

## Modernisation of Danube ports and transshipment sites: Benchmarks and the New Port East project at Vukovar

Working Groups for Priority Area 1a of the EUSDR

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## Drivers for the modernisation of Danube ports and transshipment sites

- Increasing demands and requirements from the customers' side (e.g. ship turn-round time, storage capacity, opening hours)
- Investments as a precondition for using unexploited potentials and realising new transport solutions (e.g. heavy lift capacity, Ro-Ro transports, dangerous goods)
- Increasing complexity deriving from multimodal transport flows (pre- and posthaulage, buffering, storage, value added services, streamlining transshipment processes)
- Normal life-cycles of infrastructure, handling equipment and storage facilities



## Definition of benchmarks and performance indicators to support targeted investments

### Objectives:

- create a sound basis for the improvement of offered services
- develop standardised indicators for an objective comparison of ports' performance
- collect arguments for funding applications (needs assessment)



### Prerequisites:

- sound definition of scope for a well-founded comparison of ports and terminals (e.g. specific cargo, type of port)
- quantification of benchmarks & indicators whenever possible
- evaluation of benchmarks by (potential) customers of port services



## INWAPO project



- Financial support for the elaboration of a set of benchmarks and performance indicators for inland ports and sea ports
- Funded by the Central Europe Programme of the European Commission
- Participating Danube ports: Port of Vienna, Port of Bratislava, Freeport of Budapest; Lead Partner: Port of Venice
- Methodology and inputs:
  - review of published studies and projects
  - integration of external expertise with practical know-how (iC Consulenti)
  - Best Practice definition at a visit to the Port of Duisburg (port management, offered services, customer orientation)
  - inputs provided by INWAPO project partners

## Output: benchmark definition matrix

- collection of a set of 41 indicators related to infrastructure (9), superstructure (10), operation (17) and macro-economics effects (5)
- classification of benchmarking parameters by
  - category
  - cargo group

	Infrastructure	Superstructure	Operation	Macro-economic effects
Dry bulk				
Liquid bulk				
General cargo/ break bulk				
Container				
Ro-Ro				

## Infrastructure and superstructure related indicators

Infrastructure	Superstructure
<ul style="list-style-type: none"><li>▪ Total quay length</li><li>▪ Vertical quay length</li><li>▪ Sloped quay length</li><li>▪ Quay quality ratio</li><li>▪ Number of berths</li><li>▪ Anchorage capacity</li><li>▪ Number of Ro-Ro ramps</li><li>▪ Length of rail handling tracks along the quay</li><li>▪ Maximum block train length on tracks along the quay</li></ul>	<ul style="list-style-type: none"><li>▪ Total storage capacity</li><li>▪ Average storage utilization</li><li>▪ Storage capacity utilization rate,</li><li>▪ Open storage capacity</li><li>▪ Technical (or design) waterside handling capacity</li><li>▪ Average waterside handling capacity</li><li>▪ Waterside handling capacity utilization rate</li><li>▪ Technical (or design) waterside handling capacity per quay meter</li><li>▪ Average waterside handling capacity per quay meter</li><li>▪ Heavy lift capacity</li></ul>



