



Challenges for large upstream ports in North Europe in light of changing trade patterns and liner service networks

Uitdagingen voor grote stroomopwaarts gelegen zeehavens in Noord-Europa in het licht van veranderende handelspatronen en lijnvaartnetwerken

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ITMMA - University of Antwerp and Antwerp Maritime Academy

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Logistics scenarios for 2050

DHL (2012): 'Logistics in 2050'

- 5 possible scenarios:

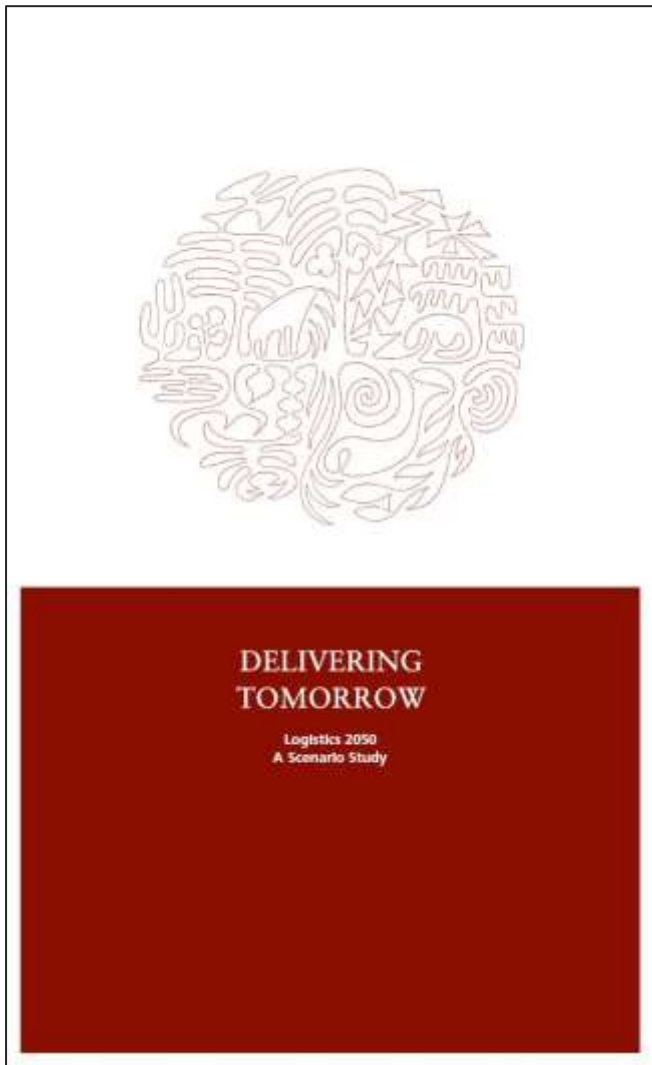
1. **Untamed Economy – Impending Collapse**

2. **Paralyzing Protectionism**

3. **Mega-efficiency in Megacities**

4. **Customized Lifestyles**

5. **Global Resilience – Local Adaptation**

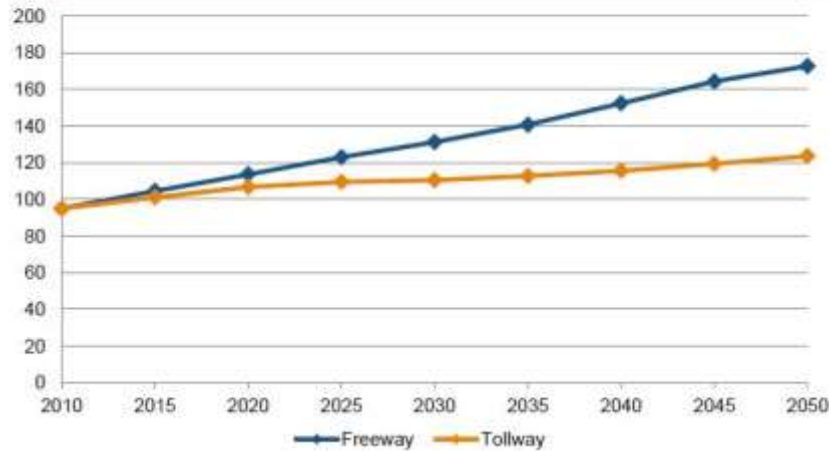


“Freeway” scenario: a world where pure market forces prevail - global competition.

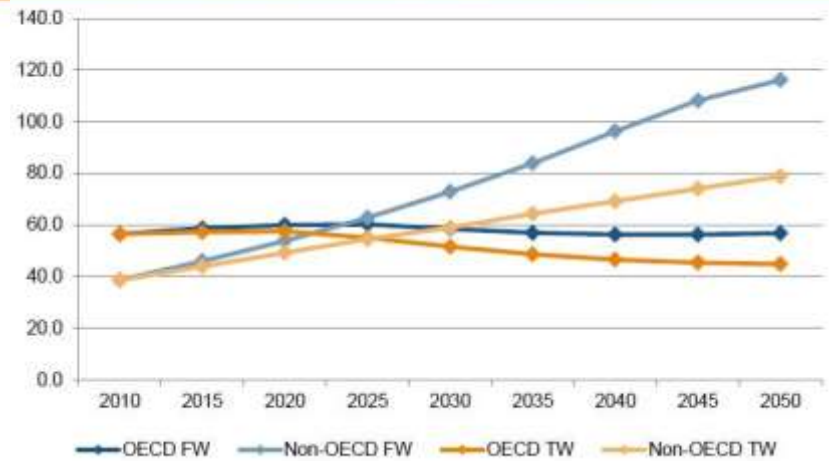
“Tollway” scenario: a more regulated world with common interests at the forefront.

Fuels in all transport (EJ)

