

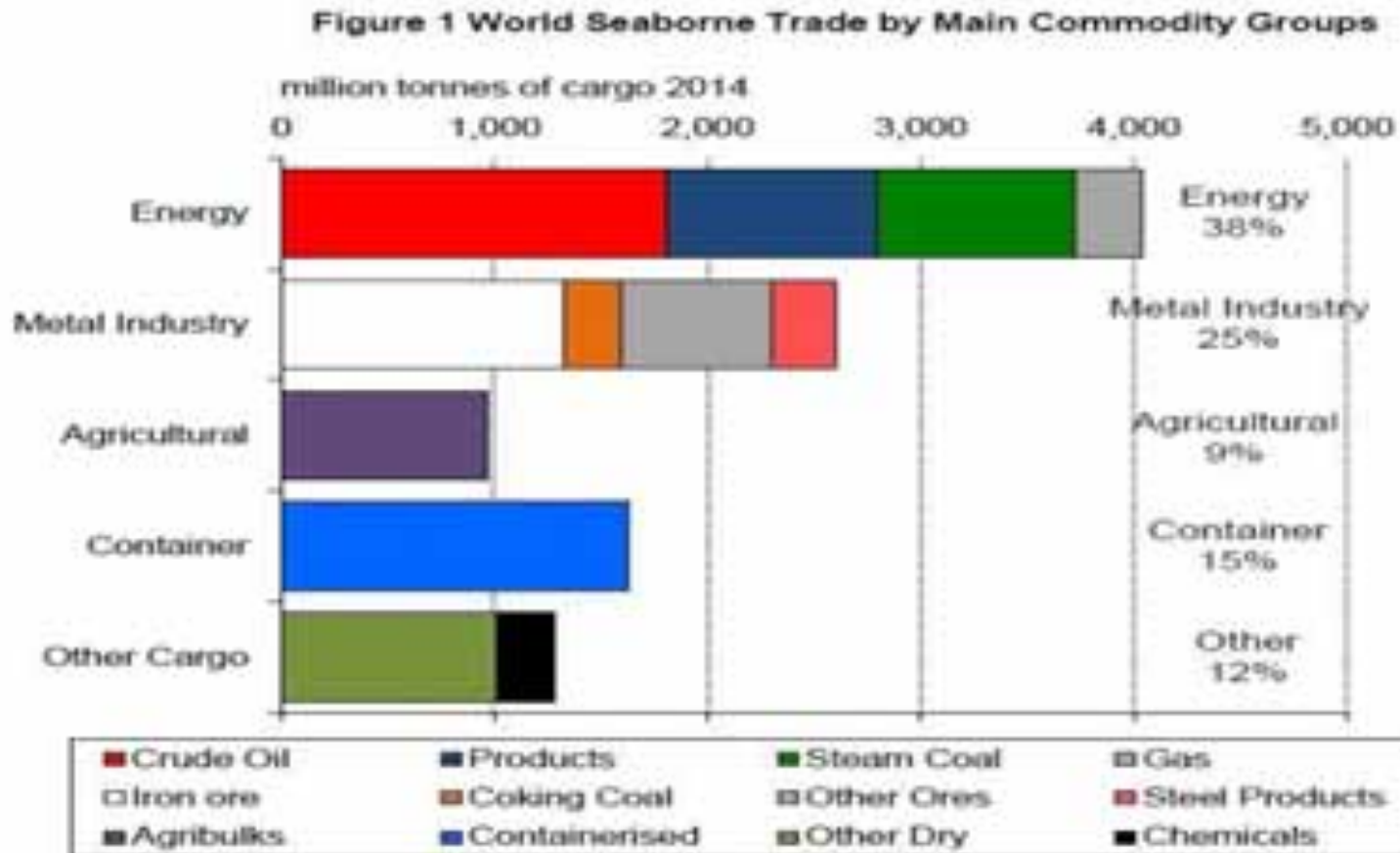
Did you know?



Did you know?



- Energy as a commodity group is responsible for 38% of the overall world seaborne trade



Source: Clarkson Research Services, February 2016

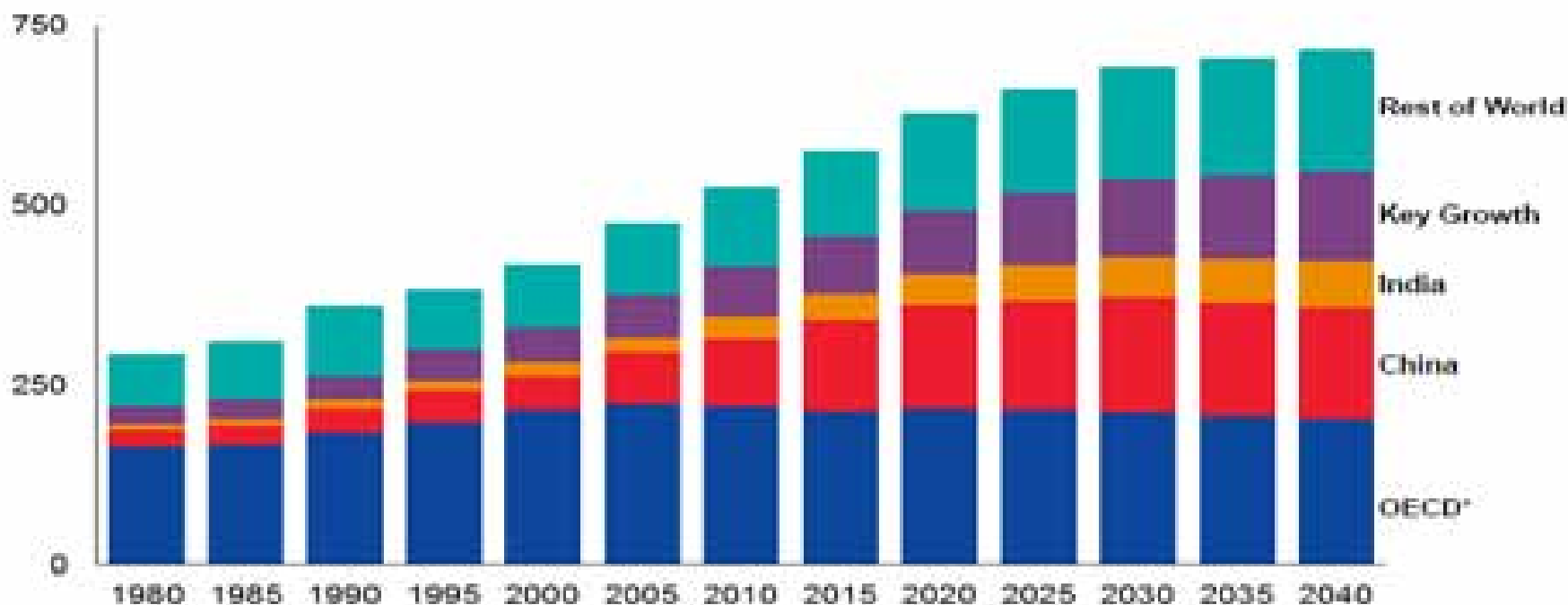
Did you know?



Developing Economies Dominate Growth

Demand by Region

Quadrillion BTUs



*Mexico and Turkey included in Key Growth countries

Did you know?



- **The Port of Eemshaven** accounts for the production of about **8,000 MW of energy**, amply sufficient to **supply half of the Netherlands with**. (Source: Port of Eemshaven)



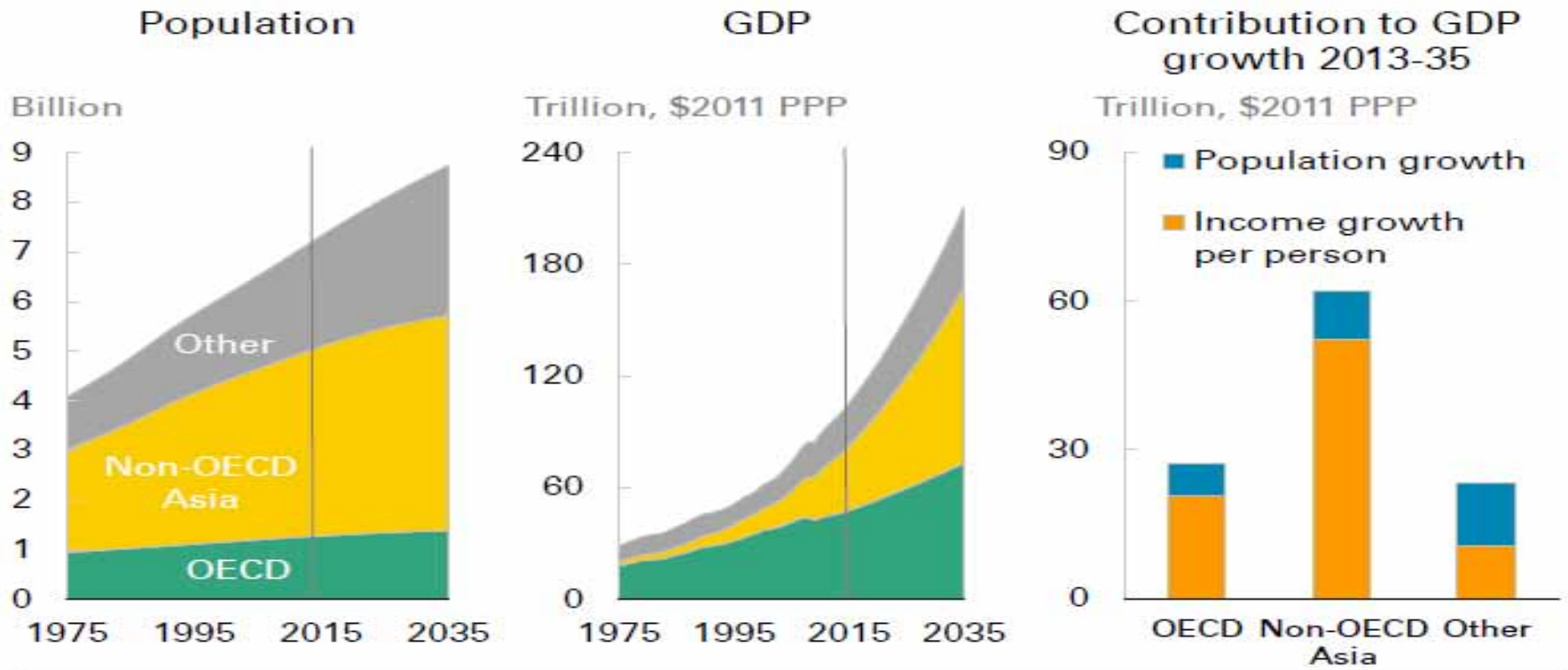
Source: Port of Eemshaven

Did you know?



- **Population growth and increase in income per person will be the main drivers behind the growing energy demand**

Global population and increases in income per person...





Did you know?



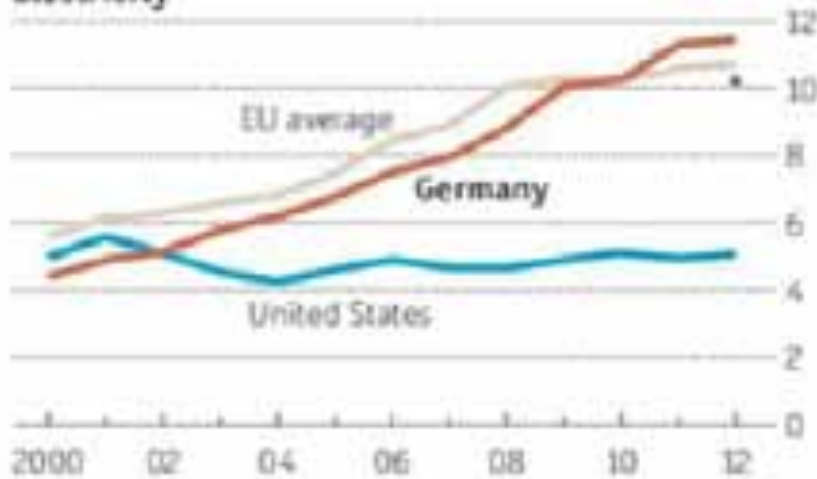
Did you know?



- Europe's main 'energy handicap' are high industrial energy prices

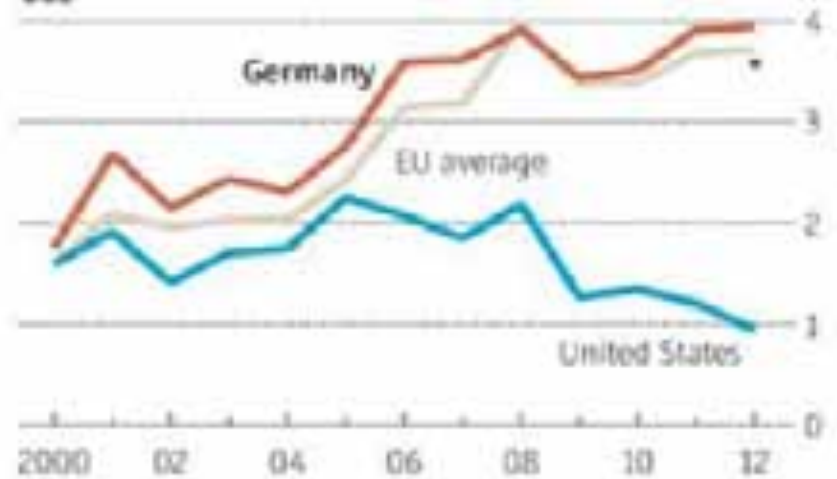
Industrial energy prices, € cents per kWh

Electricity



Source: Enerdata/McKinsey

Gas



*Estimate

(Source: The Economist. Tilting at Windmills. June 15th 2013)

Did you know?



- **As one of the first ports in Italy, the Port Authority of Genoa has developed a Port Energy Environmental Plan (PEEP) to promote the use of renewable sources and boost energy efficiency in port areas.**
- **this integrated strategy would allow to save around 197,000 t of CO2 by 2020**
(source: M. Acciaro, H. Giara, M.I. Cusano, Energy management in seaports: a new role for port authorities)

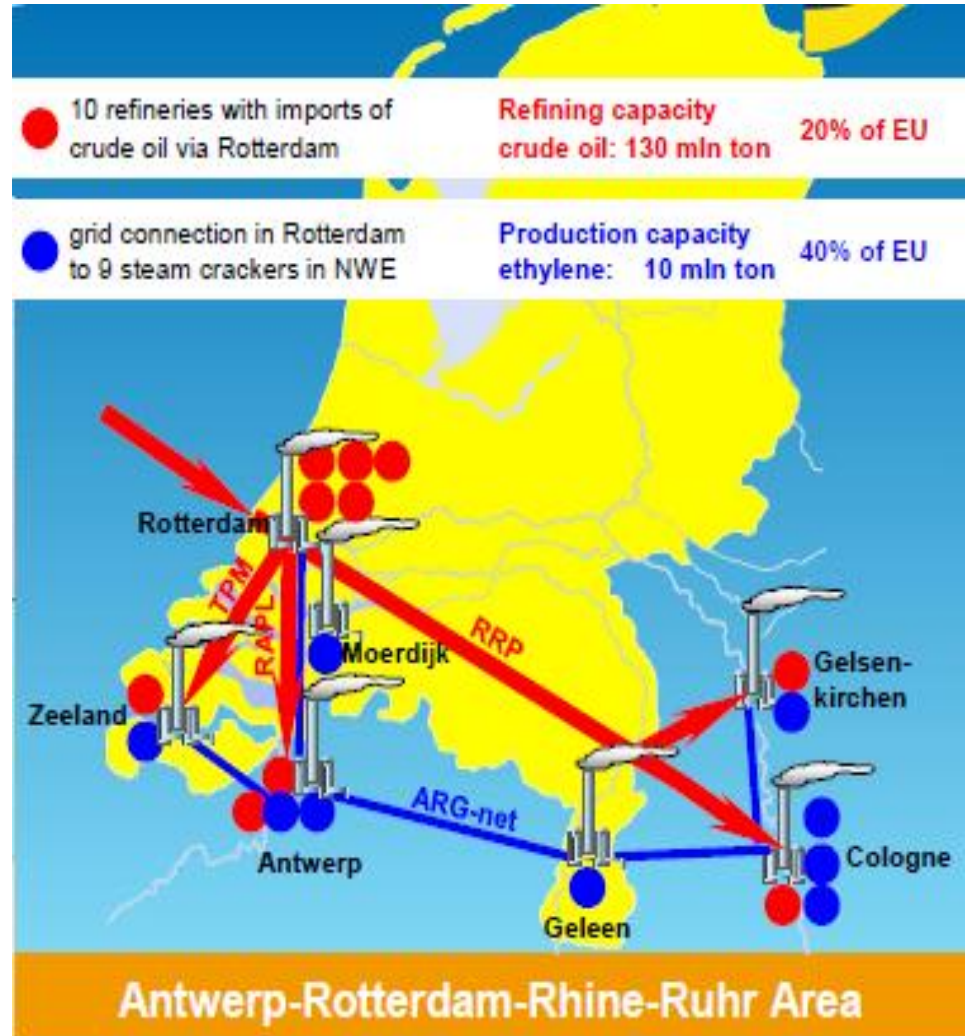


Did you know?

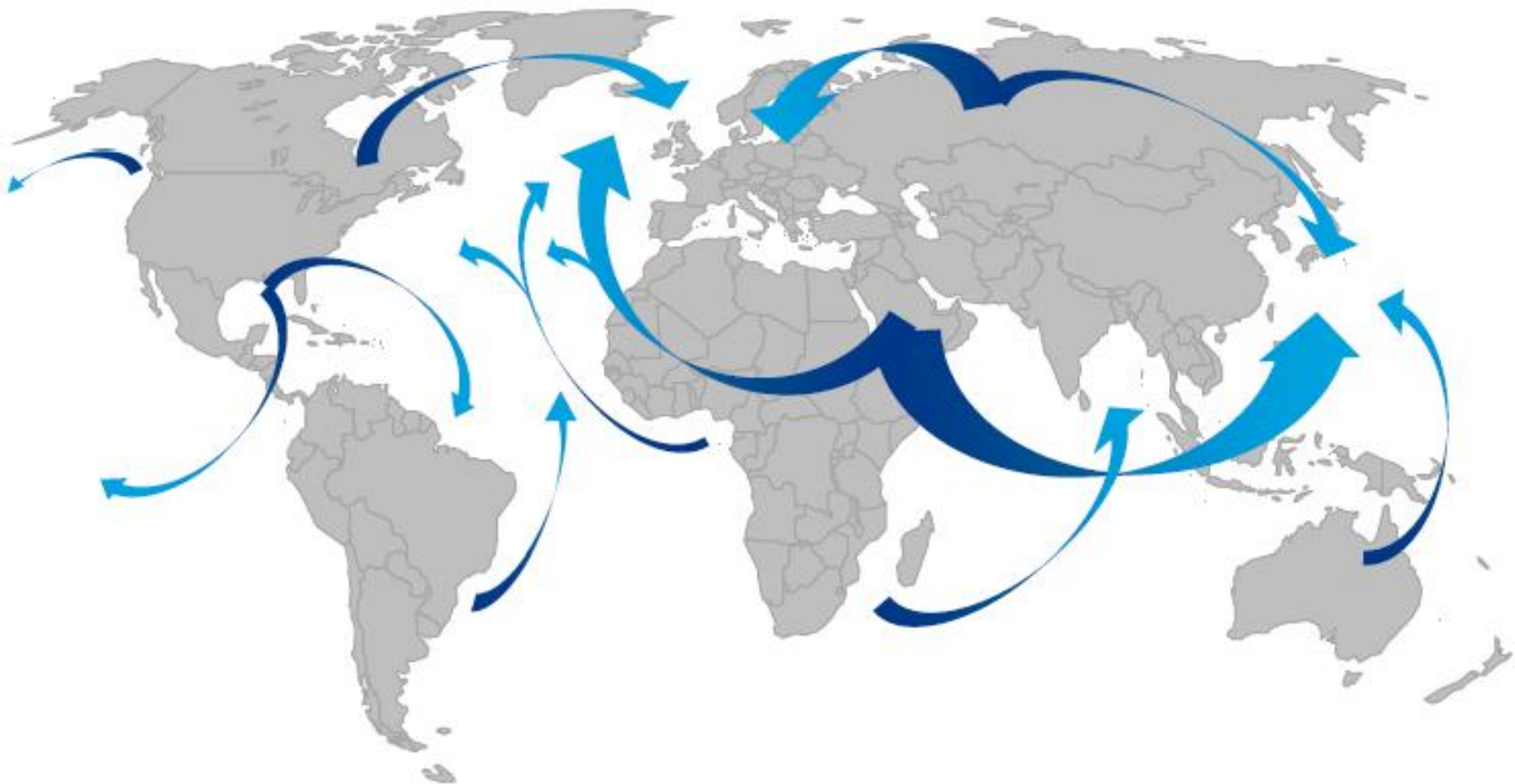


- The Antwerp-Rotterdam-Rhine-Ruhr area is the largest oil and chemical cluster in Europe

- (source: Port Authority of Rotterdam: Energy scenarios for the port)



Energy Trade



Indicative trade flows

ExxonMobil



European Ports Work!



Did you know?



- It is estimated that the Arctic holds the world's largest remaining untapped gas reserves, as well as a large oil reserves



Did you know?



