# *Ship Size Revolution and Potential New Opportunities*

**Steve Wray**
**Ocean Shipping Consultants Ltd.**
*Bilbao, April 2011*

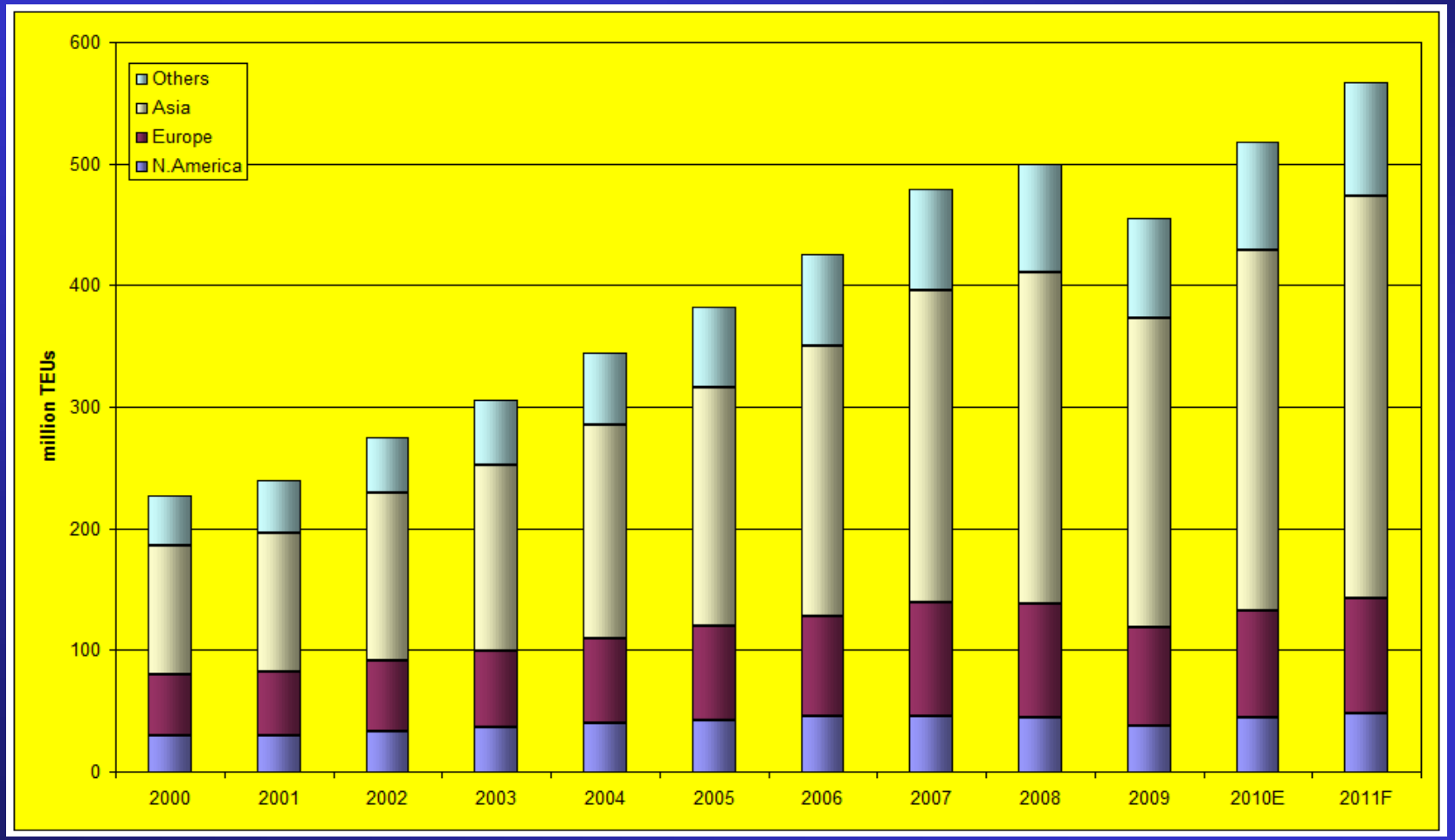


OCEAN SHIPPING CONSULTANTS Limited

# Presentation Overview – Revolution and Opportunities

- World and North European port demand
- Ship size revolution
- Implications for Terminals
- Potential new and revisited opportunities