(a) Fuel demand in all transport

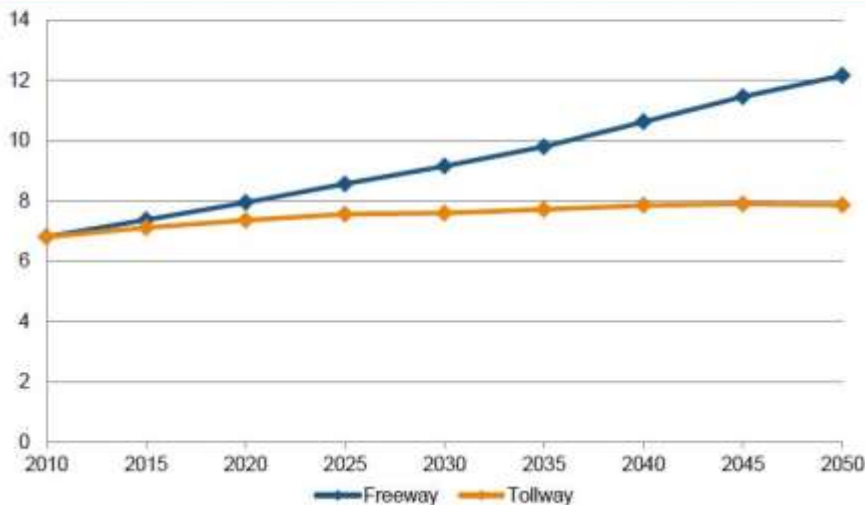


(b) Fuel demand in all transport

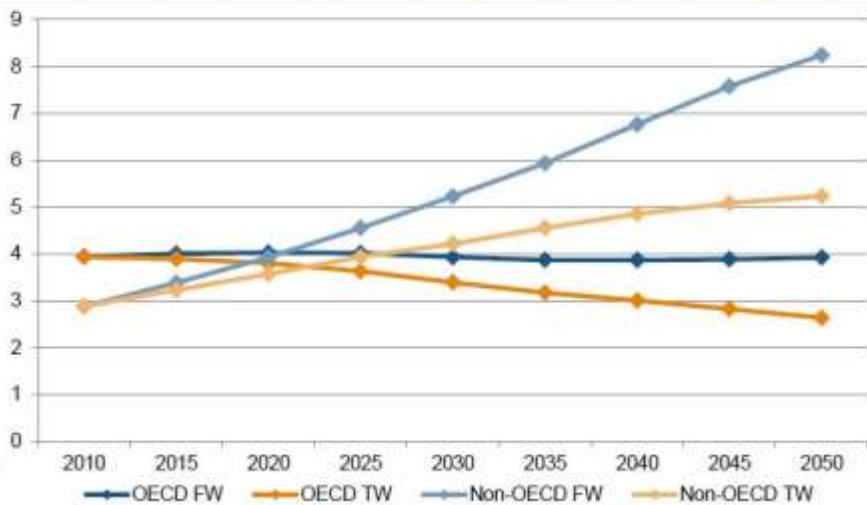


CO₂ emissions (GtCO₂)

(a) Global CO₂ emissions from transport



(b) Global CO₂ emissions transport OECD vs. non-OECD



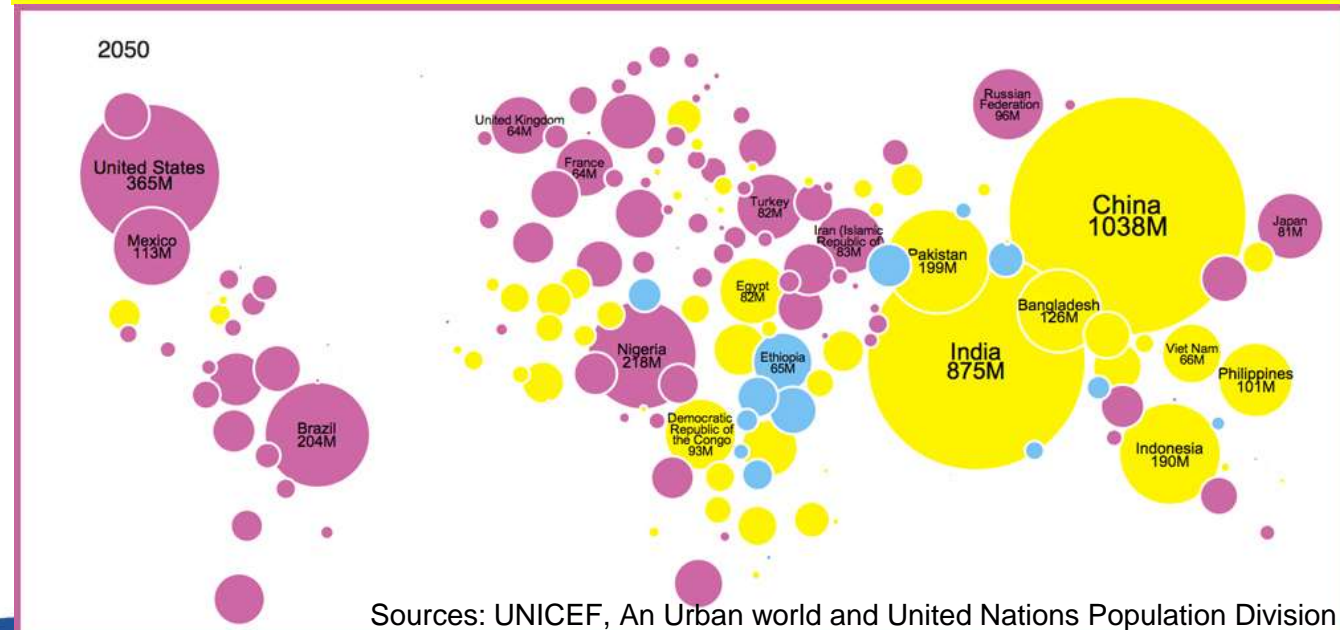
From 7 billion people to 9.2 billion in 2050. By 2050, 70% of the world's population will be urban

Population per country in cities exceeding 100,000 people (2000 and 2050)

Massive challenges..

- Logistics and mobility
- Today, cities produce 80% of global carbon emissions
- Commercial and residential buildings in cities consume 1/3 of the world's energy

