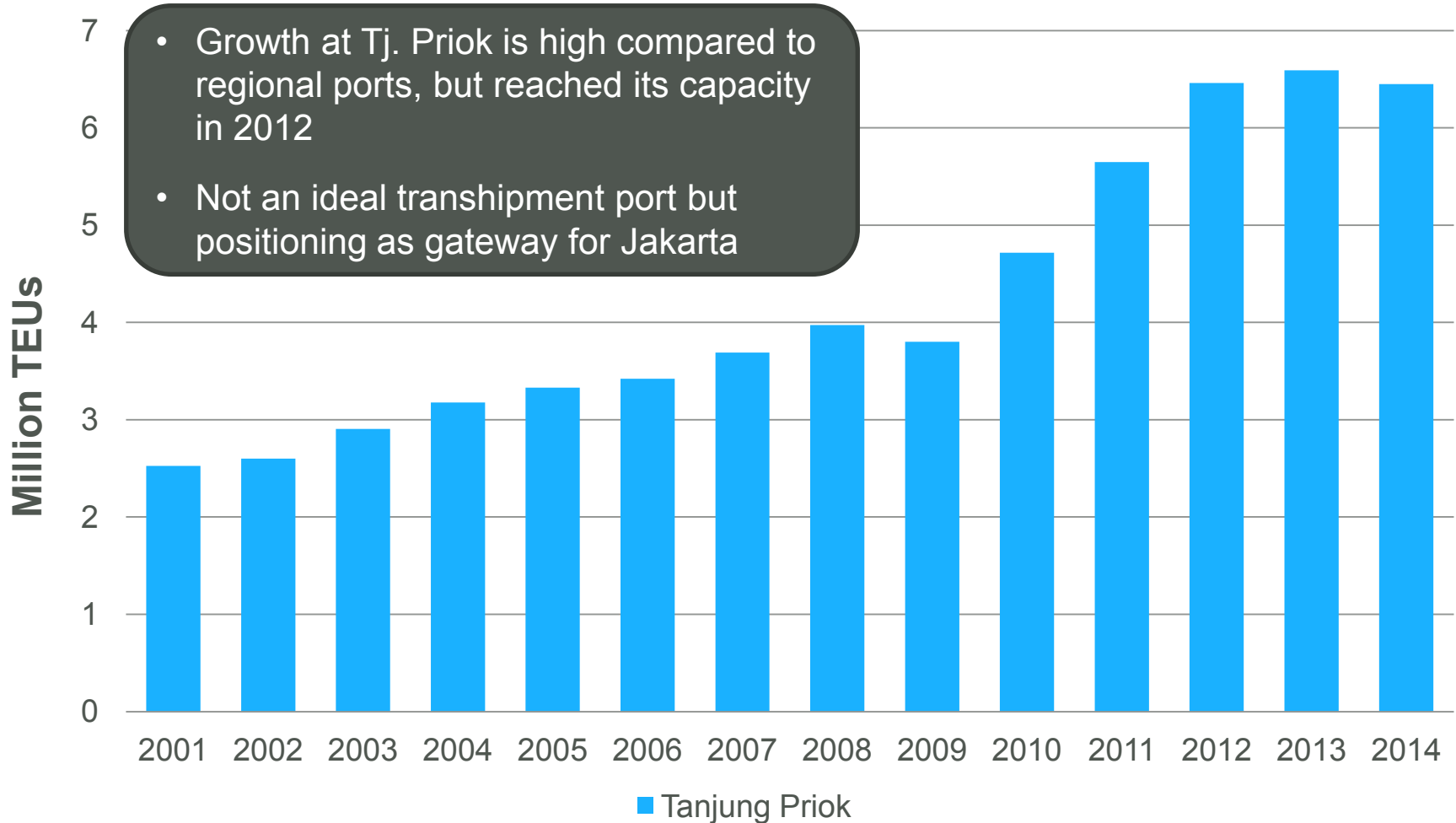


Major Container Port in the Indonesia



- Port of Tanjung Priok accounted for over **50%** of Indonesia's total container throughput
- Highly condensed industrial and population centre in Jakarta
- More ports are expected across Java and Kalimantan areas

Historical Throughput of Tanjung Priok



Market Trend Faced by Indonesian Ports

- Increasing investment opportunities for manufacturers as they seek alternatives with low labour and land cost
- Robust economic growth among ASEAN countries (6.2% compared to ASEAN avg. of 5.7% in 2012)
- Severely inadequate logistics network, incl. road / barge / rail is increasing cost of moving cargo
- Undergoing economic reform for nation's industrialisation, leading to containerisation of cargo
- Lack of expertise