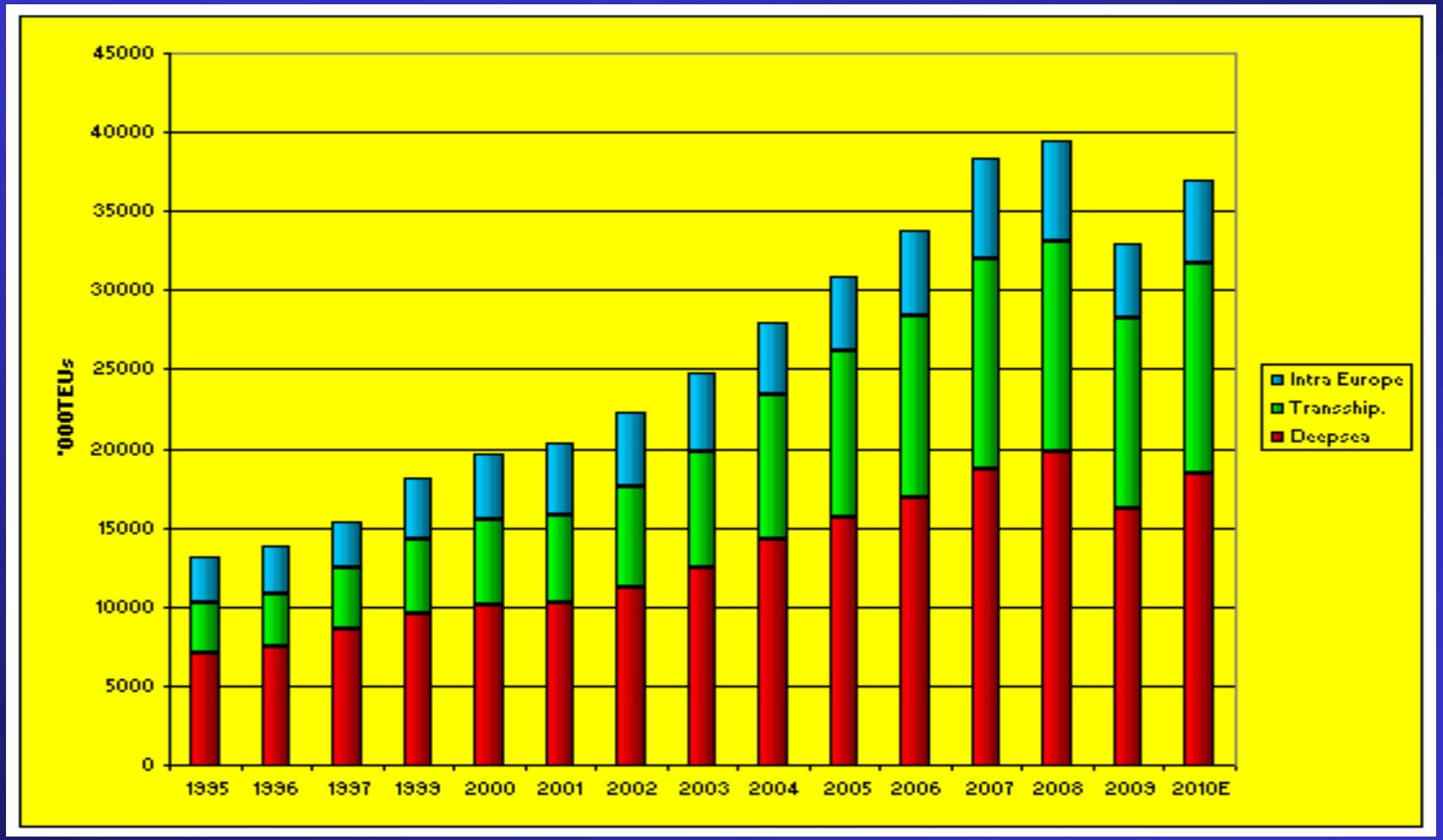
# World Container Port Demand by Main Regions Since 2000 - million TEUs






