Trends and Challenges for Container Ports

Eva Pérez

Valencia, 11 May 2016

FUNDACIÓN valenciaport

CHALLENGES FOR CONTAINER PORTS

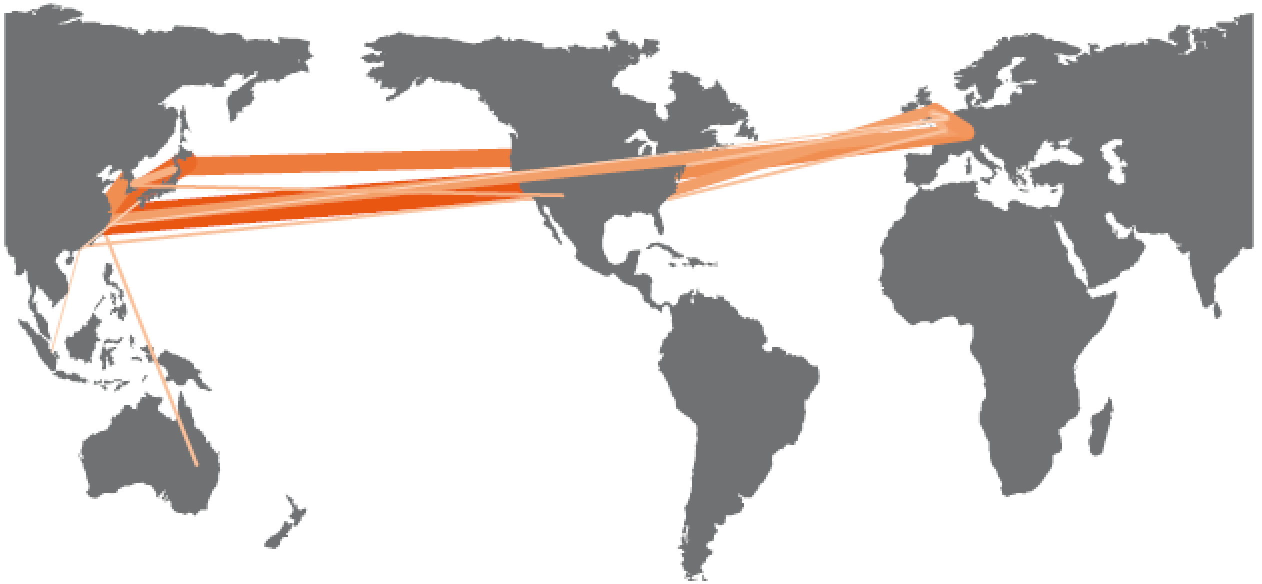
- **Changes in global trade patterns**
- **Vertical integration**
- **Horizontal concentration of ocean carriers**
- **Alliances**
- **Increasing vessel size**
- **Port overcapacity**

Change in global trade patterns

Challenges

Change in trade patterns

Top sea bilateral trade in 2010 (Western centric)



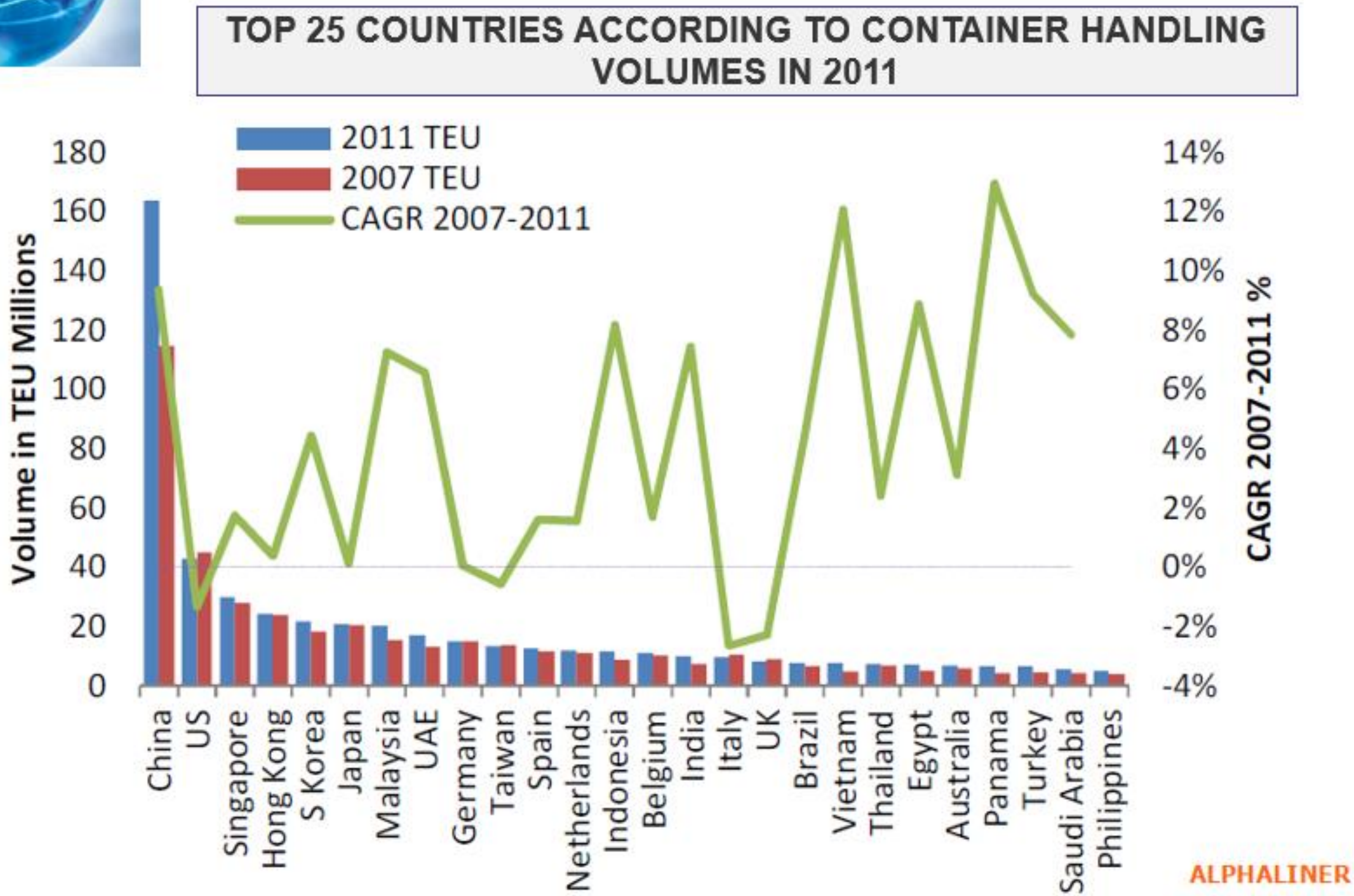
Top sea bilateral trade in 2030 (Sino centric)

GLOBAL ECONOMIC FOCUS AND SEA TRADE MOVES EAST

Source: Lloyd's Register Group Limited (2014): *Global Marine Trends 2030*

Change in trade patterns

Challenges



Based on total reported container volumes by country including transshipment and empty container handling volumes.

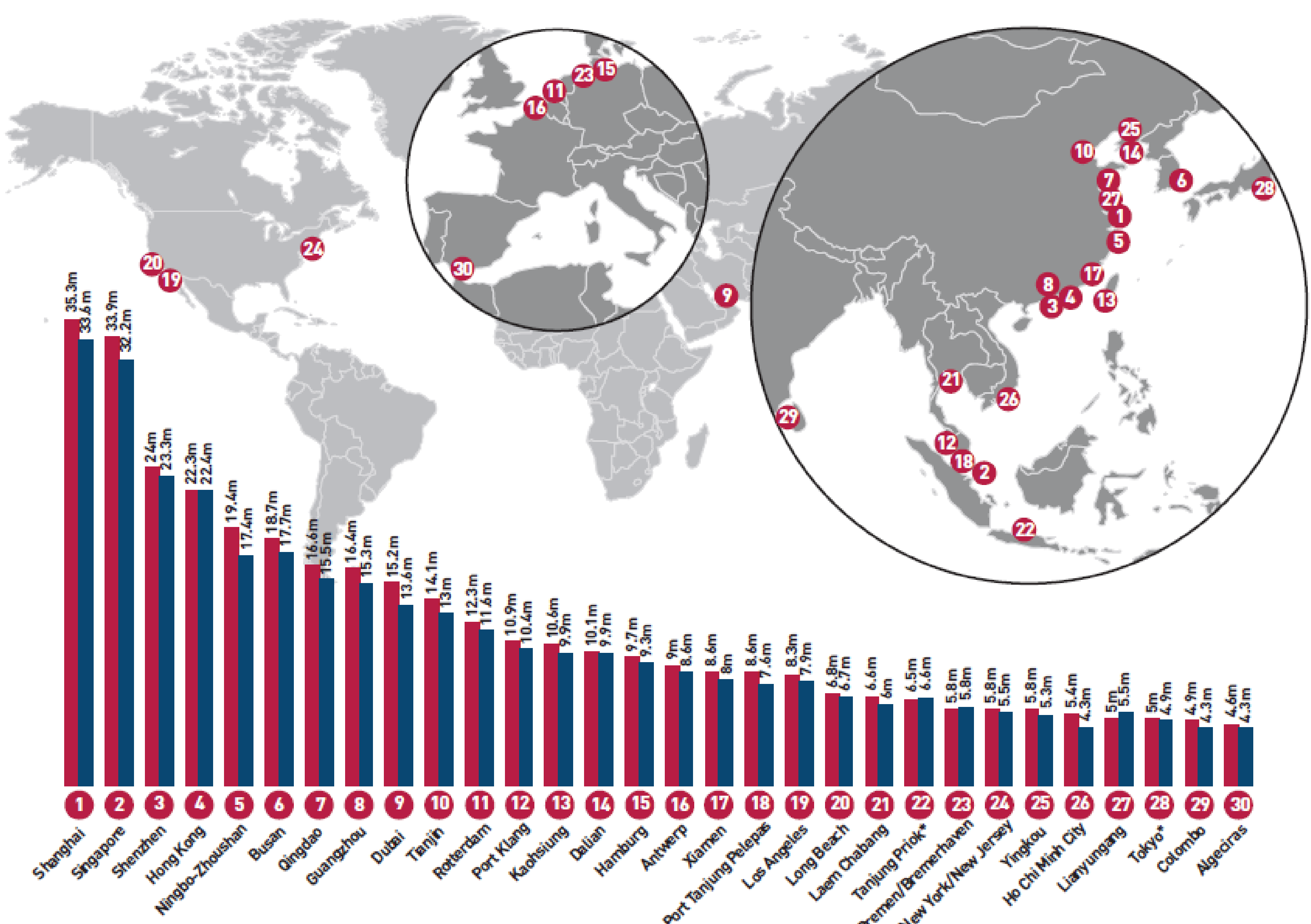
Source: Alphaliner, October 2012

TOP 30 CONTAINER PORTS

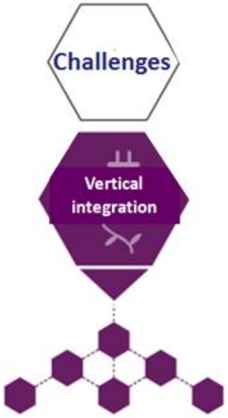
in teu

Table 1

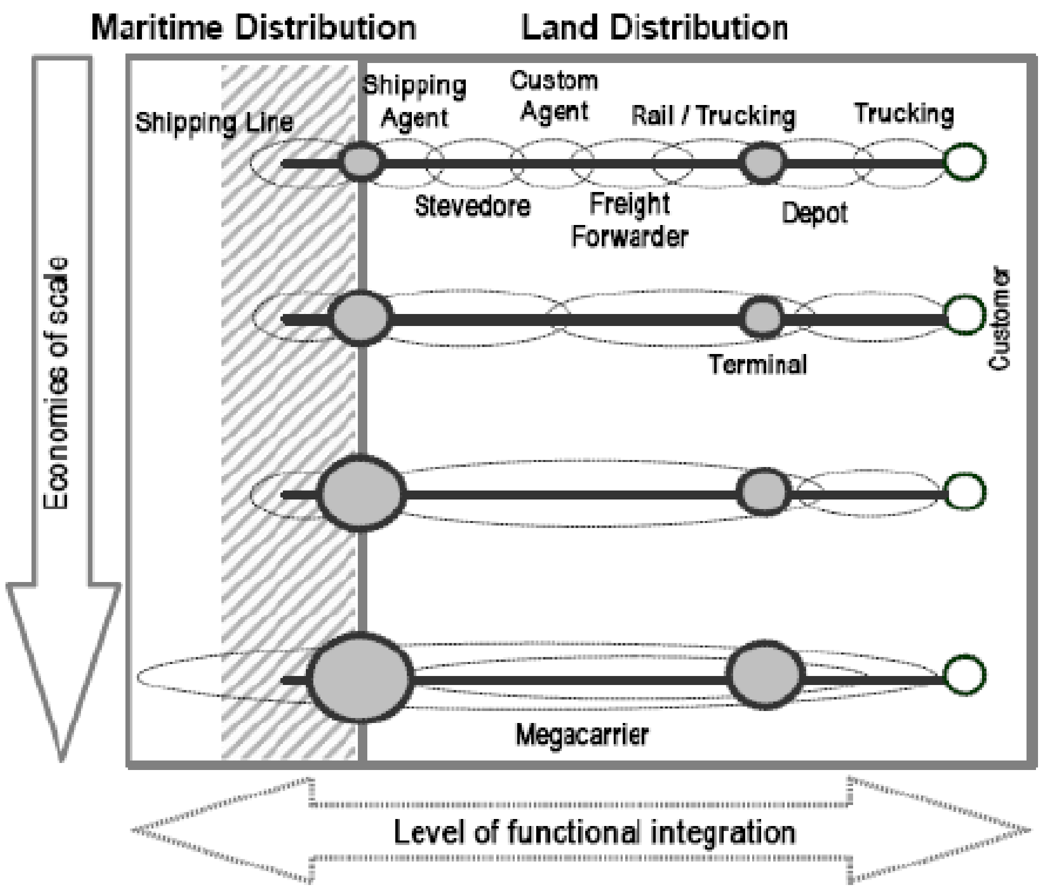
Containerisation International's latest survey of the globe's top 30 ports reveals that in 2014, a total of approximately 366m teu was handled, equivalent to about 58% of world container-handling activity, and an increase of 5.6% on 2013's results.