.. but also opportunities



A world of global cities

2012 Global Cities Index – future position of emerging cities

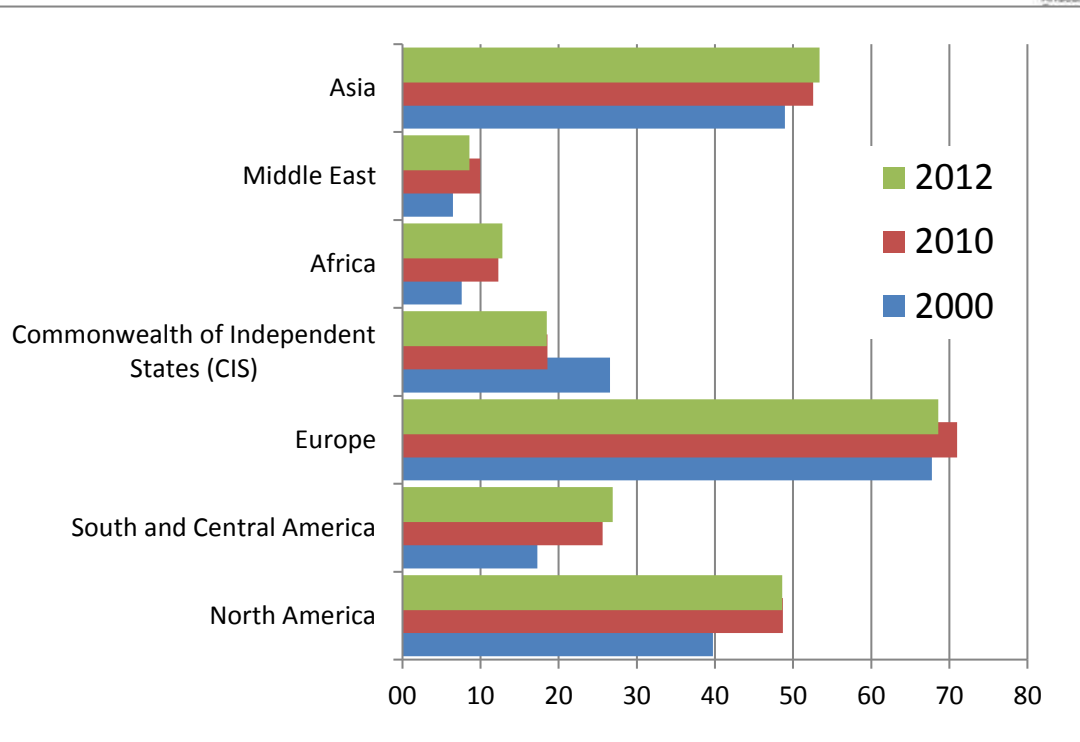


Source: The Chicago Council for Global Affairs and AT Kearney

Trade flows: a world of regional trading blocks

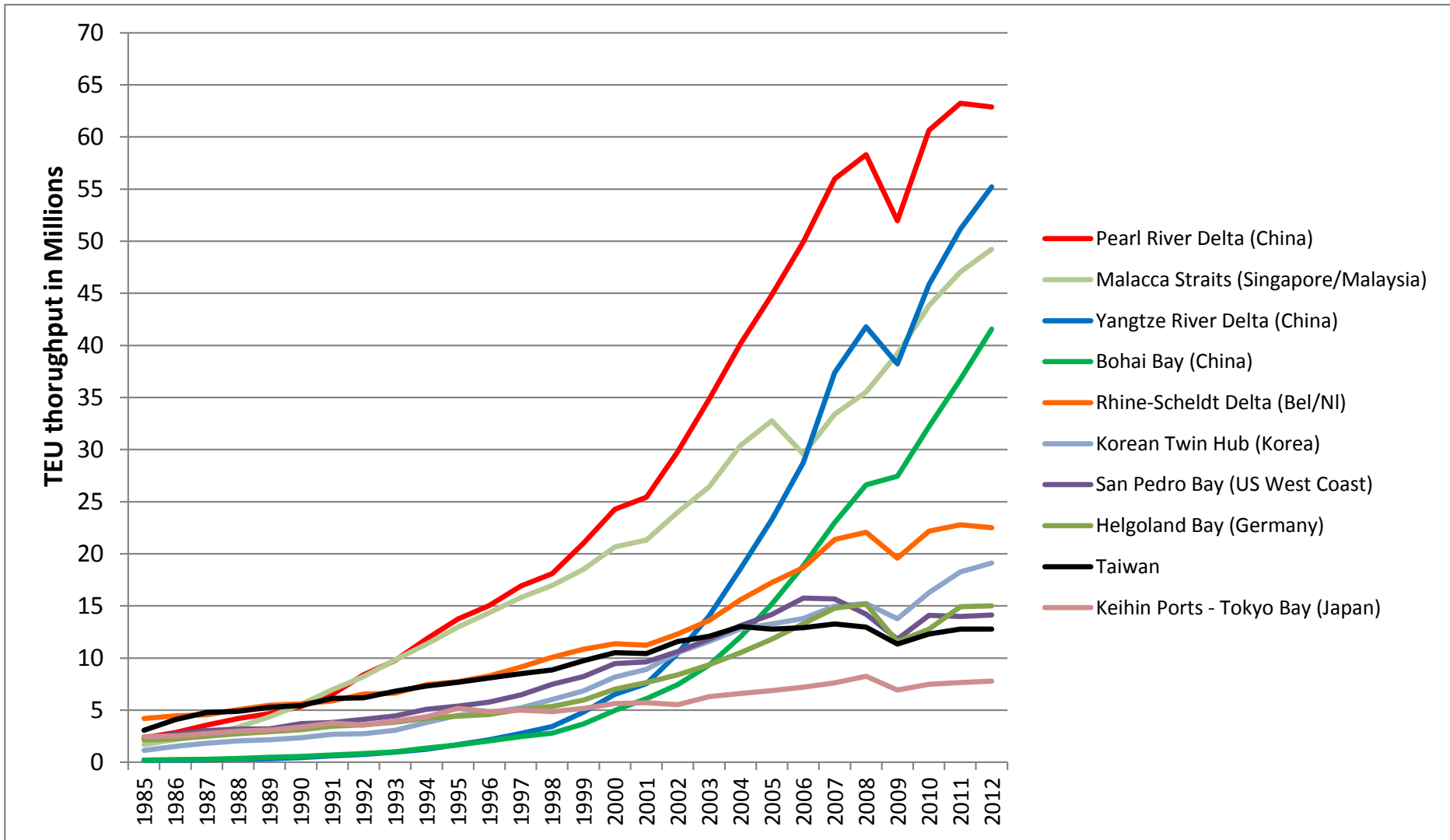
Share of intra-regional merchandise trade in total trade

Basis = trade value in billion dollars



Source: own compilation based on WTO data

Asia rising: the top container port regions in the world



Source: Notteboom (2013)

Challenge to ports: identifying the big trends in a world full of uncertainty

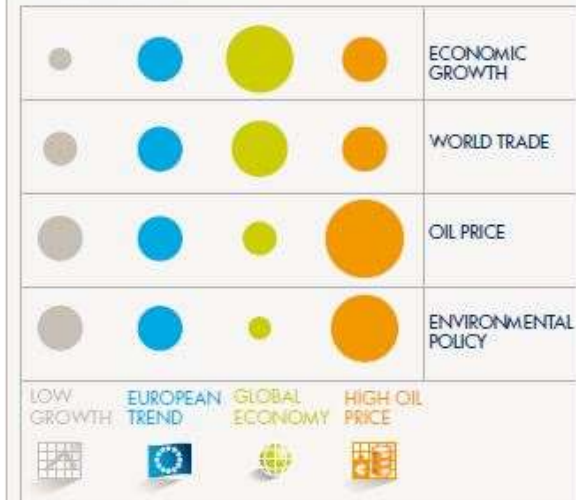
- No untamed economic growth
- Growing role of megacities, emerging economies and regional trading blocks
- Dynamics in industrial production systems
 - More volatile production systems in geographical terms
 - Location choice: global competition vs. more local competition, near shoring, move of refineries to the oil winning countries, etc..
- Developments in logistics and distribution networks
- Changing energy mix (cf. shale gas, ..)
- Impact regional political (in)stability
- Etc..

Need for resilient and sustainable logistics solutions

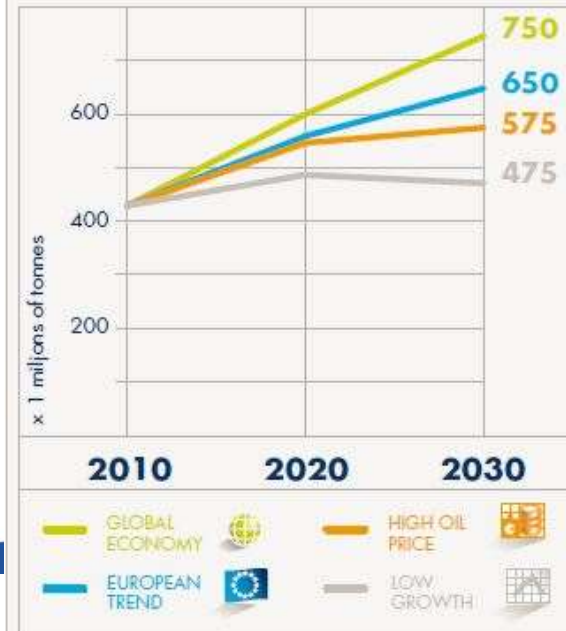
Need for adaptive strategy, agility, resilience, flexibility in port systems