- **20% of all electricity consumed on the island of Ireland is generated in Dublin Port**
- **32% of all petroleum products consumed on the island of Ireland come through Dublin Port**

(Source: Dublin Port)



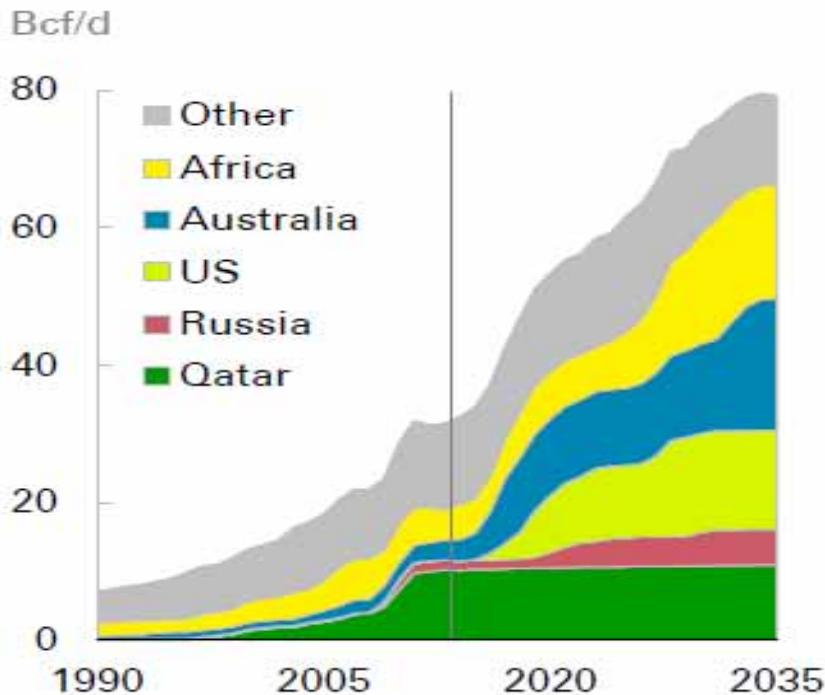
Did you know?



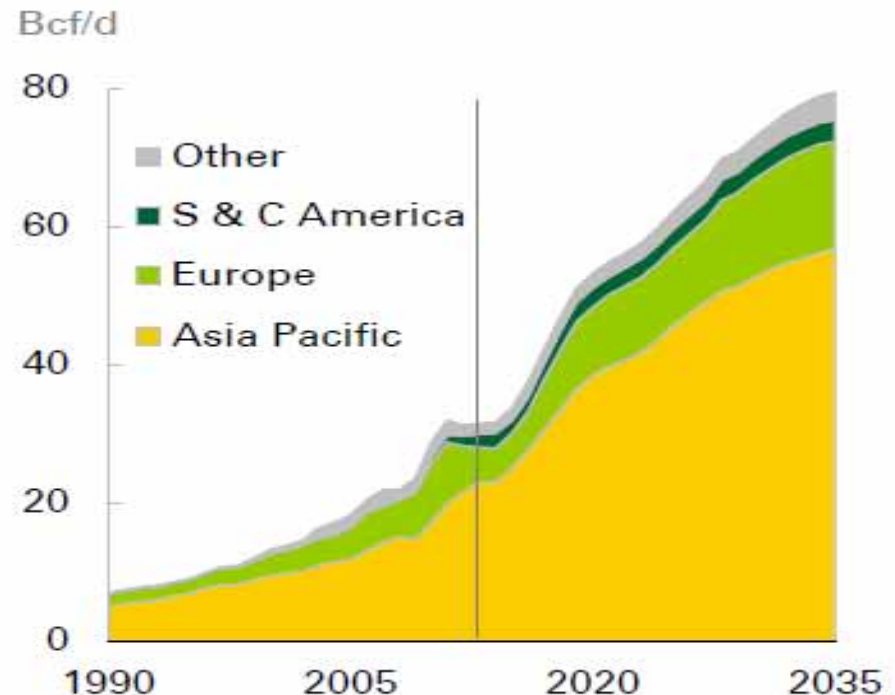
LNG supply is poised for a growth spurt...



Global LNG supply

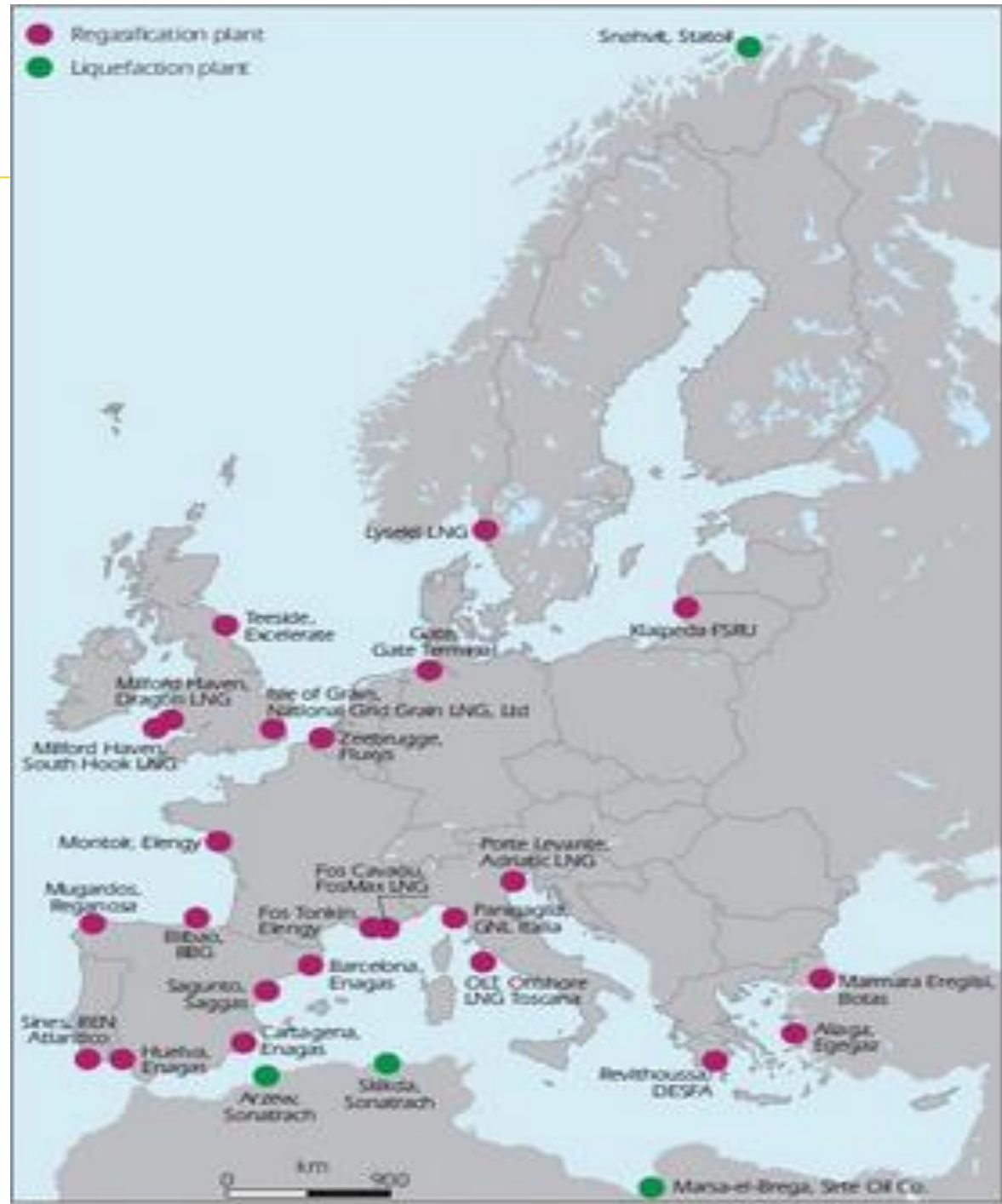


Global LNG demand



Did you know?

- Ports are vital to the European LNG sector
- Map showing LNG terminals in Europe
- (Source: IEA)



This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries, and to the name of any territory, city or area.

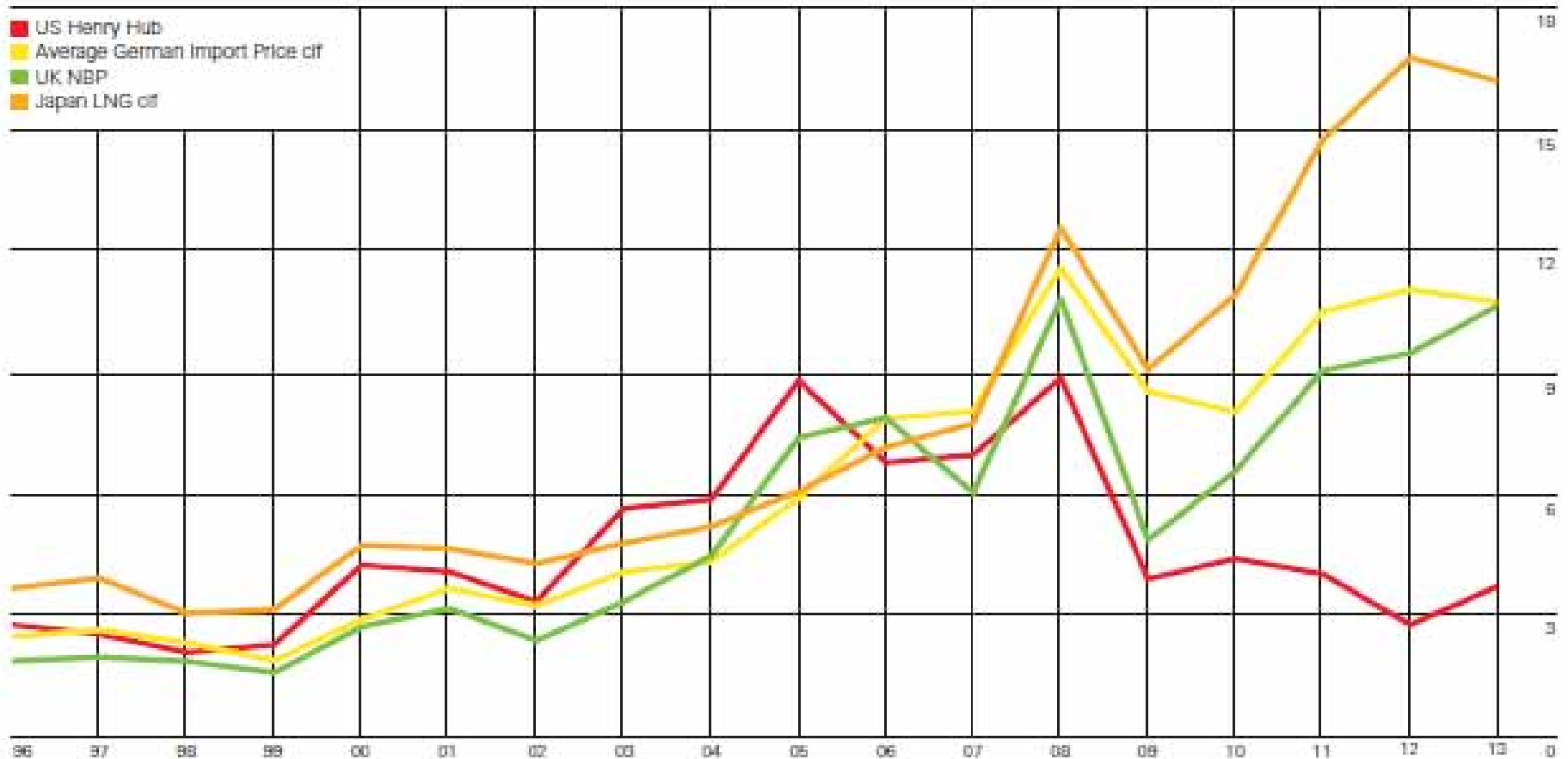
Did you know?



- **Gas prices are particularly low in the USA**

Prices
\$/Mmbtu

Source: BP statistical review of world energy 2014



Did you know?



Did you know?



- **Half of the crude oil that enters Sweden does so via the Port of Gothenburg**



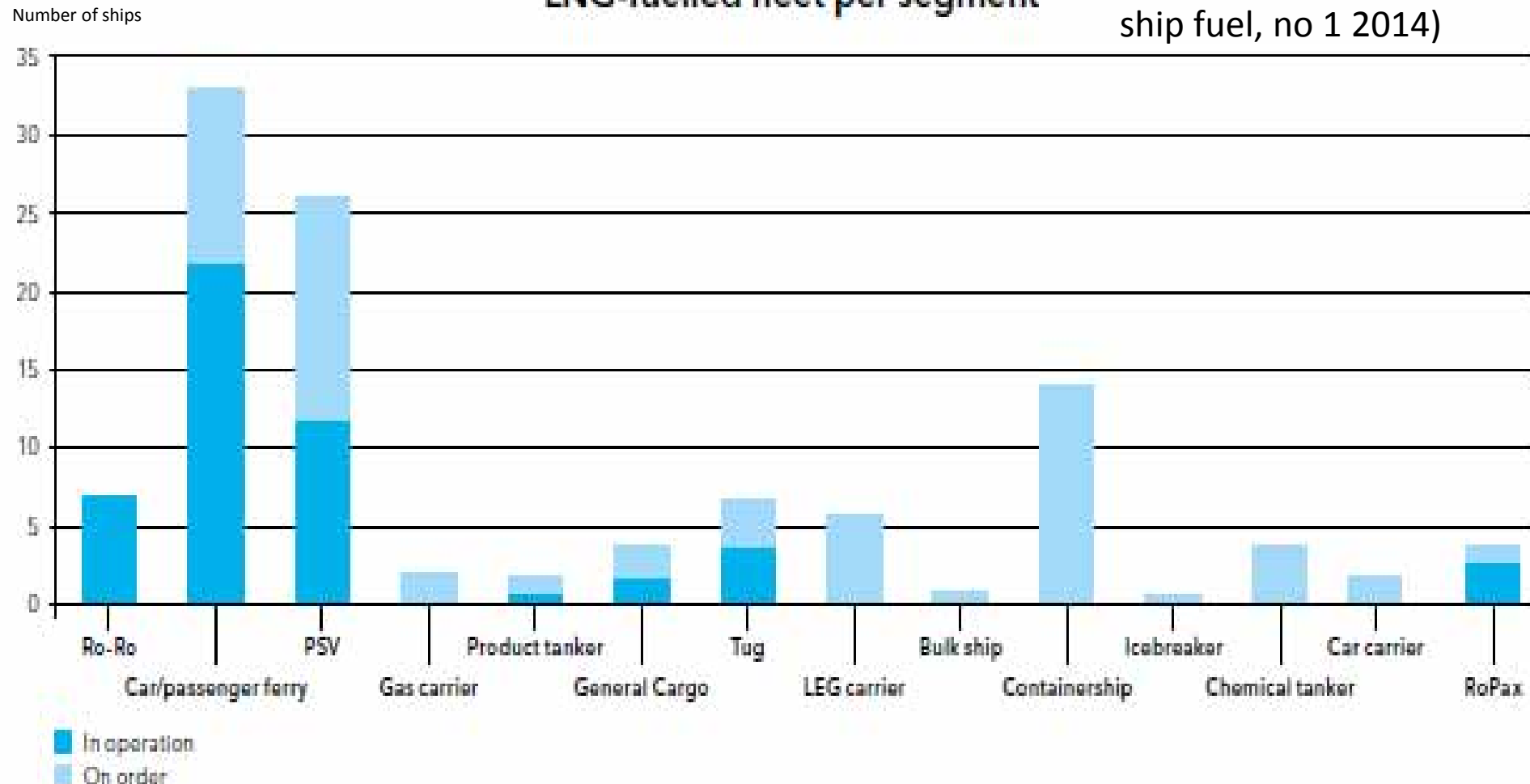
Did you know?



- **Already a more than 50 ships use LNG as a fuel**

LNG-fuelled fleet per segment

(Source: DNV GL, LNG as ship fuel, no 1 2014)

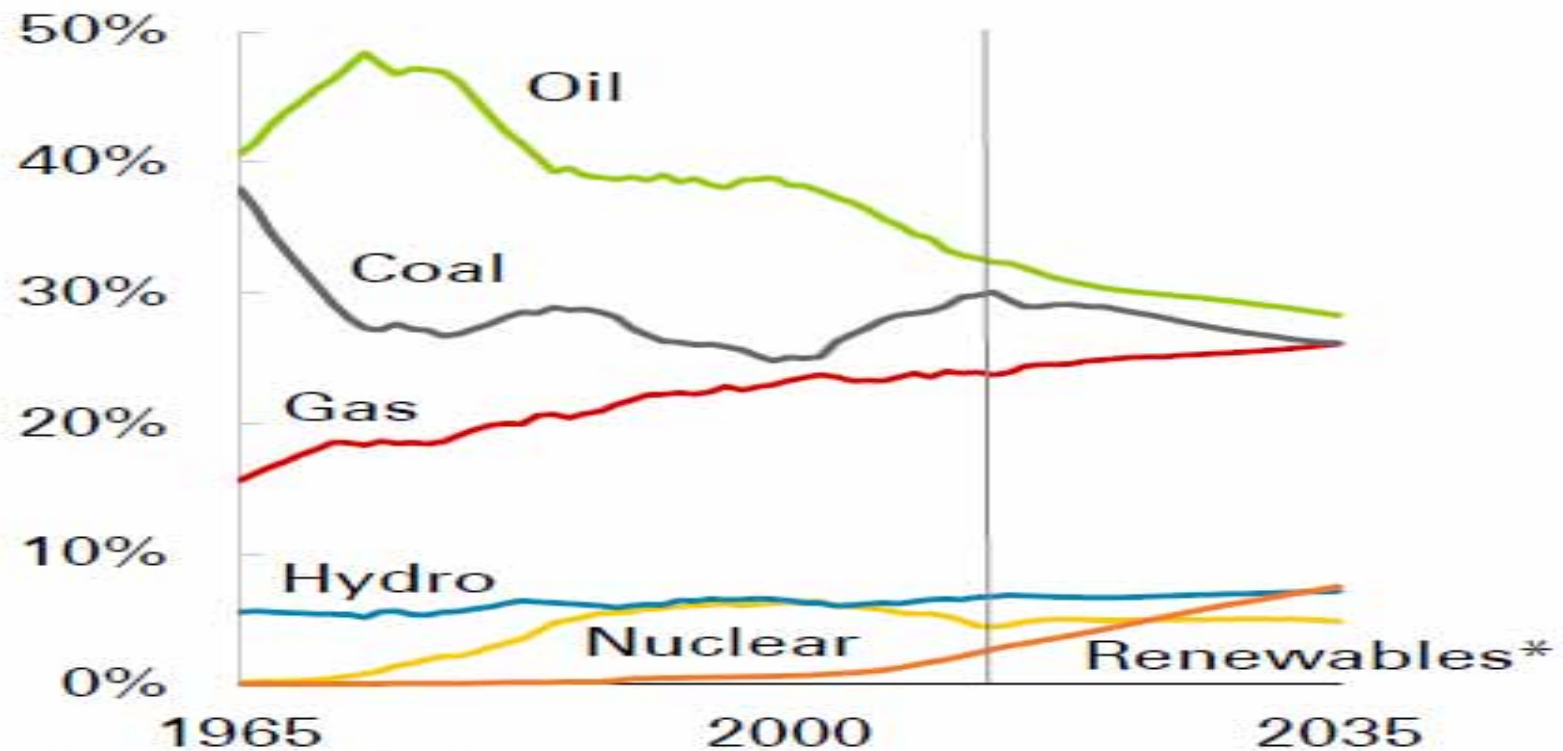


Did you know?



- In the future, fossil fuels will continue to provide most of the world's energy (Source: BP energy outlook 2035)

Shares of primary energy



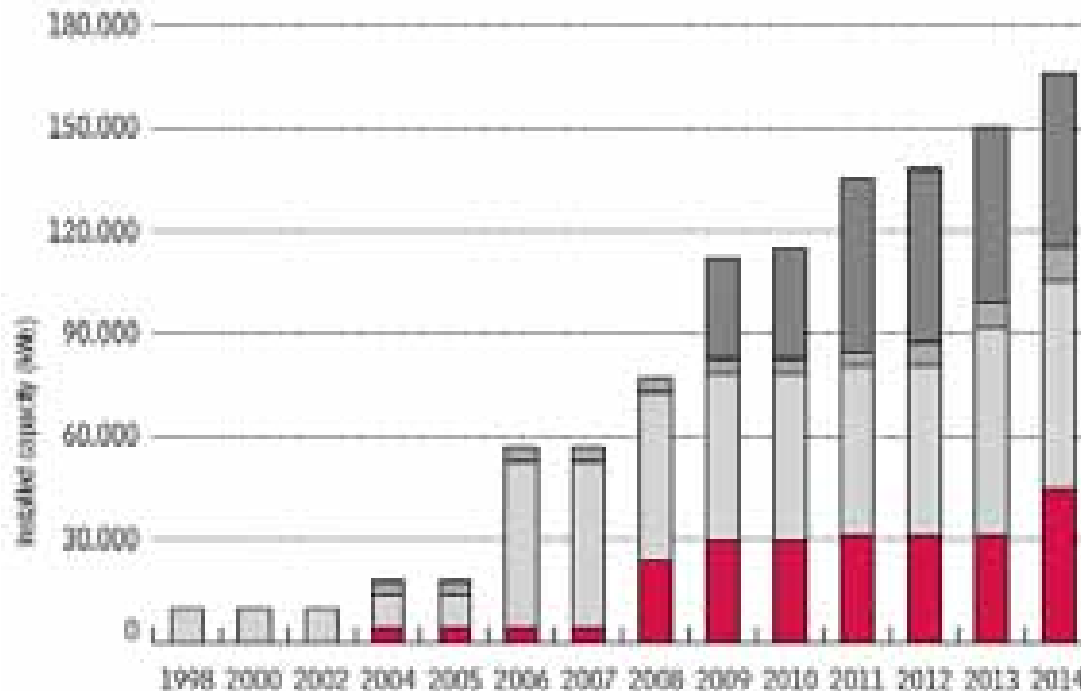
*Includes biofuels

Did you know?



