Green Inland Ports

Green Inland Ports Workshop

23 May 2024

10:00 - 12:00 CEST

Online

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ECORYS CE Delft Panteia DANUBE Erasmus University Rotterdam EICB

Green Inland Ports

OPENING SESSION

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Welcoming remarks

Jasper Tanis, Ecorys

Introduction to the Green Inland Ports project

Task 1 – Environmental impacts and Efficiency and Transition

- Document environmental effects, related legislation and which effects are not addressed & the impediments in implementing sustainable management and development

Task 2 – Urban mobility and Short-Range Inland Waterway Transport

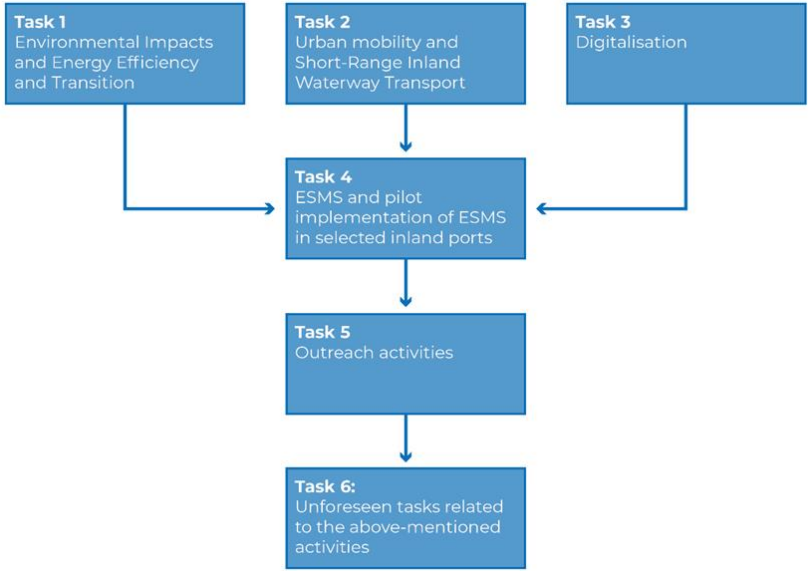
- Identify possibilities of adopting inland waterway transport for urban mobility and short-distance transport

Task 3 – Digitalisation

- Assess the role of digitalisation and propose solutions

Task 4 – ESMS and pilot implementation of ESMS in selected inland ports

- Pilot projects of several inland ports for implementing the Environmental and Sustainable Management Systems (ESMS) tools and implement coordinated actions for sustainable port management and operation



Housekeeping rules

- Please keep your **microphone off** unless you have been given the floor.
- We encourage you to use the **chat** to leave comments and interact with other participants during the event.
- Please note that this event will be **recorded**.
- If you are having any **technical issues**, please send us a message through the chat or contact us at greeninlandports@ecorys.com

Time	Agenda item
10:00 – 10:15	**Jasper Tanis (Ecorys)** Introduction to today's workshop
	Turi Fiorito (European Federation of Inland Ports)
10:15 – 10:20	*Q&A to the introduction*
10:20 – 10:30	**Nicole Imholz (CE Delft)** How to calculate environmental performance
10:30 – 10:45	*Q&A and discussion on the environmental benchmark*
10:45 – 10:55	**Ioanna Kourounioti (Panteia)** Development of ESMS which will facilitate this transition
10:55 – 11:10	*Q&A and discussion on these steps*
11:10 – 11:20	Coffee break
11:20 – 11:30	**Robert Rafael (Pro Danube)** Exploring innovative digital solutions for sustainable inland port development
11:30 – 11:40	*Q&A and discussion on exploring innovative digital solutions for sustainable inland port development*
11:40 – 11:50	**Max Weinhold (Planco)** Determining the potential of sustainable urban and short-range IWT based on lessons learnt from good practice cases
11:50 – 12:00	*Q&A and discussion on determining the potential of sustainable urban and short-range IWT based on lessons learnt from good practice cases*
12:00 – 12:10	**Jasper Tanis (Ecorys)** Wrap-up and next steps

EFIP
European Federation of Inland Ports

Welcome

Turi Fiorito

The European Federation of Inland Ports (EFIP)