Fuente: Containeration International 2015



Vertical integration



Source: Notteboom & Rodrigue (2004), adapted from Robinson (2002)

Challenges: Vertical Integration

RANKING OF CONTAINER TERMINAL OPERATORS

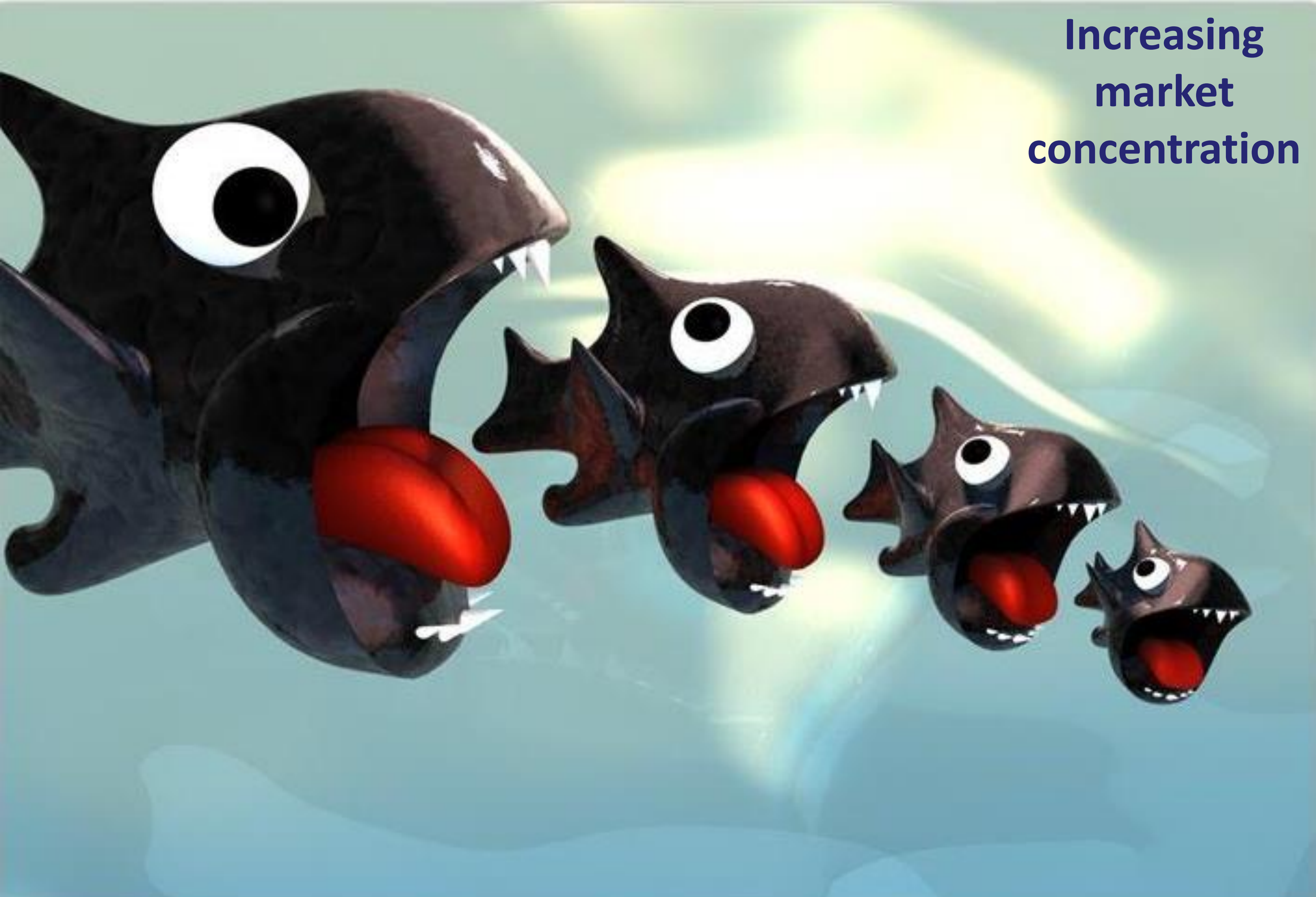
RANKING DE TERMINALISTAS MUNDIALES DEL NEGOCIO DEL CONTENEDOR

Rnk	Grupo	Cuota	2012	2011	2010	2009	2008	%12/11	%12/08
1	Hutchison	15,8%	76.800.000	75.100.000	75.000.000	65.300.000	67.600.000	+2,3%	+13,6%
2	APM Terminals	14,6%	70.800.000	72.000.000	70.000.000	59.900.000	64.400.000	-1,7%	+9,9%
3	China Merchants	12,4%	60.210.000	57.290.000	52.300.000	43.870.000	50.480.000	+5,1%	+19,3%
4	PSA	12,3%	60.060.000	57.090.000	60.280.000	56.930.000	63.200.000	+5,2%	-5,0%
5	DP World	11,5%	56.076.000						
6	Cosco Pacific	11,4%	55.685.225						
7	Terminal Investment Limited (MSC)	4,1%	20.000.000						
8	Eurogate	2,7%	13.268.444						
9	Evergreen	2,4%	11.500.000						
10	Hanjin	1,7%	8.250.000						
11	SSA Marine	1,6%	8.000.000						
12	CMA CGM	1,6%	8.000.000						
13	NYK Line	1,5%	7.300.000						
14	HHLA	1,5%	7.200.000						
15	ICTSI	1,2%	5.628.021						
16	APL-NOL	1,0%	4.800.000	4.700.000	4.600.000	4.300.000	4.929.800	+2,1%	-2,6%
17	OOCL	0,9%	4.200.000	4.100.000	4.000.000	3.500.000	3.500.000	+2,4%	+20,0%
18	Grup TCB	0,7%	3.600.000	3.300.000	3.100.000	2.700.000	3.300.000	+9,1%	+9,1%
19	Noatum Ports	0,7%	3.593.292	3.306.862	3.263.557	2.817.015	3.317.416	+8,7%	+8,3%
20	Global Port Investments	0,3%	1.449.000	1.344.000	1.095.000	604.000	1.326.000	+7,8%	+9,3%
	TOP 20 Grupos	**100,0%**	**486.419.982**	**469.046.608**	**451.939.017**	**400.843.156**	**432.479.180**	**+3,7%**	**+12,5%**

Fuente: TRANSPORTE XXI en base a datos publicados por las compañías. Los datos de Evergreen, SSA Marine, CMA CGM y APL-NOL han sido estimados. Datos en TEUs. Las cifras incluyen las operaciones en las terminales de uso común.

Top 6 global/international terminal operators, 2014 (total teu basis)

Ranking 2014	Operator	Million teu	2014 % Volume Growth
1	Hutchison Port Holdings	82.9	6.0%
2	China Merchants Holdings International	80.6	13.1%
3	APM Terminals	79.1	5.5%
4	Cosco Pacific	67.3	9.9%
5	PSA International	65.4	5.8%
6	DP World	60.0	8.9%


Increasing
market
concentration

MERGERS AND ACQUISITIONS

1993

1. APL
2. Cosco
3. DSR-Senator
4. Evergreen
5. Hanjin
6. Hapag-Lloyd
7. Hyundai
8. K Line
9. Maersk
10. MOL
11. MSC
12. Nedlloyd
13. NOL
14. NYK
15. OOCL
16. P&O
17. Sealand
18. UASC
19. Yang Ming
20. Zim

1998

1. APL
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8. MOL
9. MSC
10. NYK
11. OOCL
12. P&O Nedlloyd
13. Sealand
14. UASC
15. Yang Ming
16. Zim

2000

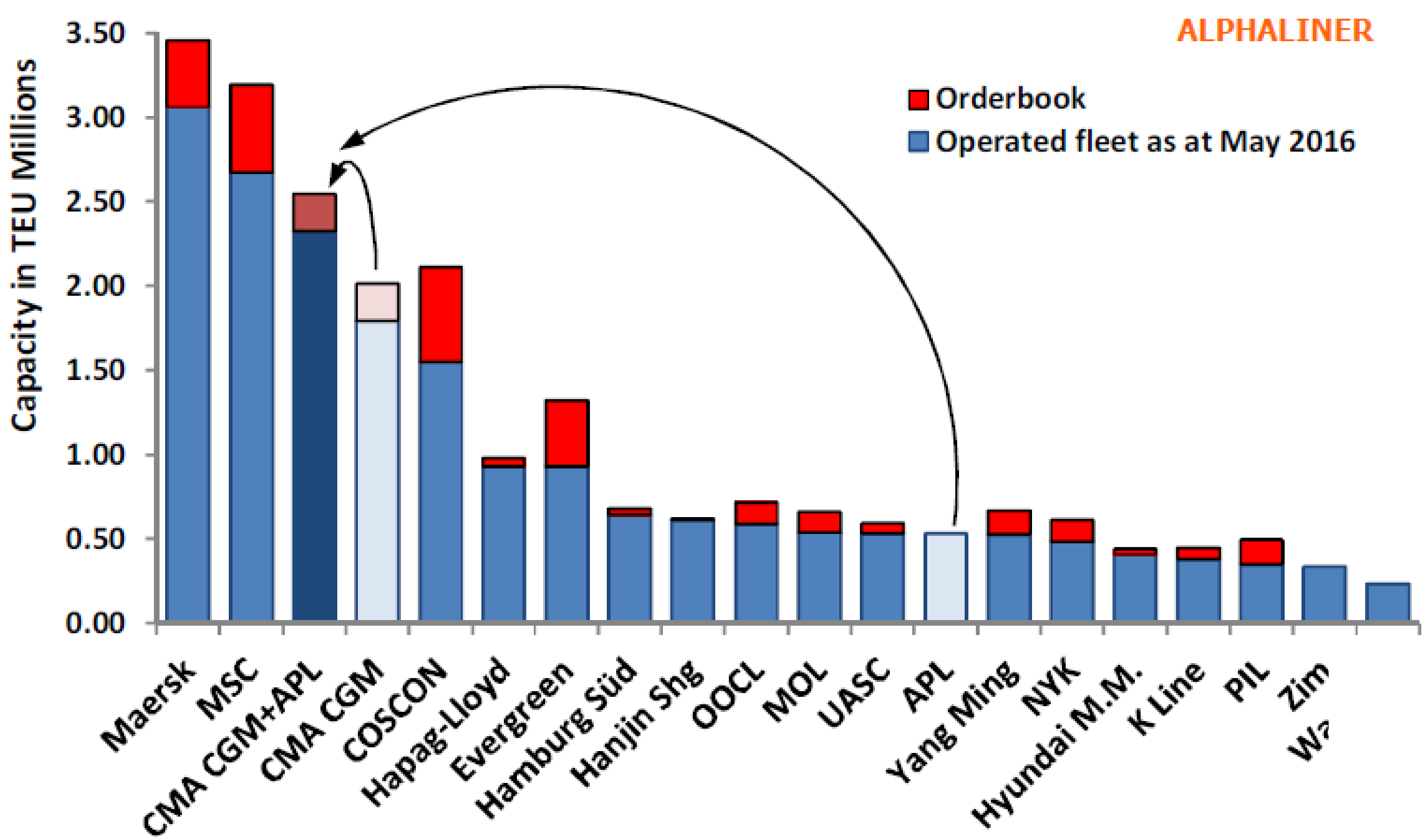
1. Maersk/Sealand
2. Grand Alliance (P&O, NYK, HL, OOCL) MSC
3. New World Alliance (APL/NOL, MOL, Hyundai)
4. Cosco/Yang Ming/K Line/Hanjin/DRS-Senator
5. Evergreen
6. MSC
7. Zim