- During the last 15 years, the Port of Antwerp has seen a significant growth in renewable energy capacity (source: Port of Antwerp)

INSTALLED CAPACITY RENEWABLE ENERGY IN THE PORT OF ANTWERP



**1,055,823
kWe**

**INSTALLED
COGENERATION
CAPACITY IN THE
PORT
OF ANTWERP**

- Solar panels
- Biogas
- Biomass
- Wind power



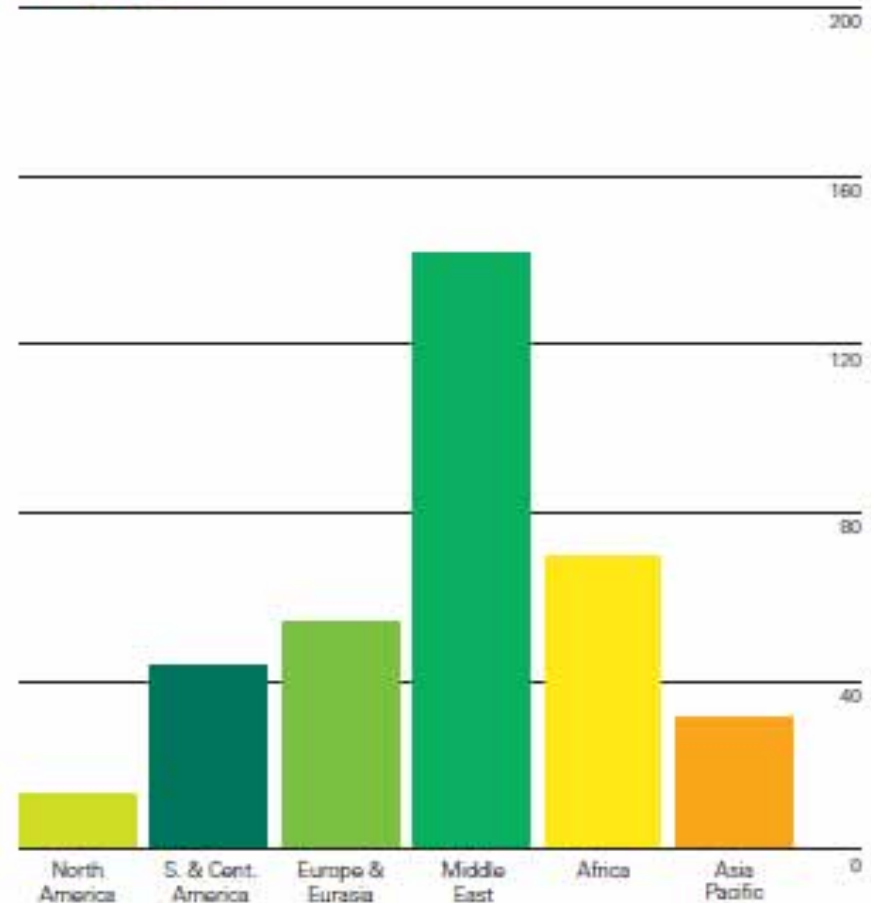
Did you know?



- **The world proven gas reserves at end-2013 stood at 185.7 trillion cubic metres (tcm), sufficient to meet 55.1 years of global production**
- (source: BP statistical review of world energy 2014)

Reserves-to-production (R/P) ratios Years

2013 by region



Did you know?



Did you know?



- **The Seawise giant (or « Jahre Viking »), an oil tanker, was the largest ship ever built.** (<http://www.largestships.com/biggest-oil-tankers/>)



QE2: 254 metres long x 34 metres breadth and has a gross tonnage of 70,327



Eiffel Tower: 310.7 metres high with a gross weight of 10,100 tonnes



Empire State Building: 381 metres high with a gross weight of 300,000 tonnes



The Jahre Viking: 410.5 metres long x 68.8 metres breadth x 24.6 metres draft

Did you know?



- **The Port of Barcelona is an important oil port.**
 - The Port of Barcelona's total storage **capacity for oil products is 2.6 Million m³**
 - The **new berth "34B"**, situated in the Port of Barcelona, is **one of the biggest facilities dedicated exclusively to oil products in the Mediterranean**
 - The **oil products traffic** increased significantly in the last 5 years, achieving **6.2 million tonnes in 2013**

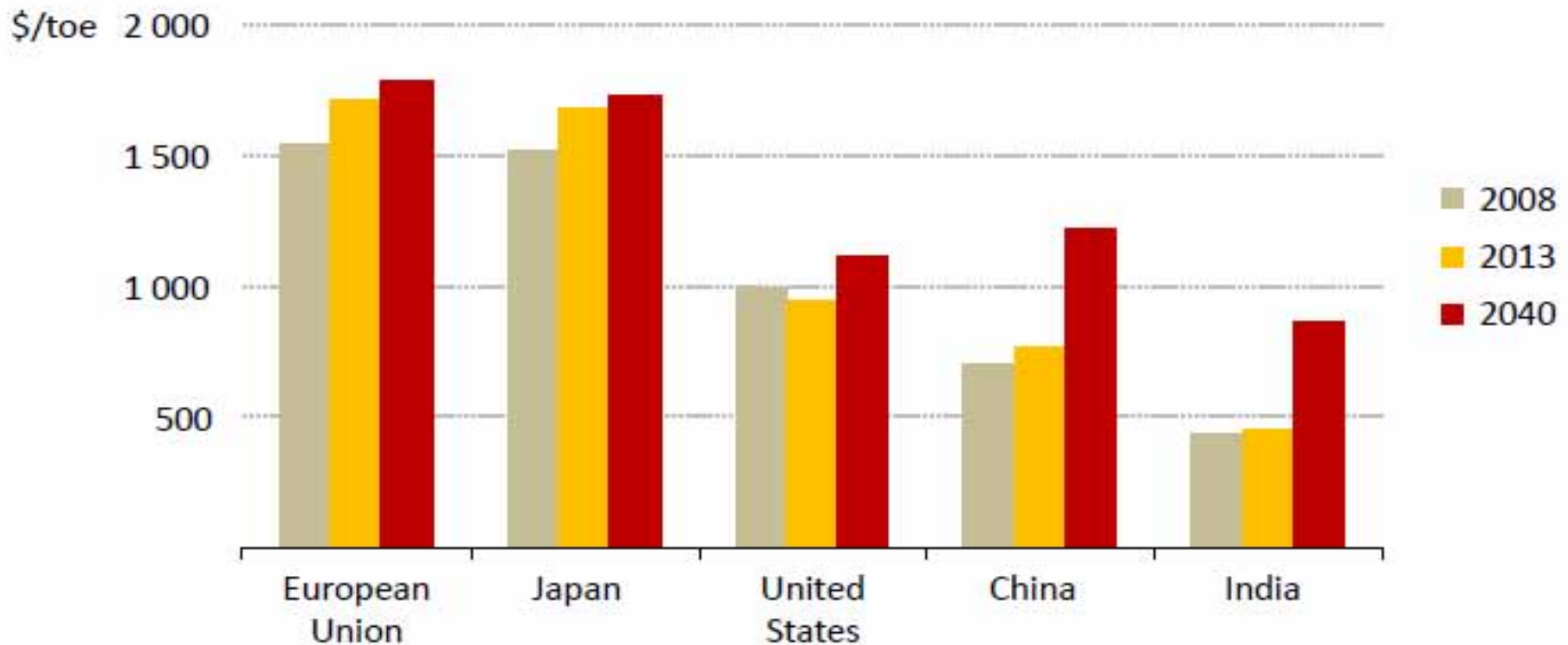


Did you know?



- Energy prices are particularly high in Europe and Japan, compared to other big economies such as the US, China and India. This situation will remain so in the future...

Weighted average cost of energy paid by consumers



Did you know?



- The EU-28 is highly dependent on the import of fossil fuels

EU-28 Energy Import Dependency

By Fuel

	1995	2000	2005	2010	2011	2012
Total	43.0%	46.7%	52.2%	52.7%	53.9%	53.4%
Solid Fuels	21.5%	30.6%	39.4%	39.4%	41.7%	42.2%
of which Hard Coal	29.7%	42.6%	55.7%	57.9%	62.3%	62.5%
Petroleum and Products	74.0%	75.7%	82.1%	84.4%	85.1%	86.4%
of which Crude and NGL	73.0%	74.5%	81.3%	84.6%	85.5%	87.8%
Natural Gas	43.4%	48.9%	57.1%	62.1%	67.1%	65.8%

- (Source: EU energy in figures statistical pocketbook 2014)



Did you know?



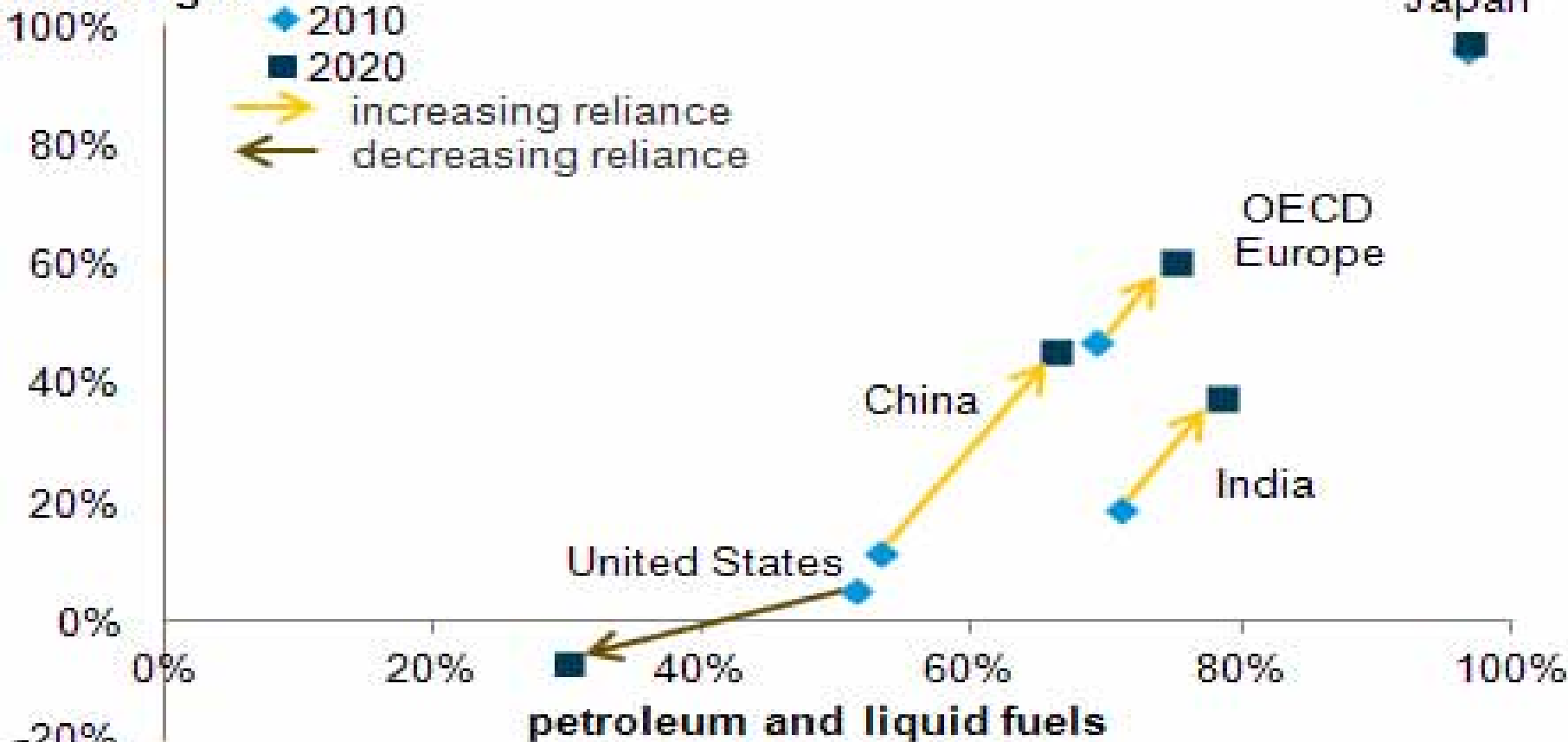
Did you know?



- **Europe's gas import reliance is projected to increase on the short term** (Source: <http://www.eia.gov/todayinenergy/detail.cfm?id=14691>)

Changing import reliance (2010-20)

natural gas



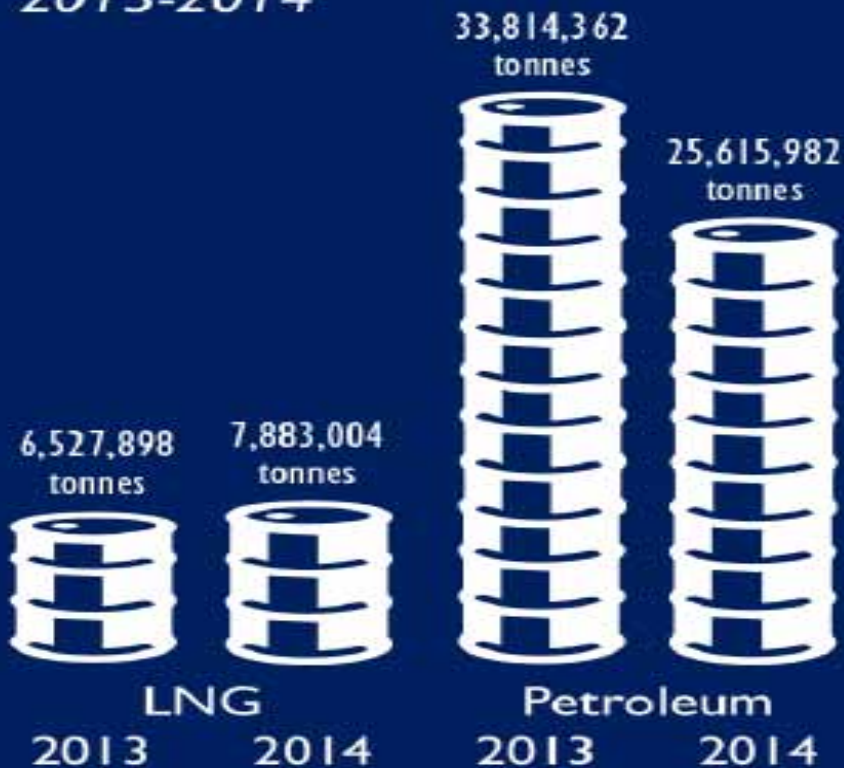
Did you know?



- **The Port of Milford Haven is the UK's top energy port** (source: Port of Milford Haven)

Cargo tonnages through the Haven

2013-2014



30%
of UK's gas demand can be
supplied by Milford Haven

Did you know?



- **LNG trade has a bright future**

GROWING LNG TRADE

Volumes:

- In 1964, 80,000 tonnes of LNG were shipped globally; in 2013, it was 239 million tonnes. *Source: IHS*
- In 2018 global LNG volumes shipped are expected to be 330 million tonnes. *Source: Shell + PFC Energy*

Global fleet size:

- At the end of 2013, there were more than 380 LNG carriers world-wide. *Source: Lloyd's Register*
- At the start of 2018, there are expected to be more than 520 carriers world-wide. *Source: Clarksons*

(Source: Shell 2013)

Did you know?



- **Russia is a major provider of oil and gas for the EU-28**

EU-28 Imports* by Country of Origin

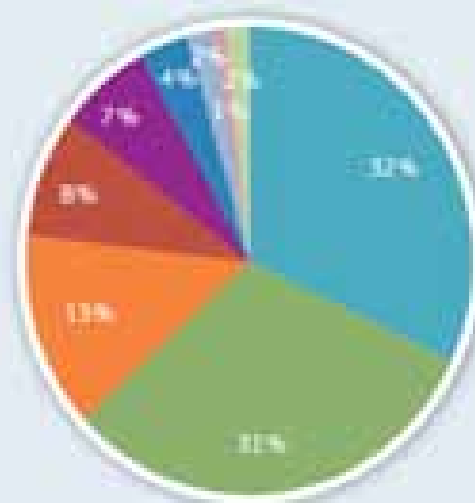
Imports* of Crude Oil - 2012

Total = 523 094 kton



Imports* of Natural Gas - 2012

Total = 12 824 707 TJ-GCV



- (Source: EU energy in figures statistical pocketbook 2014)



Gas Trade Flows in Europe (Source: <https://www.iea.org/gtf/index.asp>)



Did you know?

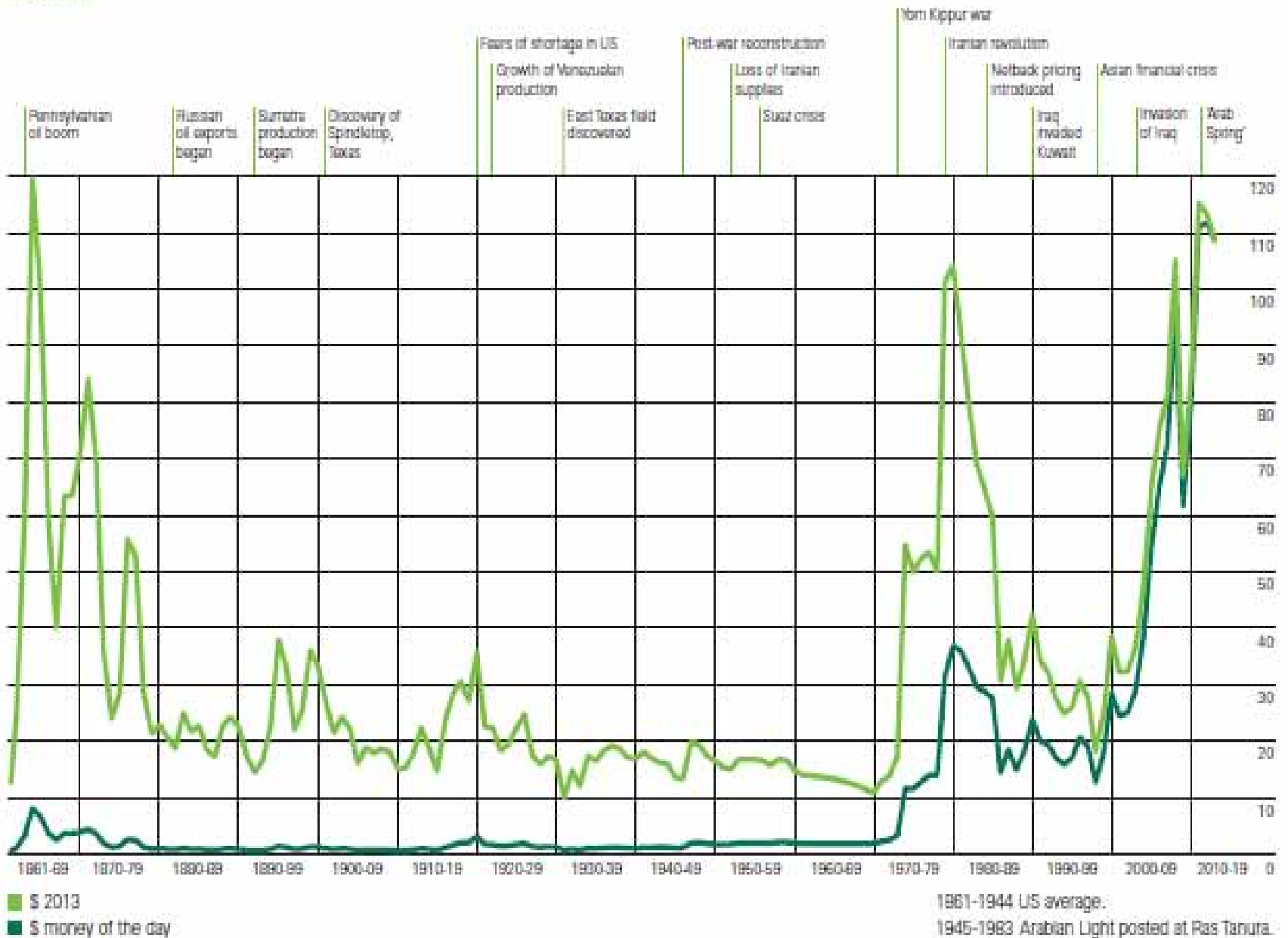


Crude oil prices 1861-2013

US dollars per barrel

World events

Source: BP statistical review of world energy 2014



■ \$ 2013

■ \$ money of the day

1861-1944 US average:

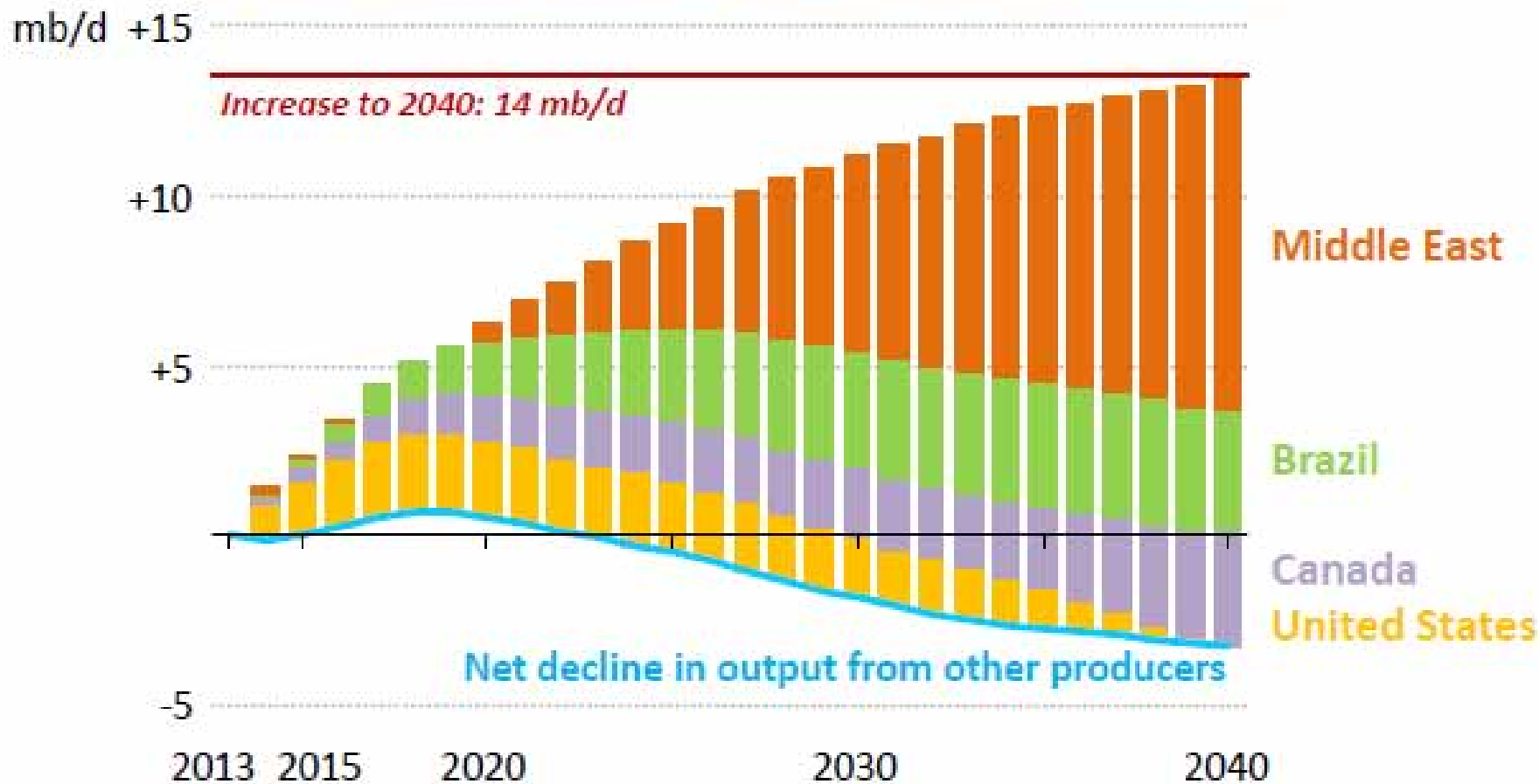
1945-1983 Arabian Light posted at Ras Tanura.