OCEAN SHIPPING CONSULTANTS Limited

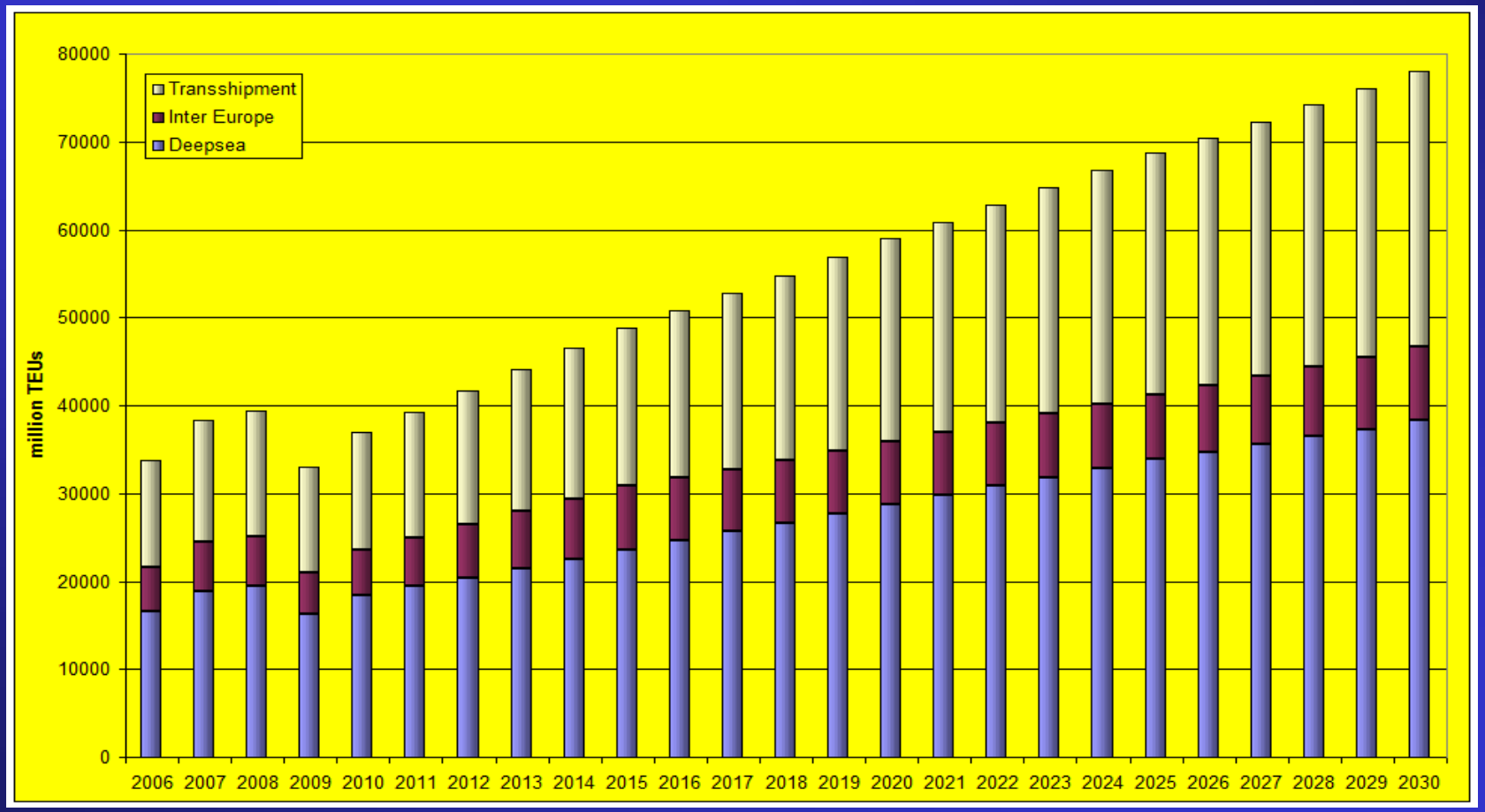
# North Continent Container Port Demand by Type






OCEAN SHIPPING CONSULTANTS Limited

# North Continent Base Case Total Demand Forecast to 2030






OCEAN SHIPPING CONSULTANTS Limited

# What is Happening to the Container Fleet?

- The role of 10,000TEU+ vessels has increased dramatically - driven by scale economies and competitive pressures
- Sheer level of ordering for ULCS and New Panamax vessels is difficult to justify - overtonnaging (again) will be the likely outcome
- Transpacific and Asia-Europe trades will absorb most of this tonnage - but the 'cascade' effect will see redeployment of 6,000TEU+ vessels into the Atlantic and some N-S trades
- At the same time fuel is much more expensive - there are pressures to slower steaming and dropping port calls
- The overall effect will be further port concentration and transshipment activity

# Economy of Scale Calculation

Deep-sea Containership Trading Costs

| Vessel Size (TEU) | 2,000 | 3,500 | 4,500 | 6,800 | 8,500 | 10,800 | 12,500 | 14,500 | 18,000 |
|---|---|---|---|---|---|---|---|---|---|
| Cost elements | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| Daily capital charge | 20,242 | 28,941 | 32,157 | 45,350 | 53,595 | 59,779 | 65,963 | 71,323 | 78,331 |
| Operating costs | 5,751 | 7,153 | 7,431 | 8,673 | 9,386 | 9,921 | 10,556 | 11,019 | 11,759 |
| Fuel at sea | 22,395 | 33,948 | 63,369 | 83,190 | 103,738 | 134,698 | 165,520 | 175,794 | 189,692 |
| Fuel in port | 1,380 | 1,725 | 1,725 | 1,932 | 1,932 | 2,070 | 2,070 | 2,070 | 2,070 |
| Daily costs at sea/TEU | 24.19 | 20.01 | 22.88 | 20.18 | 19.61 | 18.93 | 19.36 | 17.80 | 15.54 |
| Daily costs in port/TEU | 13.69 | 10.81 | 9.18 | 8.23 | 7.64 | 6.65 | 6.29 | 5.82 | 5.12 |