2009

Fuente: Ricardo Sánchez, CEPAL

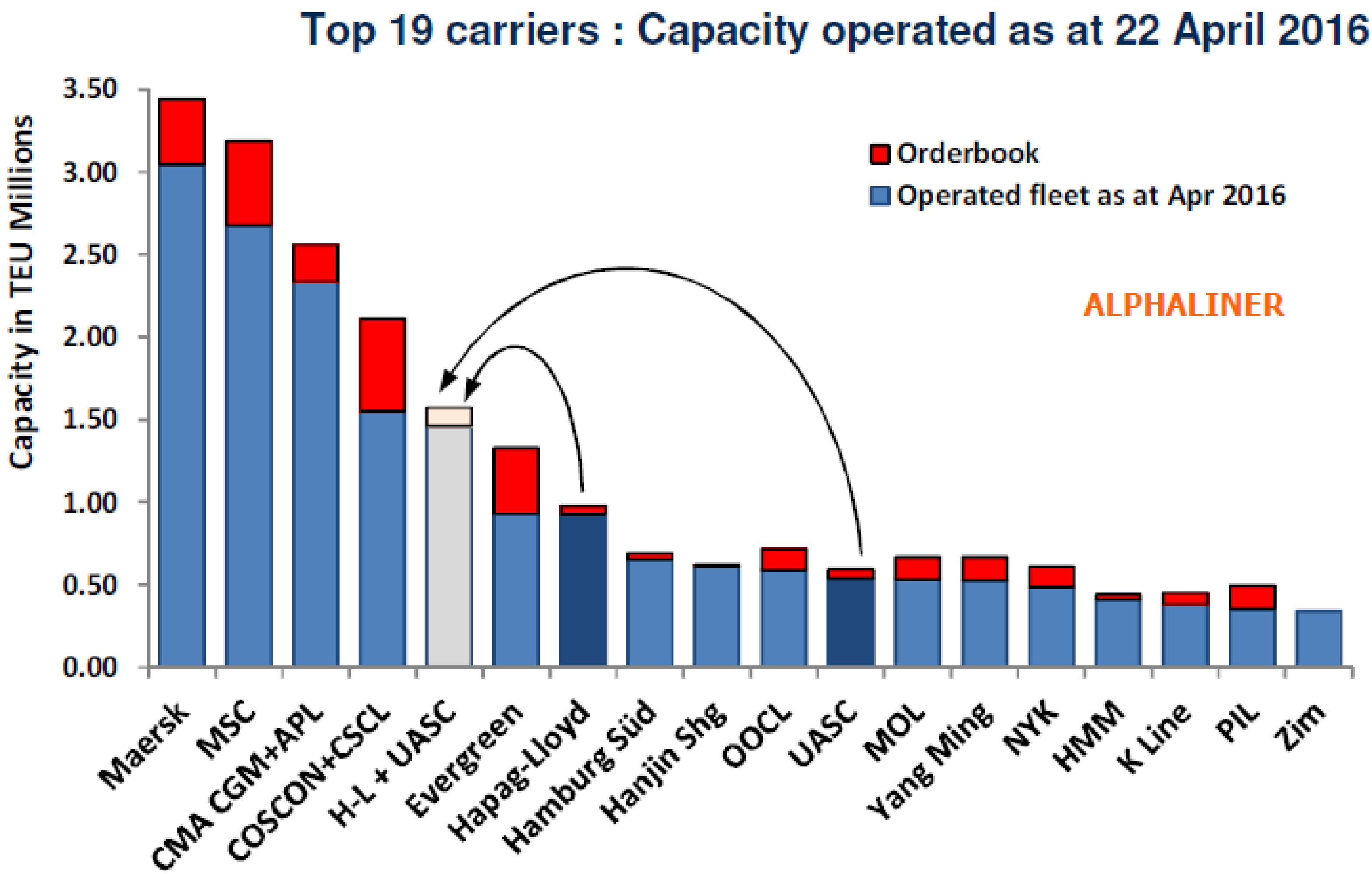
MERGERS AND ACQUISITIONS

Top 20 Carriers : Impact of CMA CGM-APL merger



Fuente: Alphaliner 2016

MERGERS AND ACQUISITIONS



Source: Alphaliner, 2016

Challenge: Alliances

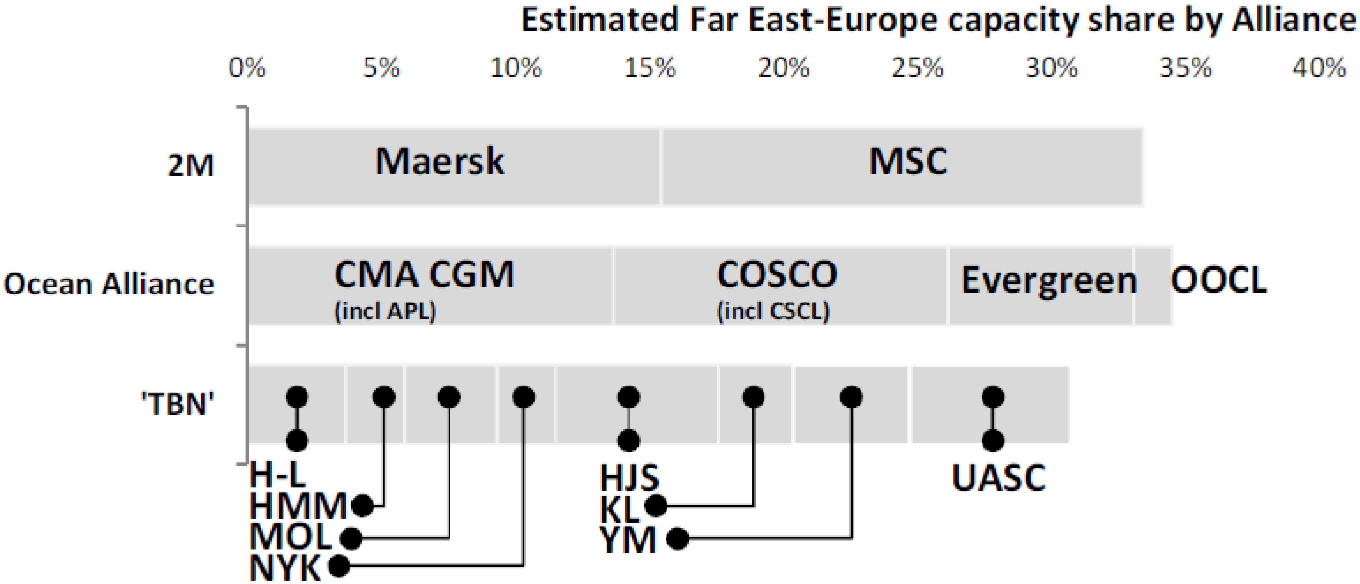
Challenge: Alliances

Far East-North Europe Services Matrix (as at May 2016)

Alliance	Carriers / Service Name	Maersk	MSC	K Line	Yang Ming	Hanjin Shg	Evergreen	COSCO (CKYHE+O3)	CMA CGM	UASC	APL	Hapag-Lloyd	HMM	MOL	NYK	OOCL	PIL	Hamburg Süd	Ave. weekly TEU	Capacity by Alliance	in TEU
2M	AE 1 / Shogun	X	X																14,460		
2M	AE 2 / Swan	X	X																17,070		
2M	AE 5 / Albatros	X	X																18,660	2M Total	81,500
2M	AE 6 / Lion	X	X																13,050	2M Ave.	16,300
2M	AE 10 / Silk	X	X																18,260		
CKYHE	NE 2			X	X	o	o	o	o	o									13,940		
CKYHE	NE 3			o	o	o	o	X	o	o									13,480		
CKYHE	NE 5 / CEM			o	o	o	X	o	o	o									13,810	CKYHE Total	66,430
CKYHE	NE 6			o	o	X	o	o		o									13,100	CKYHE Ave.	13,286
CKYHE	NE 7			o	X	o	X	o	o	o									12,100		
G6	Loop 1										o	o	o	X	X	o			9,350		
G6	Loop 4										X	X	X	o	X	X			13,200	G6 Total	49,410
G6	Loop 5										X	X	X	o	o	X			13,210	G6 Ave.	12,353
G6	Loop 7								o		X	X	o	X	X	o			13,650		
O3	FAL 1 / AEX 3 / AEC 2						o	o	X	o	o								15,490		
O3	FAL 23 / AEX 7 / AEC 8			o	o	o	o	X	X	X							o	o	12,380	O3 Total	46,670
O3	FAL 8 / AEX 1 / AEC 1			o	o	o	o	X	o	X								o	18,800	O3 Ave.	15,557
Total no. of weekly sailings		5	5	7	7	7	8	8	8	8	5	4	4	4	4	4	1	2			

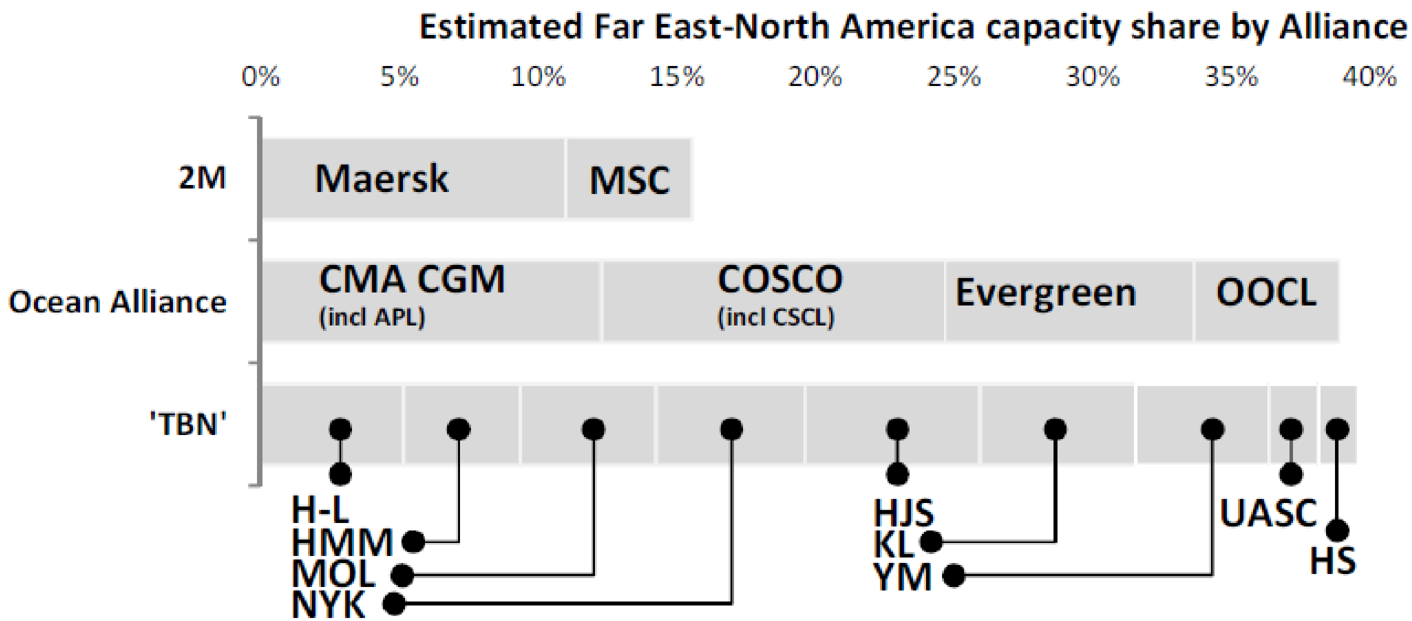
Fuente: Alphaliner 2016

Challenge: Alliances



SHARE OF TOTAL CAPACITY BY ALLIANCE

Source: Alphaliner 2016



Increasing concentration

Challenges

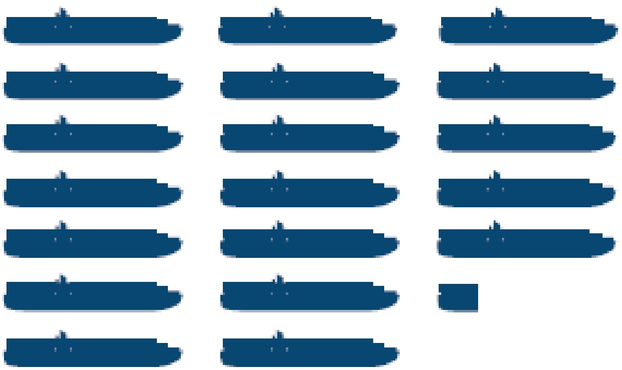
THE 2M ALLIANCE

MAERSK

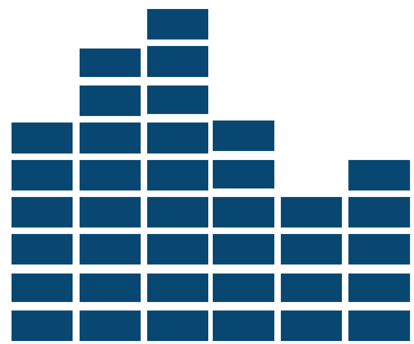
MSC

193 vessels

= 10 vessels



2.4 million teu Capacity



77 ports

22 strings

Duration of agreement

Begins early 2015

Duration of the 2m agreement is 10 years

Expires 2025

Lloyd's List Graphic • Source: Companies

Challenge: Alliances

Ocean Alliance

Total capacity operated by Ocean Alliance partners, including services outside of alliances:

5.40 Mteu

Planned capacity in Ocean Alliance services:

2.78 Mteu

2M

Total capacity operated by Maersk and MSC, Including non-2M services:

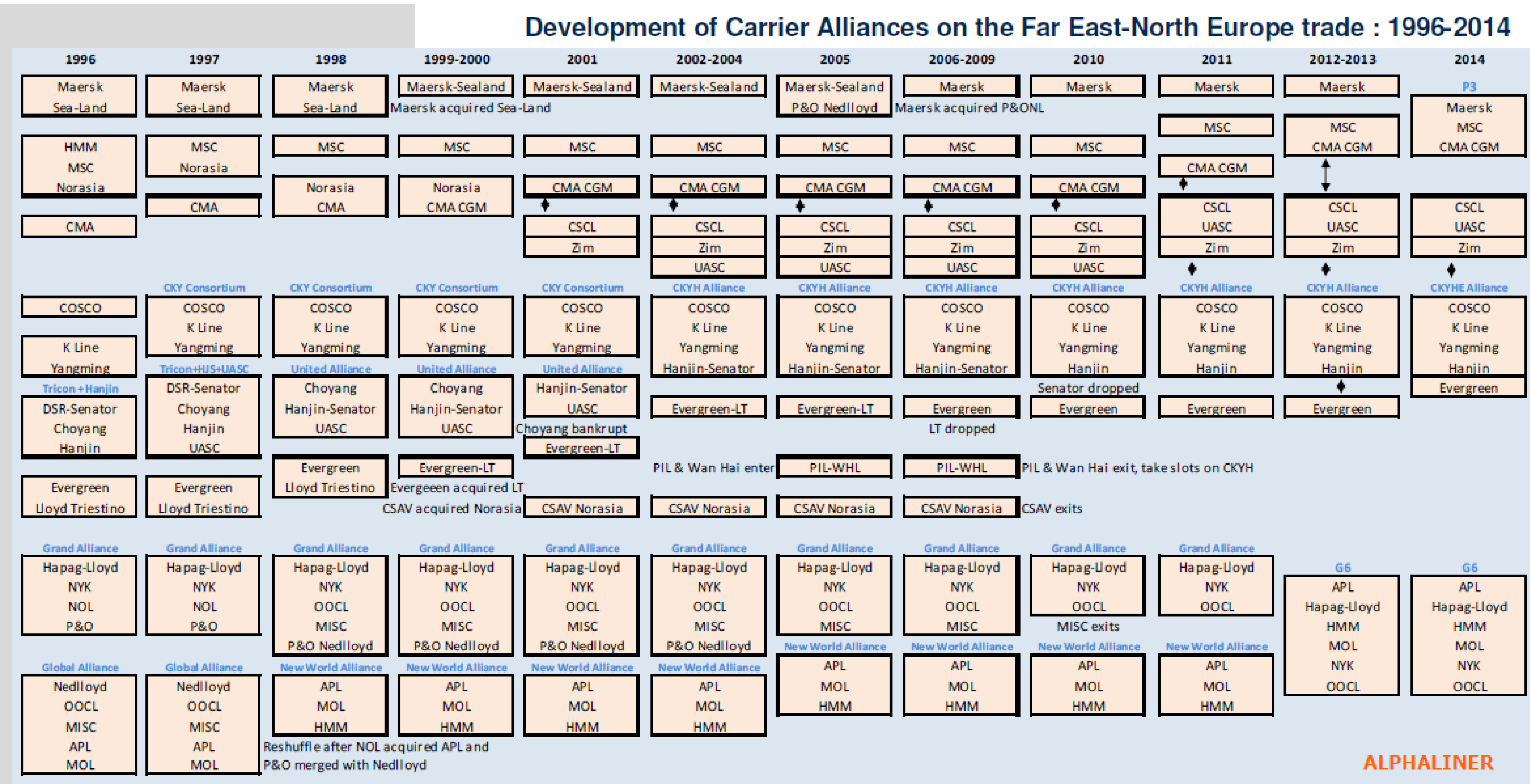
5.72 Mteu

Capacity operated in 2M services:

2.15 Mteu

Challenge: Alliances

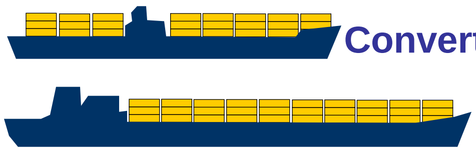
EVOLUTION IN ALLIANCES OPERATING BETWEEN ASIA AND EUROPE



Fuente: Alphaliner 2014

EVOLUTION OF CONTAINERSHIP SIZE

First Generation (1956-1970)



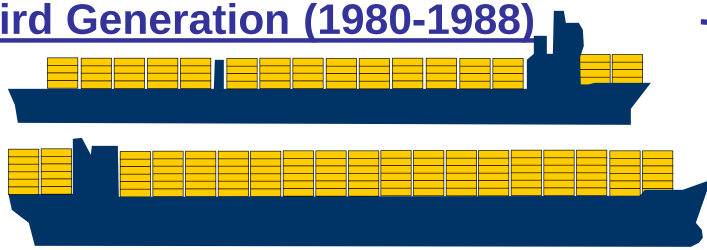
Converted Cargo Vessel

Converted Tanker

Second Generation (1970-1980)

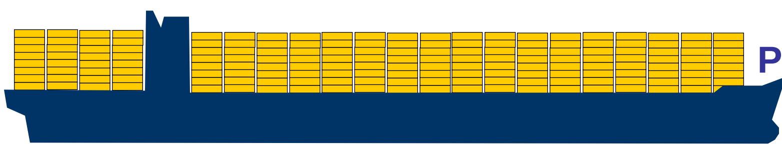
Cellular Containership

Third Generation (1980-1988)



Panamax Class

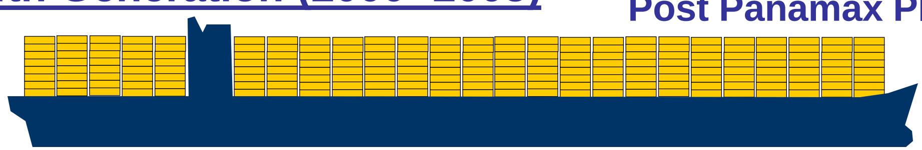
Fourth Generation (1988-2000)



Post Panamax

Fifth Generation (2000- 2005)

Post Panamax Plus



2013

Generation	Length	Draft	TEU
First Generation (1956-1970)	135m – 200m	< 9 metres	500 – 800 TEU
Second Generation (1970-1980)	215 metres	10 metres	1, 000 – 2,500 TEU
Third Generation (1980-1988)	250 – 290 metres	11 - 12 metres	3,000 – 4,000 TEU
Fourth Generation (1988-2000)	275 – 305 metres	11 - 13 metres	4000 – 5,000 TEU
Fifth Generation (2000- 2005)	352 metres	14 - 15 metres	6,000 – 9,000 TEU
2013	400 metres	16.5 metres	18,000 TEUs

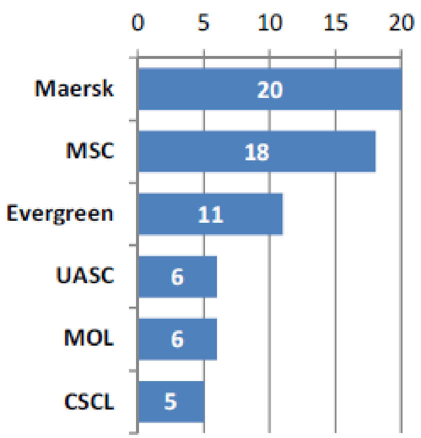
Ultra Large Containerships 18,000-20,150 teu : Full list of orders

MOL's latest orders bring the order-book for containerships of over 18,000 teu to 66 units.

In addition to this, the Hong-Kong based carrier OOCL is expected to announce orders for next-generation jumbos in the coming weeks, further adding to the pipeline for ships of this size class.

Maersk Line has also indicated that it was seeking new ships of this size. These would add to the 20 'EEE' class ships, which the Danish carrier ordered in 2011.