Traffic forecasts Port Compass 2030 - Rotterdam

Four scenarios; importance of factors

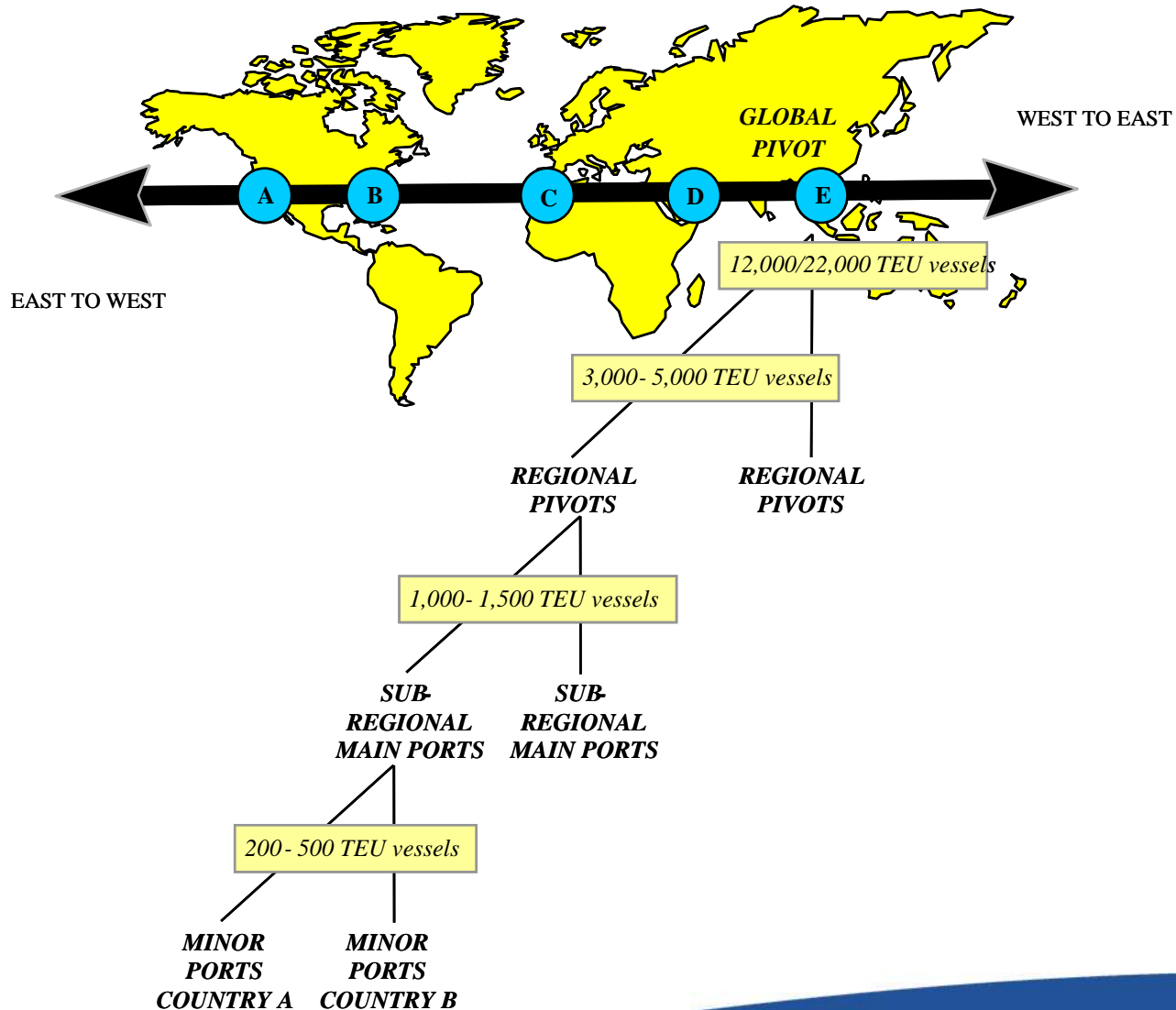


Forecasts of throughput Rotterdam 2030



Cargo routing via the global shipping network

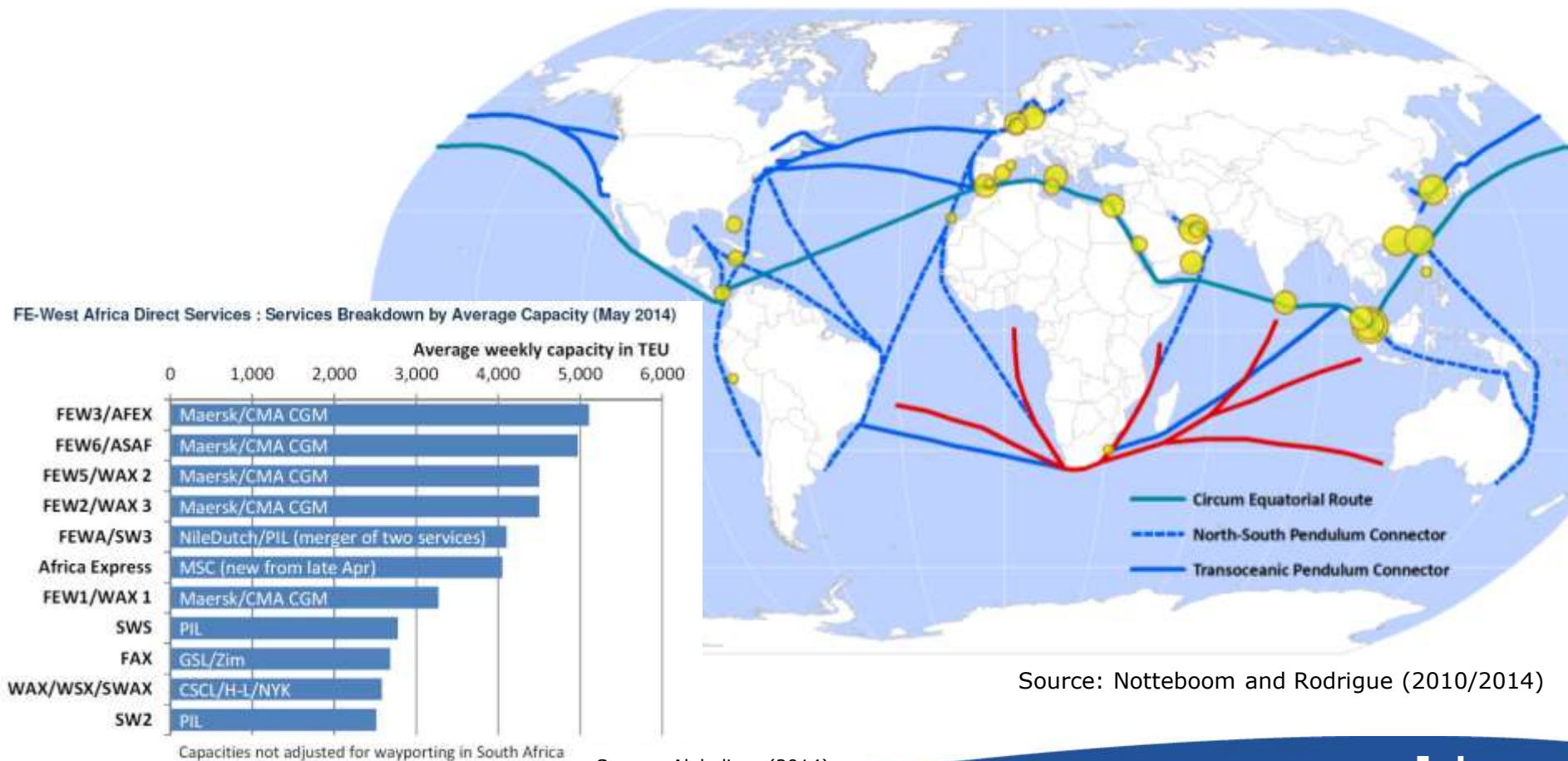
The multi-layered transshipment scenario



A dominant equatorial route

Rediscovering the Cape route?

- Expected growth in 'south-south' trade is expected to reduce the dominance of the 'equatorial route'



Source: Alphaliner (2014)

Source: Notteboom and Rodrigue (2010/2014)

Which global routing structure is likely to emerge?