assumes $467/t - HFO ; $690/t - MDO and no slow steaming

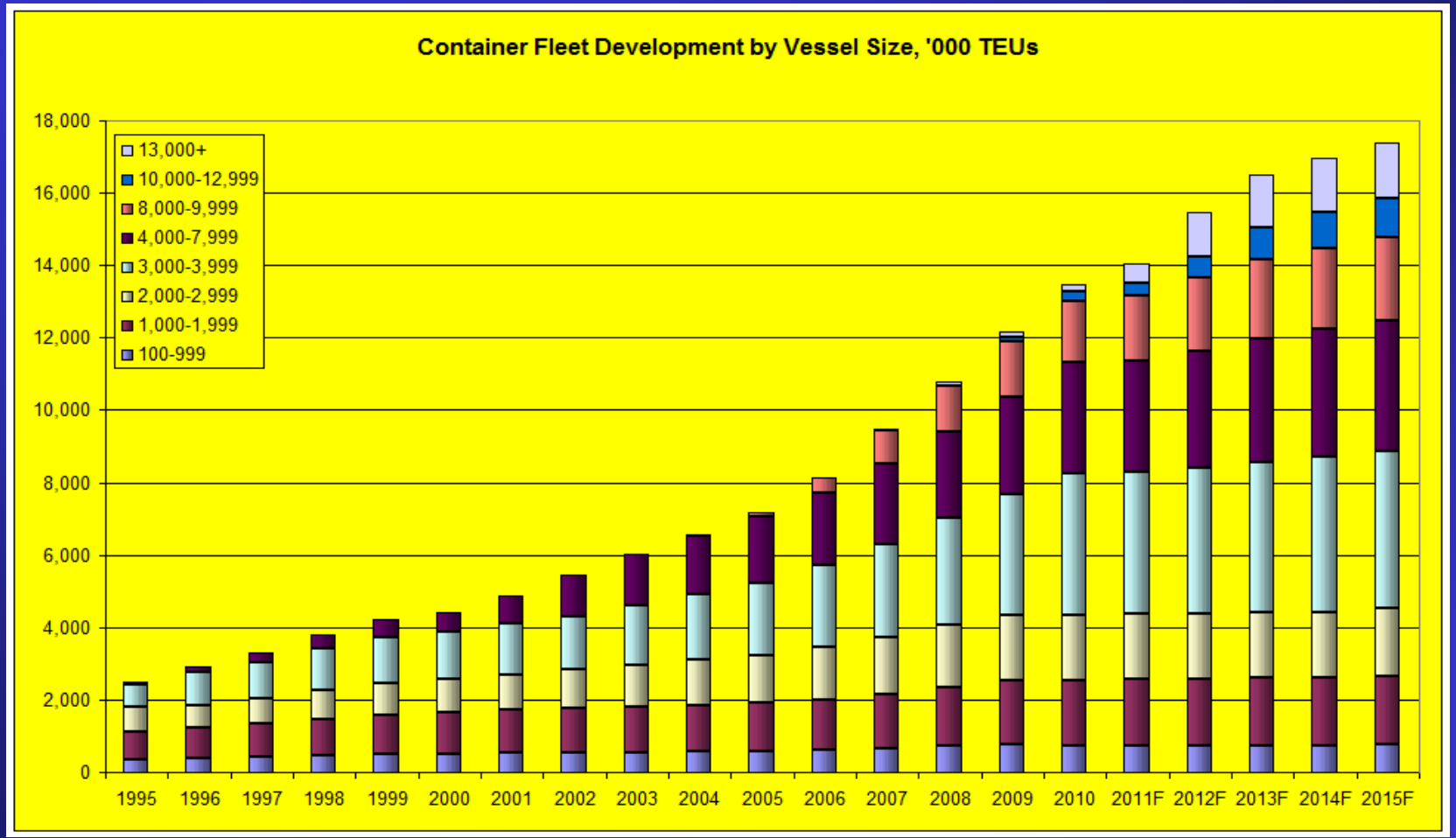
Source: Ocean Shipping Consultants Ltd.