# Operational (service) indicators and economic indicators

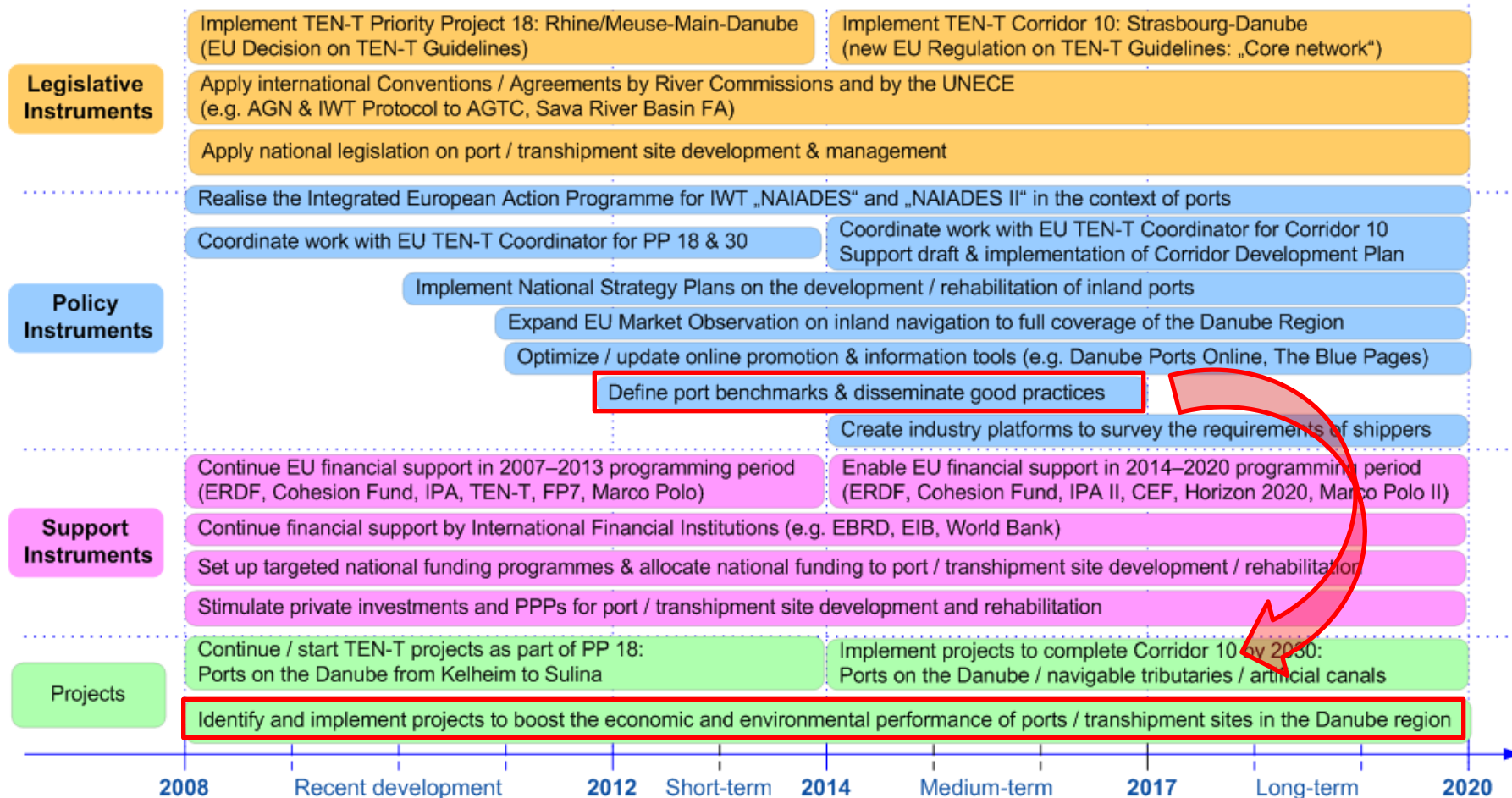
Operation	Macro-economic effects
<ul style="list-style-type: none"><li>▪ Number of motorised cargo vessels (MCV) and pushed barges handled</li><li>▪ Waterside tonnage handled</li><li>▪ Direct waterside transshipment</li><li>▪ Indirect waterside transshipment</li><li>▪ Arrival rate</li><li>▪ Service rate</li><li>▪ Berth occupancy</li><li>▪ Traffic intensity</li><li>▪ Average waiting time</li><li>▪ Average service time</li><li>▪ Average ship turn-round time in port</li><li>▪ Tonnage (or TEU) per ship or tonnage (TEU) per call</li><li>▪ Time without equipment malfunction</li><li>▪ Equipment reliability</li><li>▪ Market trends for different cargo categories</li><li>▪ Customs clearance efficiency</li><li>▪ Opening hours</li></ul>	<ul style="list-style-type: none"><li>▪ Gross Value Added</li><li>▪ Direct full time employment</li><li>▪ Indirect full time employment</li><li>▪ Investment of private or public companies per quay length or per m<sup>2</sup> of port area</li><li>▪ Waterside trade values (export, import, domestic)</li></ul>