Arctic routes: High expectations but limited use in medium term

Rail Asia-Europe: strong outlook but capacity limited compared to Suez route

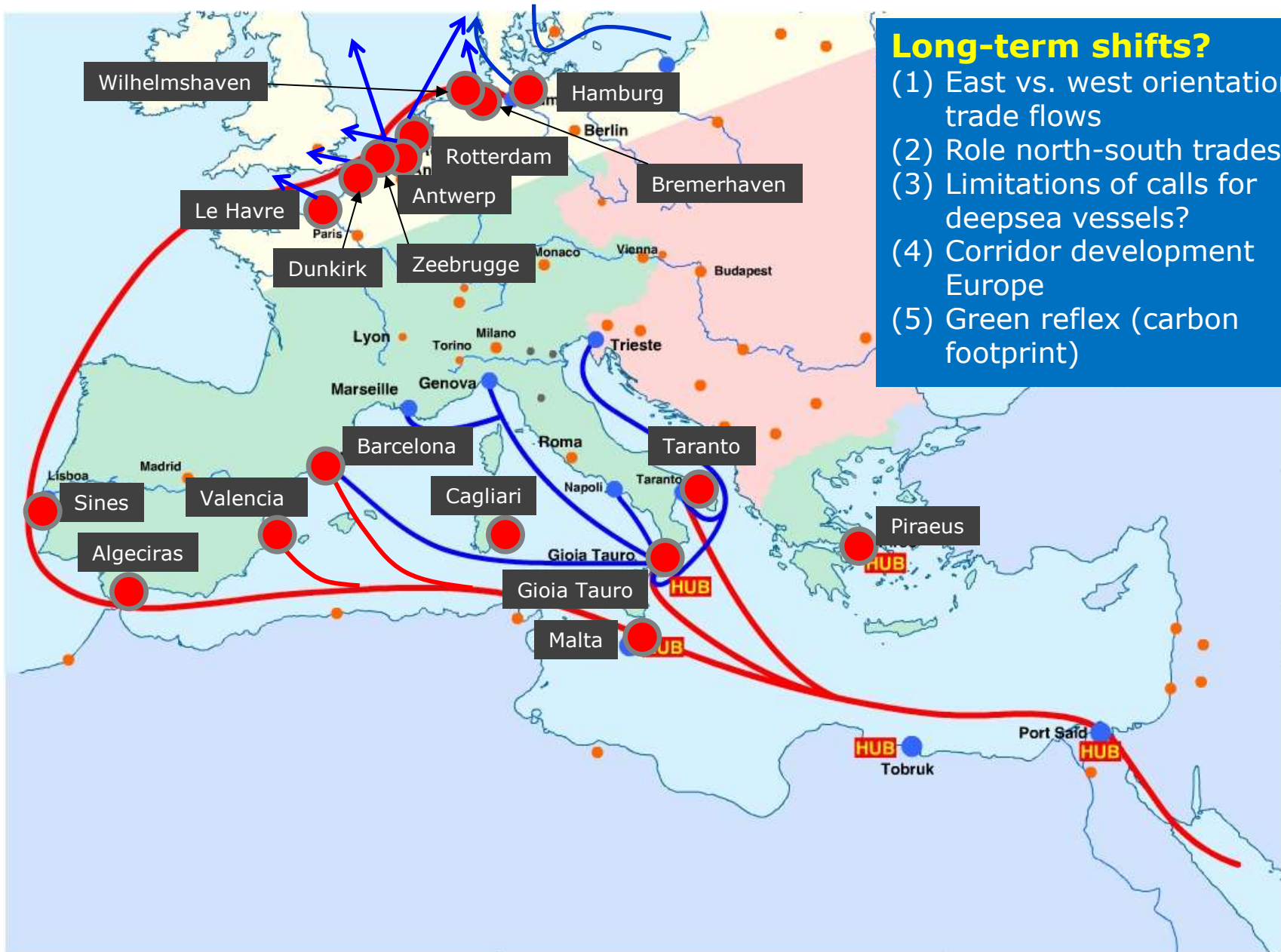
North American double stack train corridors face more competition



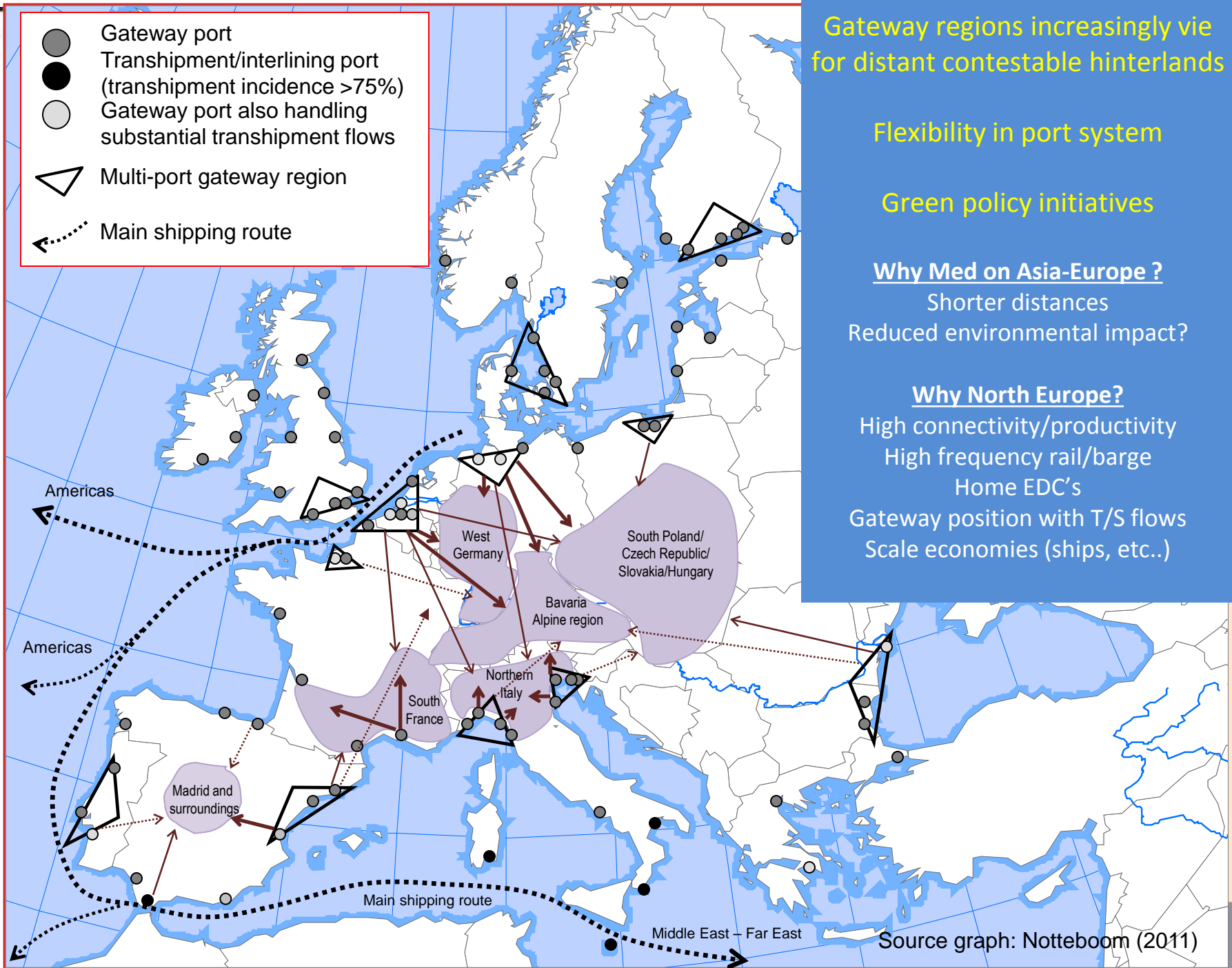
New larger Panama Canal locks in 2016



Direct calls vs. sea-sea transshipment in Europe: key issues for the future



- Gateway port
- Transshipment/interlining port (transshipment incidence >75%)
- Gateway port also handling substantial transshipment flows
- △ Multi-port gateway region
- ↔ Main shipping route