# Much Larger Vessel Sizes - a continuing process

- We are in the middle of a size-based revolution for container ships
- This is not just in the arterial trades - much larger vessel sizes are expected in north-south trades and for feeders
- The economic drivers are clear - lines that don't move up will see their competitive position undermined
- Already 13,500TEU+ vessels are a reality and larger vessels (18,000TEU) have already been ordered by Maersk for delivery 2013-15
- The decision to proceed with Panama Canal expansion was a key factor. This will accelerate penetration of larger vessels into the Atlantic

***Shipping lines will introduce much larger vessels as already seen with the recent Maersk order. Ports will have to respond***

# A Ship Size Revolution is Underway - I






OCEAN SHIPPING CONSULTANTS Limited

# A Ship Size Revolution is Underway - II

**Ship Size Development on Deep-Sea Trades to 2020**

| | 2000 | 2007 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|
| **East Asia** | | | | | |
| Average Vessel Capacity | 4800 | 6215 | 8500 | 12000 | 13500 |
| Largest Vessel | 7500 | 13500 | 15500 | 18000 | 18000 |
| **Transatlantic Services** | | | | | |
| Average Vessel Capacity | 3125 | 3170 | 3250 | 3850 | 5200 |
| Largest Vessel | 4550 | 6470 | 6600 | 8500 | 10000 |
| **South/Central American Services** | | | | | |
| Average Vessel Capacity | 1345 | 2508 | 3200 | 3800 | 4500 |
| Largest Vessel | 2500 | 5560 | 6600 | 6600 | 8000 |
| **Indian Sub-Continent Services** | | | | | |
| Average Vessel Capacity | 1020 | 2975 | 3250 | 4500 | 5500 |
| Largest Vessel | 1850 | 5060 | 5060 | 6800 | 10000 |
| **African Services** | | | | | |
| Average Vessel Capacity | 1415 | 2250 | 2400 | 3200 | 3400 |
| Largest Vessel | 3150 | 5060 | 5100 | 5500 | 6600 |
| **Australian Services** | | | | | |
| Average Vessel Capacity | 1890 | 2205 | 2200 | 2500 | 3200 |
| Largest Vessel | 3750 | 4130 | 5500 | 5500 | 5500 |
| **Iberia/Mediterranean Services** | | | | | |
| Average Vessel Capacity | 550 | 1095 | 1200 | 1500 | 2000 |
| Largest Vessel | 1465 | 5925 | 6000 | 6000 | 6000 |
| **Intra North Europe & Scandinavia** | | | | | |
| Average Vessel Capacity | 420 | 490 | 600 | 750 | 950 |
| Largest Vessel | 1100 | 1440 | 1500 | 1800 | 1800 |

Source: Ocean Shipping Consultants Ltd

# Design Developments of Large Containerships

| | TEUs | Length overall (m) | Beam (m) | Maximum draught* (m) | Required berth depth (m)* |
|---|---|---|---|---|---|
| First generation: 1968 | 1,100 | | | | |
| Second generation: 1970-80 | 2-3,000 | 213 | 27.4 | 10.8 | 12.0 |
| Panamax: 1980-90 | 3-4,500 | 294 | 32.0 | 12.2 | 12.8-13.0 |
| Post-panamax: 1988-95 | 4-5,000 | 280-305 | 41.1 | 12.7 | 13.5-14.0 |
| Fifth generation: 1996-2005 | 6,400-8,000 | 300-347 | 42.9 | 14.0-14.5 | 14.8-15.3 |
| Super post-panamax: 1997-> | 8,000-11,400 | 320-380 | 43-47 | 14.5-15.0 | 15.3-15.8 |
| Ultra large container ships: 2006-> | 15,500 | 380-400 | 56.4 | 15.5 | 16.3 |
| New-panamax: 2010 | 12,500 | 366 | 49.0 | 15.2 | 16.0 |
| Triple E-Class | 18,000 | 400 | 59.0 | 15.5 | 16.3 |

* Maximum draught is rarely realised, even when vessels are fully laden, so required berth depth is less in practice.

