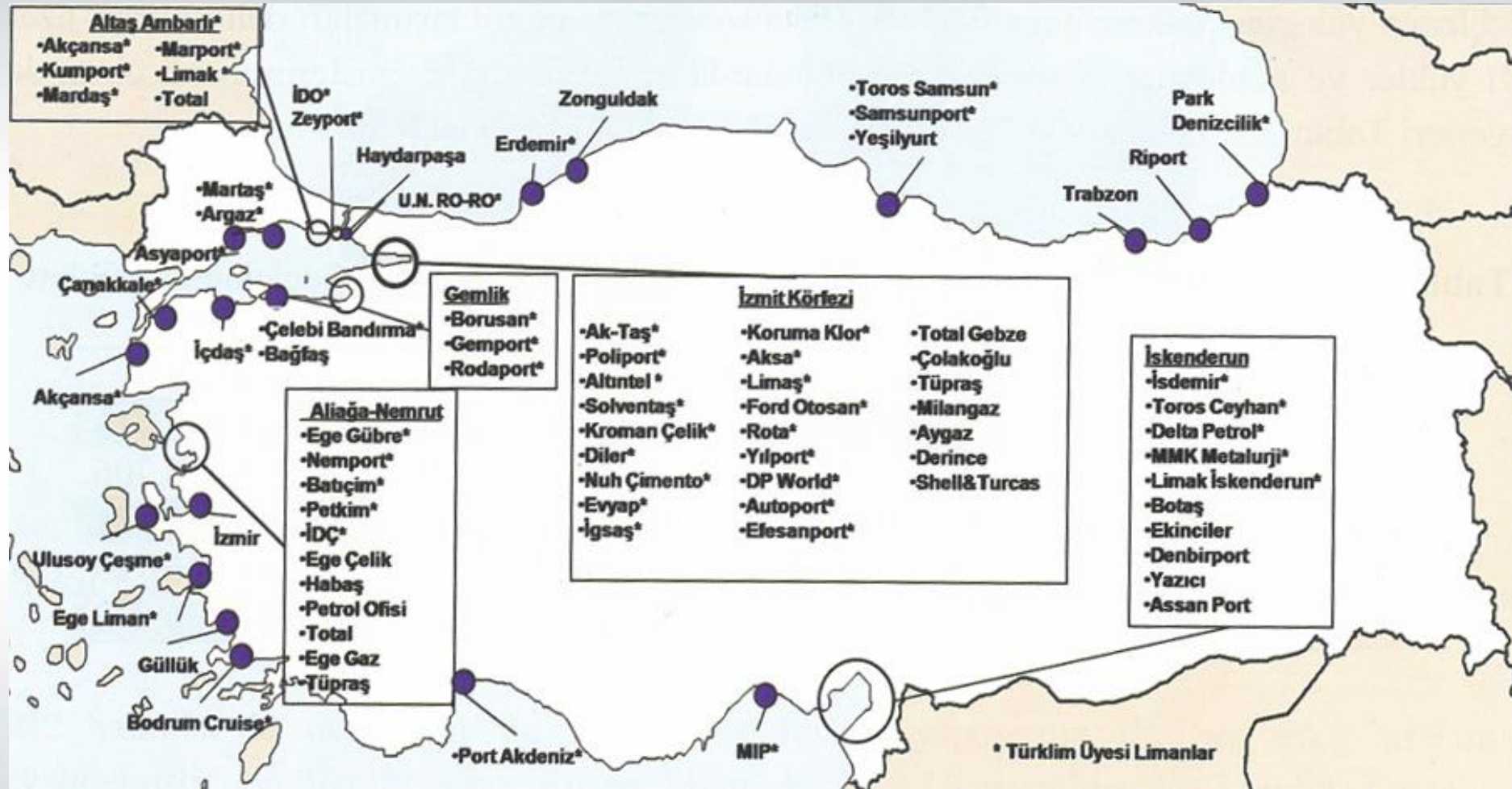




PRESENTATION
ASSESSING PORTS DEVELOPMENT IN TURKEY

Turkish Ports



*Source: Türklim – Türkiye Limancılık Sektörü Raporu 2013

Trends in Ports Development

Increased Vessel Size

- Larger Vessels in main Trade Routes = Larger Vessels in Feeder Lines
- Large vessels are not getting any longer. They become beamier.
- Yard, Landside, Gate and Intermodal Capacities have to keep up.

Effects in Port Development

- Deeper Quays
- Larger Crane Outreach and Height
- Enhanced Gate and Intermodal Capacities
- Increased Productivity and Need for Automation

To keep up with the new operating conditions;