## Knowledge management complete – what now?

- Publication of the knowledge management report on [www.inwapo-project.eu](http://www.inwapo-project.eu)
- Feedback can be provided by phone and mail: [simon.hartl@via-donau.org](mailto:simon.hartl@via-donau.org), +43 50 4321 1614
- Critical review of the overall set of benchmarks and indicators:
  - Which ones are suitable to steer the future development of ports and transshipment sites?
  - Which ones are relevant from the port and terminal operators' point of view?
  - Which ones are relevant from the customers' point of view?
  - Are there any important indicators missing?
- Detailed discussion at the next Priority Area 1a Working Group on Ports



# Overview: Ports & Sustainable Freight Transport



## Port Authority Vukovar – New Port East project of reconstruction and modernisation of Vukovar Port

- port location - 1335 rkm of Danube corridor
- positioned alongside Danube river
- VIc class of navigability



## Application of benchmarks and performance indicators in practice

### Port of Vukovar – New Port East

- Specific objective of the project is to modernise and increase the capacity of Vukovar port
- New Port East project encompasses the construction of infrastructural port facilities, bank, road and rail as well as communal infrastructure including three new terminals
  - bulk cargo terminal 24000  $m^2$
  - multipurpose terminal 4000  $m^2$
  - general cargo terminal 12000  $m^2$
- Construction works are divided in two phases in order to keep port operability even during construction

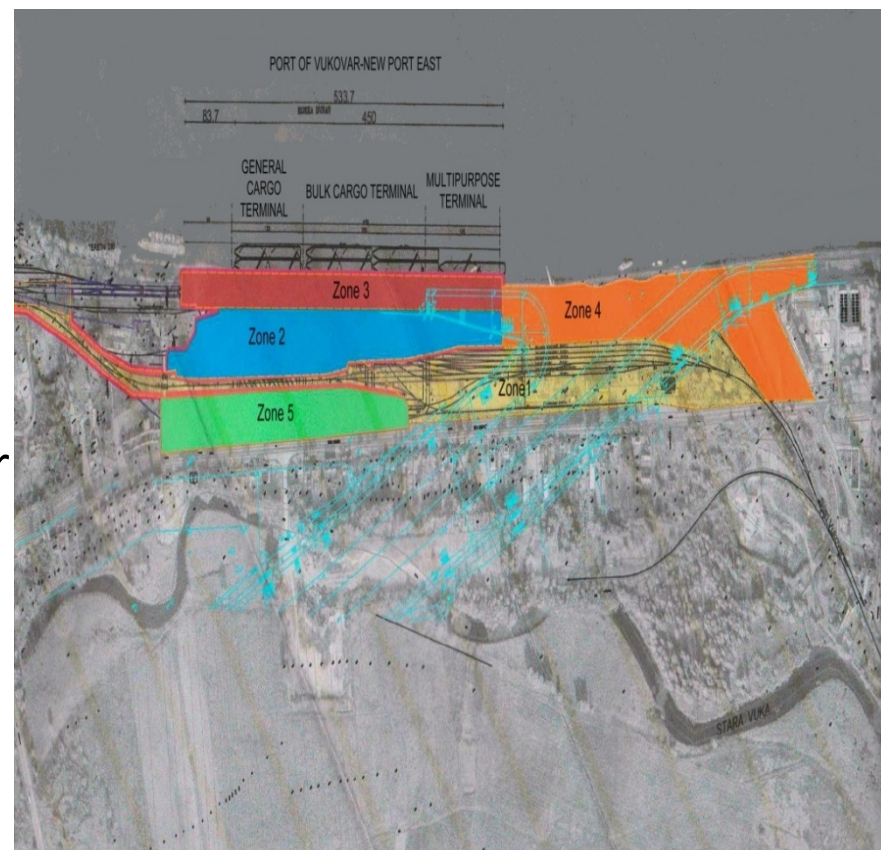
## Port of Vukovar – New Port East

- Current status of project
  - preliminary design - finished
  - location permit - obtained
  - main design preparation – in progress,foreseen to be finished during 2015
  - construction works foreseen to begin during last quarter in 2015
  - model of financing - national budget
    - EU cofinancing
- Total amount of construction works estimated to 24,17 mil €



## Situation of the building on the plot- division into zones

- Zone 1- reconstructed route of the railway track
- Zone 2 - the part of the coastal area for storage of goods
- Zone 3 – operative coast which will be reconstructed as the “vertical bank”
- Zone 4 - area of the existing Vukovar Port on the Danube which will remain operable until the Canal Danube – Sava construction
- Zone 5 - part of the area for storage of goods in transshipment