Source: Ocean Shipping Consultants Ltd

# Implications for Container Terminals

- In order to handle much larger vessels and consignment sizes terminals must expand and make better use of existing facilities
- In North Europe, consignment sizes are averaging nearly 2,700TEU for 6,000TEU+ sizes. For very large vessels, up to 5,000TEUs have been handled at single port calls
- These increases will be noted in all major front rank ports
- Terminal productivity has increased - especially volume per berth metre - but there remain wide differences
- Terminals which do not lift productivity will see market share decline
- There is scope for considerable further improvement

# What does all this mean?

- Massive demand growth
- Concentration of demand in largest fleet sectors
- Increased transshipment:
  - Hub and spoke *and* relay
- Bigger ships *and* much bigger consignments concentrated on hub port calls
- Short/medium term pressure on shipping profitability
- Imperative that port productivity keeps pace with vessel size developments
- Imperative that handling equipment keeps pace with increase in vessel size

# Possible European Opportunities – New and Revisited Markets

- Further direct calls into the Baltic ex FE, e.g. DCT Gdansk
- Further direct calls into the Black Sea ex FE, e.g. Constanta (CSCT)
- Further direct calls ex FE into the Adriatic, e.g. NAPA ports
- Relay possibilities at El Ferrol ? Atlantic arc

# Opportunity 1: Comparative Transport Costs For Baltic T/shipment (DCT-Gdansk)

**Comparative Transshipment Costs for Baltic Markets end-2009**

- Euro per 40' container

| | via Rotterdam | via Hamburg | via Gdansk |
|---|---|---|---|
| **6800TEU Vessel + 500TEU feeder** | | | |
| Deepsea Cost | 528 | 537 | 578 |
| Transshipment Stevedoring | 125 | 154 | 115 |
| Typical Feeder Costs | 167 | 160 | 113 |
| **Total** | **819** | **851** | **806** |
| **10,000 and 12,500TEU Vessels + 1000TEU feeder** | | | |
| Deepsea Cost | 483 | 504 | 520 |
| Transshipment Stevedoring | 125 | 154 | 115 |
| Typical Feeder Costs | 121 | 116 | 87 |
| **Total** | **729** | **774** | **723** |

Current competition

Source: Ocean Shipping Consultants Ltd.

# 2010/11 Position at Gdansk

- Still served by feeder but also direct call by Maersk Line
- Cheap handling rate incentive to get Maersk to call initially pays dividends
- Solution to prevalent delays at major hubs
- January 2010 Maersk Taikung calls (332m long x 43.2m wide x 14.5m draft) - 8,200TEU
- Maersk announce regular weekly call (Monday) at Gdansk on AE10 service from China
- Understood that 15,500TEU vessels will be introduced by Maersk in May 2011
- Deepwater is key to berthing larger vessels (16.5m deep) and growing market position - challenge Hamburg regional supremacy
- Other lines are likely to follow Maersk's strategy when they develop sufficient demand (c.2014)

# Opportunity 2: Maersk Line /CMA-CGM AE3/BEX Direct to Black Sea




OCEAN SHIPPING CONSULTANTS Limited

# Opportunity 2: Direct Black Sea Calls ex FE

- Supply/demand balance in Black Sea was adversely affected by economic downturn and is estimated at under 46% in 2010
- Demand is set to continue to grow strongly as a result of local demand and as transit demand expands into Balkans and S.Russia
- There will be strong arguments for increased t/s within the Black Sea and renewed expansion is anticipated in this sector
- Maersk Line and CMA-CGM offer a combined service (AE3/Bosphurus Express) with 6,500TEU vessels calling at ports in Turkey, Romania and Ukraine
- Zim Line also offers a direct service with 4-5,000TEU vessels.
- More are likely to follow as demand increases / recovers

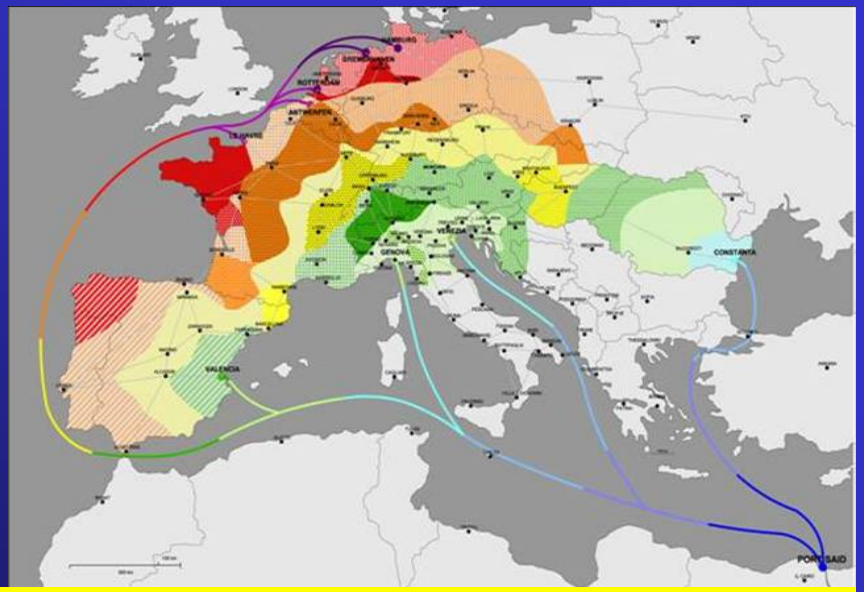
# Opportunity 3: Direct Adriatic Calls ex FE