> 18,000 TEU units ordered by carrier



ALPHALINER

	TEU (declared) tdw	LOA m	Breath m	Draft m
TBN 4 units in series from 2017	20,150 TBA	400.0	58.8	16.0 MOL Samsung H.I.
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TBN 11 units in series from Feb 2018	20,000 TBA	400.0	59.0	16.0 Evergreen Imabari
TBN 6 units in series from May 2016	19,154 197,850	399.9	58.8	16.0 MSC Samsung H.I.
BARZAN 6 units in series from Apr 2015	TBA TBA	400.0	58.6	16.0 UASC Hyundai Samho/Hyundai H.I.
MSC OSCAR 12 units in series from Jan 2015	19,224 teu 197,362 tdw	395.4	58.6	16.0 MSC Daewoo (DSME)
CSCL GLOBE 5 units in series from Nov 2014	18,982 teu 184,320 tdw	399.7	58.6	16.0 CSCL Hyundai H.I.
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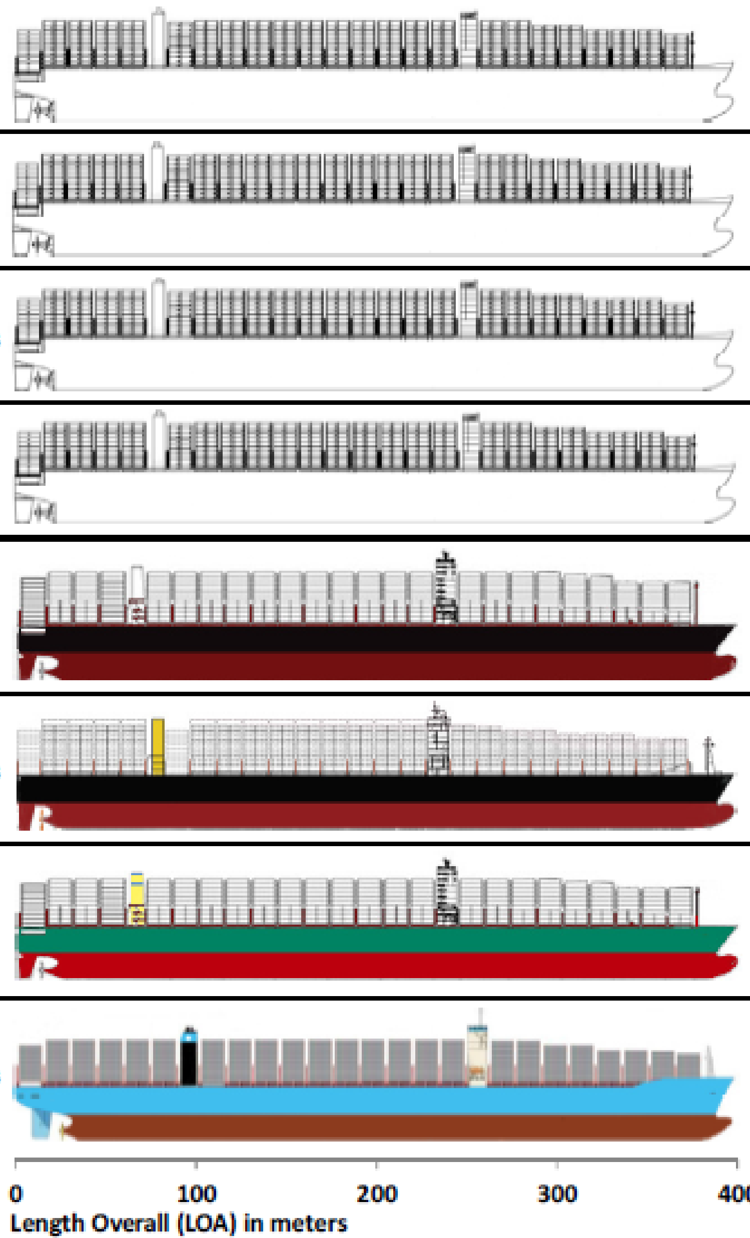
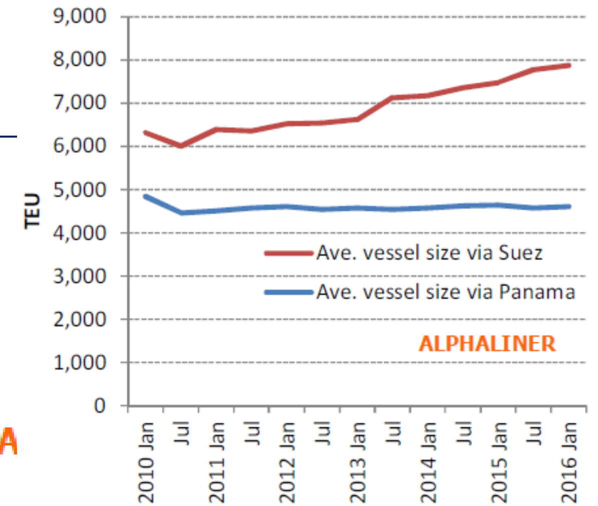
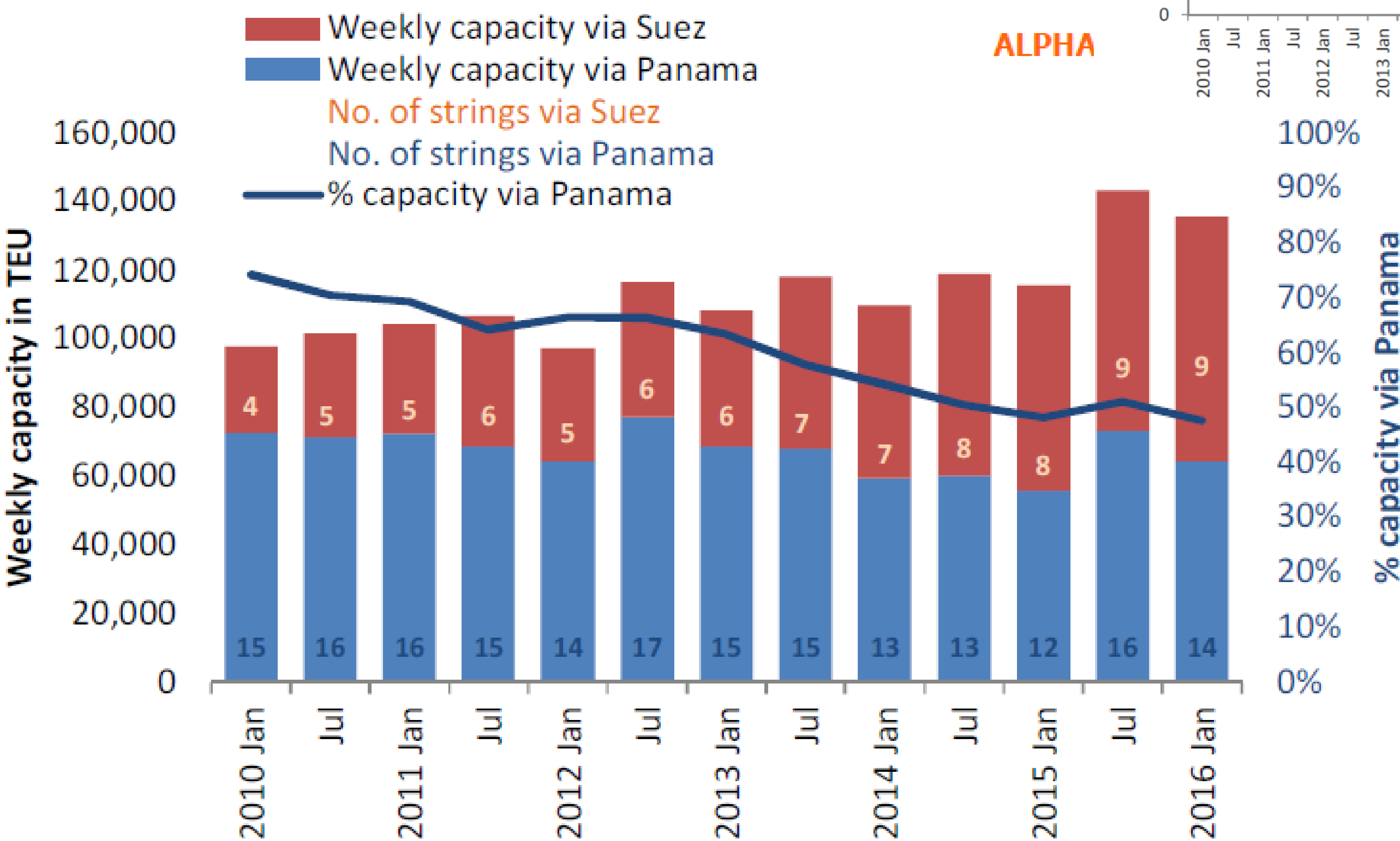


Challenge: Change in Routes





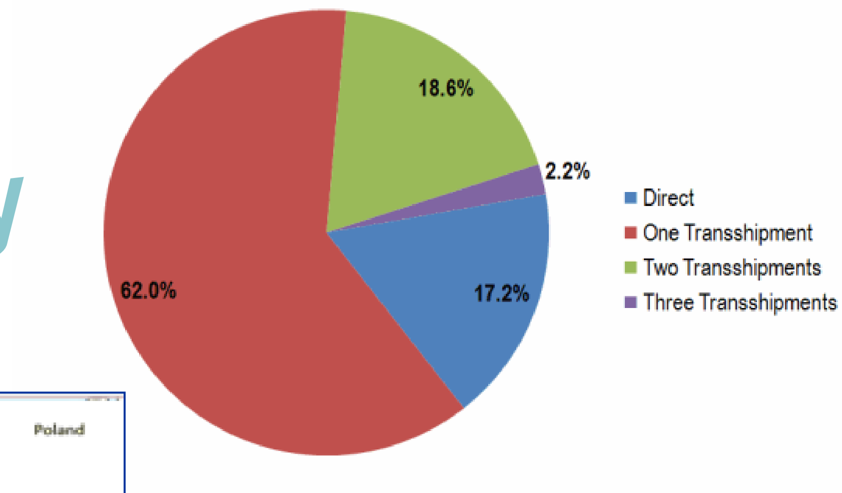
Source: Alphaliner, 2016

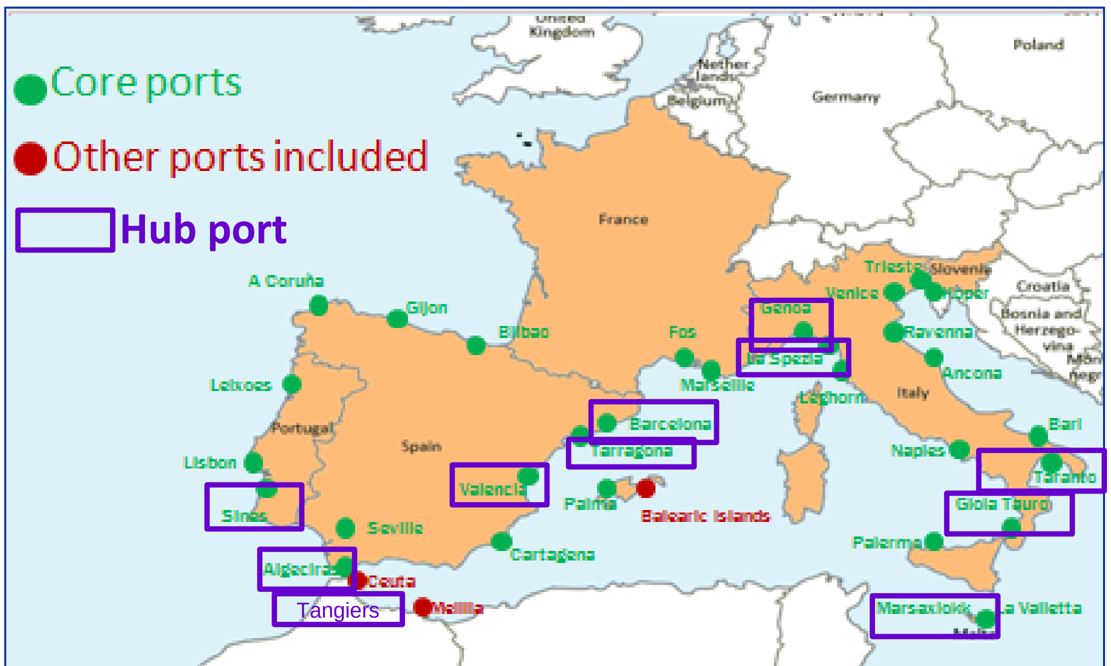
Port competition and overcapacity

Challenges

40% overcapacity

% port-to-port connections including transhipment





How many hub ports are needed?

Automation

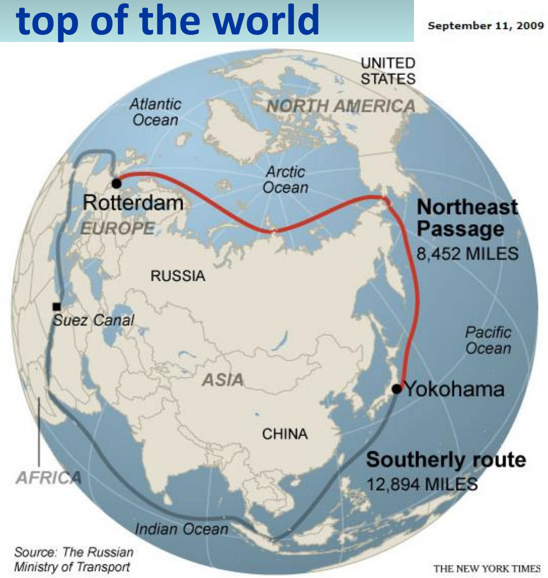
& many other challenges

etc

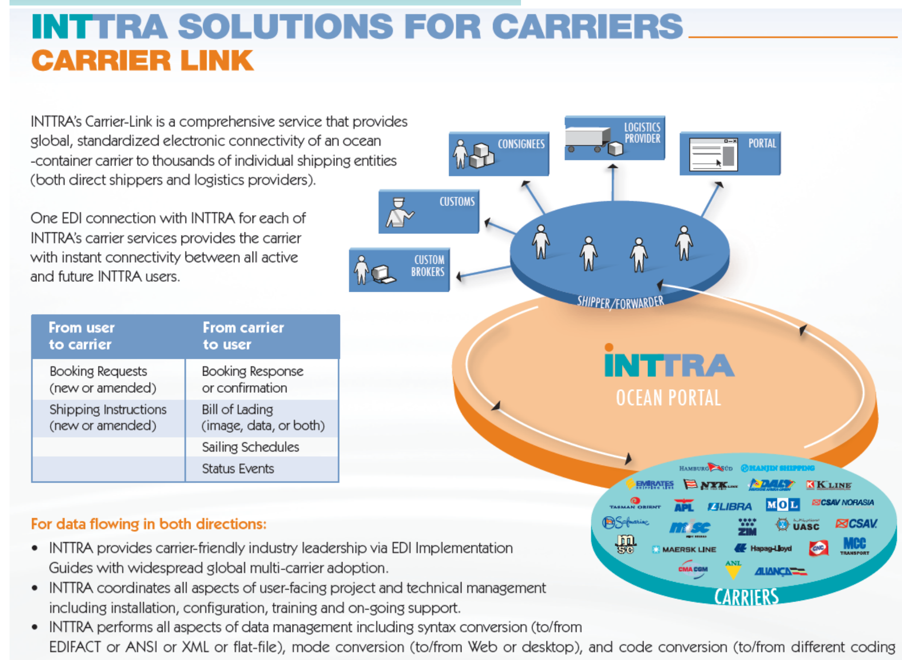
...

etc

A shortcut across the top of the world



Increasing use of ICT



INTTRA SOLUTIONS FOR CARRIERS

CARRIER LINK

INTTRA's Carrier-Link is a comprehensive service that provides global, standardized electronic connectivity of an ocean -container carrier to thousands of individual shipping entities (both direct shippers and logistics providers).