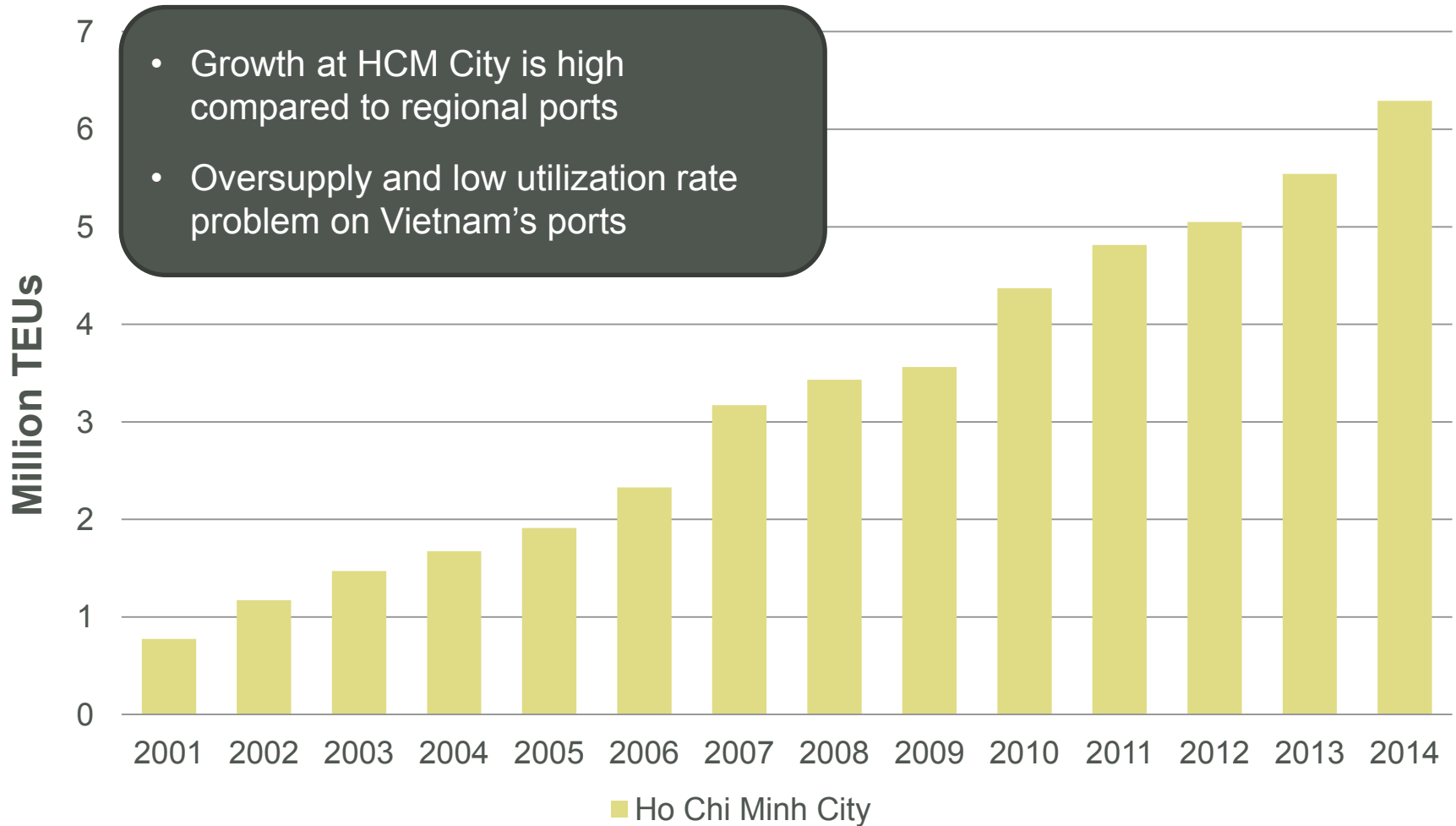


Major Container Port in the Vietnam



- The terminals in HCM and Cai Mep on the Mekong river accounts for more than **60% of all container traffic in Vietnam**
- Currently the only ports in Vietnam capable of accommodating larger, deep-draught vessels.
- Ho Chi Minh City saw volumes rise **9.8% in 2013 to 5.5M TEU**

Historical Throughput of Ho Chi Minh City



Market Trend Faced by Vietnam Ports

- **Increasing investment opportunities** for manufacturers.
- **Urbanisation** provide sufficient labour for manufacturing industry.
- More **stable political economy with impressive economic growth**, compare to other ASEAN countries. (6.2% compared to ASEAN avg. of 5.7% in 2012)
- Strong policy support on foreign investment.
- **Inadequate infrastructure** leads to some difficulties in operating business, **such as transportation.**