## Construction works

- Construction works – divided in two phases
- The 1<sup>st</sup> phase of the project - foreseen to be conducted before Danube-Sava canal construction including:
  - reconstruction of industrial railway tracks
  - reconstruction of roads
  - operational bank reconstruction
  - reconstruction and construction of new open storage area
- The 2<sup>nd</sup> phase of the project - foreseen to be conducted after Danube-Sava canal construction including:
  - removing existing railtracks on the canal route
  - roads reconstruction and adaptation
  - sheltered warehouse construction within zone 5

## Port infrastructure indicators

Existing port infrastructure	Future port infrastructure
➤ total quay length - $L_q = 430 \text{ m}$	➤ total quay length - $L_q = 455 \text{ m}$
➤ vertical quay length - $L_{qv} = 55 \text{ m}$	➤ vertical quay length - $L_{qv} = 455 \text{ m}$
➤ sloped quay length - $L_{qs} = 375 \text{ m}$	➤ -
➤ quay quality ratio - $R_q = \frac{L_{qv}}{L_q} = \frac{55}{430} = 0,12$	➤ quay quality ratio - $R_q = \frac{L_{qv}}{L_q} = \frac{455}{455} = 1$
➤ number of berths - $N_b = 4$	➤ number of berths - $N_b = 4$



## Port suprastructure indicators

Existing port suprastructure	Future port suprastructure
➤ total storage capacity - $C_S = 13000 \text{ m}^2$	➤ total storage capacity - $C_S = 20000 \text{ m}^2$
➤ open storage capacity - $C_{so} = 10000 \text{ m}^2$	➤ open storage capacity - $C_{so} = 15500 \text{ m}^2$
➤ covered storage capacity - $C_{sc} = 3000 \text{ m}^2$	➤ covered storage capacity - $C_{sc} = 4500 \text{ m}^2$
➤ heavy lift capacity - $C_{hv} = 63 \text{ t}$	➤ heavy lift capacity - $C_{hv} = 63 \text{ t}$

## Port performance indicators

### Port performance indicators- existing port review

➤ waterside tonnage handled -  $Q_w$

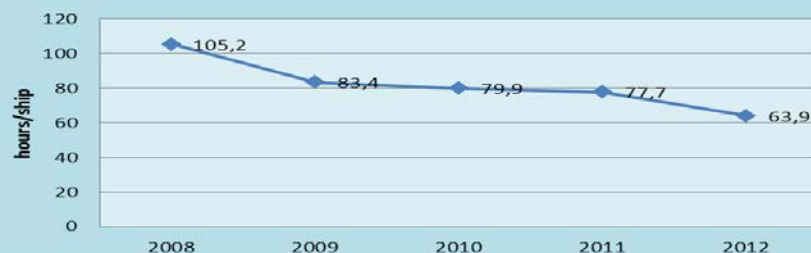
➤ average ship turn-round time in port  
-  $T_{ta}$

➤ number of motorised cargo vessels  
and pushed barges handled -  $N_s$

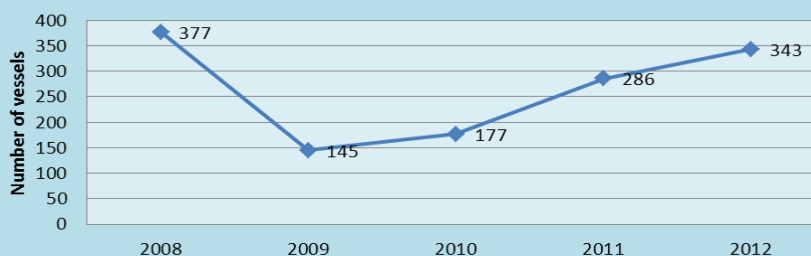
**Waterside tonnage handled**



**Average ship turn-round time in port  
(h/ship)**



**Number of motorised cargo vessels and pushed  
barges handled**



## Project New Port East – conclusion

Completing the project :

- total capacity of the port will be increased
- will improve port reliability and shorten the anchoring time
- will raise port competitiveness
- will strengthen inland navigation and foster economic development in the region





## Thank You

### Questions ?

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