One EDI connection with INTTRA for each of INTTRA's carrier services provides the carrier with instant connectivity between all active and future INTTRA users.

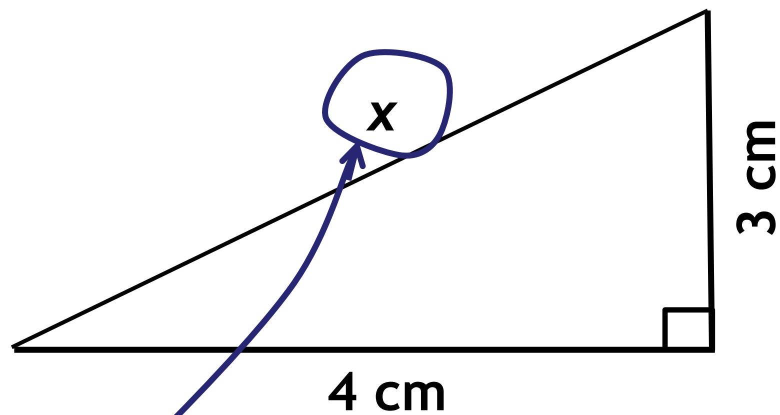
From user to carrier	From carrier to user
Booking Requests (new or amended)	Booking Response or confirmation
Shipping Instructions (new or amended)	Bill of Lading (image, data, or both)
	Sailing Schedules
	Status Events

For data flowing in both directions:

- INTTRA provides carrier-friendly industry leadership via EDI Implementation Guides with widespread global multi-carrier adoption.
- INTTRA coordinates all aspects of user-facing project and technical management including installation, configuration, training and on-going support.
- INTTRA performs all aspects of data management including syntax conversion (to/from EDIFACT or ANSI or XML or flat-file), mode conversion (to/from Web or desktop), and code conversion (to/from different coding standards for coded data).

So many challenges!

Problem: Find x



Solution: Here it is

STRATEGIES:

Valenciaport 2020:

Market led initiatives

Efficiency

Financial sustainability

Social and environmental sustainability

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Integration of the Port Cluster and Innovation

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Our reply to challenges related to changes in global trade patterns

Market intelligence:

Market analysis and traffic forecasting

Integration of Customs and ports statistics

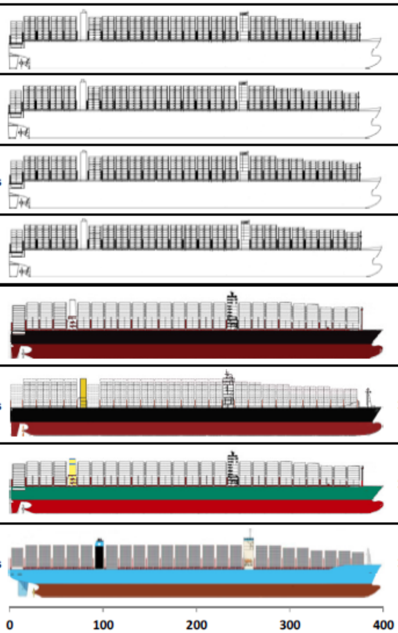
Exploitation of statistics generated by the port community system

Big data projects at container terminals

Internet of things (es. SOLAS gross verified mass of containers)

Ultra Large Containerships 18,000-20,150 teu : Full list of orders

ALPHALINER



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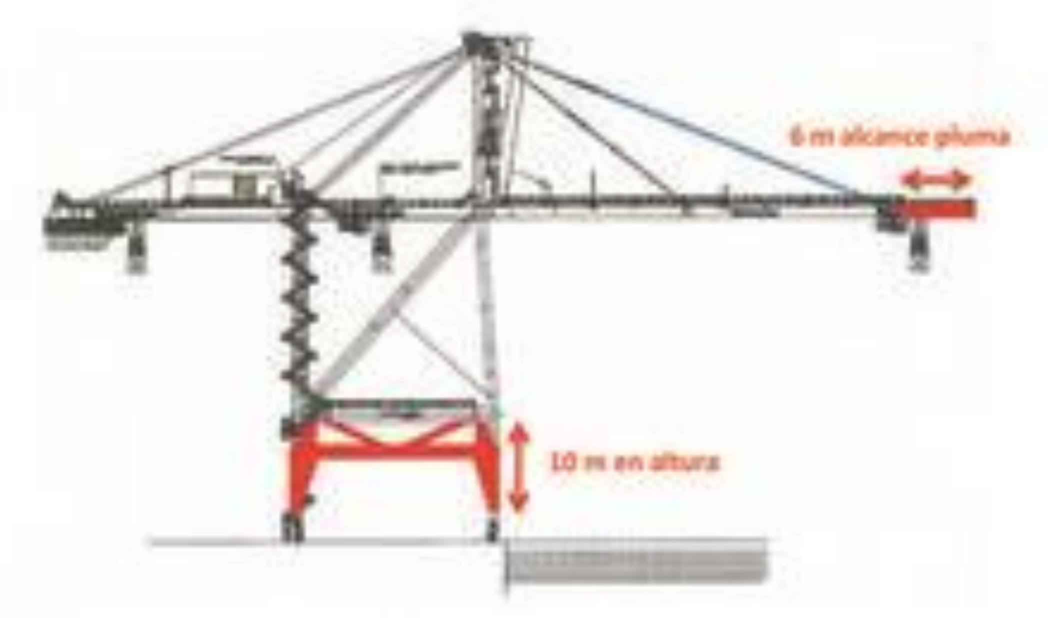
Our reply to increasing vessel size

- **Semi-automation / Automation**
- **Increasing size of cranes**



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Our reply to increasing vessel size

Noatum apuesta por el puerto de Valencia

▶ La firma concesionaria de la principal terminal de contenedores del recinto del Grao asegura que duplicará su capacidad de gestión de mercancías a partir de 2019 cuando termine la obras de ampliación y aumento de grúas, en las que invertirá 100 millones de euros.

Levante
EL MERCANTIL VALENCIANO

▶1 Abril, 2016

▶21 Enero, 2015

Noatum invierte 24 millones para recibir buques de más de 18.000 contenedores

▶ La concesionaria de la mayor terminal del puerto de Valencia instalará grúas nuevas de hasta 48 metros y adaptará otras seis a partir de marzo

JOSÉ LUIS ZARAGOZÁ VALENCIA

■ El puerto de Valencia entrará de lleno a partir de marzo de 2015 en la carrera iniciada durante estos últimos años por los principales puertos del Mediterráneo para conseguir más escalas de barcos de las grandes navieras. Noatum Container Terminal —la sociedad que explota el principal recinto de carga y descarga de contenedores en el Grao— tiene previsto adaptar sus instalaciones a las necesidades de los megabuques con capacidad de carga superior a los 18.000 TEU (unidades equivalentes a veinte pies) con la incorporación de tres nuevas grúas *Malaccamax* que permitan gestionar estos gigantes del mar. Eso supondrá una inversión de unos 24 millones de euros, según aseguran ayer fuentes de Noatum Ports.

La firma concesionaria de la mayor terminal de contenedores del puerto de Valencia tiene previsto reformar tres grúas para elevarlas hasta 42 metros, mientras «está en fase de estudio» adaptar hasta 48 metros otras tantas ubicadas en sus instalaciones. Los muelles controlados por la compañía del grupo inversor JP Morgan, que junto con los de MSC y TCV acaparan 4,4 millones de contenedores anuales, tiene entre otros clientes a la naviera Maerks. El barco de la empresa danesa *Morten Maerks* —con capacidad para 18.000 TEU aunque sin llegar a ese tonelaje— escaló en el puerto de Valencia el pasado viernes, lo que supuso un hito histórico y responde a la remodelación de servicios que está suponiendo la entrada en funcionamiento de la alianza entre Maersk Line y Mediterranean Shipping Company, denominada *2M*.

Noatum Container Terminal ha acelerado la ampliación de sus muelles para mejorar su capacidad

Noatum Valencia maneja la principal terminal pública de contenedores de España, pues ofrece 2.300 metros de muelle y 19 grúas capaces de asegurar el servicio a grandes barcos de transporte de mercancías.

El espacio que sí está adaptado a las nuevas medidas de los mayores buques portacontenedores del mundo es APM Terminals Algeciras, directo competidor de España del emplazamiento de Valencia junto con el de Barcelona.

El recinto andaluz se ha convertido en escala regular de los Triple-E, buques portacontenedores de Maersk. El proyecto Algeciras 2014 supuso una inversión de 42 millones de euros para comprar cuatro grúas nuevas. El grupo gestor de la instalación en la zona sur del puerto del Valencia aglutina el 51,3 % del tráfico total. Prevé inversiones de 100 millones de euros para modernizar instalaciones y el material auxiliar, así como ampliar la línea de atraque de barcos a través del muelle de Costa, hasta ahora subarrendado a una concesionaria de vehículos.

Terminal de Noatum en el puerto de Valencia. JOSÉ ALEIXANDRE

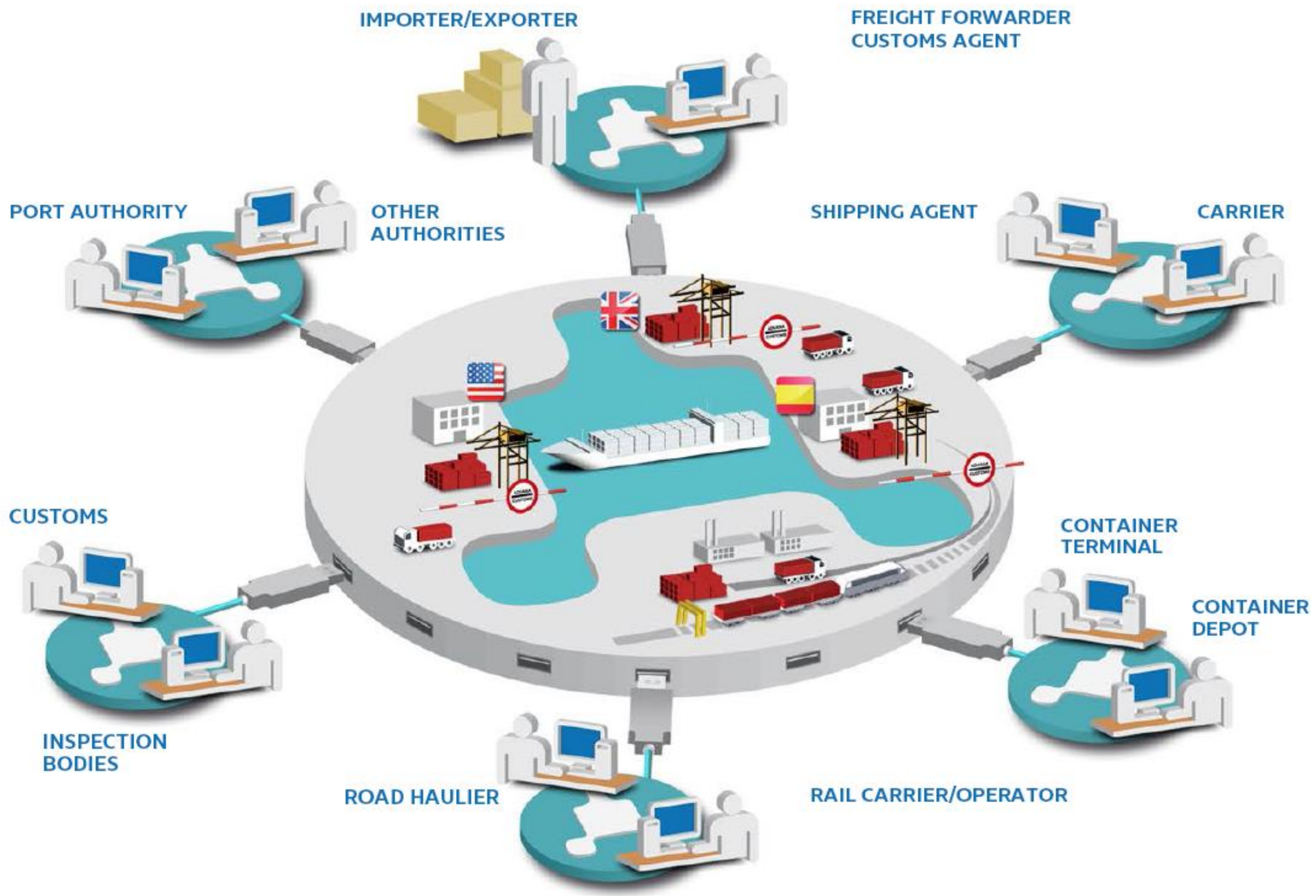
Trade facilitation, less paperwork, more efficiency:

Let's cut the red tape

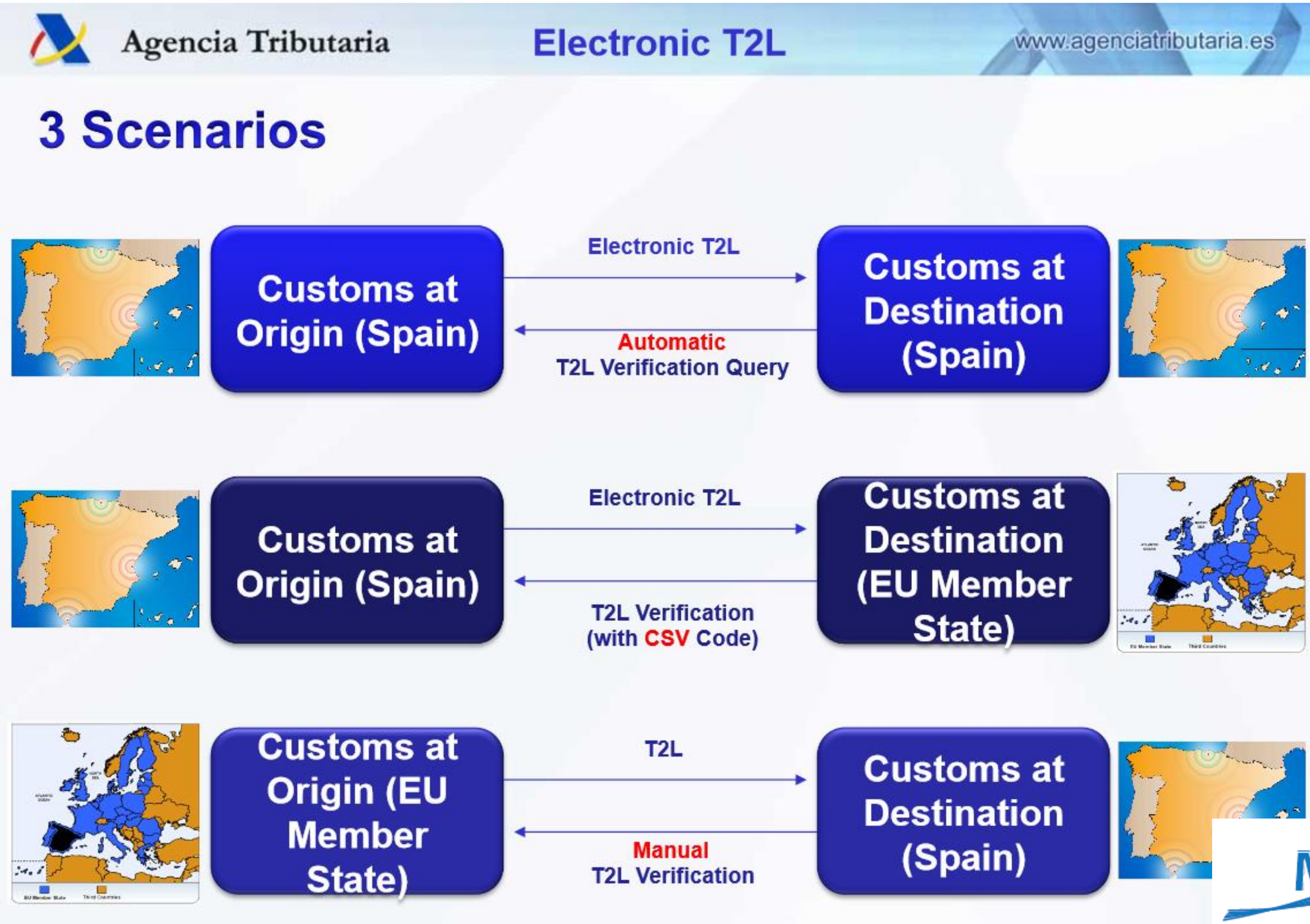
Innovative Solutions

Solutions to Improve Port Services Efficiency:

valenciaport pcs.net
Port Community System



39.8 million Euros of net savings in Spain acc. to Customs



Co-financed by the European Union

Trans-European Transport Network (TEN-T)

Innovative Solutions

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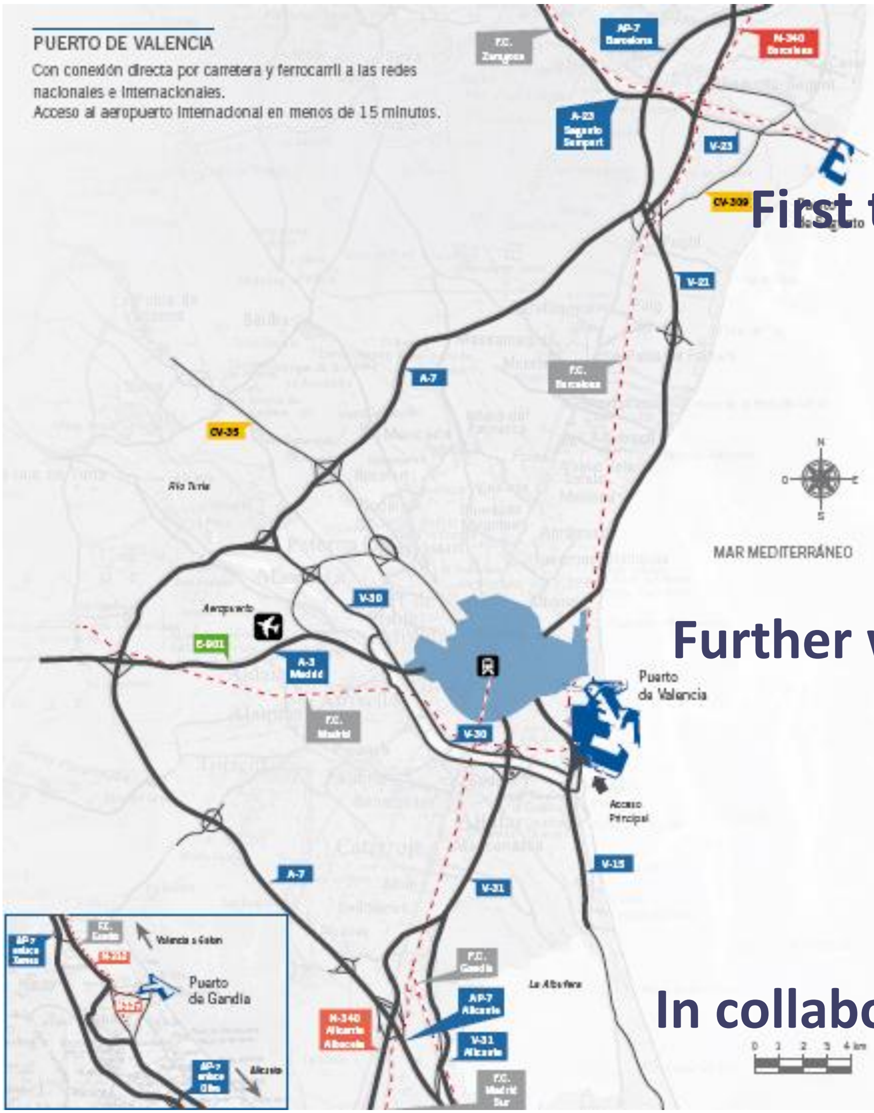
Automation as the only way to grow



Port of Valencia Automatic Gates

First tests: MOS4MOS

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Further work: MEDITA
MEDITERRANIAN INFORMATION TRAFFIC APPLICATION

Med — L'Europe en Méditerranée / Europe in the Mediterranean
Projet cofinancé par le Fonds Européen de Développement Régional (FEDER)
Project cofinanced by the European Regional Development Fund (ERDF)

In collaboration with

Livorno Port Authority
INTERPORTO TOSCANO A.Vespucci s.p.a
REGIONE TOSCANA

Intermodality and Rail Corridors

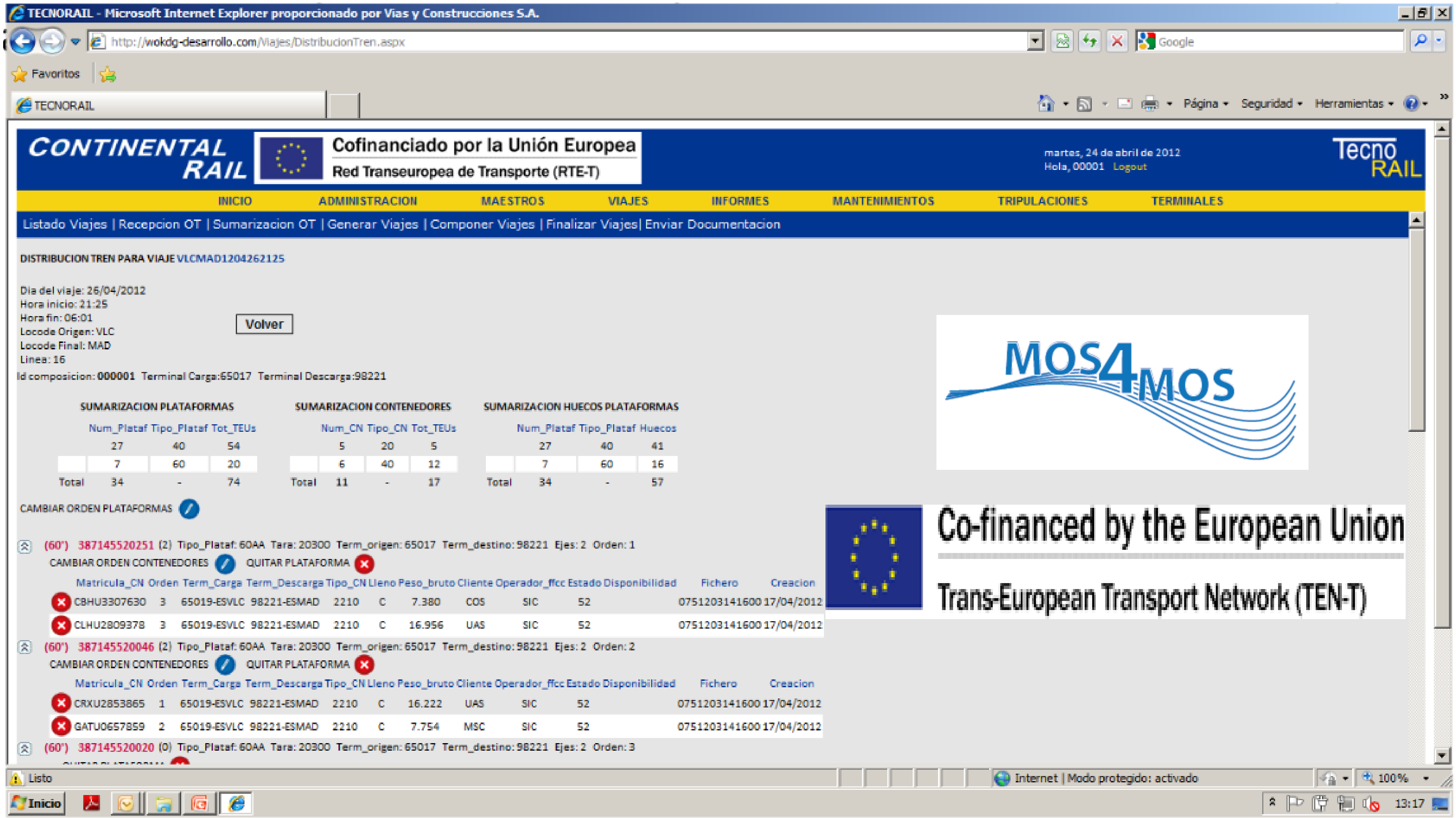
Rail corridors:

- **Madrid – Centro – Portugal**
- **Mediterráneo - Atlántico**
- **Mediterráneo**

58 trains per week

FUNDACIÓN valenciaport

First RTMS in Spain developed by Continental Rail: 2.6 million Euros of net profits for MOS4MOS partners



Railway Transport Management System Prototype

Energy efficiency

GREENCRANES is a pilot action involving three Member States: **Spain, Italy and Slovenia**, including public administrations, strategic ports, port industrial partners and innovation centres.