1984-2013 Brent dated.

Did you know?



Oil production growth in United States, Canada, Brazil & the Middle East



(Source: World Energy Outlook 2014)

Did you know?



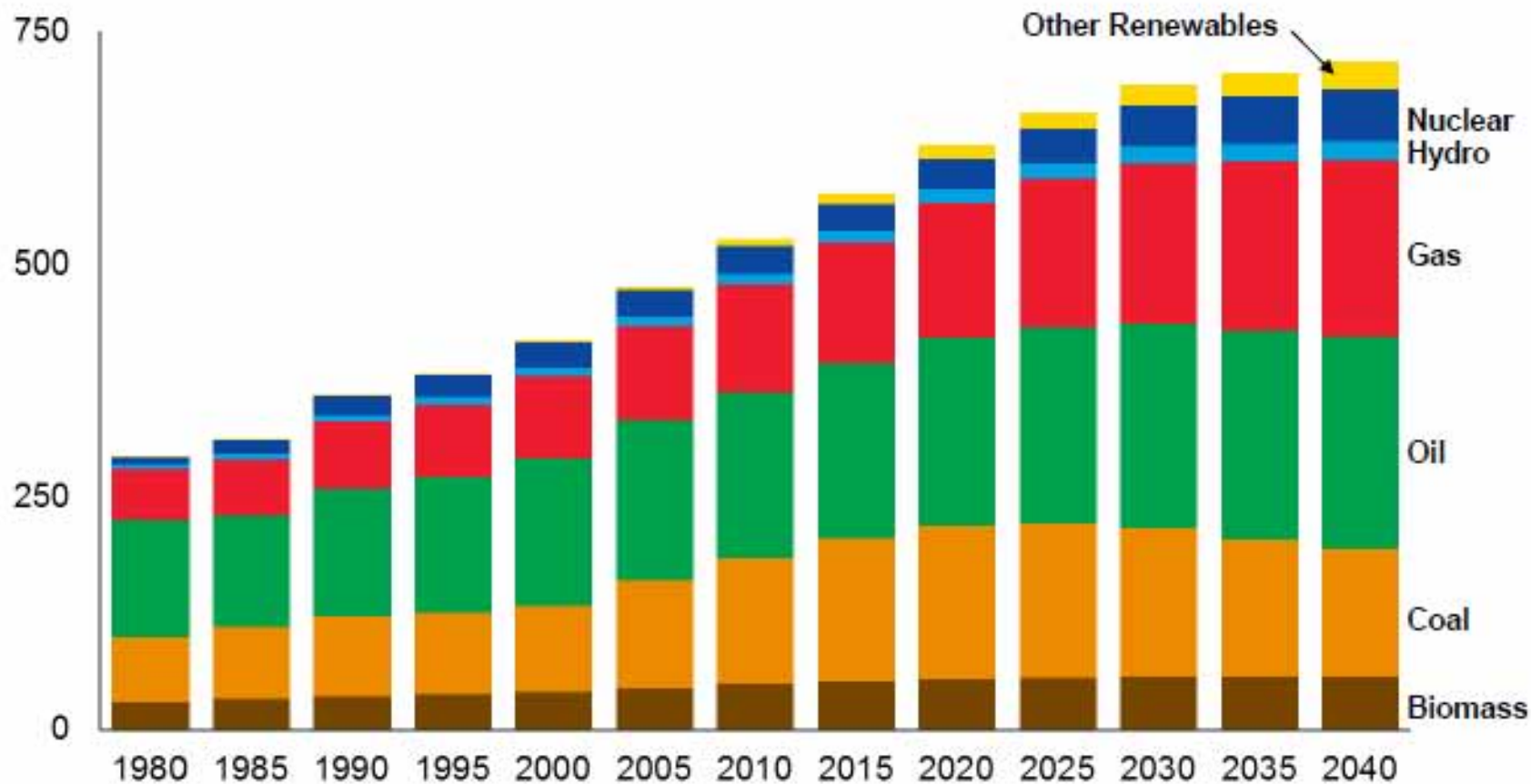
- The **port of Rotterdam** is one of the leading energy ports in the world.
- At the moment, there is an installed **wind turbine capacity of 200 megawatts (MW)** in the port area. That represents some **10% of the total wind energy produced in the Netherlands.**



Energy Use Evolves Over Time

Demand by Fuel

Quadrillion BTUs



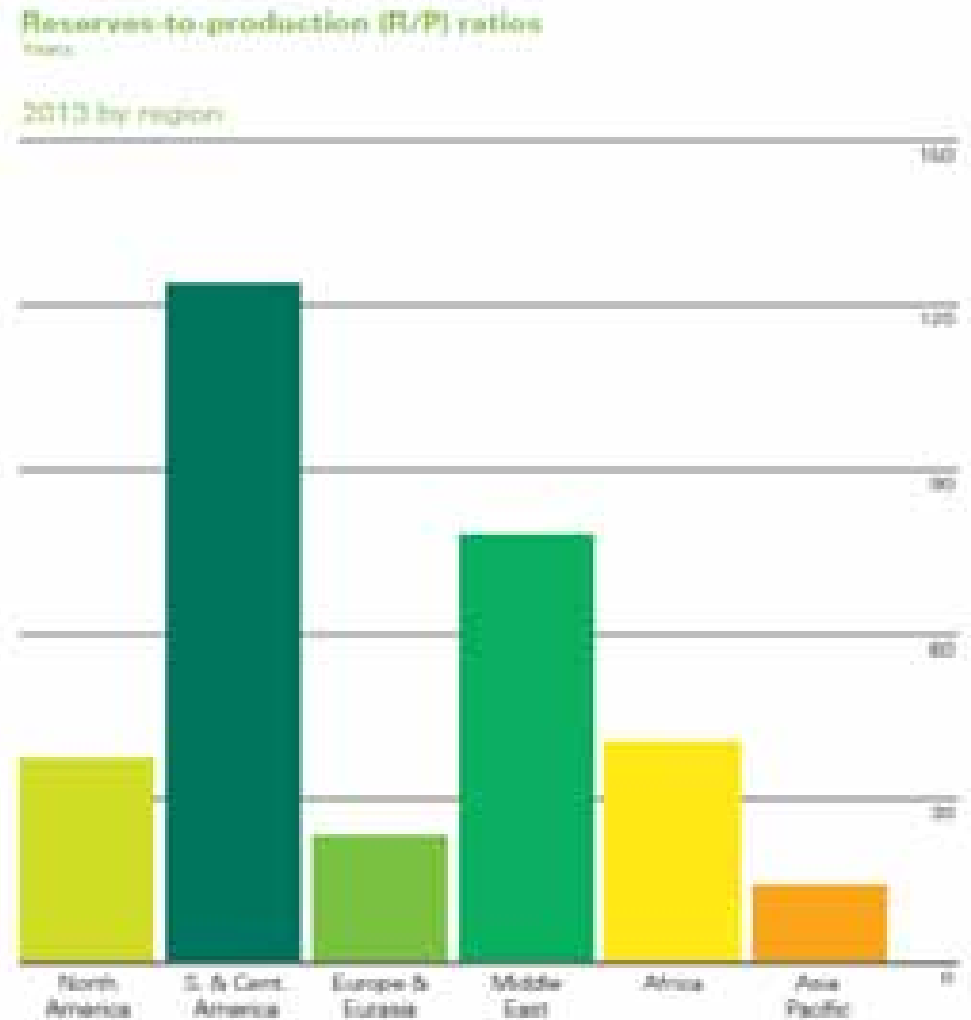
Did you know?



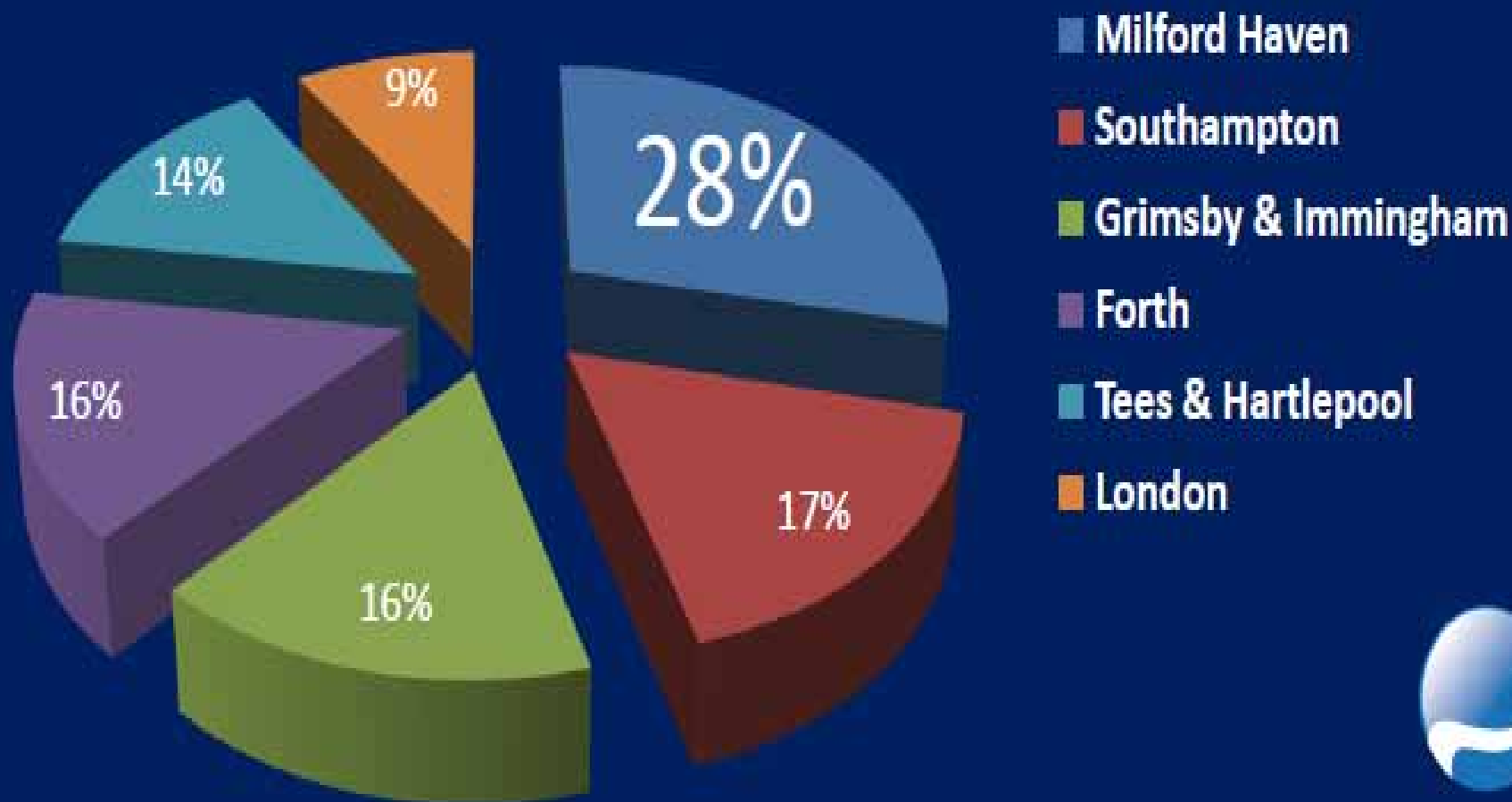
Did you know?



- **The total world proved oil reserves reached 1687.9 billion barrels at the end of 2013, sufficient to meet 55.3 years of global production.**
- (source: BP statistical review of world energy 2014 report)



Total Oil & Gas through UK Ports 2013 (million tonnes)



Port of Milford Haven

Did you know?

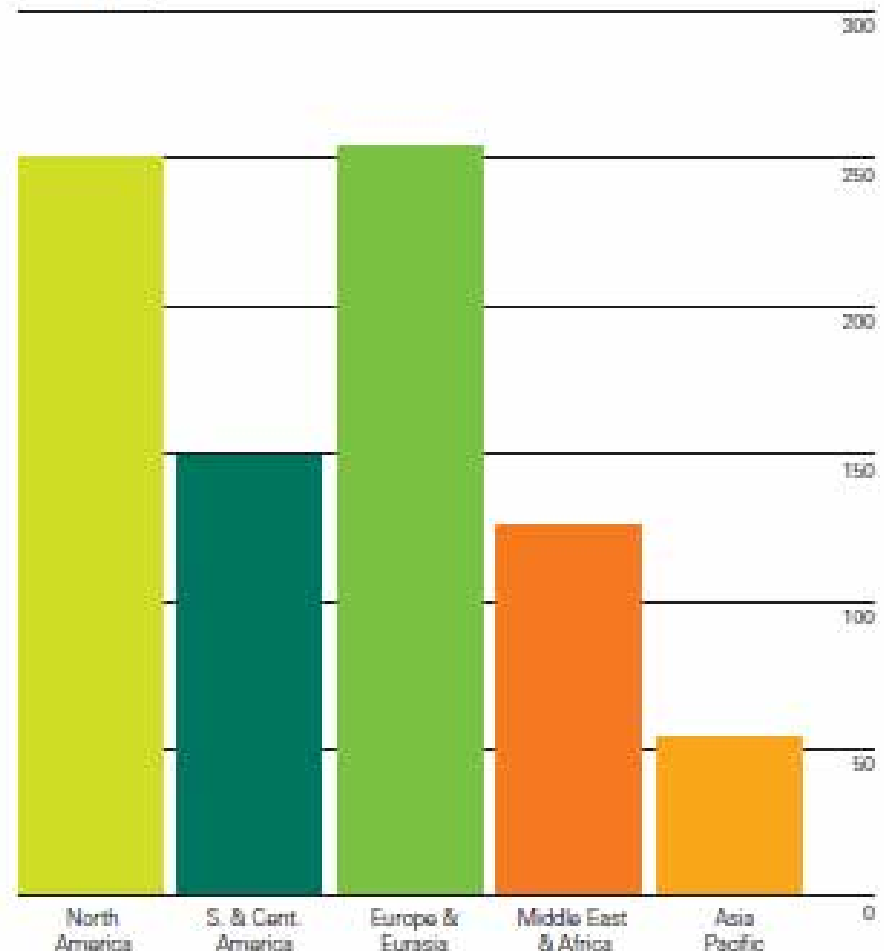


- **The world proved coal reserves in 2013 were sufficient to meet 113 years of global production, which is by far the largest R/P ratio for any fossil fuel**
- (Source: Statistical review of world energy 2014)

Reserves-to-production (R/P) ratios

Years

2013 by region





European Ports Work!





Ports Observatory for Performance Indicator Analysis (PORTOPIA): key developments

May
2015

Prof. dr. Michaël Doms (michael.doms@vub.ac.be)
Administrative and Scientific Coordinator

ESPO CONFERENCE 2015



PORTS OBSERVATORY FOR PERFORMANCE INDICATORS ANALYSIS

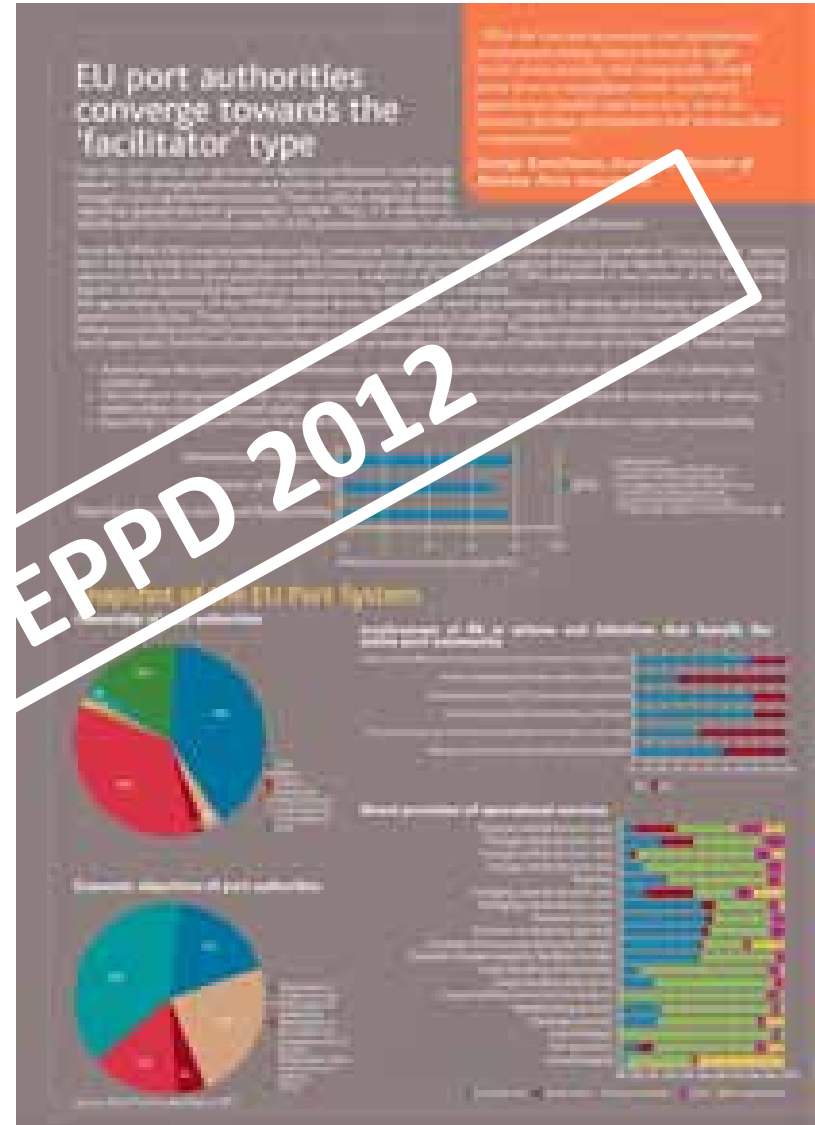
- 12 partner consortium, led/coordinated by University of Brussels (VUB) – Department of Business – Unit Management and Strategy
- Consisting of universities, research institutes and industrial partners with a proven track record
- Project duration: 4 years – started September 2013
- www.portopia.eu; <http://www.facebook.com/portopia>



- Partners:



2010 – 2012: pprism.espo.be



Extract of the EPPD 2012

- Market tendencies: Rapid Exchange System Dashboard (based on quarterly traffic data supplied by port authorities)
- Average Call Size
- Average Vessel Size
- Traffic growth
- Market Share
- Transshipment incidence / intra-European traffic dependency
- Modal Split
- Forecasting module
 - Short and mid-term market expectations