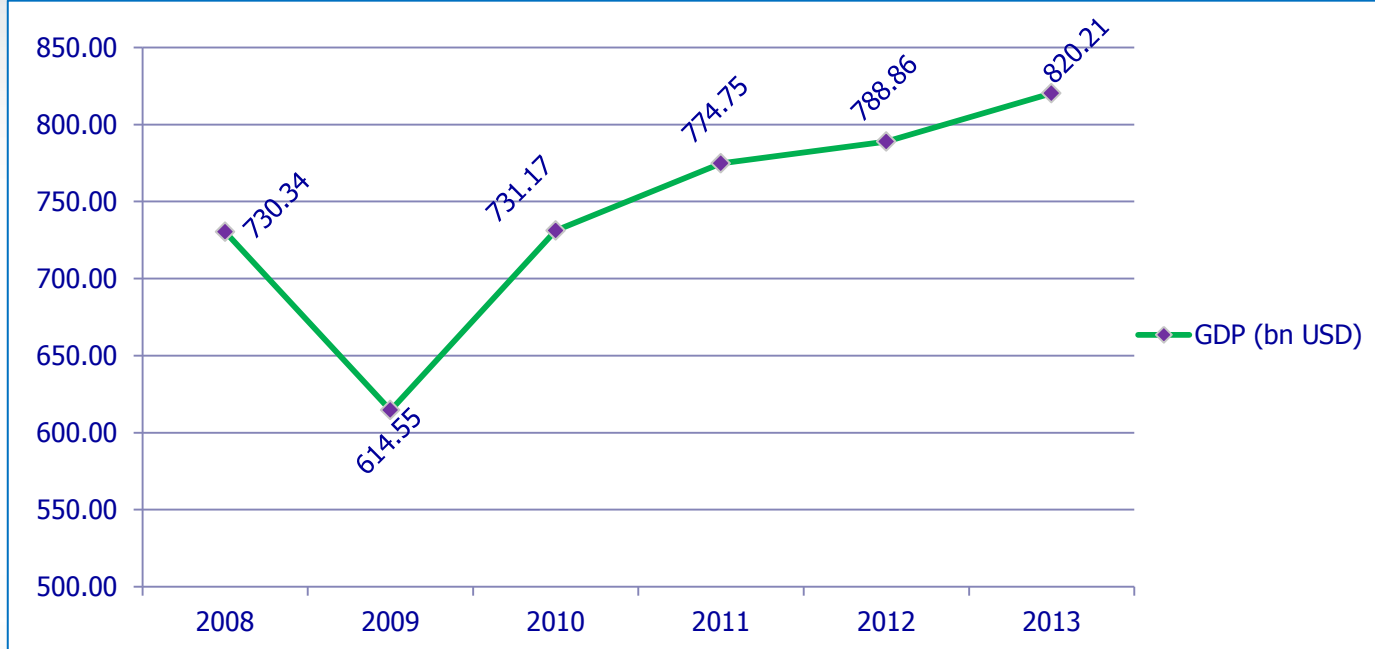
- Better Quay-, Yard-, Landside & Hinterland Planning
- Better Ports' Infrastructure
- Automation and Terminal Operation Systems are needed.



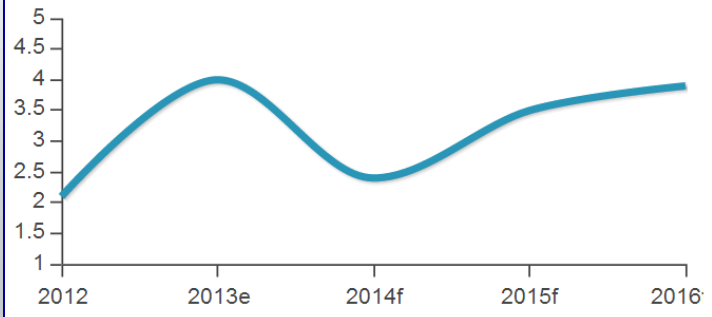
Turkey and the Regional Overview

Economic Indicators and Forecasts

Turkey GDP Variation (bn USD)



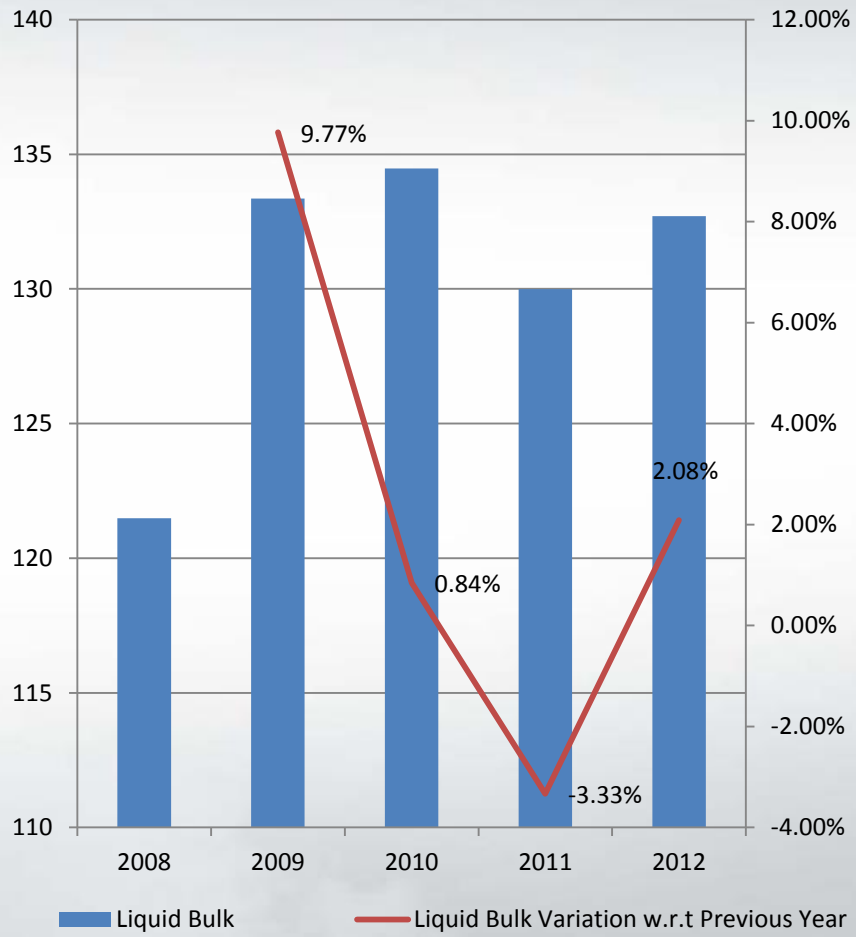
Annual GDP Growth Rate Forecast (%)