- North Adriatic natural gateway into central Europe, especially Austria, Hungary and Slovak Rep
- Demand within Adriatic to expand steadily
- Significant investment in regional ports
- Strategic position for development of Med/NAF – average growth rate of 4.5% in Med Basin (2010/11)
- Save total transit time and road distances – 5 days transit time reduction at sea
- Save 135kg of CO2 ex Suez to Munich via Venice instead of Rotterdam
- Direct calls by Maersk (AE12) and JCS of UASC, Hanjin, HMM and YML (AMC3)
- NAPA – cooperate internationally ; compete internally
  - Short-sea shipping ; motorways of the sea ; hinterland connections
  - Technology – common ict platform to exchange information
  - Shared marketing and promotion

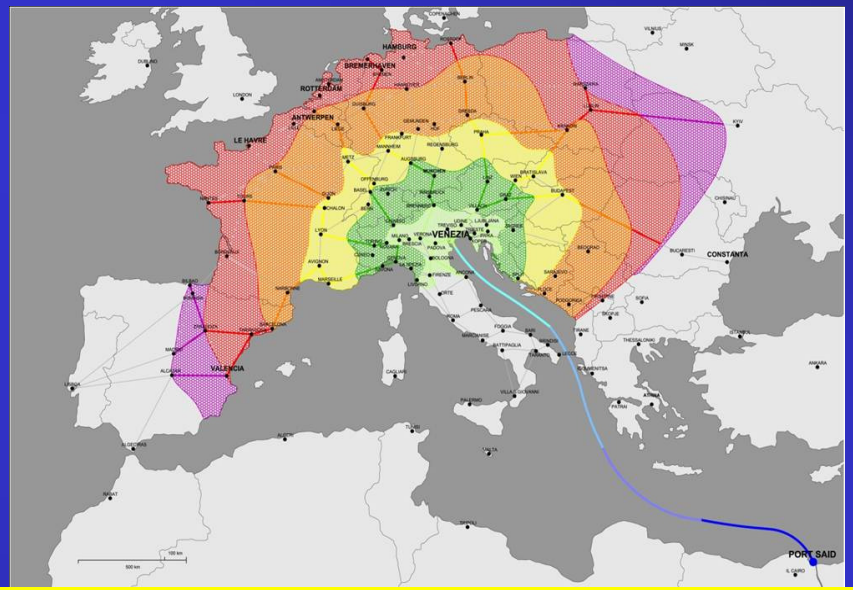
# The Environmental Aspect

Shipping **a container,** transported by ship and railway, **from Suez** to Munich **via VENICE**, rather than via ROTTERDAM, allows for **a reduction of 135 kg/TEU of CO2 emissions**

| Classe di emissione CO2 kg/TEU | 0 - 10 | 11 - 20 | 21 - 30 | 31 - 40 | 41 - 50 | 51 - 60 | 61 - 70 | 71 - 80 | 81 - 90 | 91 - 100 | 101 - 110 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Emissioni CO2 marittime | | | | | | | | | | | |
| Emissioni CO2 Multimodali via Venezia | | | | | | | | | | | |