Project Consortium

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noatum

LUKA KOPER Port of Koper

KONECRANES

ABB

MIT

RINA

Autorità portuale Livorno

Global Service Srl

Scuola Superiore Sant'Anna di Studi Universitari e di Perfezionamento

External Companies

TERBERG BENSCHOP Manufacturer of special vehicles

alfaland soluciones integrales para la logística

Cummins Westport

gasNatural fenosa

HAM

KALMAR

ecomotive solutions

HVM High Vacuum Maintenance

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ECO-RTG RETROFITTING

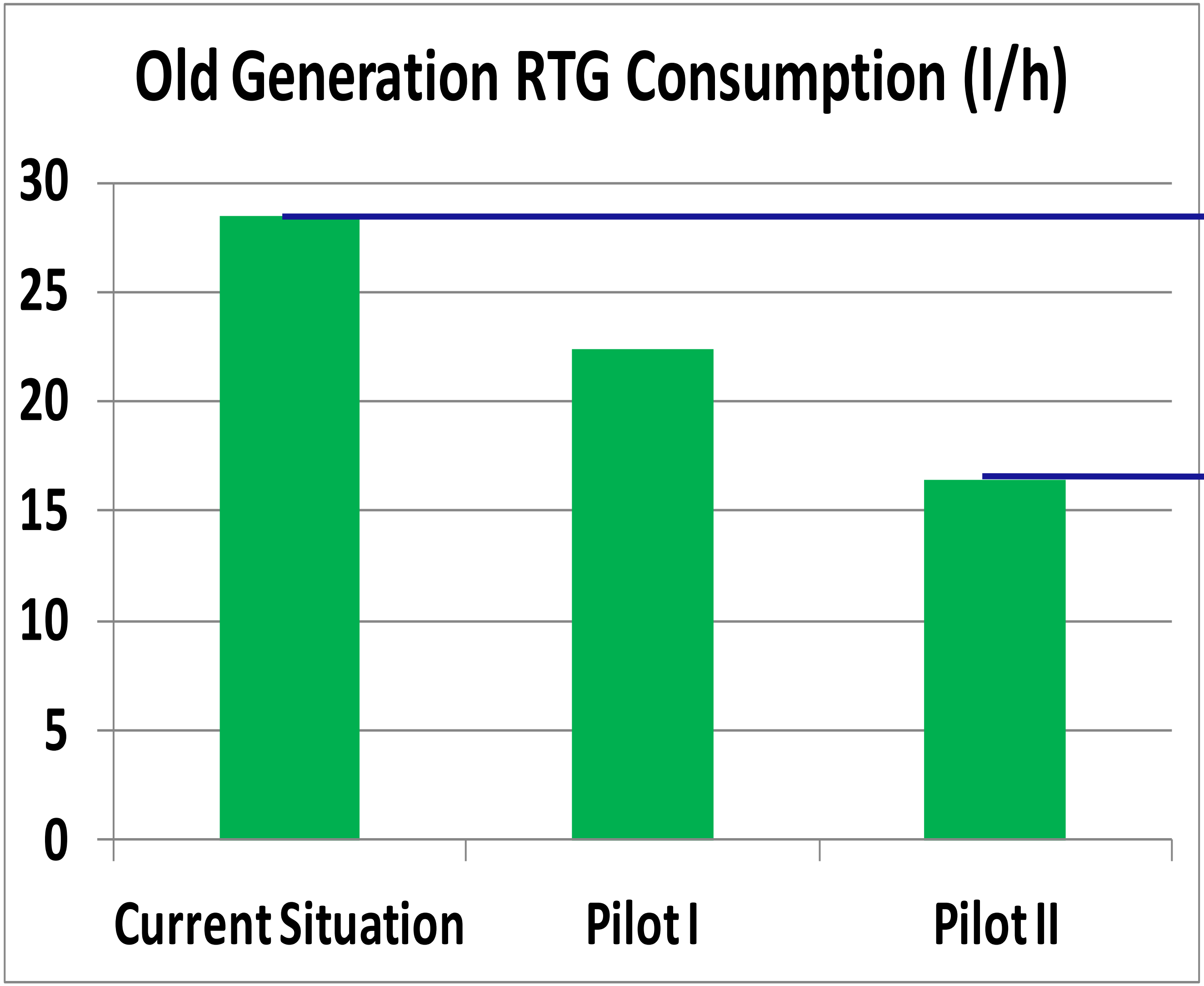
Green Cranes

Co-financed by the European Union

Trans-European Transport Network (TEN-T)

Green Cranes

Co-financed by the European Union
Trans-European Transport Network (TEN-T)



45 % Decrease

Fuel Cost €
Emissions

FUNDACIÓN valenciaport

THE FIRST EUROPEAN LNG TERMINAL TRACTOR

https://www.youtube.com/watch?v=oudKsHQSasA

Green Cranes

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Quick Deployment of GREENCRANES Products in the Port Sector

portstrategy insight for senior port executives

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Home » News » LNG » LNG tractors for new Turkish terminal

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LNG tractors for new Turkish terminal

08 Jul 2014

Netherlands-based Terberg Benschop is to supply 40 LNG tractors for Asyaport's new container terminal, being built in Turkey on the Marmara Sea.

Terberg will supply 40 LNG tractors for Asyaport's new container terminal

The YT222 tractors with 170kW Mercedes engines are powerful enough to handle two trailers carrying 20 inch containers.

Asyaport says it chose LNG as a fuel for its environmental properties and the fact that it's considerably cheaper in Turkey than diesel. There is also an LNG filling station near the terminal, so maintenance is easy.

Terberg's Turkish distributor Portunus, based in Istanbul, will provide service and support. Delivery will begin in January 2015.

Asyaport's new deep-water container terminal is strategically located as a transhipment hub for containers destined for the Black Sea via the Bosporus. It will handle vessels carrying up to 18,000 teu and will have an annual capacity of around two million teu.

Investors in the terminal include Terminal Investment Ltd SA (TIL), the terminal operating subsidiary of Mediterranean Shipping Company (MSC), and the Soyuer Group in Turkey.

Following this order, Terberg will also supply 28 tractors to TIL's terminal at Lomé in Togo, West Africa.

SEAterminals

https://www.youtube.com/user/FValenciaport/featured

SEA TERMINALS

Smart, Energy Efficient and Adaptive Port Terminals

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TERBERG BENSCHOP Manufacturer of special vehicles
amplía)))
BPO BALTIC PORTS ORGANIZATION
NACCO MATERIALS HANDLING GROUP
Autorità portuale Livorno
GS Global Service Srl
SCUOLA SUPERIORE SANT'ANNA PISA
OLT Offshore LNG Toscana

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INGENIERIA DE APLICACIONES ENERGÉTICAS, S.L.

SEAterminals

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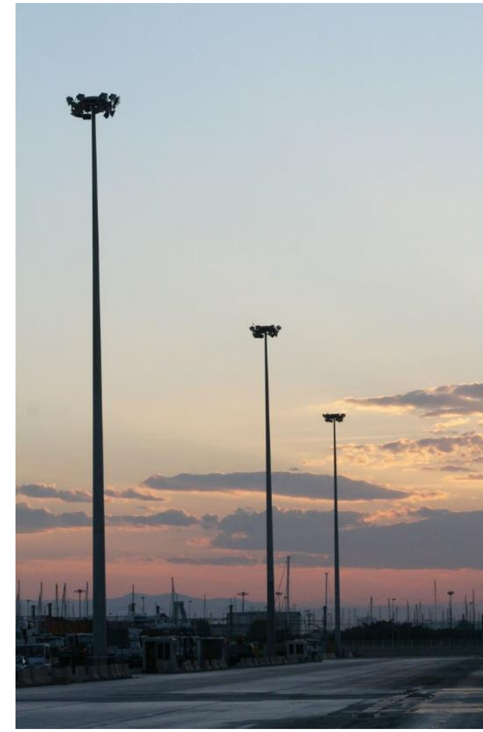
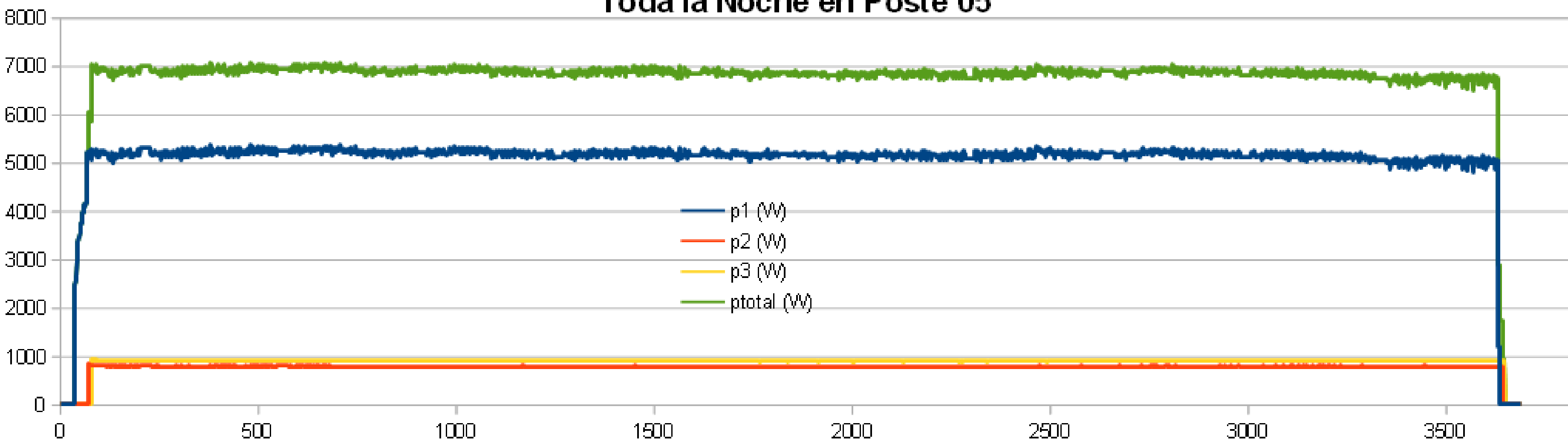
DYNAMIC LIGHTING:

80% SAVINGS

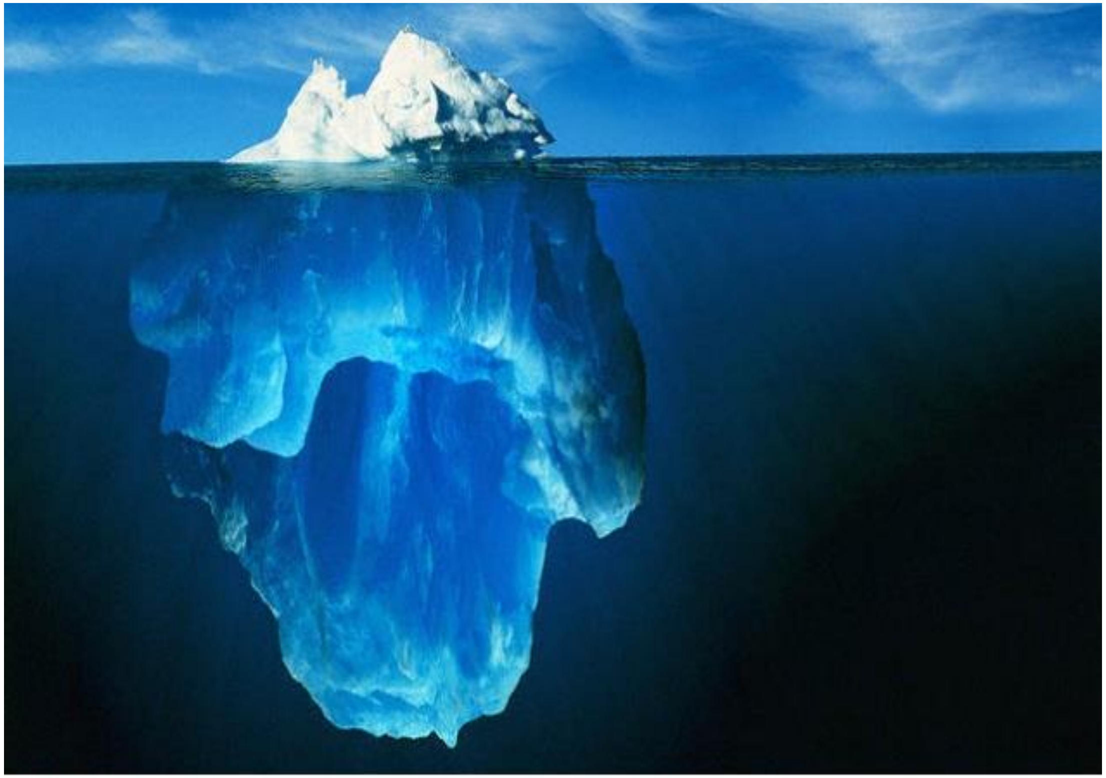


Toda la Noche en Poste 05



& many other initiatives

A port is what you can see, and that other 90% makes it strong and stable ….



Innovation is the key to make the port foundations solid enough for the port to face current challenges

THANKS FOR YOUR ATTENTION!

http://www.fundacion.valenciaport.com/fundacion/

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