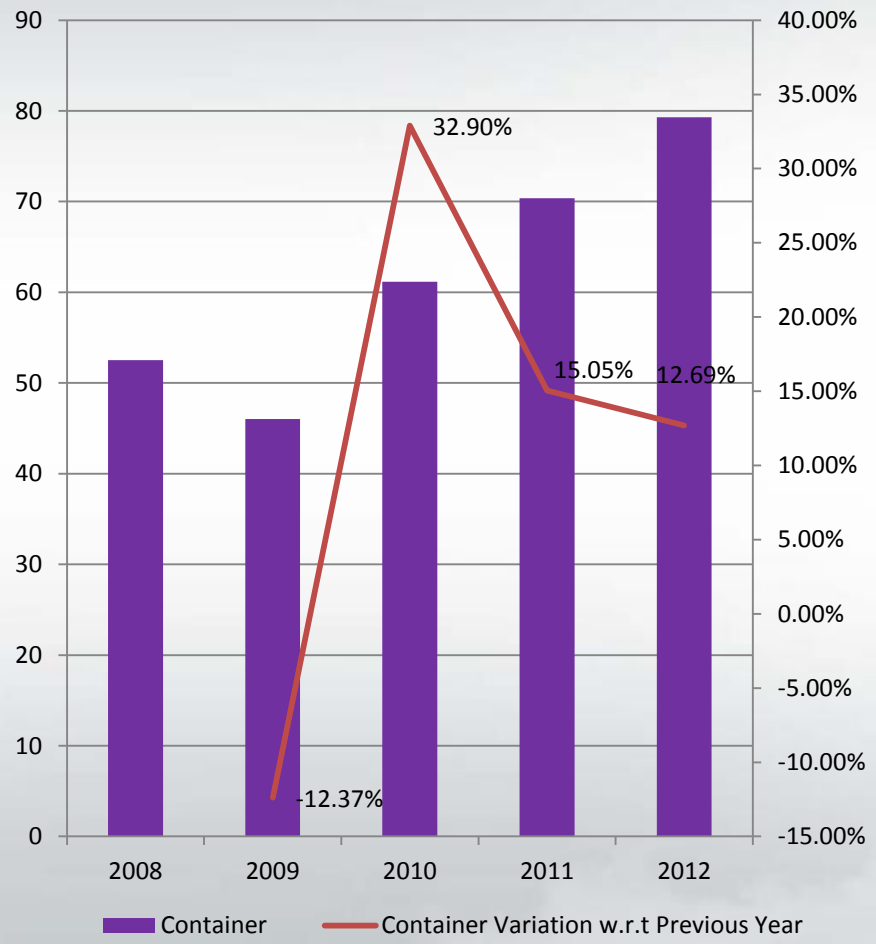
*Source: World Bank

Turkey and the Regional Overview

Turkish Ports - Liquid Bulk Throughput (Mio tons)



Turkish Ports - Container Throughput (Mio tons)



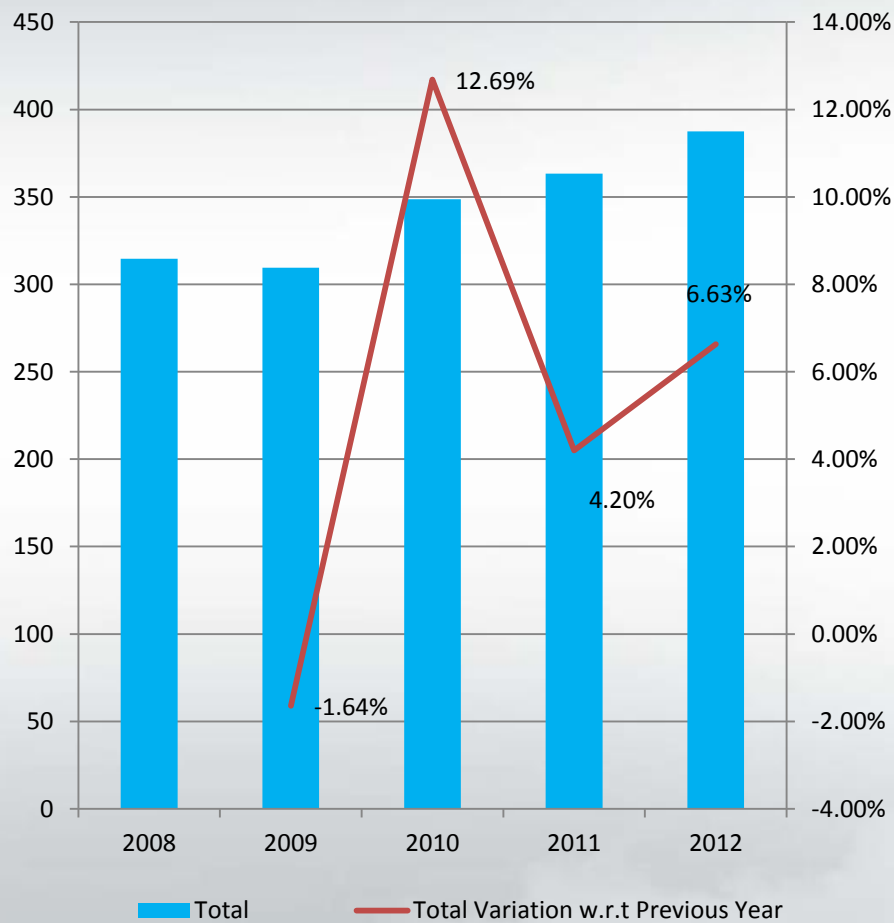
*Source: Türklim – Türkiye Limancılık Sektörü Raporu 2013

Turkey and the Regional Overview

Turkish Ports - Bulk/General Cargo Throughput (Mio tons)



Turkish Ports - Total Throughput (Mio tons)



*Source: Türklim – Türkiye Limancılık Sektörü Raporu 2013

Turkish Ports: Status

Logistics Performance Index 2014: Turkey Indicators

Key Dimensions	Explanation	Ranking among 155 Countries	Score (1 to 5)	Top Performer and Score (1 to 5)
Customs	Efficiency of the clearance process	34	3.23	Norway (4.21)
Infrastructure	Quality of trade and transport related infrastructure	27	3.53	Germany (4.32)
International shipments	Ease of arranging competitively priced shipments	48	3.18	Germany (3.82)