Gateway regions increasingly vie for distant contestable hinterlands

Flexibility in port system

Green policy initiatives

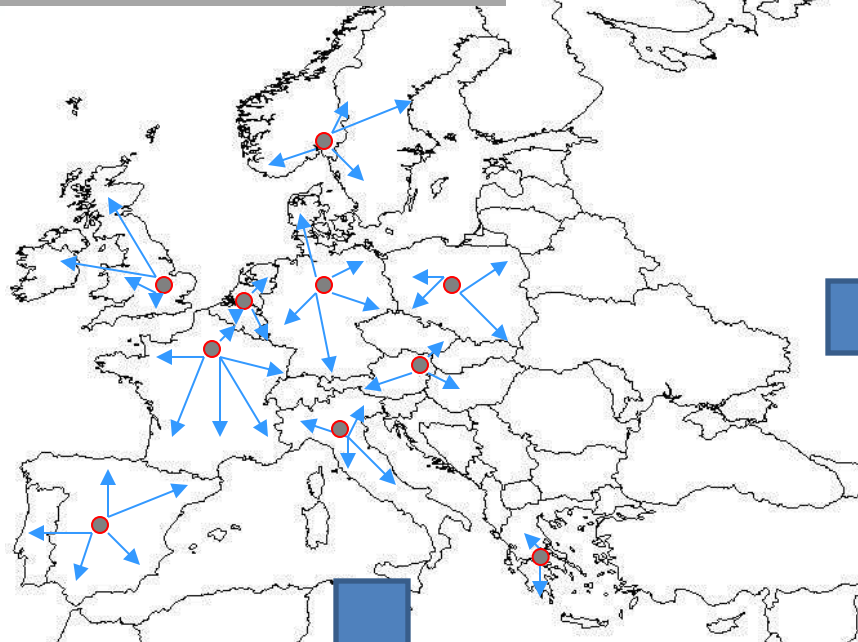
Why Med on Asia-Europe ?

Shorter distances
Reduced environmental impact?

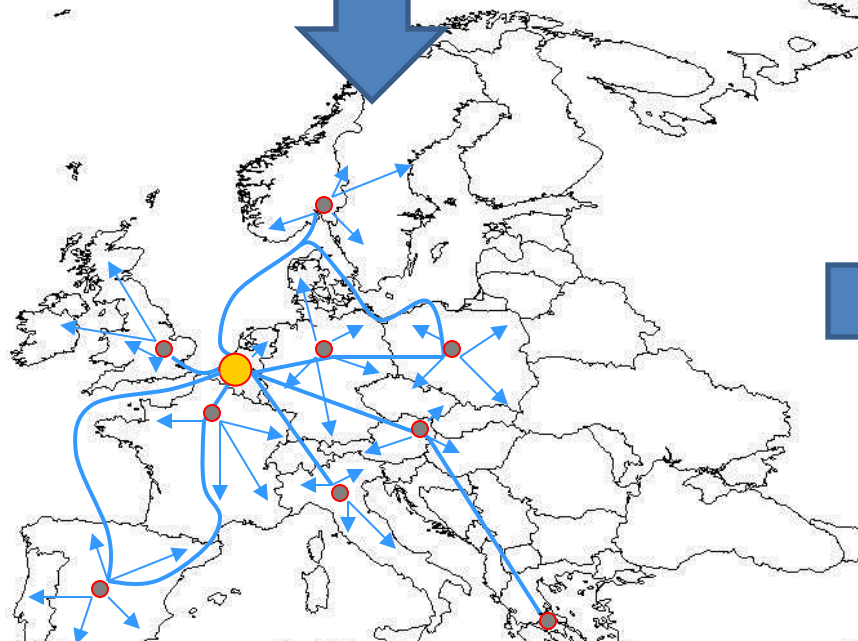
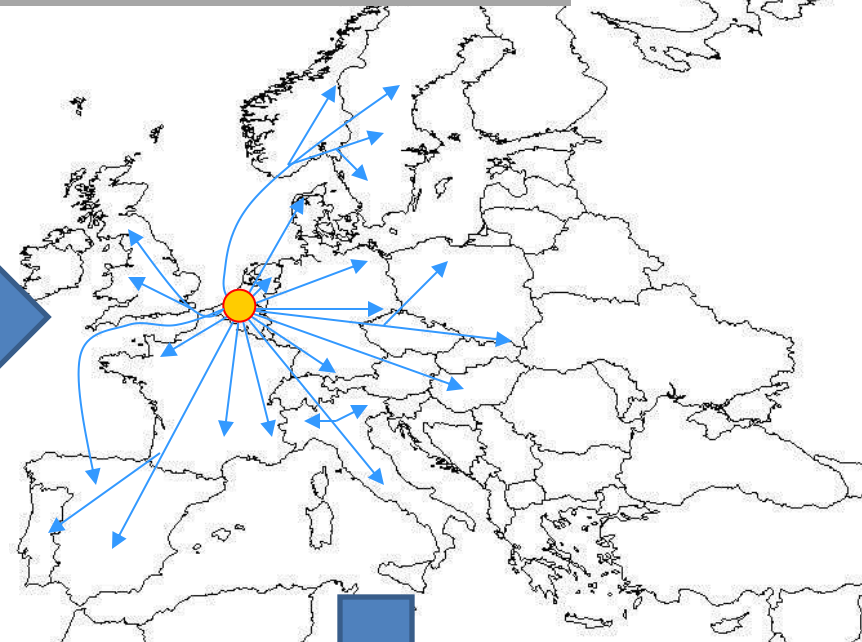
Why North Europe?

High connectivity/productivity
High frequency rail/barge
Home EDC's
Gateway position with T/S flows
Scale economies (ships, etc..)