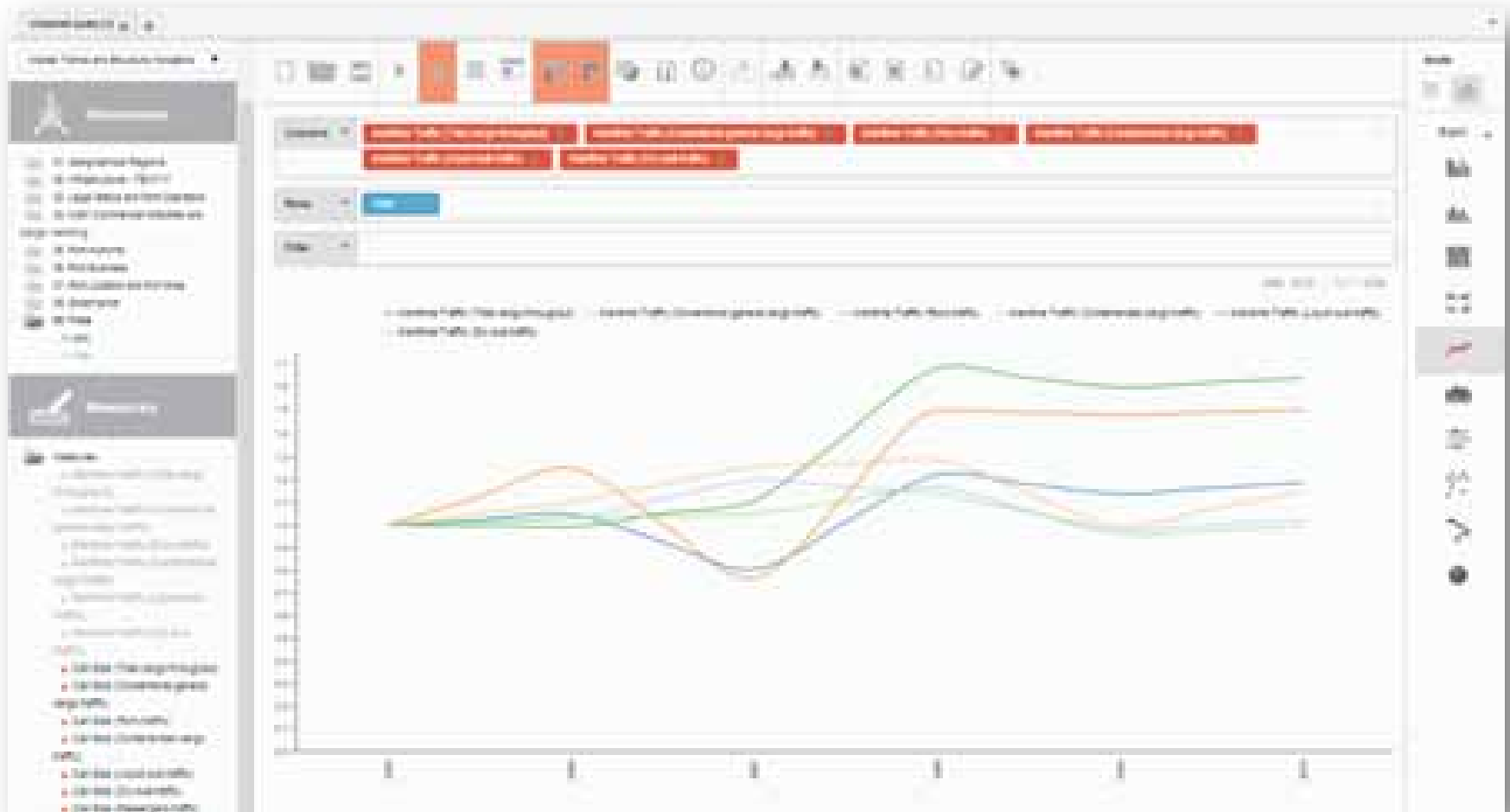
PORTOPIA Service Cloud

The desktop overview



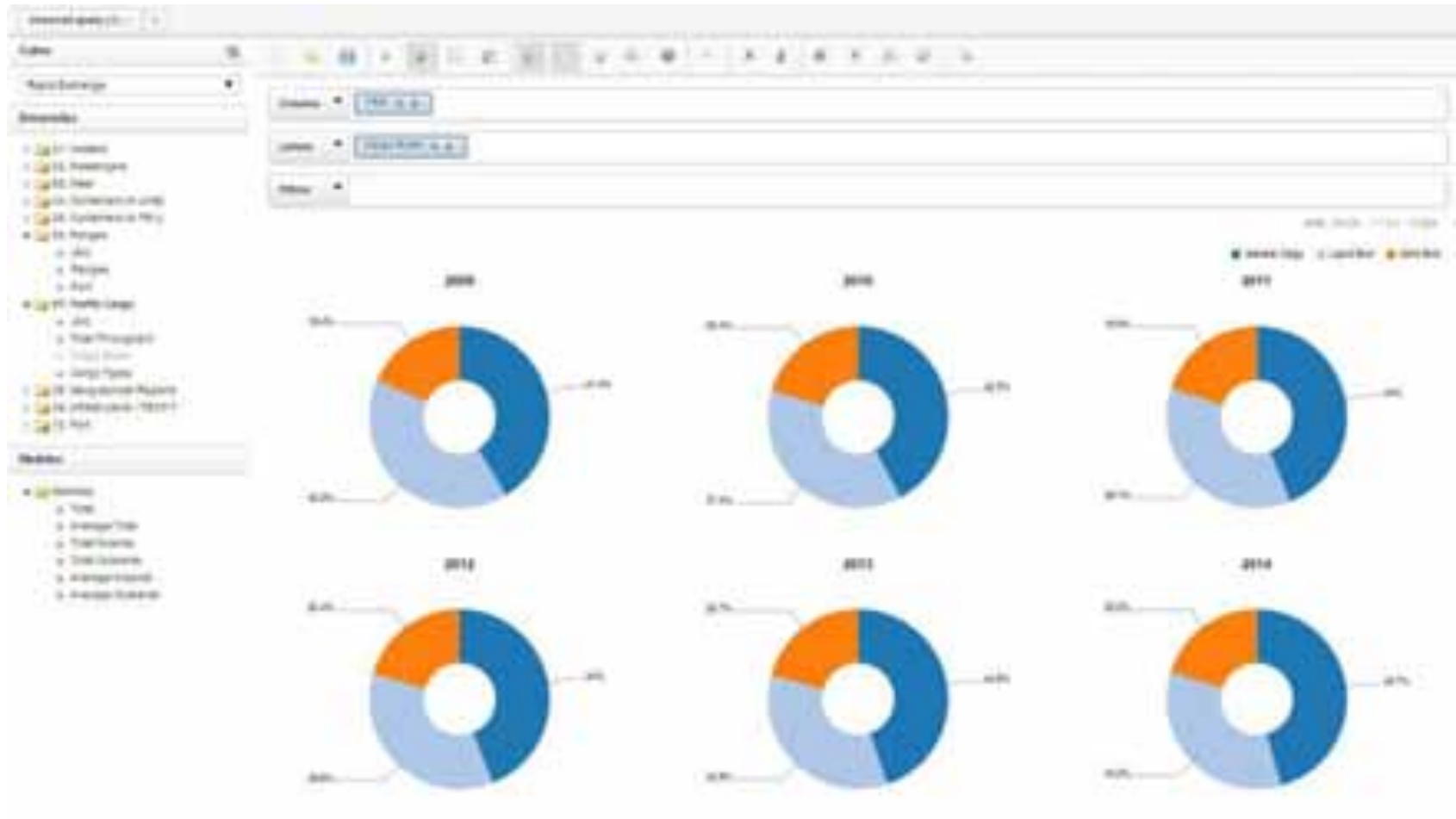
DATA ANALYSIS MODULE

Market Trends & Structure Indicator's Analysis



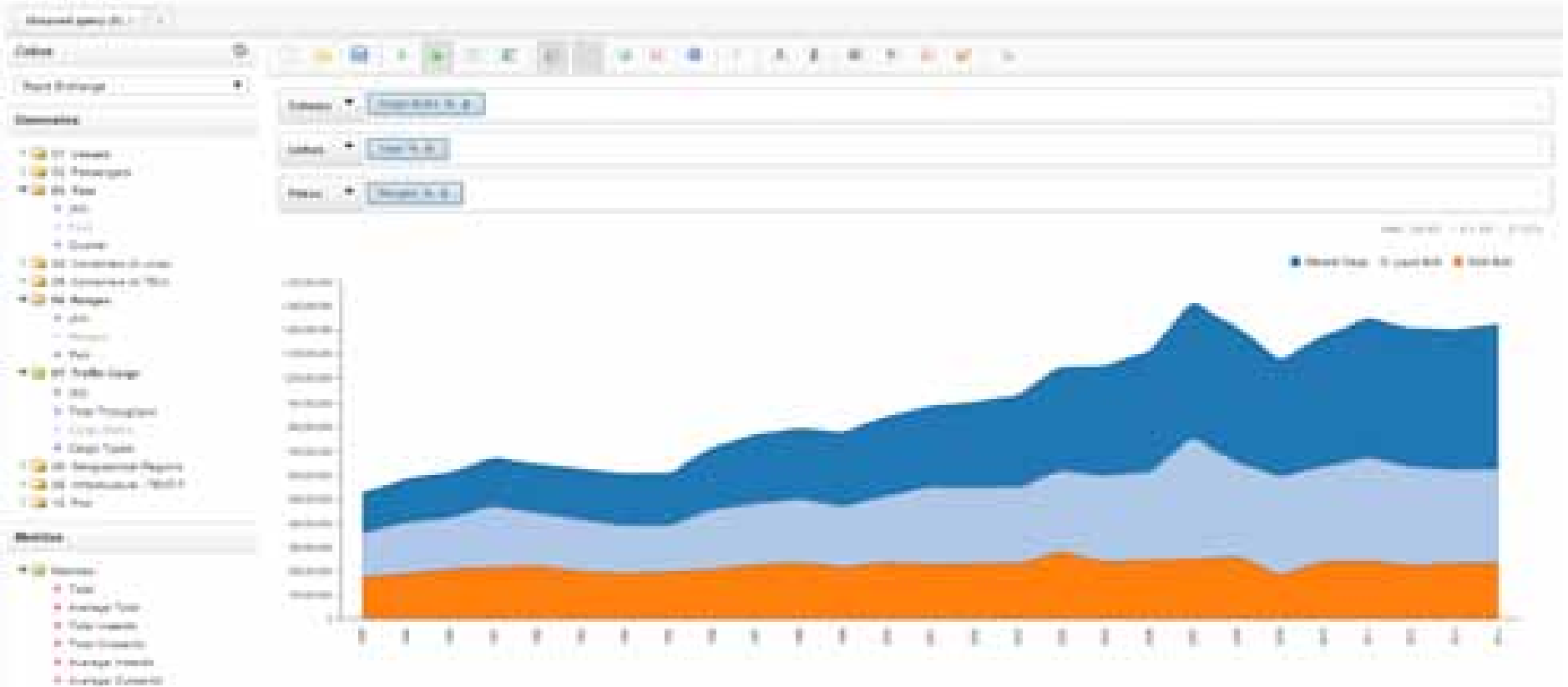
DATA ANALYSIS MODULE

Market Trends & Structure Indicator's Analysis



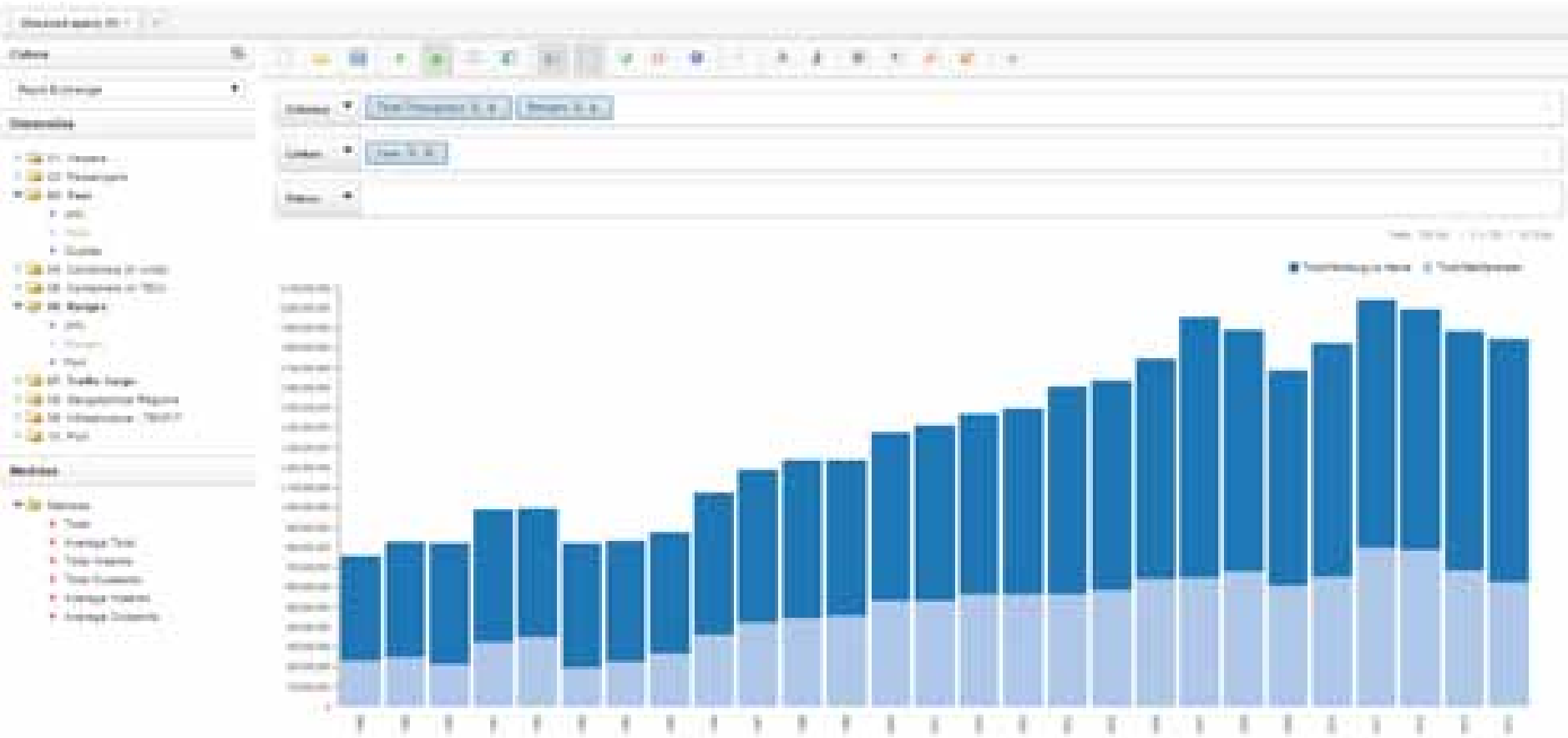
DATA ANALYSIS MODULE

Market Trends & Structure Indicator's Analysis

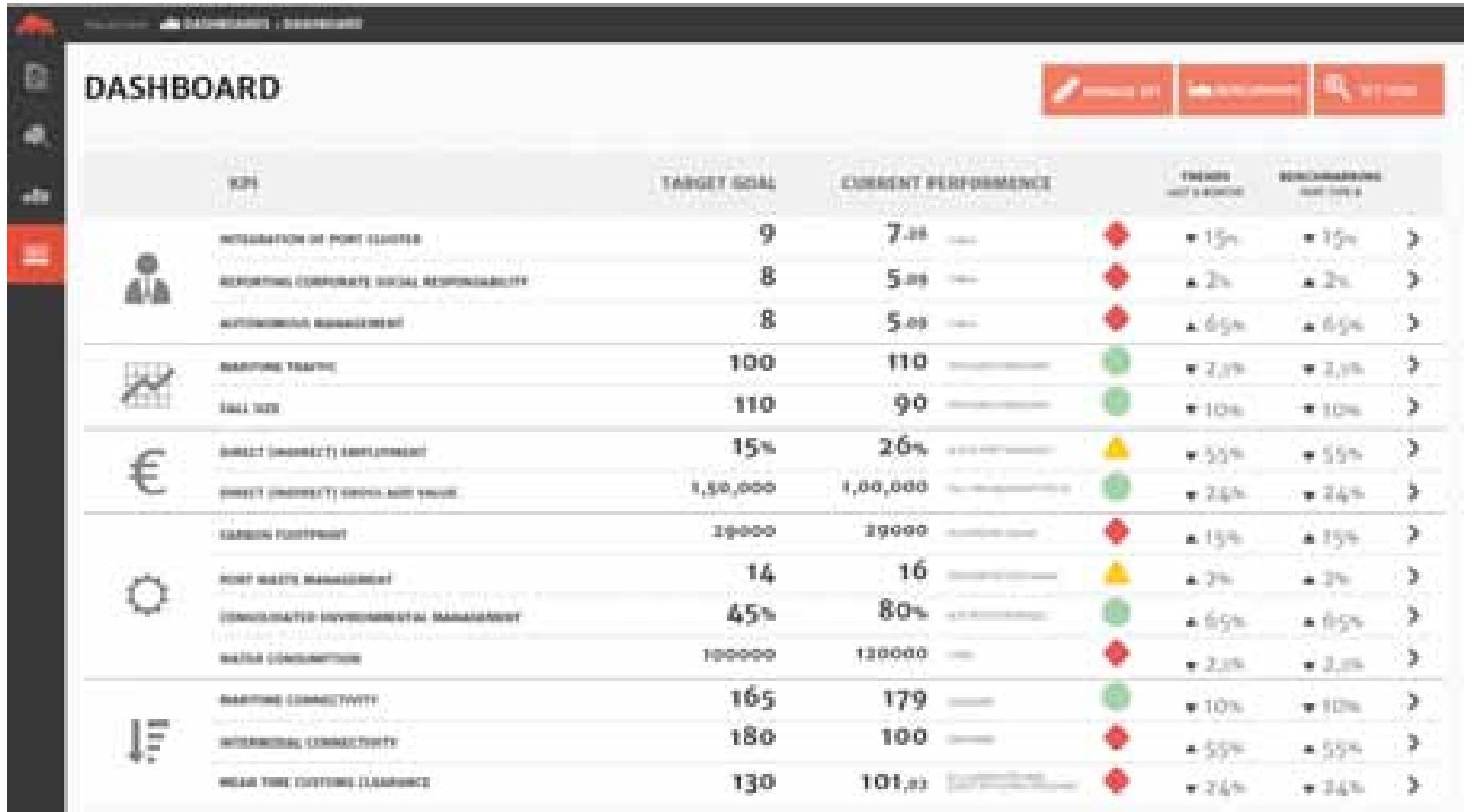


DATA ANALYSIS MODULE

Market Trends & Structure Indicator's Analysis

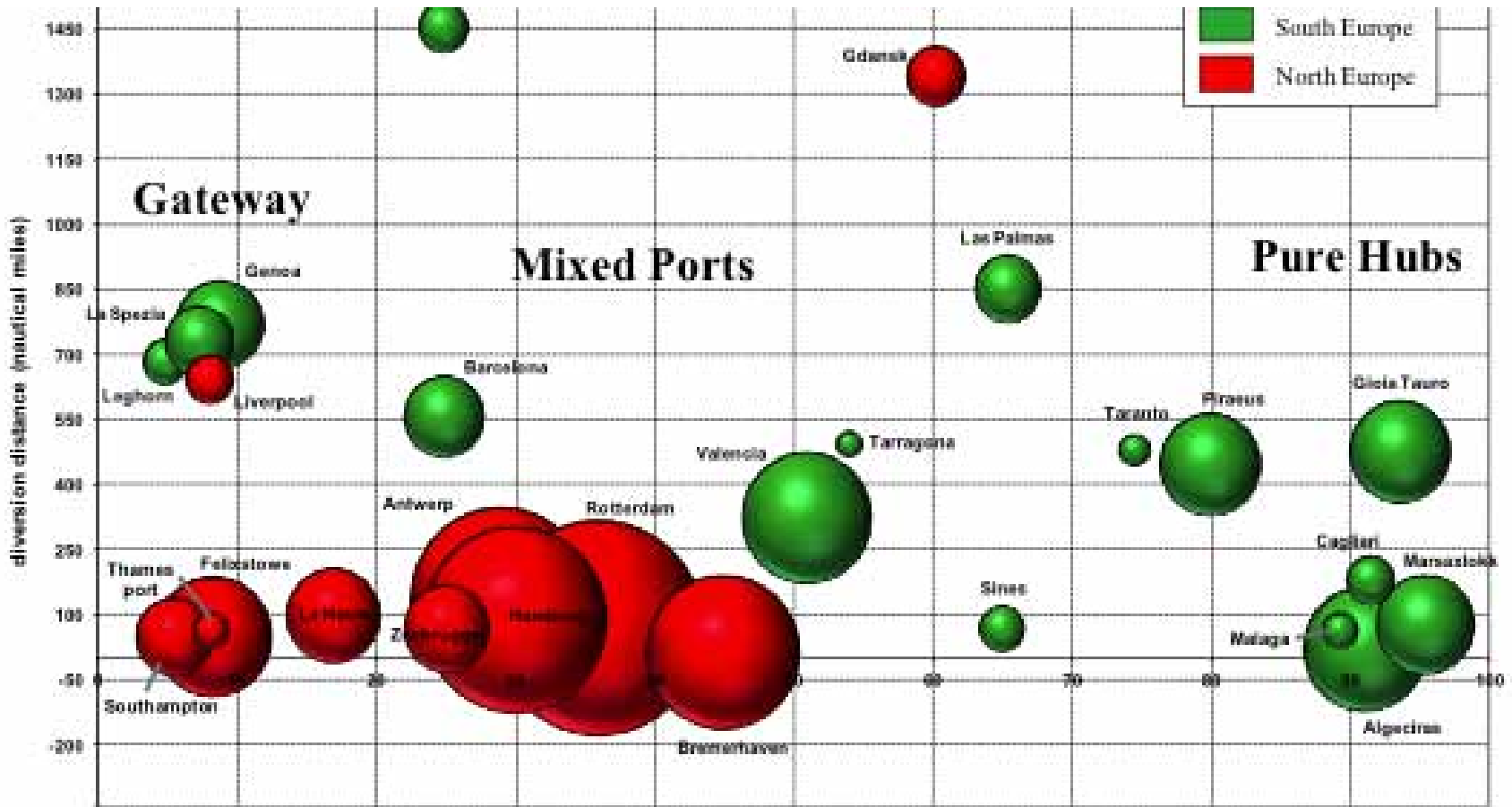


Dashboard example



**Visit us at the PORTOPIA booth
in the exhibition area!**

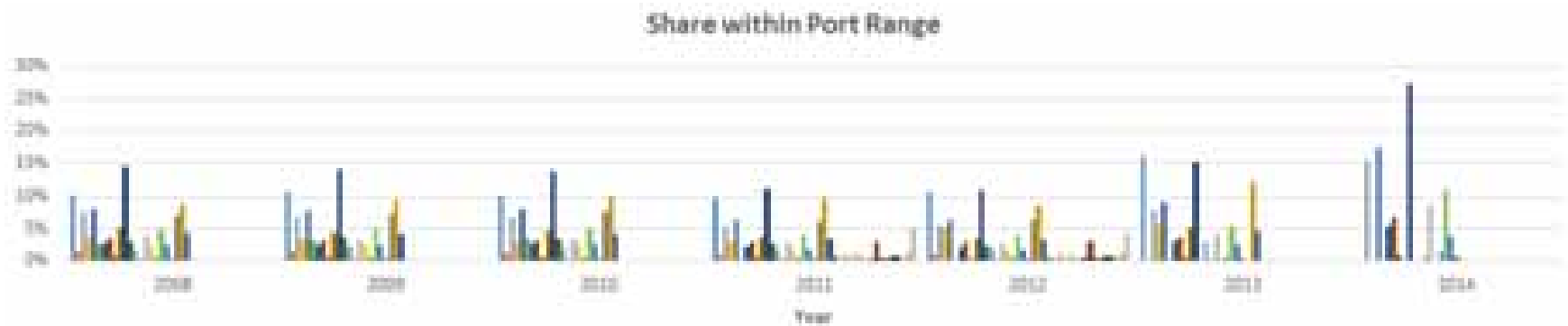
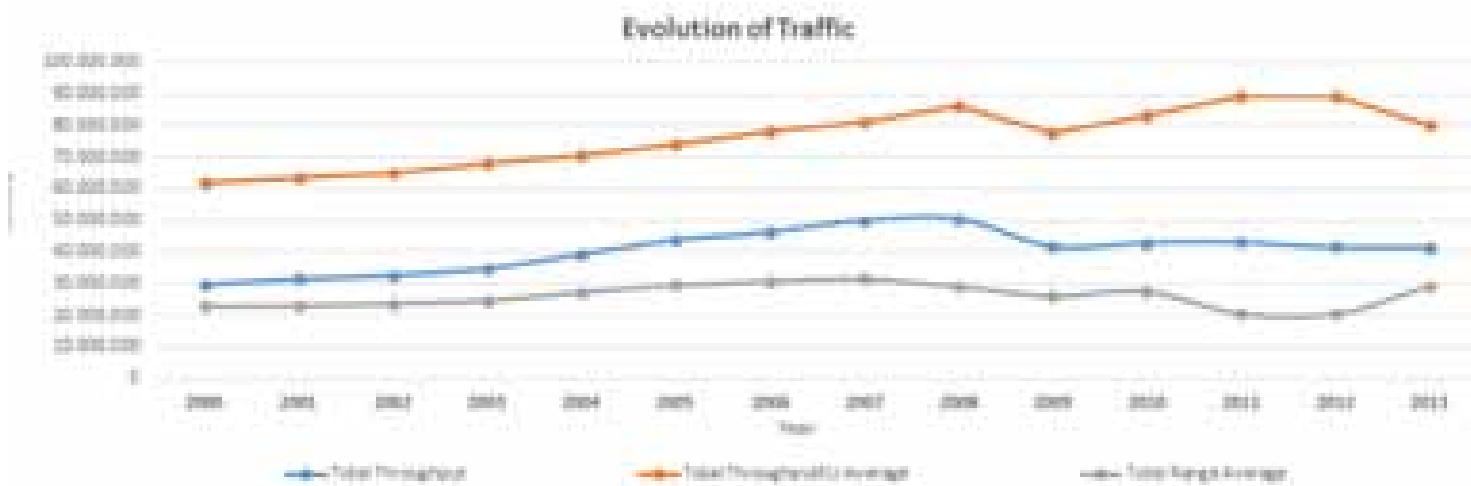
Transshipment incidence vs diversion



RES Dashboard development



RES Dashboard development



RES Dashboard development

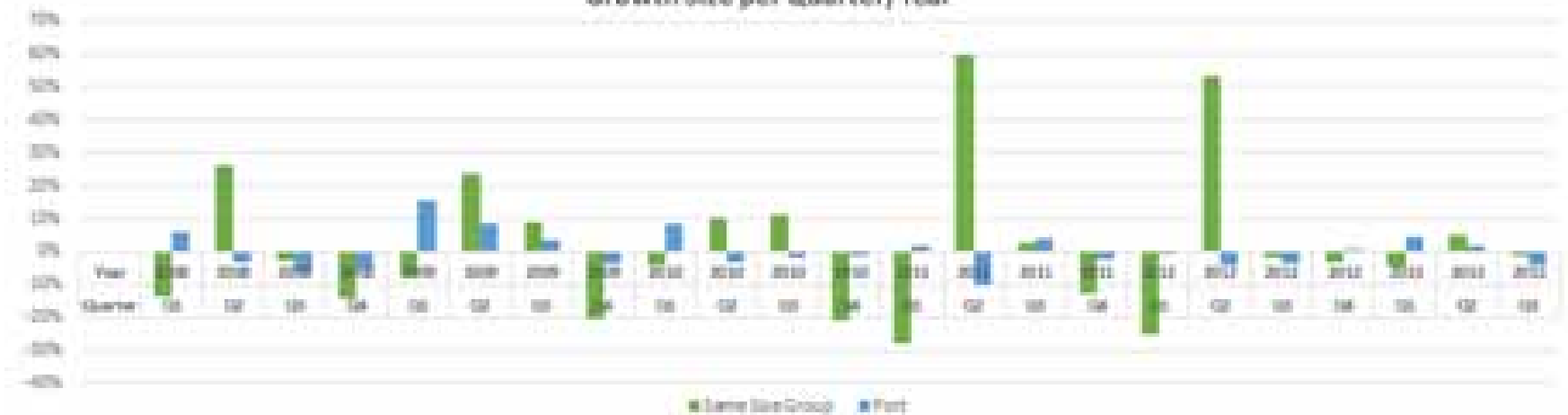


RES Dashboard development

Growth per Year

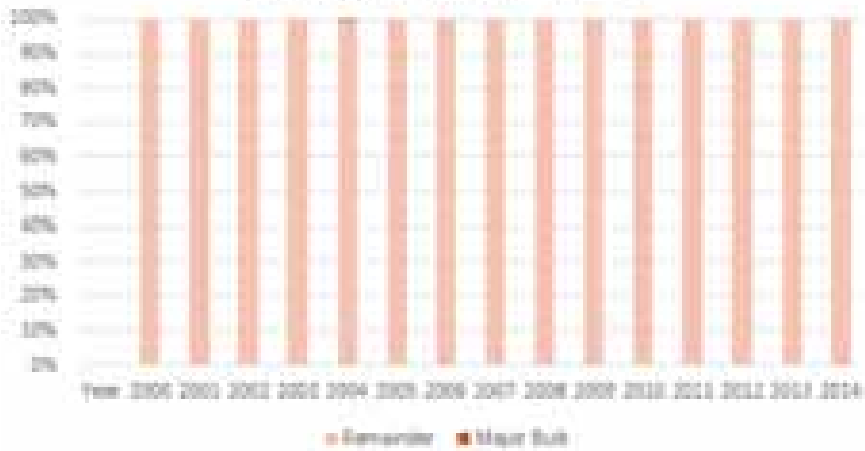


Growth Size per Quarter/Year

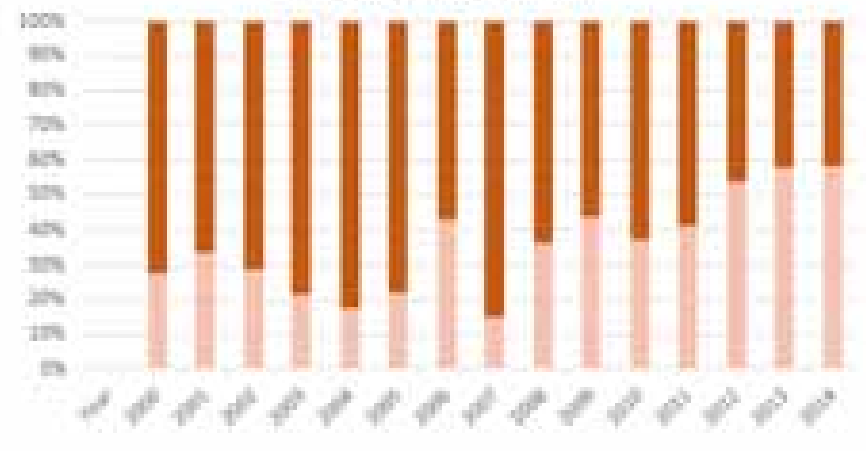


RES Dashboard development

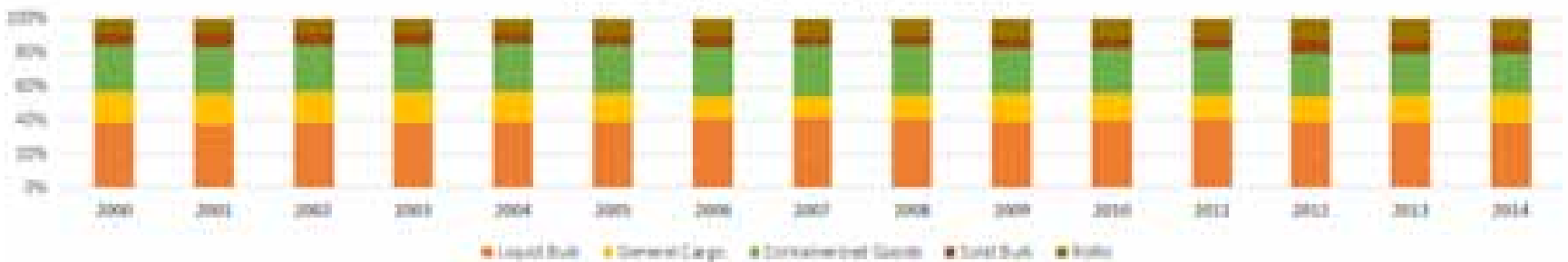
Liquid Bulk Share Timeline



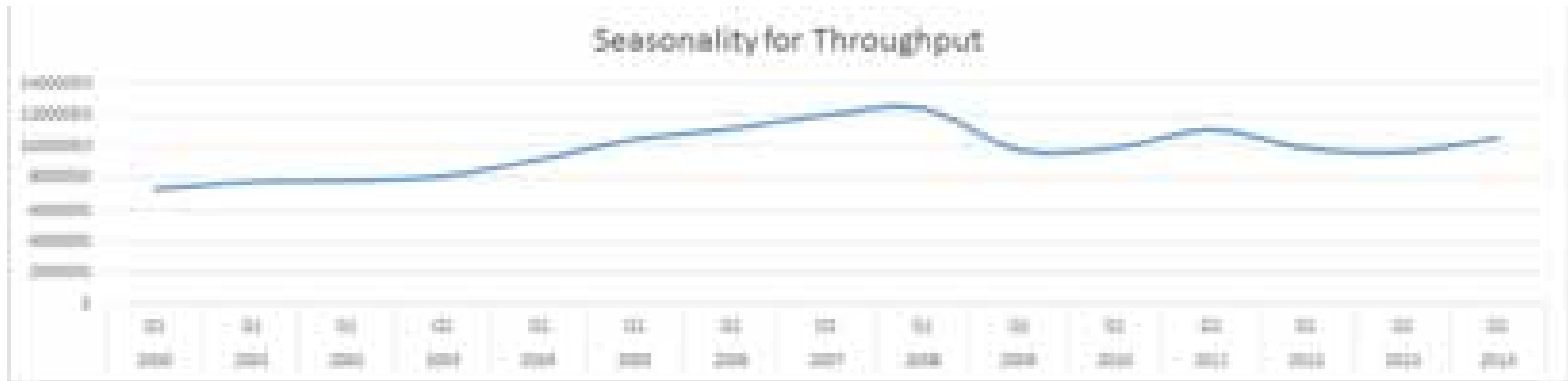
Dry Bulk Share Timeline



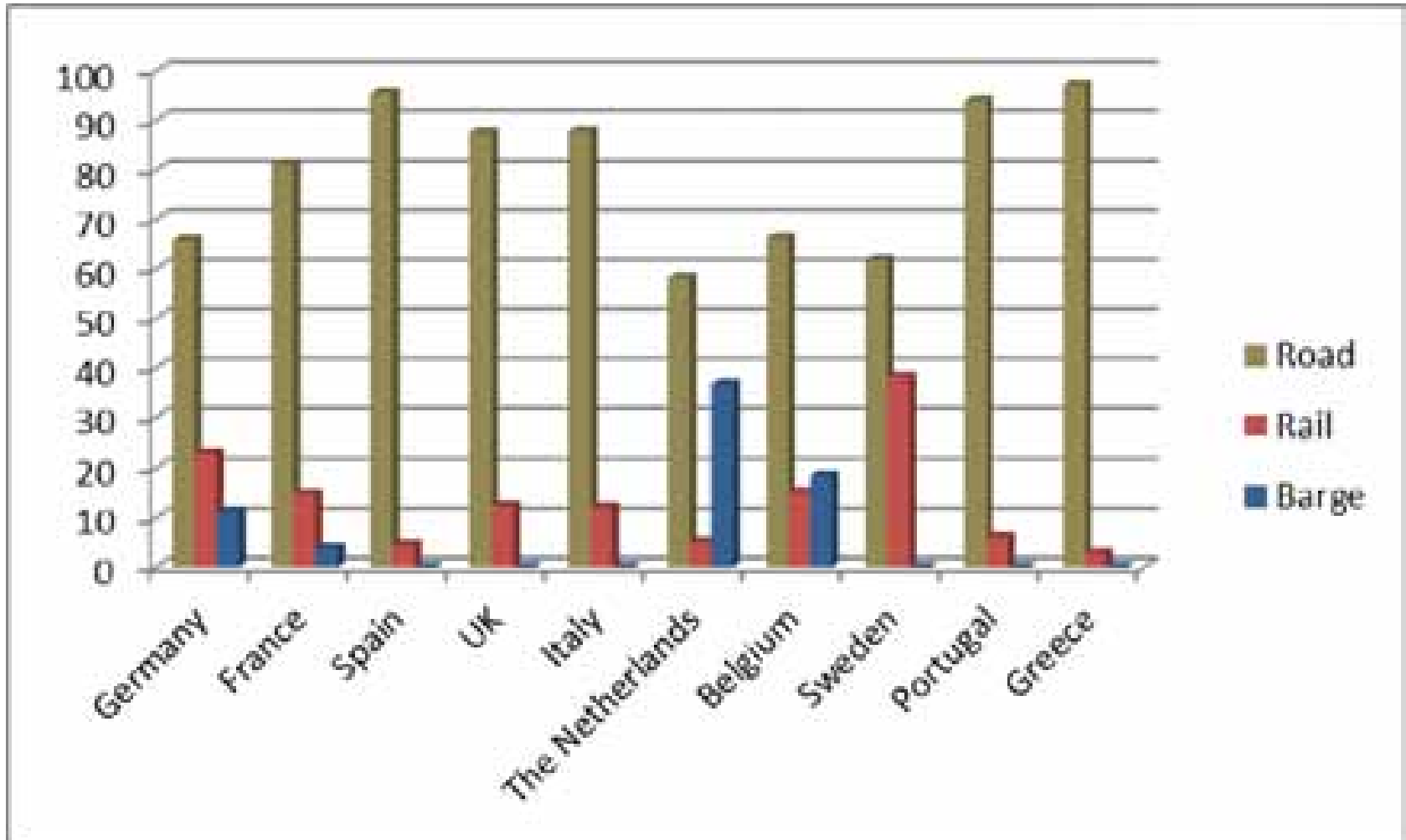
Split of Cargo Sub-Categories Timeline



RES Dashboard development



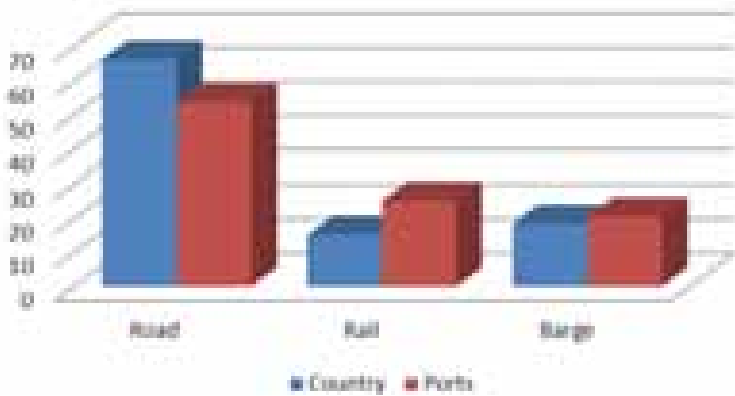
Modal Split