*Source: World Bank

Turkish Ports: Status

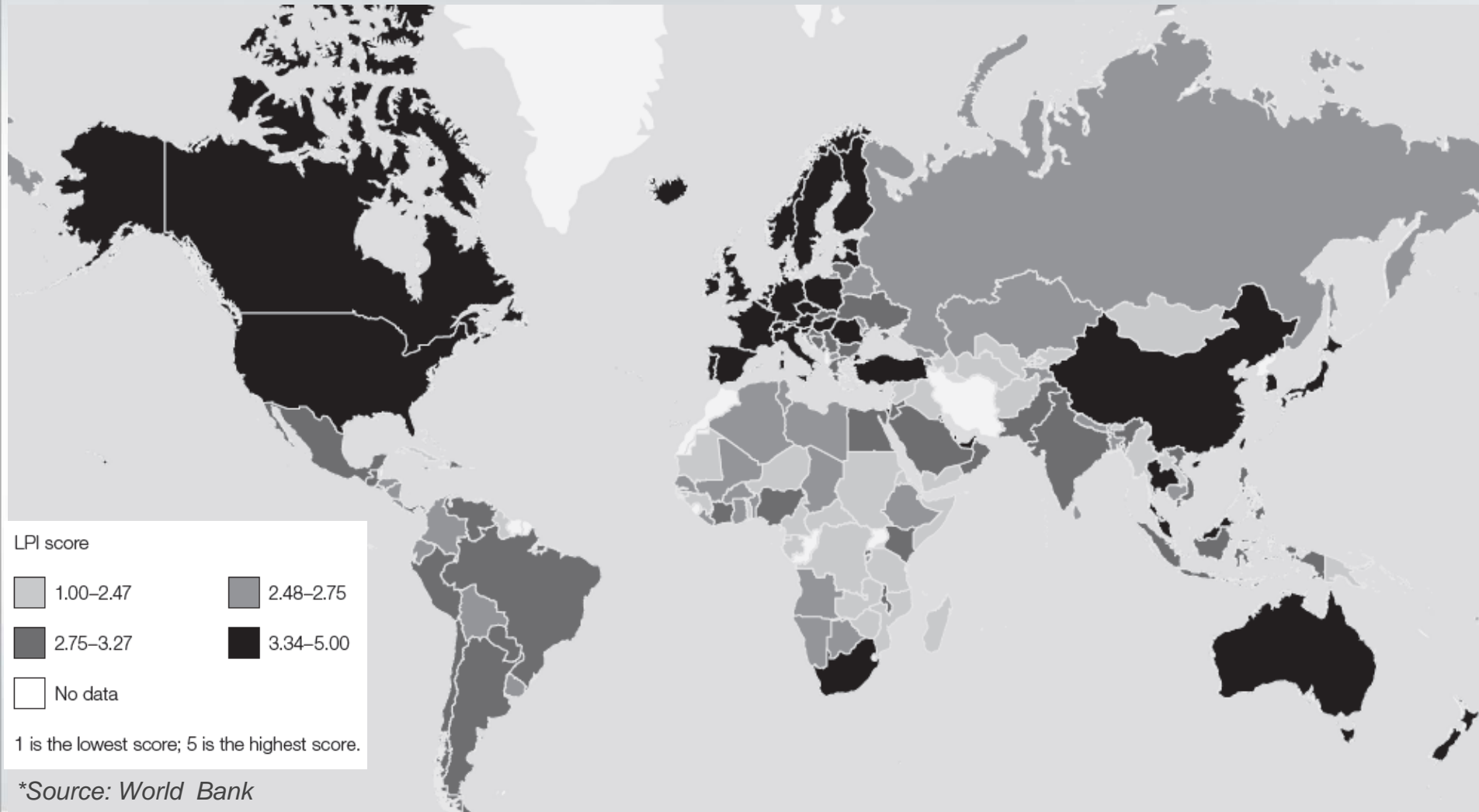
Logistics Performance Index 2014: Turkey Indicators

Key Dimensions	Explanation	Ranking among 155 Countries	Score (1 to 5)	Top Performer and Score (1 to 5)
Logistics competence	Competence and quality of logistics services	22	3.64	Norway (4.19)
Tracking & tracing	Ability to track and trace consignments	19	3.77	Germany (4.17)
Timeliness	Timeliness of shipments in reaching destination within the scheduled or expected delivery time	41	3.68	Luxembourg (4.71)
TURKEY'S Standing				
Logistics Performance Index Rank	Weighted average of the country scores on the six key dimensions	30	3.5	Germany (4.12)