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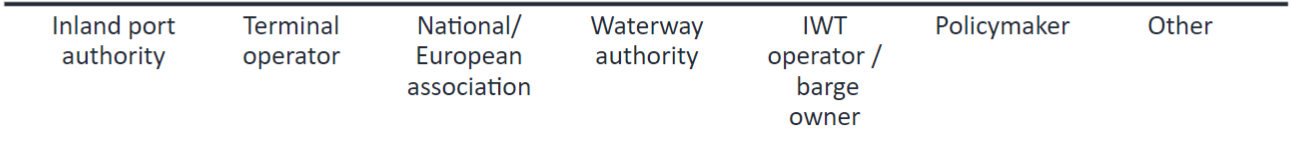
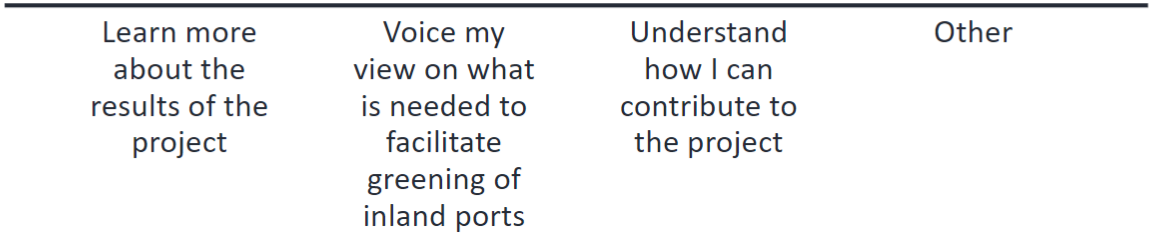
What type of organisation are you representing today?



What are your expectations for today's workshop?



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Environmental Impact of Inland Ports

Nicole Imholz, CE Delft

Why a tool for environmental performance?

- Task 1: determine environmental impact and good practices
- Goal
  - Find hotspots
  - Starting point for monitoring
  - Effect of measures or good practices to reduce impact
- Scope of the tool
  - Emissions, resources and energy use, and waste of activities in the port area
  - Various environmental effects

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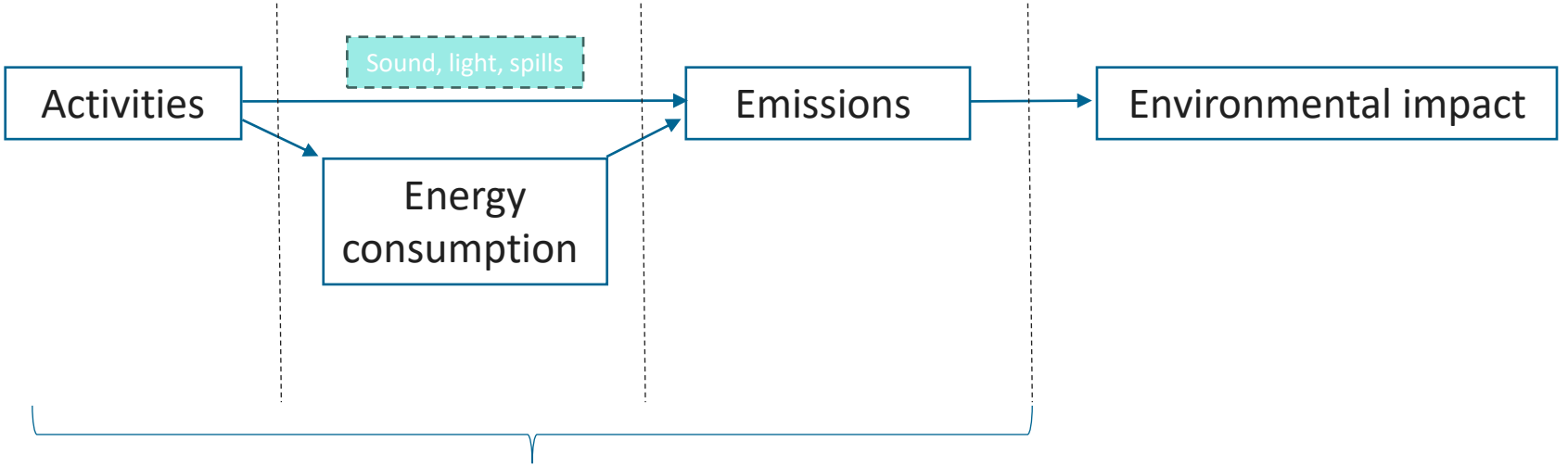
How to calculate environmental impact of inland ports?