Distribution based on RDCs



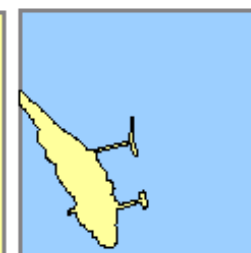
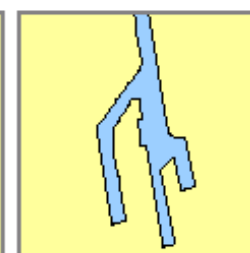
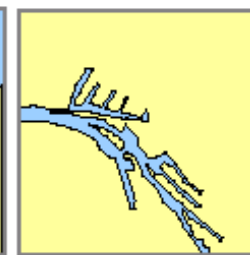
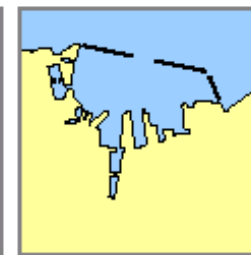
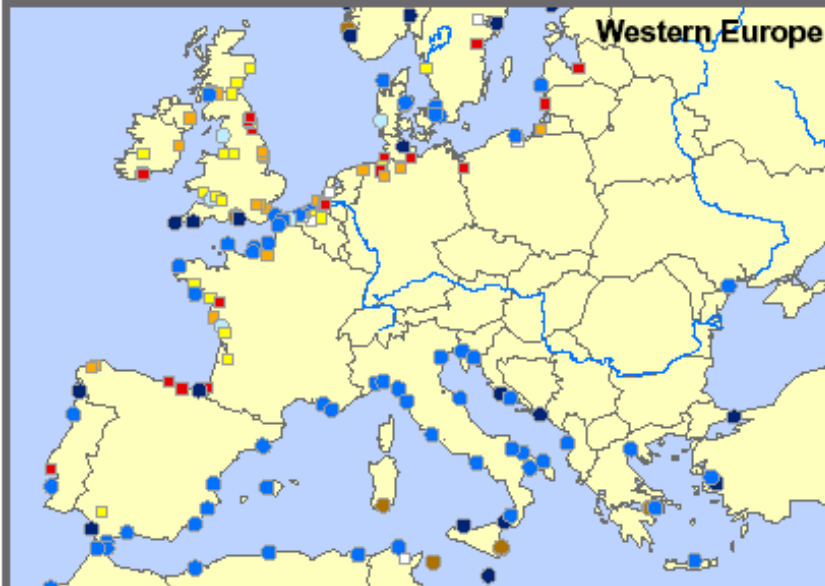
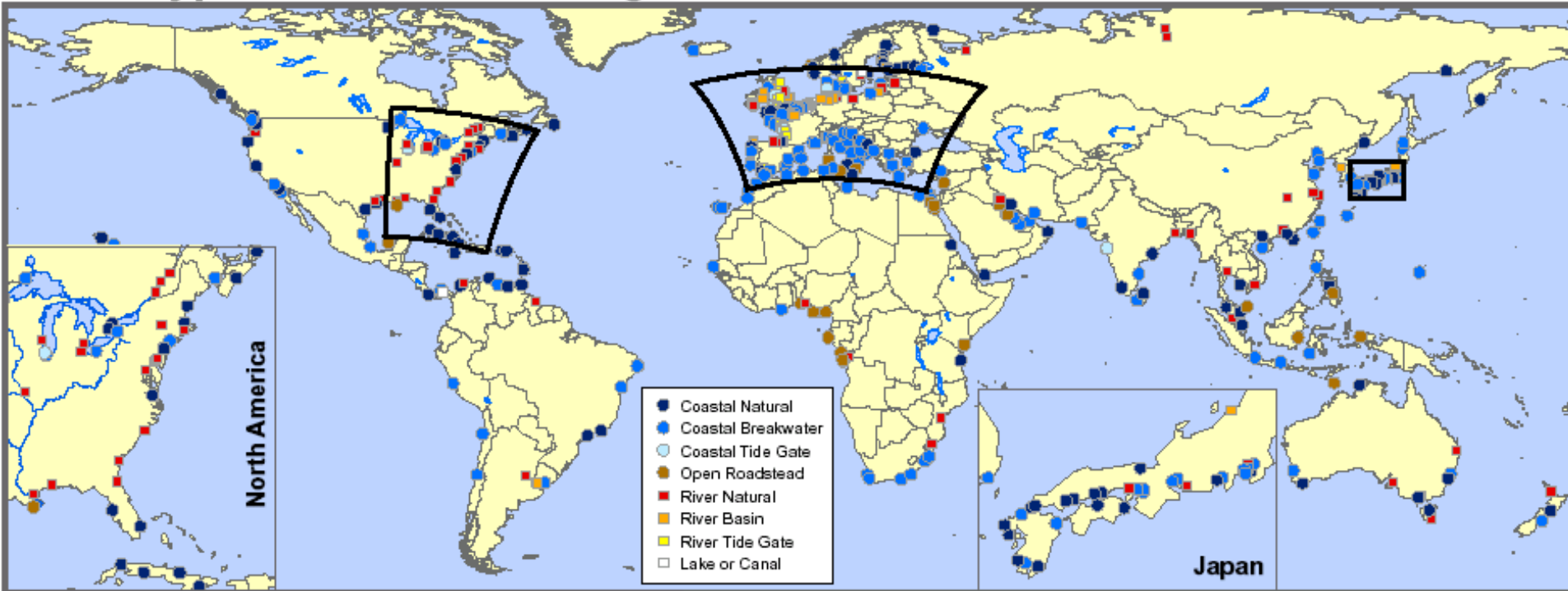
Distribution based on one EDC



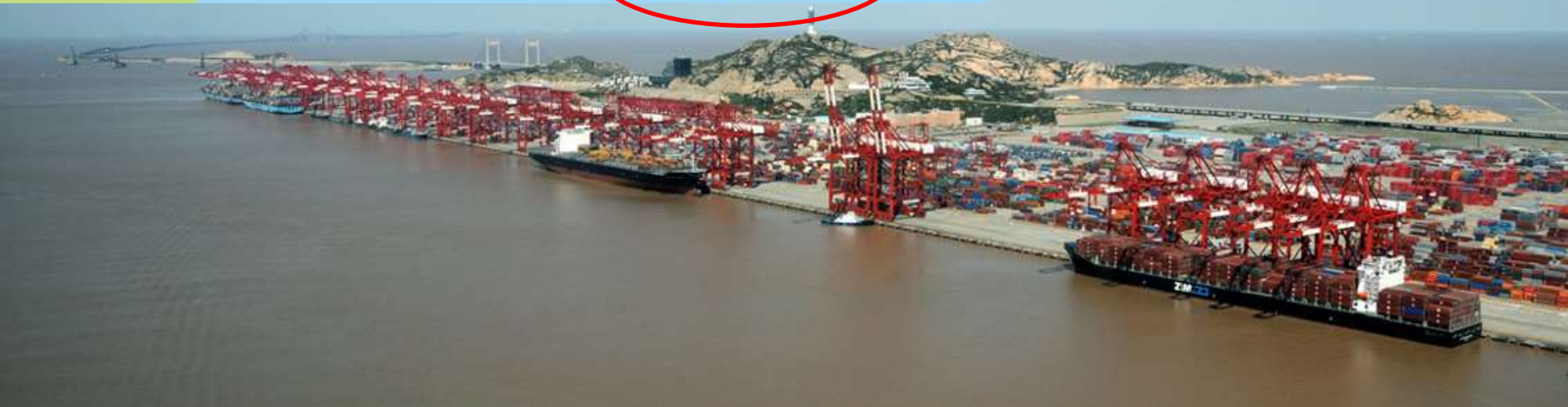
Towards new waves in distribution networks?
Impact e-business, 3D printing, customized lifestyles in longer term

Distribution based on tiered system (EDC+RDCs)

The role of upstream ports?



The rise of coastal ports Yangshan in Shanghai



Containerization and the decline of the upstream urban port in Europe

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This paper examines the impact of containerization on upstream urban ports in Europe, briefly discusses the changing socio-economic role of such ports, and considers whether the few remaining upstream urban ports currently still attracting large containerhips can continue to do so in the long-term. Citing the trend towards larger containerhips, the analysis concludes by offering the view that continued investment in container-handling infrastructure within traditional upstream urban ports may be a flawed policy. Such ports are becoming outmoded (for the largest containerhips), superseded by more appropriate custom-built infrastructure at coastal locations.

1. Introduction

Many writers have argued that technological change is at the dynamic heart of economic growth and development and fundamental to the evolution of a global economic system [1-3]. Technological change is considered to be a principal factor determining the structure of industry on a global scale [4]. The general meaning of technological progress is that a unit of a good or service is produced by a new technique using fewer resources than the previous one [5].