*Source: World Bank

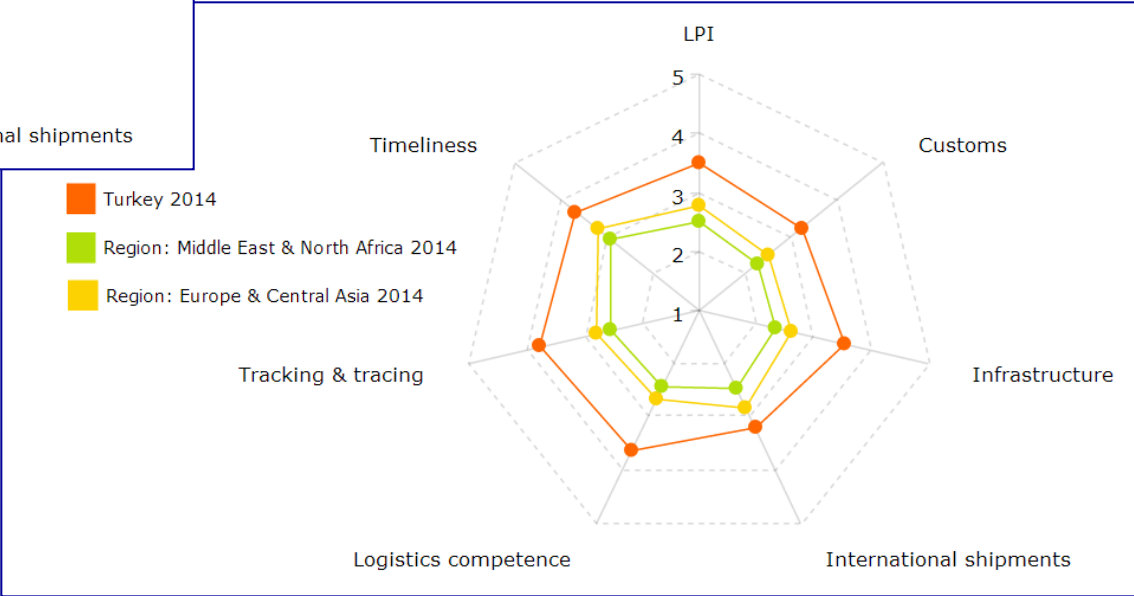
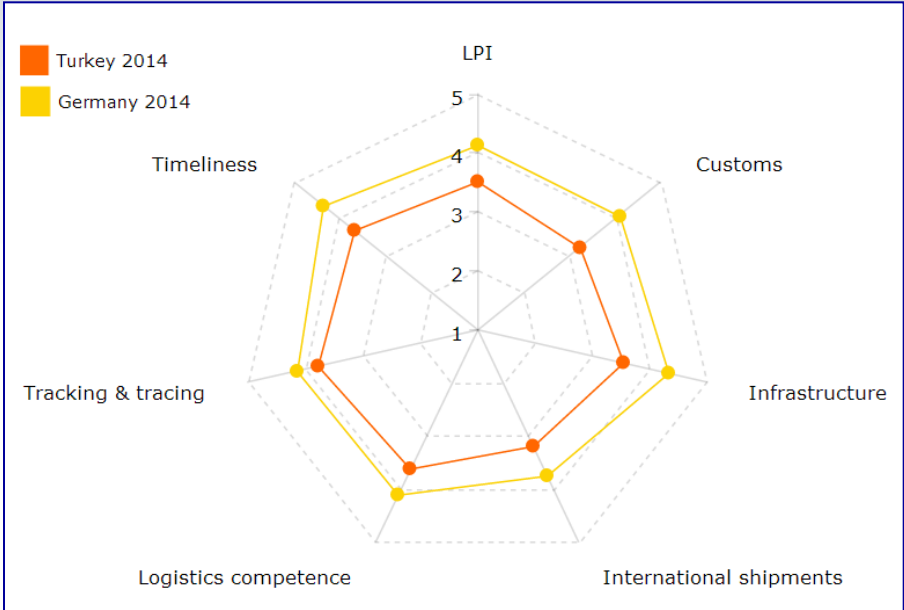
Turkish Ports: Status

Logistics Performance Index 2014: Global Comparison



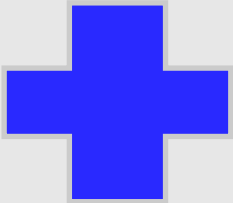
Turkish Ports: Status

Logistics Performance Index 2014: Turkey Indicators



*Source: World Bank

Turkish Ports: Status



Strengths and Opportunities for Turkish Ports

- Geographical Location
- Increase in Foreign Trade Rate and Economical Conjuncture
- Positive Attitude of Private Sector towards the Ports' Industry
- Good Quality and Low Price Policy in Ports' Services
- Availability of Skilled Labor and Working Environment
- Keeping up with the Latest Technology in Ports



Weaknesses and Threads Summary for Turkish Ports

- Legal and Administrative Structure, Bureaucracy
- Infrastructural Problems
- Lack of Long-Term Nat'l and Int'l Ports Policy
- Transportation Facilities
- Technology Investments in Ports

*Source: Türklim – Türkiye Limançılık Sektörü Raporu 2013

Turkish Ports: Direction and Needs?

What is ahead?

- Increase in total throughput of Turkish Ports: Higher than the regional average
- Increase in throughput of Turkish Ports: Sustainable in the long run
- Banks estimate a USD 7bn in the pipeline for port projects in Turkey*
- Larger vessels require port infrastructure investments at the operating ports
- Increased competition: Increased operational skills and need for automation

What is needed?

- Optimized planning and reliable design
- High quality port construction to answer increasing infrastructure demands
- Condition assessment of existing ports and refurbishment/reconstruction as required
- Operating Systems, Remote Control, Yard & Terminal Automation Systems
- Effective port equipment to handle peak demands created by larger vessels