Based on literature and databases
Average default values

Calculate through
ReCiPe (2016)

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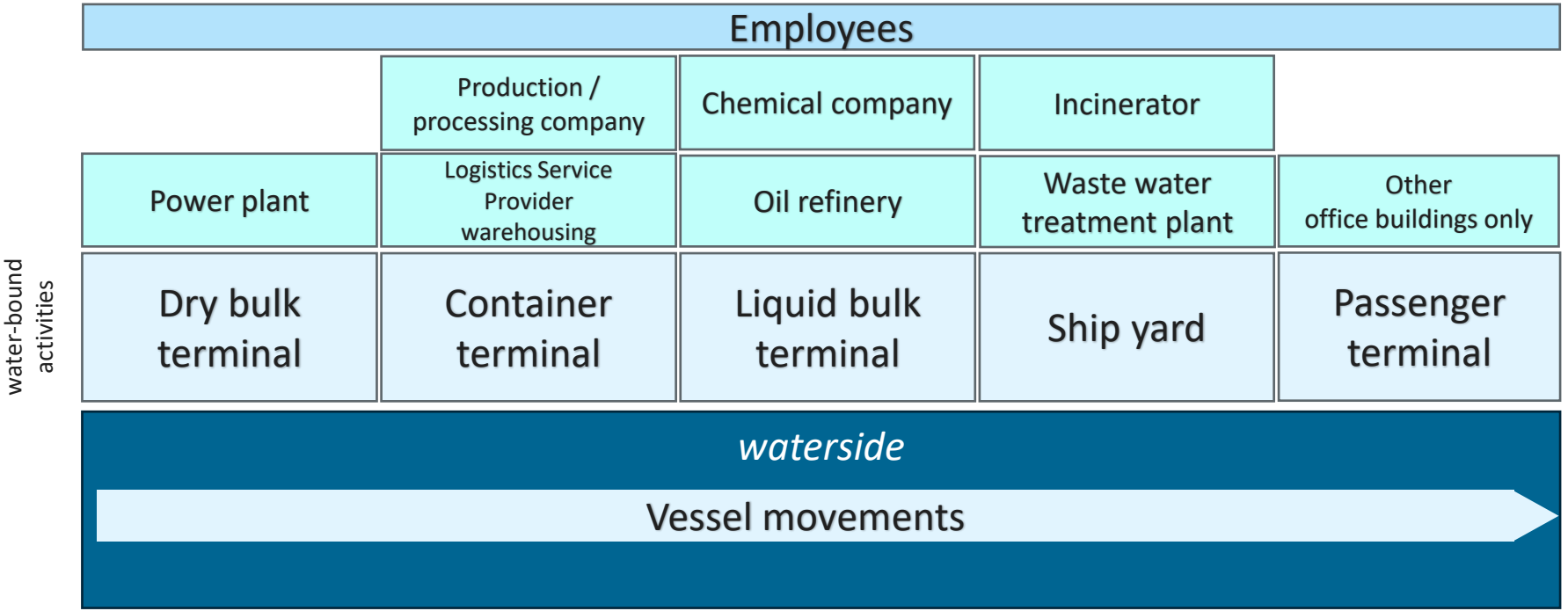
The tool is divided into actors potentially present in ports



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Use of the tool: input - employees

Employees in port area	Unit	Amount	Example amount	Explanation (or question for port, terminal, or port company)
Total number of employees in port area	FTE	783	200	These are the total number of full time equivalent (FTE) people working in the port, terminal or port company. (E.g. if 100 people work 50%, these are 50 FTEs.) Working from home is not included, it is now assumed each employee works at the port. To include working from home, correct the number of FTE with the % working on location. (e.g. if 100 people work full time and 40% of their time work from home, this means 60 FTE have to be filled in). It is assumed employees work 48 weeks per year.
Optional:				Default is commuting by car with combustion engine and a 30 km commuting distance. Offices are heated with natural gas and 100% of the employees work indoors or in heated/cooled spaces. Option to specify.
Commute to work				Use lines 25-28 to fill in the relative amounts of different transportation methods of employees. Use line 29 to fill in the average daily distance commuted by an average employee. The emissions of each mode of transportation are given by Ecoinvent (emission database).
Employees commuting by car combustion engine	%	75%	100%	
Employees commuting by electric car	%	5%	0%	
Employees commuting by public transport (train/tram/bus)	%	0%	0%	
Employees commuting by bike	%	20%	0%	
Average commuting distance	km	15	30	The average total commuting distance per day per employee, so both from home to work and work to home. (This can go to outside the borders or geographical area of the port.)