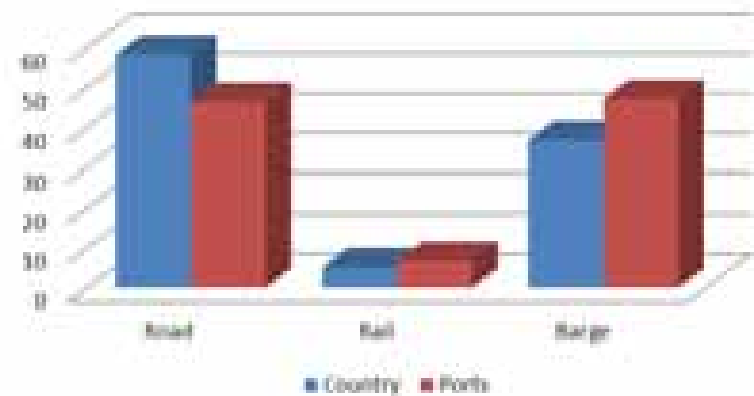
Modal split

Ports vs country level

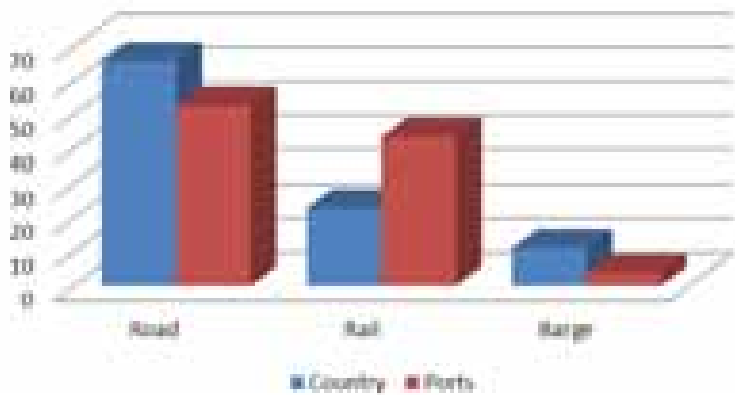
Belgium



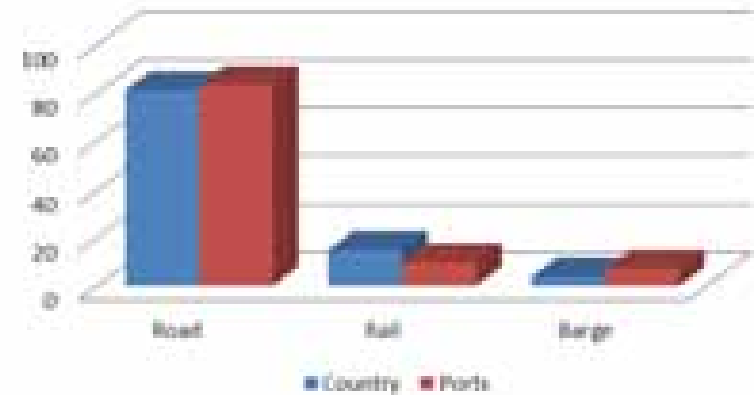
The Netherlands



Germany

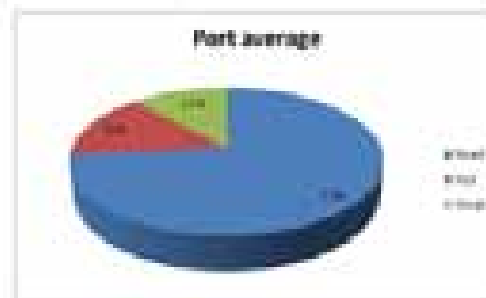
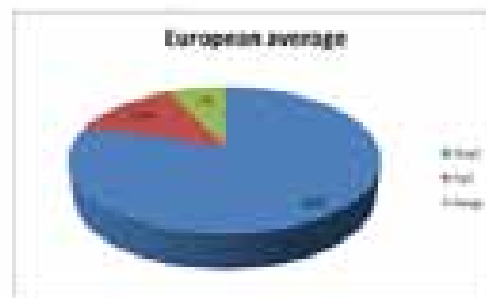
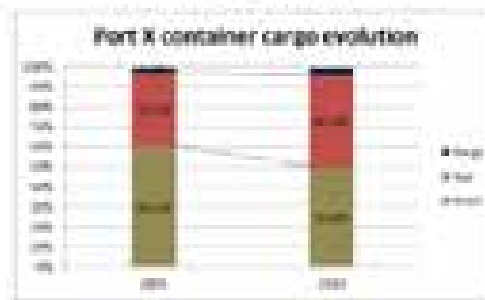
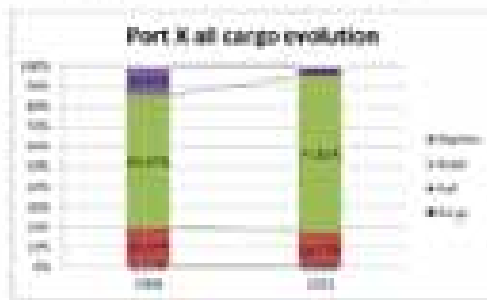


France



Modal split dashboard

- Comparable to first output document
- Evolution of user port
- European average of all ports compared to user port
- Comparison of user port to custom aggregation



- Direct and indirect Employment (in FTE)
- Direct and indirect Gross Added Value (in €)
- Flowback to Treasury (in €)
- Private Investment (in €)
- Other indicators:
 - Hrs of Training per FTE
 - Gender (% of women)

PORTOPIA

Direct employment

Calculate Yearly 18

	2007	2008	2009	2010	2011	2012
Share of ports	24%	25%	25%	28%	29%	32%
Number of ports	12	12	12	13	14	18
Direct employment (sample)	324.921	330.356	314.226	309.387	325.325	371.071
Direct employment (extrapolation)	1.336.611	1.301.229	1.238.163	1.087.676	1.132.767	1.148.876
Growth rate (sample)		1,67%	-4,88%	-1,54%	5,15%	14,06%
Growth rate (extrapolation)		-2,65%	-5,43%	-12,15%	4,15%	1,42%

ILLUSTRATIVE - TENTATIVE

Modeling of socio-economic impacts

Possible models based on :

- The uniqueness of the port (port profile); and
- The traffic mix in a port.