**Source: TRACECA Maritime Sector Overview, Egis Int'l. & Dornier Consulting, October 2013*

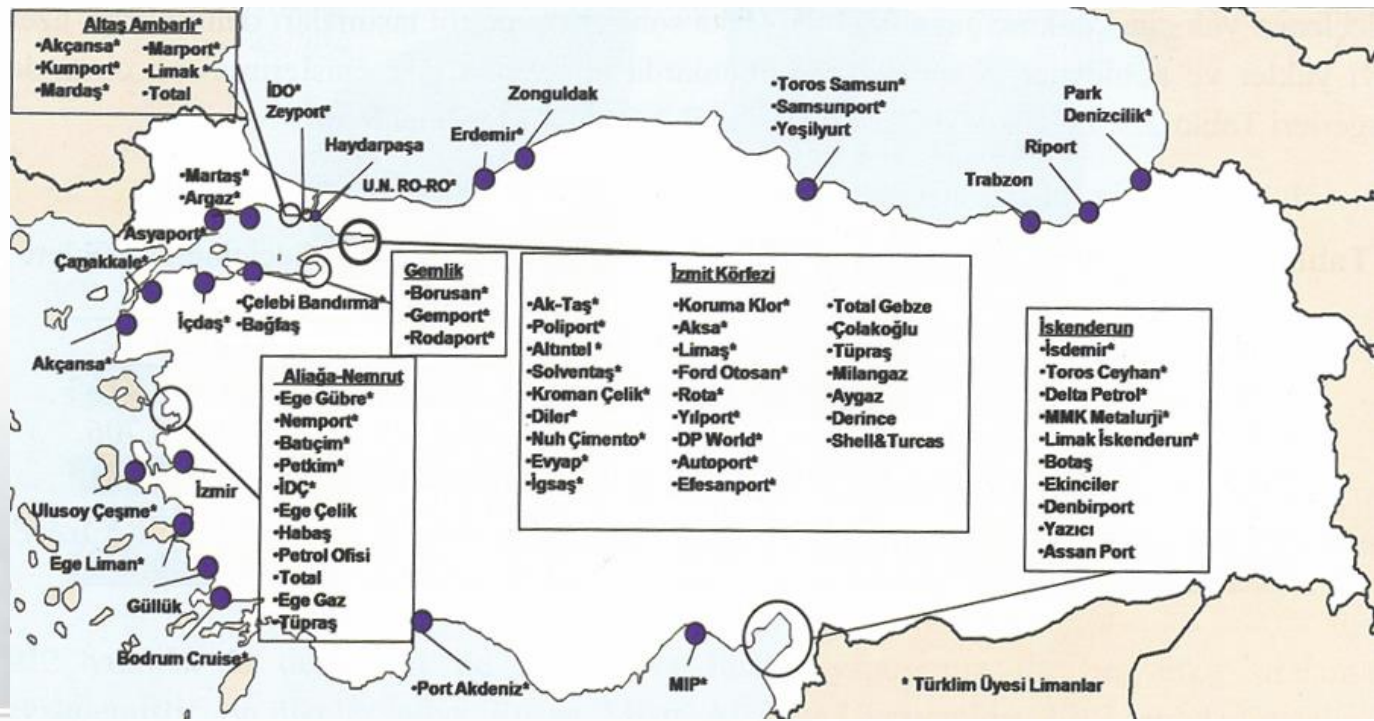
Sustainable Port Services → Sustainable Infrastructure

Sustainable Port Infrastructure

is the key for;

- Adequate Capacity for Increased Demands,
- Ability to keep up with the Technological Developments,
- Competitiveness,
- Operational Safety...

Sustainable Port Services



Earthquake Impacts and Changes in Turkish Legislation

Turkish Earthquake Technical Regulations Modified in 2007

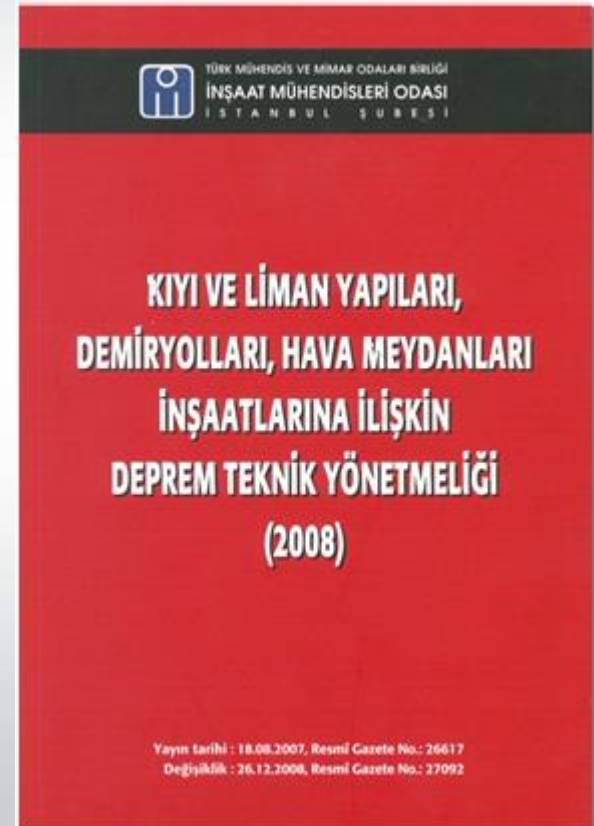
Technical Seismic Regulation on Construction of Coastal and Harbour Structures, Railways and Airports (Ministry of Transport of the Republic of Turkey, 2008)

- Stringent structural design
- Performance based design philosophy
- Focus on earthquake impacts

Most marine structures constructed before 2007, fail to comply with the new earthquake regulation.

- Condition assessment
- Refurbishment and modernization
- Reconstruction

ensure structural safety and smooth port operations.



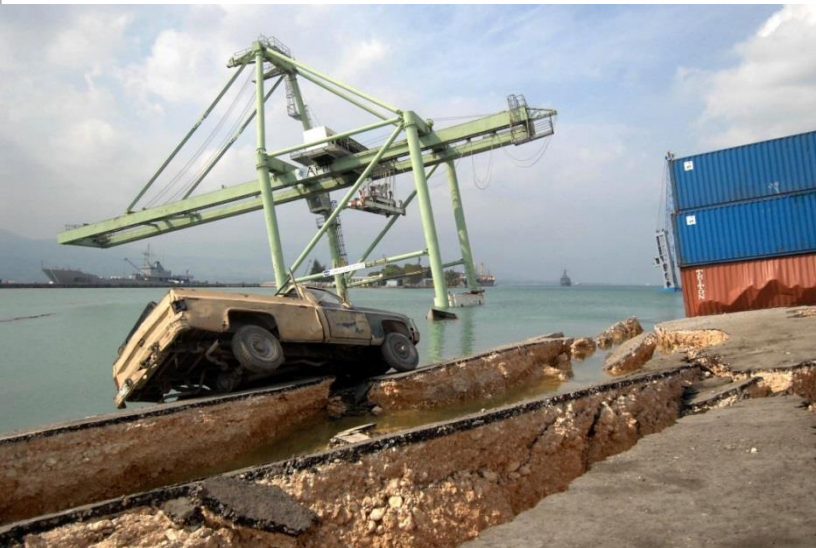
Earthquake Impacts and Changes in Turkish Legislation

17 August 1999, Eastern Marmara (Izmit) Earthquake, Magnitude: 7.4, Duration: 45 seconds

Impacts on Marine Facilities within ~100 km distance from earthquake epicenter;