Use of the tool: input - dry bulk terminal

use default values

Waterbound activities				
Terminal and activity	**Unit**	**Amount**	**Example amount**	**Explanation (or question for port, terminal, or port company)**
Dry bulk terminal(s)				
Total dry bulk transshipped	t/y	1.717.789	1.000.000	We have built a model of average energy use by cargo handling equipment (CHE) per ton dry bulk transshipped. This model assumes diesel machine operation consuming 37,6 kg diesel per operating hour per machine, and that CHE can on average process 100 t/h. For example, a total dry bulk of 500 ton transshipped requires therefore 5 CHE operating hours, consuming 188 kg diesel. By default it is assumed all cargo arrives or leaves the port by truck. In case cargo is moved via train, this can be specified in line 50.
Total energy use available?		no	no	In case you know the total fuel/electricity use, please fill out lines 44-48 and select 'yes' here.
Optional:				
Specification total energy use of cargo handling equipment				
Total fuel use cargo handling equipment				This is for all cargo handling equipment combined the total consumption in 1 year. This includes cranes, forklifts, conveyor belts… all equipment used in dry bulk terminal(s).
Diesel use	L/y	0	0	
Fuel use	L/y			
Fuel use	L/y			
Fuel use	L/y			
Total electricity use cargo handling equipment	kWh/y	0	0	This is for all cargo handling equipment combined, in 1 year. This includes cranes, forklifts, conveyor belts… all equipment used in dry bulk terminal(s).
How bulk cargo enters or leaves the port				Default is that either dry bulk arrives to the port by truck (before transshipment) or leaves the port by truck (after transshipment). If this also happens by train, you can specify here the fraction that leaves or arrives by train instead.
% arriving/leaving by train (rest is truck)	%	0%	0%	
Remark: on-site generated electricity or heat can be specified under 'Power plants' in lines 153-164.				

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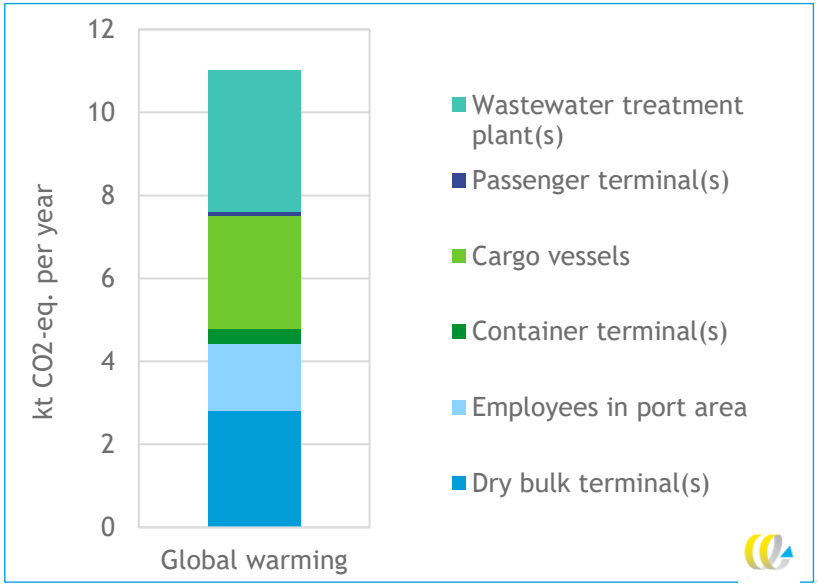
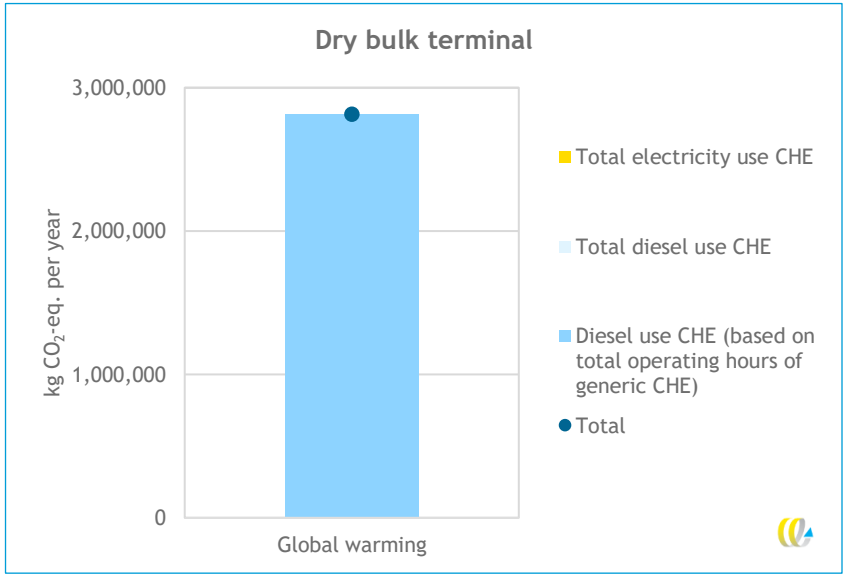
Use of the tool: results