Modeling of socio-economic impacts

Sample:

- 128 data points;
- 8 core TEN-T ports :
 - 20% of total European throughput in 2012; and
 - Diversified set of ports.
- 16 years: 1997 – 2013.

Data source:

- Socio-economic data based on the reports of the National Bank of Belgium and the 'Havenmonitor'; and
- Traffic data based on EUROSTAT
- Port specific data (for the port profile)

Applications

Estimates at the port level

Approach:

1. Determine proxies based on the best model;
2. Insert port-related data for each traffic category for a chosen year; and
3. Calculate the socio-economic impact of the port.

Estimates have been made for the attendees of the EAS committee.

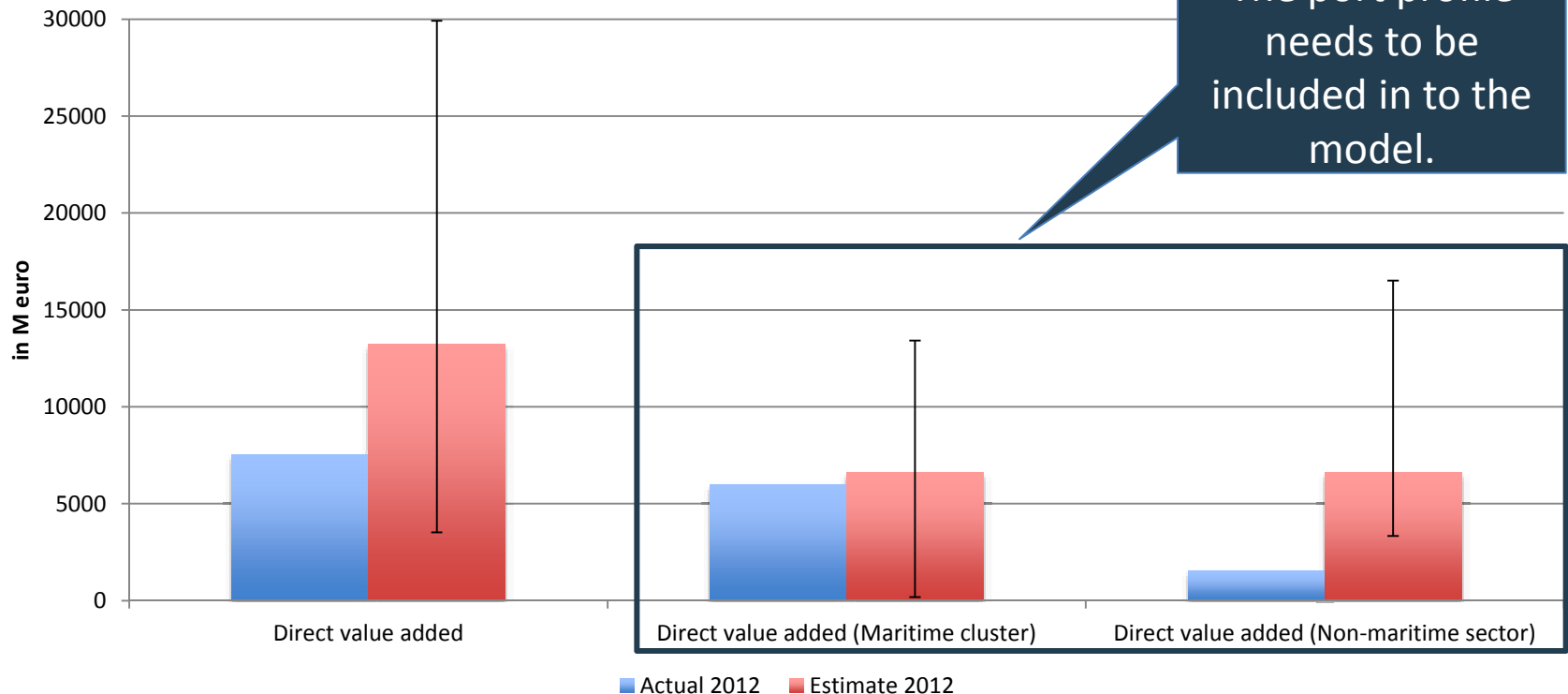
Every participating port at the ESPO conference can get an on-the-spot estimate

Applications

Estimates at the port level

Results - Direct value added (example)

Direct value added in Port X in 2012

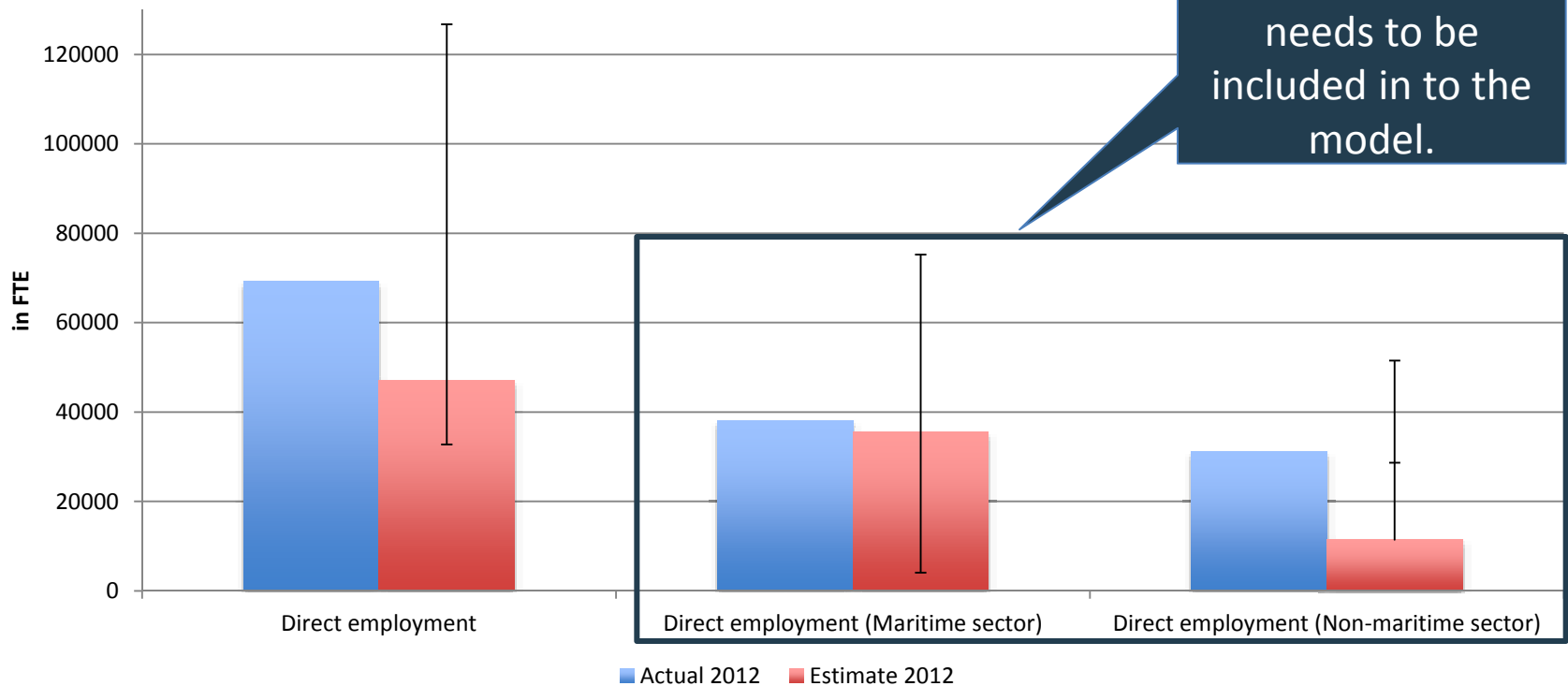


Applications

Estimates at the port level

Results - Direct employment (example)

Direct employment for PORT X in 2012



Applications

Flash estimates at the port level

Objective:

Eliminating the existing time lag (mostly 2 years) in the estimation of socio-economic impacts of ports.

Applications

Flash estimates at the port level

Approach:

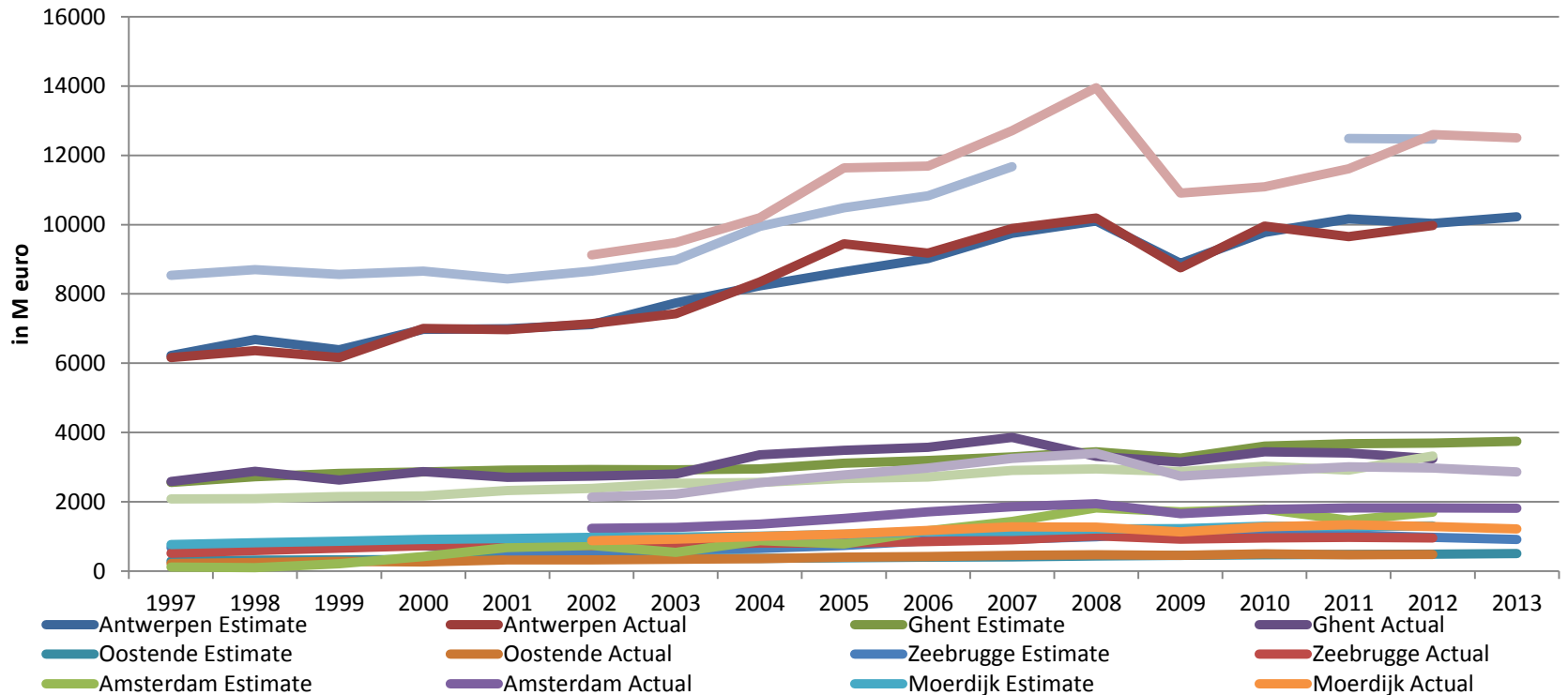
1. Determine proxies based on the best model;
2. Insert port-related data for the lagging years; and
3. Calculate the socio-economic impact of the port.

Applications

Flash estimates at the port level

Results - Direct value added

Direct value added

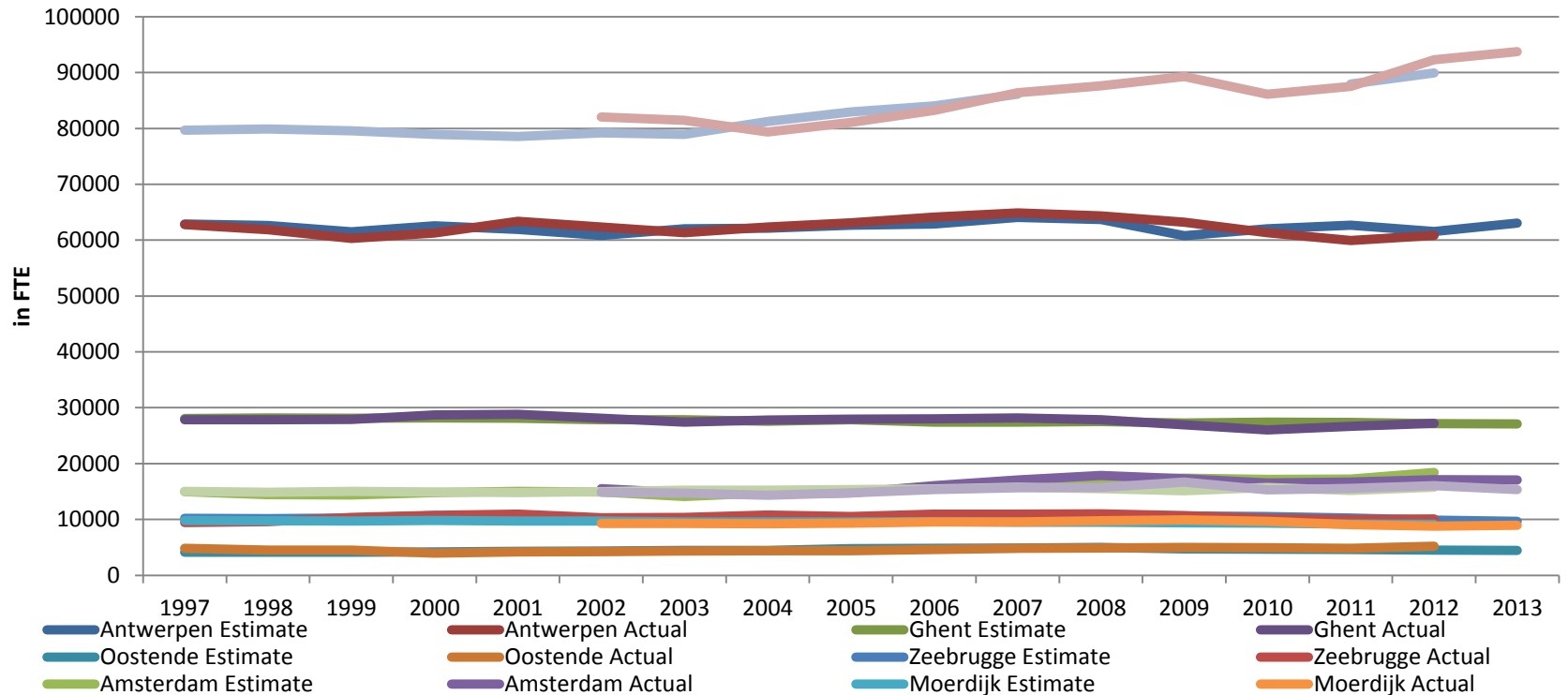


Applications

Flash estimates at the port level

Results - Direct employment

Direct employment



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in the exhibition area!**

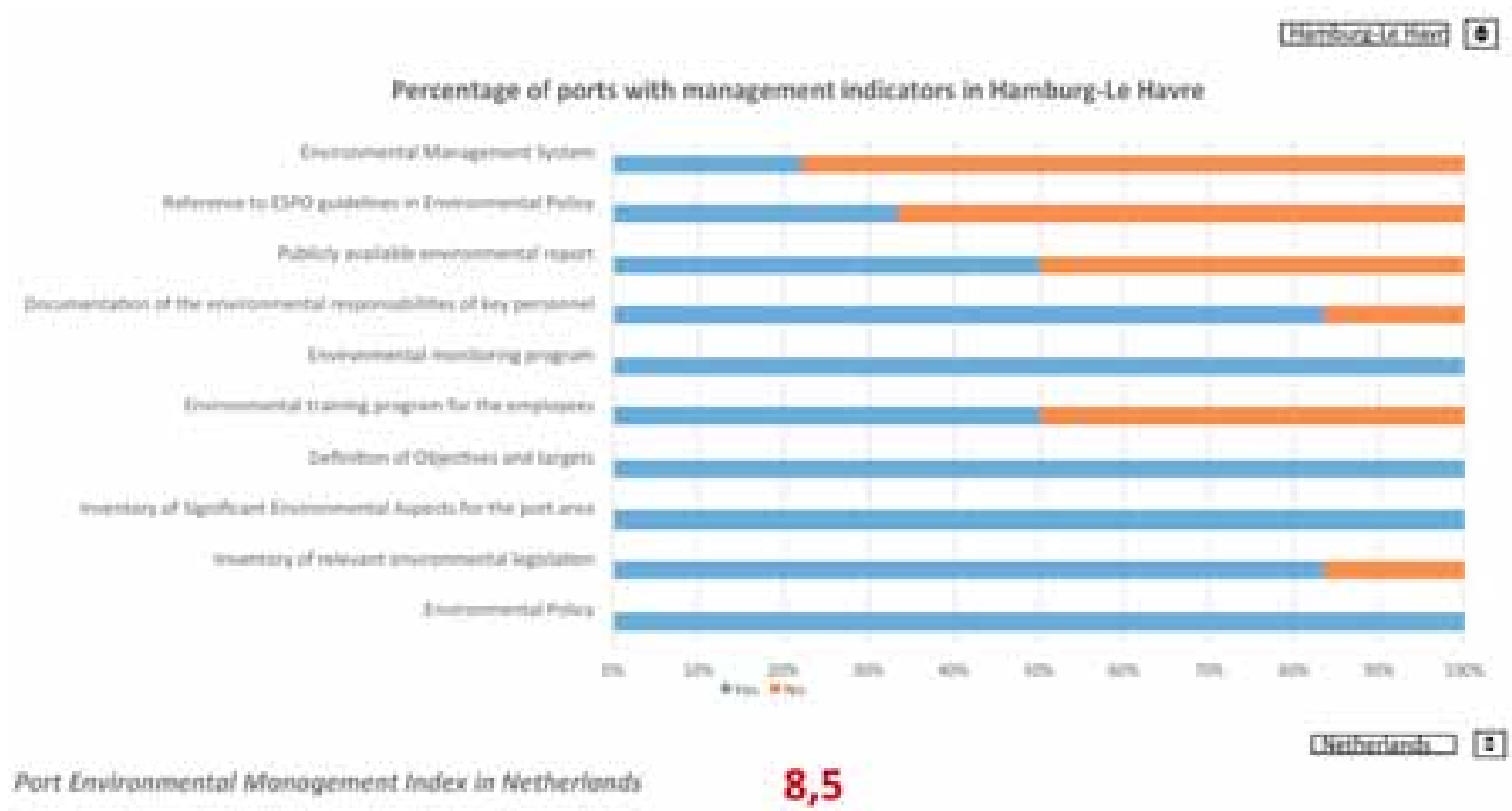
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Indicators: Environment, Security and Health & Occupational Safety

- Dashboards based on ECOPORTS self-diagnosis method (environmental management index)
- CO2 footprint
- Water quality
- Waste production
- Nautical accidents
- Port security incidents
- Fatal accidents, work-related accidents, lost workdays
- Investments in protection