- **4 Heavy Damaged** (Complete Failure)
- **6 Medium Damaged** (Partial Failure, Repair and Maintenance needed)
- **5 Light Damaged** (Small Damages not affecting Operability)
- **6 Undamaged**

(Source: Deniz Yapılarında Deprem Etkileri ve 1999 Gölçük Depremi Örneği)



Photos: Representative

Earthquake Impacts and Changes in Turkish Legislation

Earthquakes cause Serious Damages on Port Structures leading to;

- Safety Deficiencies
- Substantial Loss of Port Operations
- Structural Damage
- Considerable Economic Impact



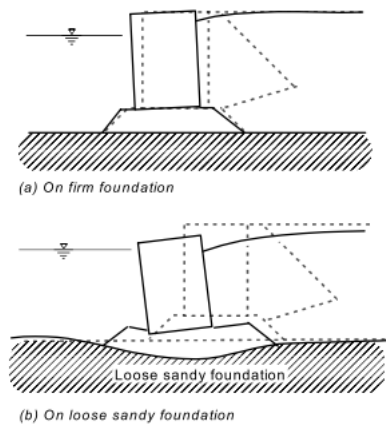
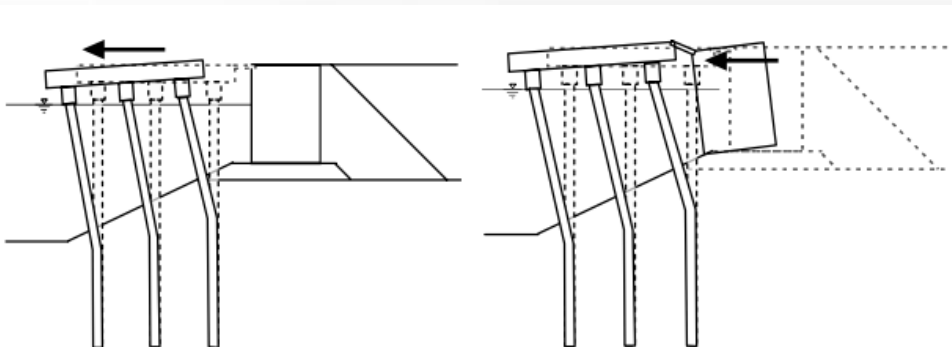
Cost of Physical Damage and Repair



Business Interruption Costs



Total Earthquake Costs in Ports



Source: Forecasting Earthquake Losses in Port Systems, Phd Dissertation, 2012

Earthquake Impacts and Changes in Turkish Legislation

Performance Based Earthquake Design

Ground Motion Level	Return Period	Probability of Exceedance	Definition
D1	72 years	50% in 50 years	Frequent
D2	475 years	10% in 50 years	Occasional
D3	2475 years	2% in 50 years	Rare

Importance Category	Ground Motion Level		
	D1	D2	D3
	Seismic Performance		
Special	-	MD	CD
Normal	MD	CD	-
Simple	CD	SD	-
Insignificant	SD	CL	-

MD-MINIMUM DAMAGE:	No loss of structural function, structure is serviceable. Duration of functionality delays is in the order of not more than a couple of days.
CD-CONTROLLED DAMAGE:	Deformations and associated damage are beyond serviceability limits but can be repairable. Duration of functionality delays is in the order of weeks or months.
SD - SEVERE DAMAGE:	Possibility of loss of structural function and damages are mostly irreparable but no partial or total collapse is observed. Duration of functionality delays is unknown, shutdown is possible.
CL - COLLAPSE LIMIT:	The structure is on the verge of collapse, partial collapses are possible

Key Stages in Ports Development



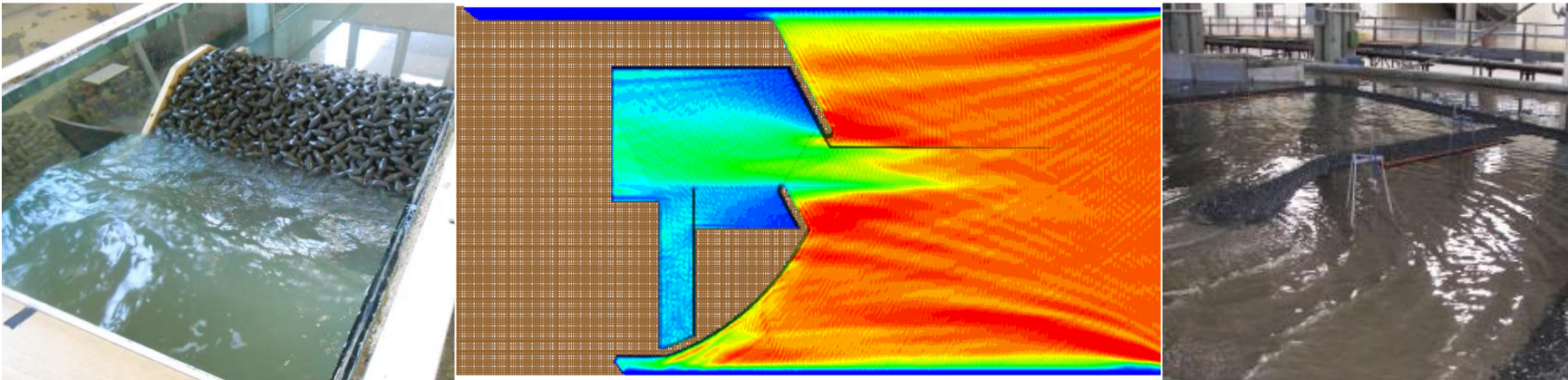
- **STRUCTURAL AND OPERATIONAL SAFETY**
- **ENVIRONMENT SAFEGUARDS**
- **EFFECTIVE, SUSTAINABLE AND PROFITABLE**



Engineering and Construction Practices in Ports Development



Planning, Tender Design, Technical Supervision Services (Misurata Free Zone Administration, Libya)