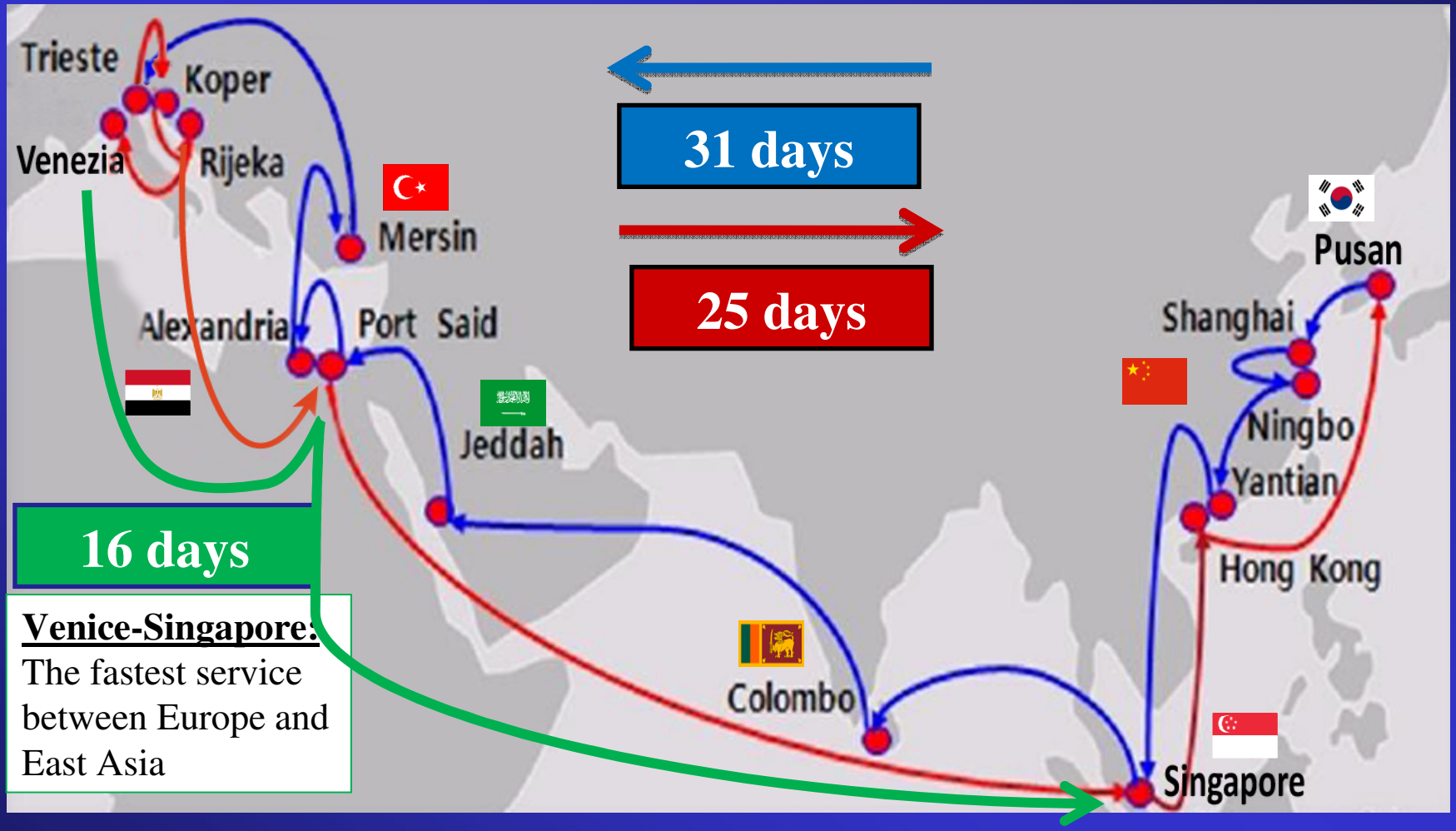



Emissions estimate on Suez-all Europe routes and railway transportation




Emissions estimate on Suez-Venice route and railway transportation

# AMC3 – Joint Direct Service to East Asia




**Venice-Singapore:**
The fastest service between Europe and East Asia

YANG MING | HMM Customer Plus | HANJIN SHIPPING Beyond the Ocean | UASC

# Opportunity 4: Relay possibilities – e.g. El Ferrol

- North Iberian ports have a unique position for deepsea trades – directly on major shipping lane from Asia-Europe and closest european port to N.America (Atlantic arc)
- Deepsea carries could serve Iberian trade without introducing new service
- Only deepwater terminal in Galicia, capable of handling trade from Far East, Americas and Europe economically
- Competition between Ferrol and Bilbao for european trades and Med ports for Asia
- Increased developments in West Africa container terminals make relay to Africa a distinct possibility

# Relay possibilities – Convenience of location

- Particularly well placed geographically for all relay linking with N.America
- Convenience of location for all relay ts, especially

- - ECNA-WAF
- - ECNA-SAF
- - FE-WAF
- - ECNA-FE
- - ECSA-FE

- Critical mass for terminal development

# Conclusion

- Ship sizes are on the increase
- Greater pressure for shorter turnaround of vessels to take full advantage of the economies of scale
- Terminals must increase their levels of productivity, or see volumes fall
- Overall, terminals are over capacity, so shipping lines will pick the best (most competitive in a region) for their services
- Competition is tough at present, because of the capacity situation
- Opportunities remain for deepwater, efficient terminals to offer direct services from the Far East and feeder options in traditional hub and spoke

# *Thank You*

**Steve Wray**
**Ocean Shipping Consultants Ltd.**

**sw@osclimited.com**

***Bilbao, April 2011***

***www.osclimited.com***



OCEAN SHIPPING CONSULTANTS Limited