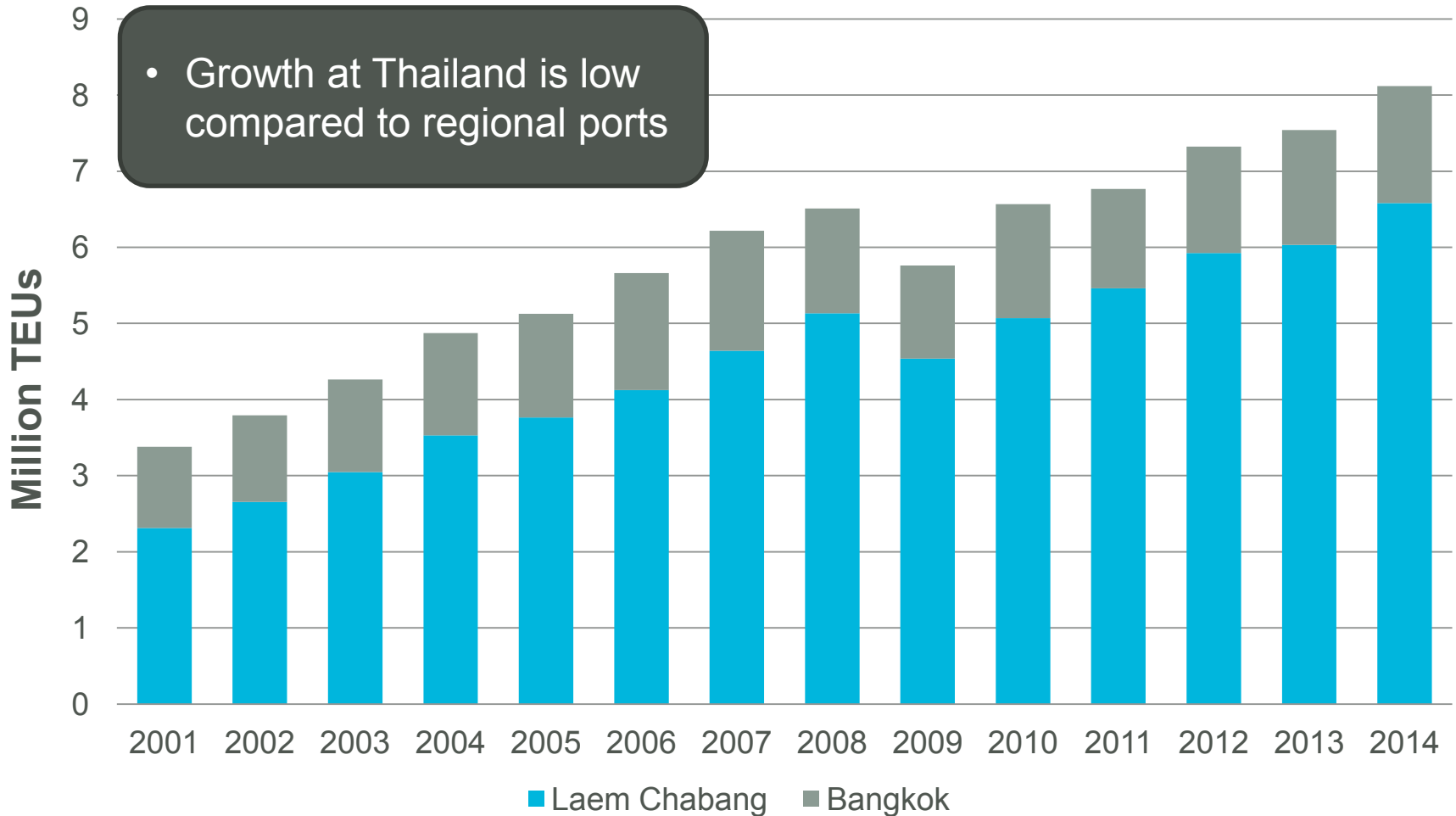


Major Container Port in the Thailand



- Thailand's Laem Chabang and Bangkok container terminal handles over **75% of Thailand's total containerised ocean freight.**
- Laem Chabang is the largest gateway in Thailand.
- Laem Chabang saw volumes rise **1.8% in 2013 to 6.0M TEU** and **Bangkok rise 8.0% to 1.5M**

Historical Throughput of Laem Chabang and Bangkok



Market Trend Faced by Thailand Ports

- High openness to **foreign investment**.
- **Well-developed infrastructure** compare to some ASEAN countries, such as Indonesia and Vietnam.
- Skilled and **well-educated workforce**.
- **High corporate taxes** (30%) compare to other ASEAN countries.
- Relatively high **labour cost** among ASEAN countries.