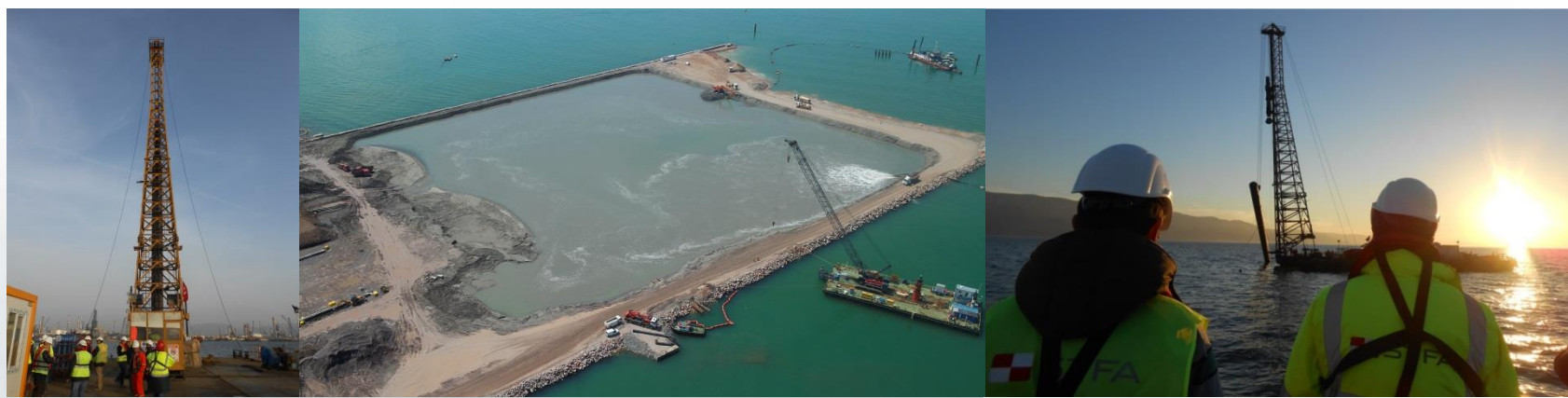


Numerical and Physical Modeling Studies (Various Projects, Oman and Libya)

Engineering and Construction Practices in Ports Development

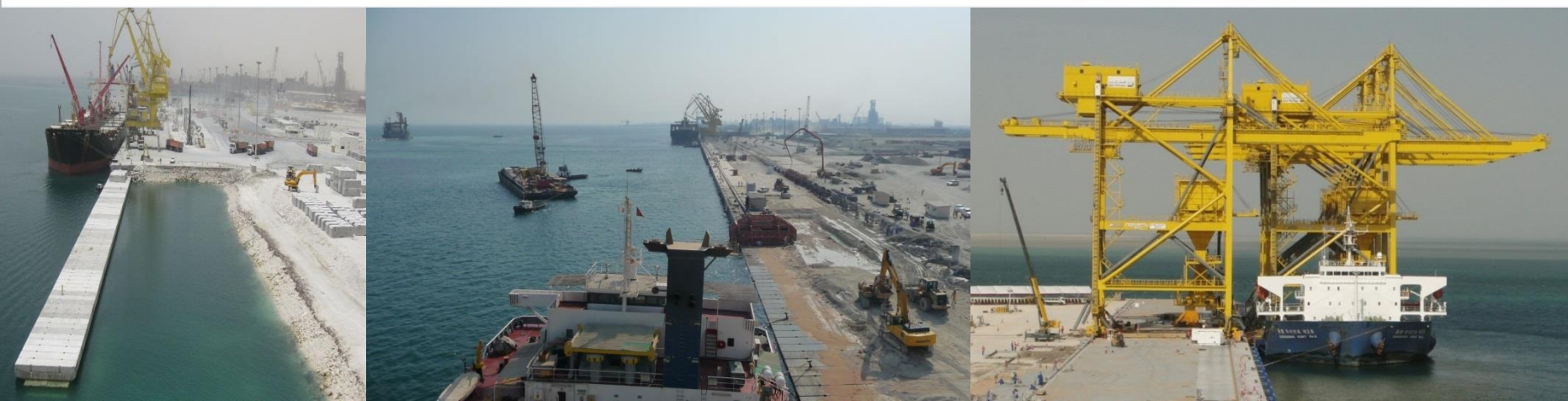


EPIC for Container Terminal, Berth No.7 *(Qatar Petroleum , Qatar)*

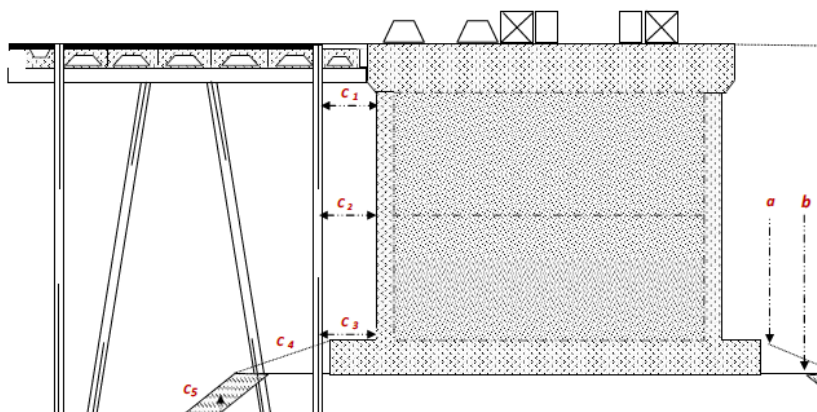


Yarımca Container Terminal Civil Works *(DP World Yarımca Liman İşletmeleri A.Ş., Izmit/Turkey)*

Engineering and Construction Practices in Ports Development



EPIC for Gabbro Berth Expansion (Package 1) at Mesaieed Port (Qatar Petroleum, Qatar)



Condition Assessment, Refurbishment Design (Various Projects, Libya and Turkey)

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