Dashboard development

Environmental Management Indicators



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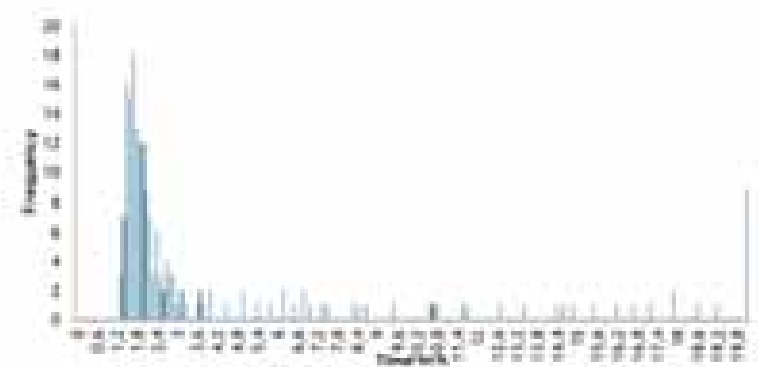
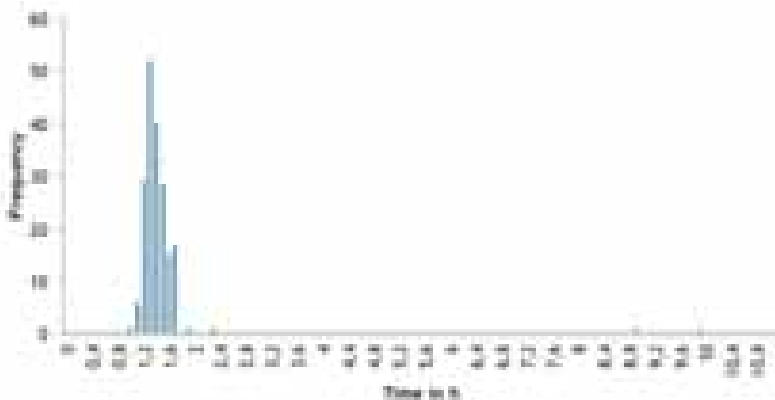
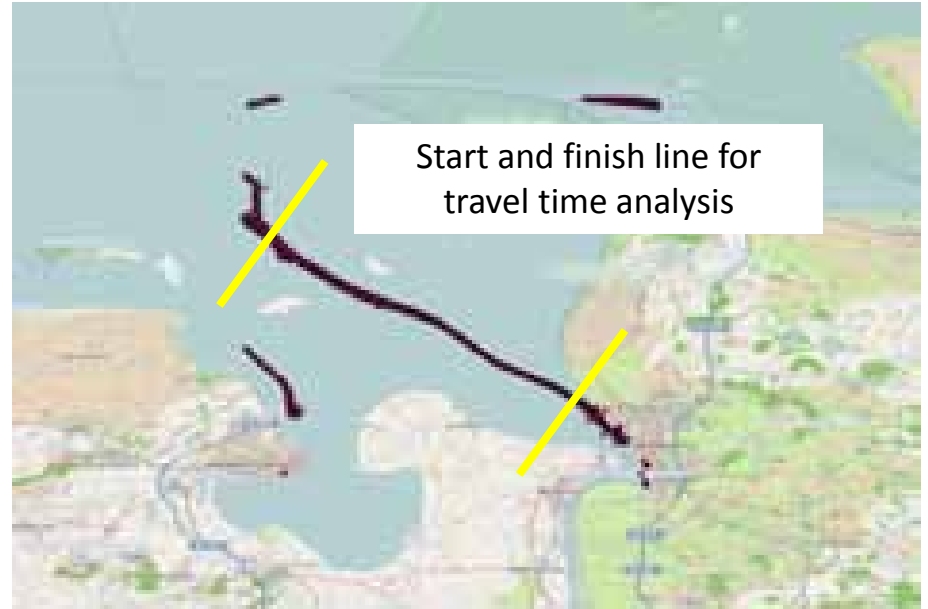
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Indicators: Logistic Chain and Operational Performance

- Intermodal connectivity index
- Maritime connectivity index
- Ro-ro connectivity index
- Maritime Access Fluidity
- Road congestion (TomTom partnership)
- Supply chain cost indicators
- Terminal productivity (aggregated level)
- Others: Mean Time Customs Clearance

Indicator development

Maritime access fluidity (Based on AIS data, supplied by MarineTraffic)



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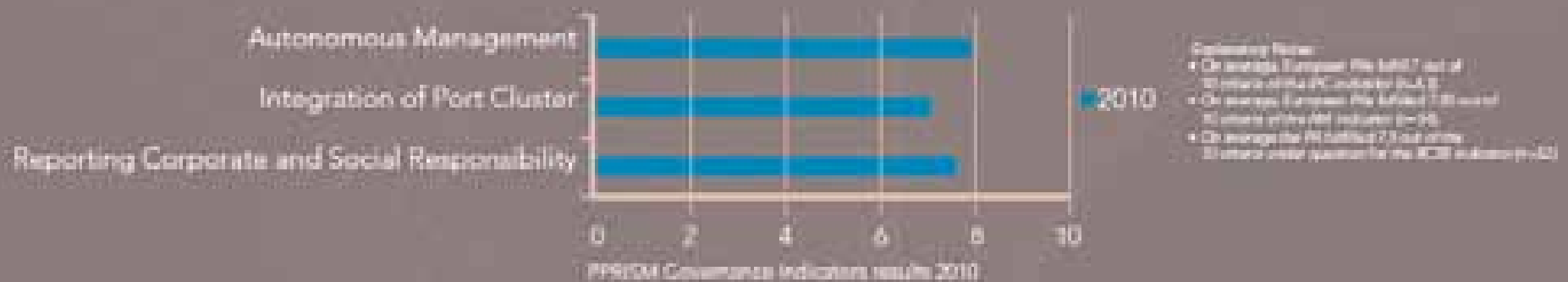
PORTOPIA

Indicators: Governance

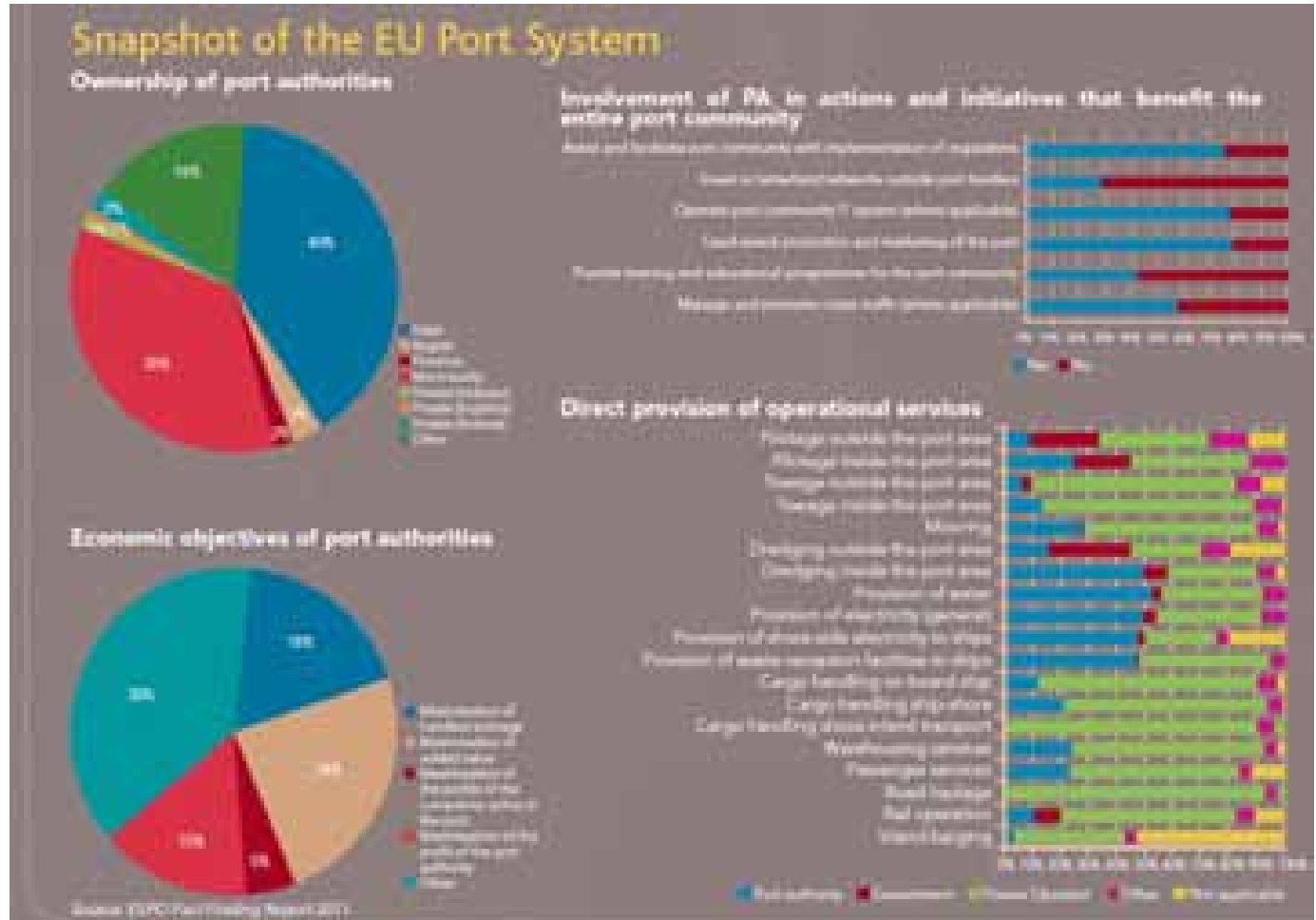
- Based on ESPO's fact finding study
- Evolution of governance models
- Evolution of autonomous management
- Evolution of port authority tasks

Governance indicators

- Autonomous Management provides information on whether port authorities maintain features that enable it to develop vital initiatives.
- The indicator Integration of Port Cluster expresses the extent to which port authorities aim towards the integration of various stakeholders composing a port cluster.
- Reporting Corporate and Social Responsibility touches upon port authority's activities that enhance corporate responsibility.



Governance indicators

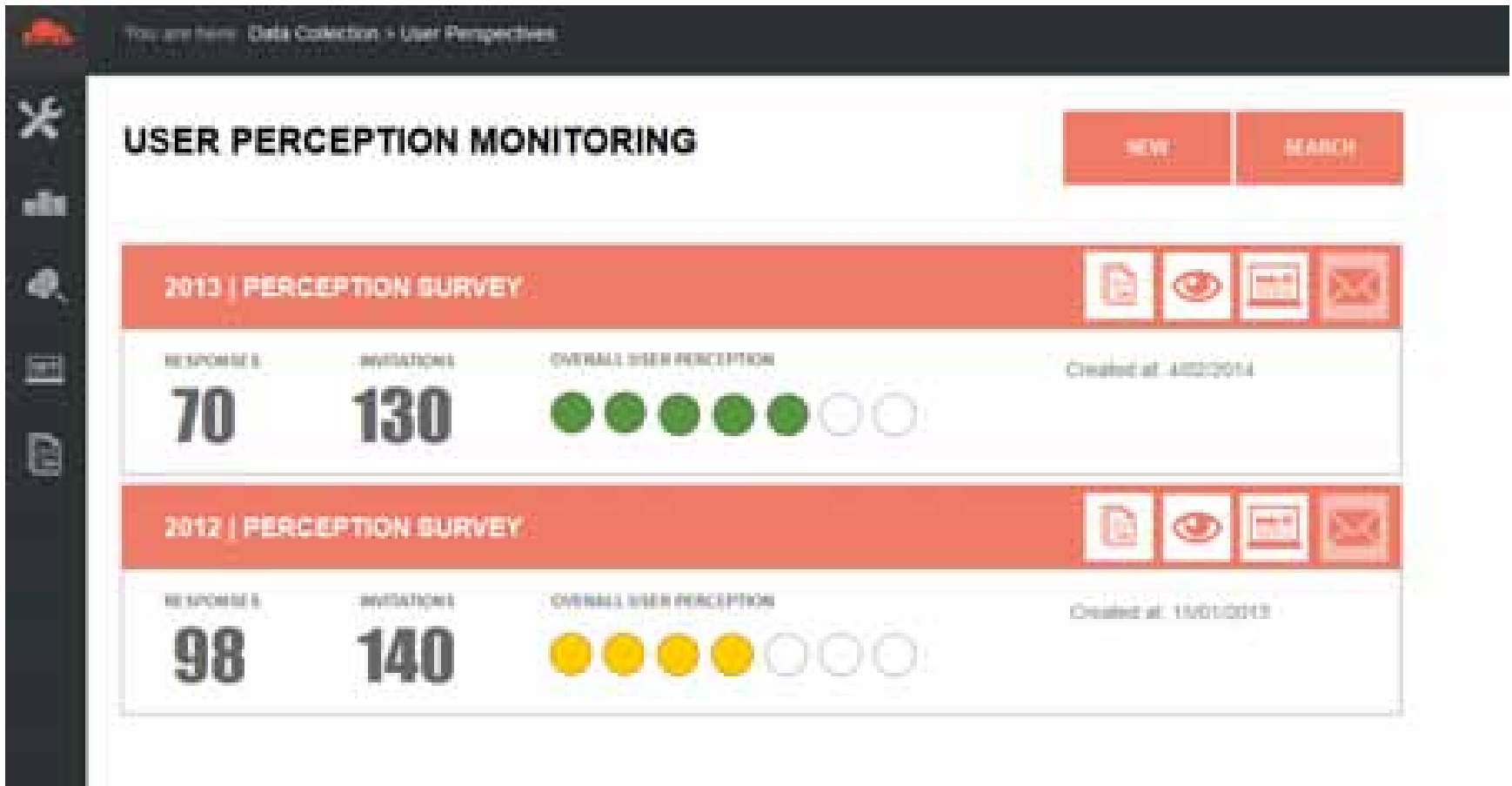


PORTOPIA

Indicators: User Perceptions of Port Performance

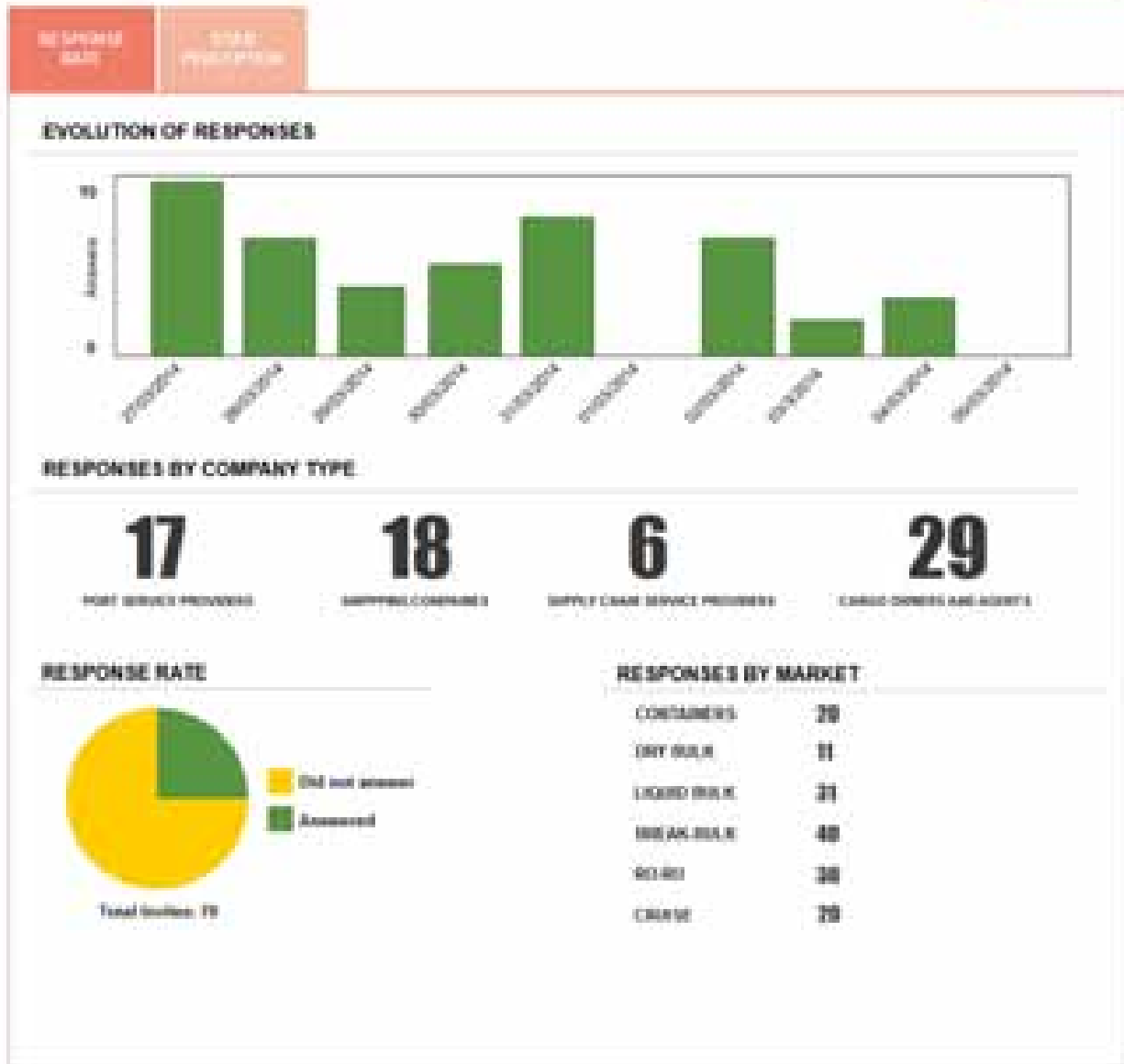
- Development of an ICT tool to measure the user perceptions on port performance (= effectiveness of service delivery / **user satisfaction**)
- Port-centric approach
 - Tool can be customized (not all criteria are important for each port cf. diversity of ports) – markets, port components.
 - Ports submit the survey to their users (shippers, shipping lines, forwarders, other service providers)
- PORTOPIA provides the technological solution, scientific quality assurance and basic analytical tool
- Initially based on the CSI initiative of the AAPA, but modified and tailored to European needs

User perception measurement tool



USER PERCEPTION MONITORING

STATUS



USER PERCEPTION MONITORING

BACK

RESOURCES
RISK

USER
PERCEPTION

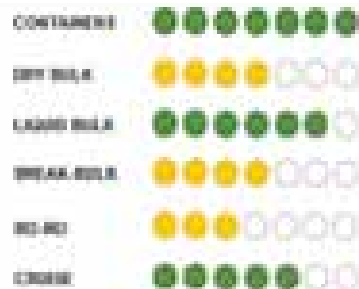
OVERALL USER PERCEPTION



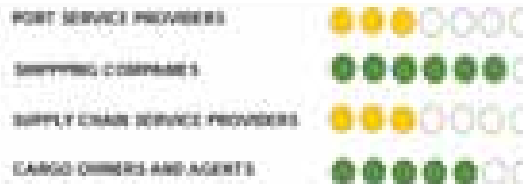
USER'S RATING



RATING BY MARKET



RATING COMPANY TYPE



[MORE DETAILS](#)

USER PERCEPTION MONITORING

01/06/2015

OVERALL USER PERCEPTION



USER'S RATING



RATING BY MARKET



RATING COMPANY TYPE



SCORE DETAILS

ITEMS	CONFIDENCE LEVEL	IMPACT RANK	RATING
1) BREAK BULK	50%	50%	4.0
2) Ship to port interface	50%	50%	5.0
Number of berths	50%	50%	5.0
Shovel related port costs	50%	50%	5.0
Shovel fuel, engine handling cost	50%	50%	4.0
Shovel length of the queue	50%	50%	4.0
Efficiency of unloading operations	50%	50%	5.0
Quays depth	50%	50%	5.0
Operational depth	50%	50%	5.0
Number of operational cranes	50%	50%	4.0
3) Efficiency of handling services (Shifting Costs)	50%	50%	5.0
Shifting	50%	50%	5.0
Stowage	10%	10%	5.0
Trimming	10%	10%	5.0
4) Ship	50%	50%	4.0
5) Ship to terminal interface	50%	50%	4.0
6) BULK	50%	50%	4.0
7) DRY BULK	50%	50%	4.0
8) LIQUID BULK	50%	50%	5.0
9) CONTAINERS	50%	50%	5.0
10) CRANE	50%	50%	5.0

You are here: Data Collection > User Perspectives

CREATE SURVEY

STEP 01 SURVEY COVER STEP 02 MARKET ASSESSMENT STEP 03 CRITERIA SELECTION STEP 04 INVITE USERS

SURVEY TITLE *

Efficiency of auxiliary services

SURVEY PERIOD *

LAST YEAR

CANCEL

SAVE & CLOSE

BACK

NEXT

You are here: Data Collection > User Perspectives

CREATE SURVEY

STEP 01 SURVEY COVER STEP 02 MARKET ASSESSMENT STEP 03 CRITERIA SELECTION STEP 04 INVITE USERS

Please select at least one market to be assessed by the port users.

ASSESSMENT MARKETS :

- Container
- Break Bulk
- Dry Bulk
- RO-RO
- Liquid Bulk
- Cruise

CANCEL SAVE & CLOSE BACK NEXT

CREATE SURVEY

STEP 01 SURVEY COVER STEP 02 MARKET ASSESSMENT **STEP 03 CRITERIA SELECTION** STEP 04 INVITE USERS

Please select the criteria to be assessed by the port users

BREAK BULK

Ship to port interface

Number of berths

Vessel-related port costs

Break-bulk cargo handling cost

Efficiency of auxiliary services (Quality-Cost)

Bunkering

Ice-breaking

Dredging

Total length of the quays

Efficiency of (un)loading operations

On-time departure

Operational depth

Number of operational cranes

Mooring

Waste reception facilities

Pilage

Tonnage

> Port

> Port to hinterland interface

> RO-RO

CANCEL

SAVE & CLOSE

BACK

NEXT

CREATE SURVEY

STEP
01

SURVEY COVER

STEP
02

MARKET ASSESSMENT

STEP
03

CRITERIA SELECTION

STEP
04

INVITE USERS

Please fill the name and email of the users that you wish to invite to answer the survey or upload an excel file with the contacts. This step is non-mandatory, you can invite users on a later stage.

CONTACT NAME

EMAIL

Person Person

Persona@person.com



UPLOAD FILE

Upload an excel file that follows the following [excel scheme](#).

CHOOSE FILE

TO BE INVITED

CONTACT NAME	EMAIL
John Email	email@email.com
Peter User	user@user.com
Michael User	para@user.pt
Jim Pearson	jim.pearson@user.pt

CANCEL

SAVE & CLOSE

BACK

NEXT

**Visit us at the PORTOPIA booth
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