In international liner shipping, containerization represented a radical transformation of existing technologies which not only dramatically altered the processes in the ports and shipping industry but also pervaded the entire socio-economic system. Essentially, containerization greatly simplified transshipment from one mode to another (e.g. sea to truck or railcar) and increased the security of shipments. Unquestionably, containerization was of fundamental importance as a technological innovation and, although expensive in terms of capital investment requirements, its benefits were of great significance and led to the transformation and modernization of cargo-handling systems [6].

The very first recorded voyage by a ship carrying containers was in 1956 when Sea-Land's 'Ideal-X' sailed from New Jersey to Houston with 58 containers on board. However, containerization as we know it today really began in April 1966 when the SS 'Fairland' (also owned by Sea-Land) first sailed across the Atlantic from the U.S.A. to Europe carrying 226 containers. It was estimated at the time (New York Times, April 1966) that an unloading cost of \$22 a ton for conventional cargo in New York would be reduced to \$6 with containers. The potential for such dramatic cost savings led to great demand and within a short period of time all organizations involved in freight transportation (e.g. shipowners, ports, truckers, railroads and airlines) were investing in the new technology.

This paper investigates the effect of containerization on one of these groups of transport organizations: ports. Or to be more precise, upstream urban ports frequented by liner (regular scheduled) shipping operators in Europe. For the

Comment

Containerization and the competitive potential of upstream urban ports in Europe

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1. Introduction

In a recent article in this journal (June 1996, vol. 23, no. 2, 145-156), A. Baird argued that upstream ports with restricted maritime accessibility, such as Antwerp and Hamburg, will face serious problems in the near future as a consequence of the scale enlargement in container shipping and the need for faster turnaround times for vessels operating in RTW-service schedules. In addition, he identified the downstream development of European container ports as one of the most important outcomes of the containerization process, which started in the mid-sixties.

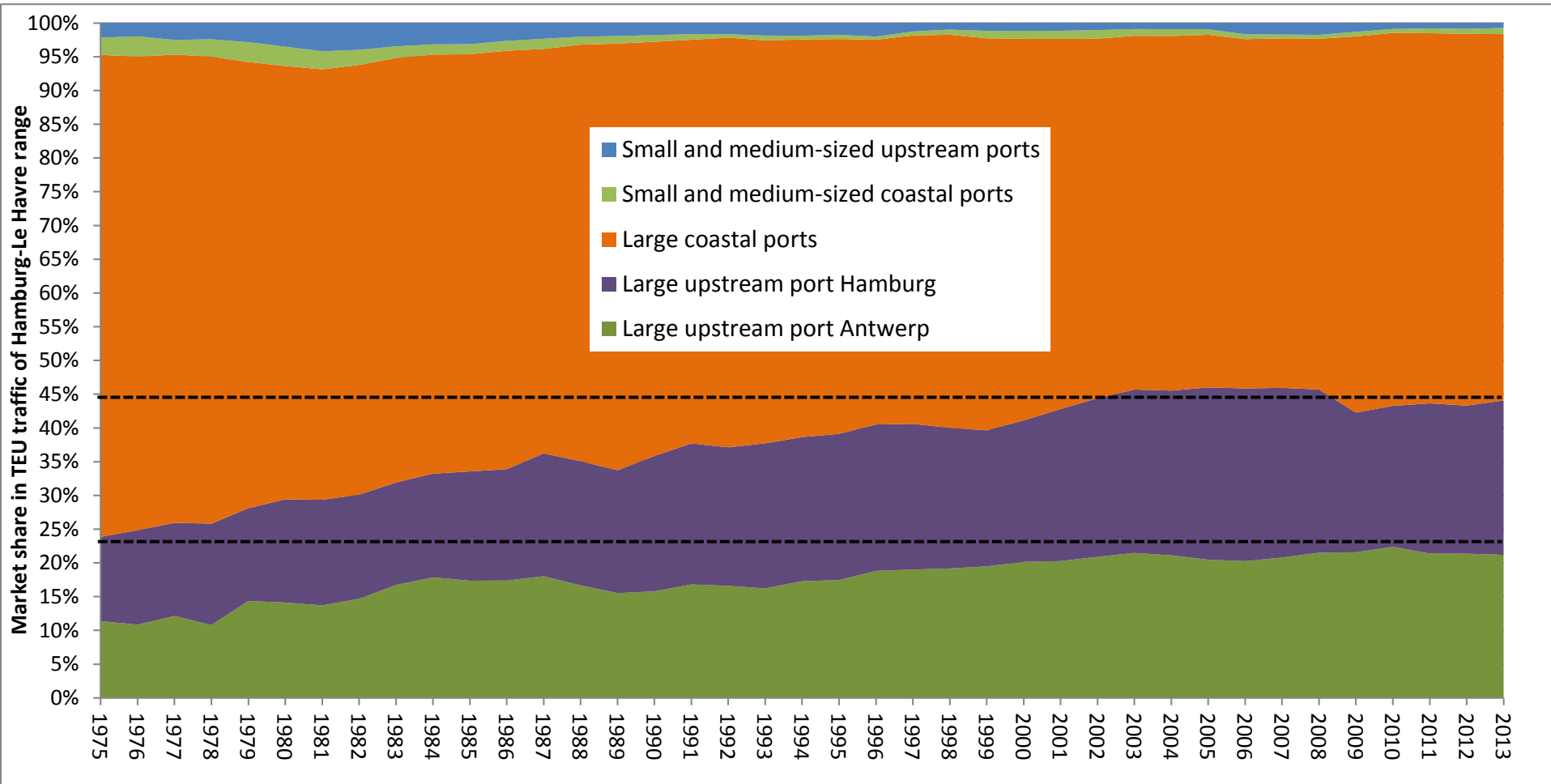
Although those points may have some merit at first sight, the actual strong competitive position of both Antwerp and Hamburg in the European container port system suggests that a port's inland location cannot always be considered as a disadvantage. It is clear that other elements play a vital role in becoming or maintaining the load centre-status, despite limited draught conditions of the maritime access channel.

It is obvious that Baird is not very acquainted with the particular situation of, e.g. the port of Antwerp. Hence, a number of mistakes and misinterpretations appear in the article. Therefore, questions can be raised about the accuracy and validity of the original findings. The response aims to clarify, correct and extend the results of the analysis originally carried out by Baird, with an emphasis on the competitive position of the port of Antwerp.

2. The impact of containerization

In his article, Baird concluded that in 1990 three European upstream ports, i.e. Rotterdam, Hamburg and Antwerp, controlled more than 95% of all container traffic in upstream ports. Although this observation is still valid in 1995, Baird's view on port competition appears to be narrow and peculiar.

Market share of container ports in the Hamburg- Le Havre range based on location (coastal vs. upstream)



The adaptive power of upstream ports?

Ports able to receive ultra large container vessels of 15,000 -18,000 TEU (DNV, 2014)



Only 3 upstream ports in the top 50 of world container ports

| Port | Country | World rank 2012 | million TEU in 2012 |
|-----------|---------|-----------------|---------------------|
| Guangzhou | China | 7 | 14.7 |
| Hamburg | Germany | 14 | 8.86 |
| Antwerp | Belgium | 15 | 8.64 |



Mary Maersk (18,000 TEU) and Evelyn Maersk (15,000 TEU) at Deurganckdock – 19 October 2013

The long-term future for upstream container port Antwerp: key issues

- Adaptive power and collective action to keep the port accessible
- Markets: cargo follows the ship vs. ship follows the cargo
- Port's connectivity/intermediacy level between economic areas
- Benefiting from scale advantages (intermodal, etc..), mitigating scale disadvantages
- Supply chain approach: focus on minimizing generalized logistics costs within sustainability targets



Thank you for your attention !

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