For the whole port



Per terminal or module



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Use of the tool: input – dry bulk terminal

Waterbound activities				
Terminal and activity	**Unit**	**Amount**	**Example amount**	**Explanation (or question for port, terminal, or port company)**
Dry bulk terminal(s)				
Total dry bulk transshipped	t/y	1.717.789	1.717.789	We have built a model of average energy use by cargo handling equipment (CHE) per ton dry bulk transshipped. This model assumes diesel machine operation consuming 37,6 kg diesel per operating hour per machine, and that CHE can on average process 100 t/h. For example, a total dry bulk of 500 ton transshipped requires therefore 5 CHE operating hours, consuming 188 kg diesel. By default it is assumed all cargo arrives or leaves the port by truck. In case cargo is moved via train, this can be specified in line 50.
Total energy use available?		yes	no	In case you know the total fuel/electricity use, please fill out lines 44-48 and select 'yes' here.
Optional:				
Specification total energy use of cargo handling equipment				
Total fuel use cargo handling equipment				This is for all cargo handling equipment combined the total consumption in 1 year. This includes cranes, forklifts, conveyor belts… all equipment used in dry bulk terminal(s).
Diesel use	L/y	5.000.000	0	
Fuel use	L/y			
Fuel use	L/y			
Fuel use	L/y			
Total electricity use cargo handling equipment	kWh/y	2.000.000	0	This is for all cargo handling equipment combined, in 1 year. This includes cranes, forklifts, conveyor belts… all equipment used in dry bulk terminal(s).
How bulk cargo enters or leaves the port				Default is that either dry bulk arrives to the port by truck (before transshipment) or leaves the port by truck (after transshipment). If this also happens by train, you can specify here the fraction that leaves or arrives by train instead.
% arriving/leaving by train (rest is truck)	%	0%	0%	
Remark: on-site generated electricity or heat can be specified under 'Power plants' in lines 153-164.				

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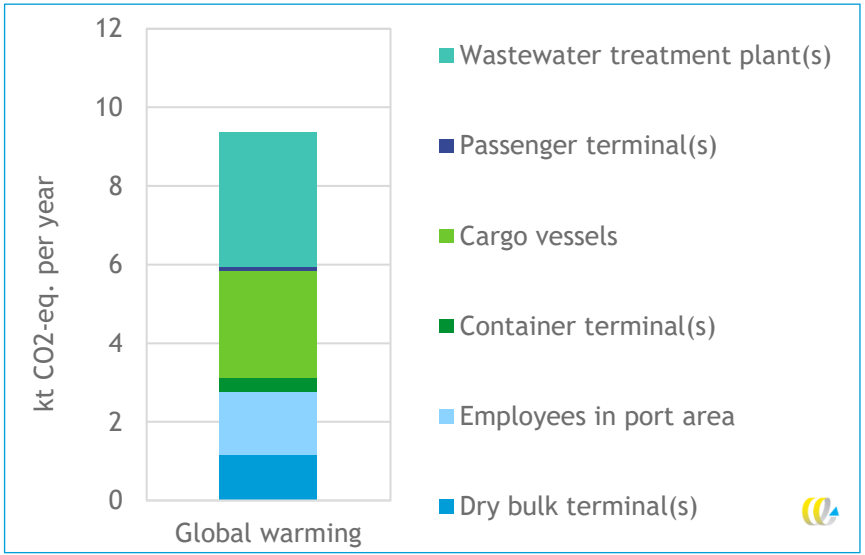
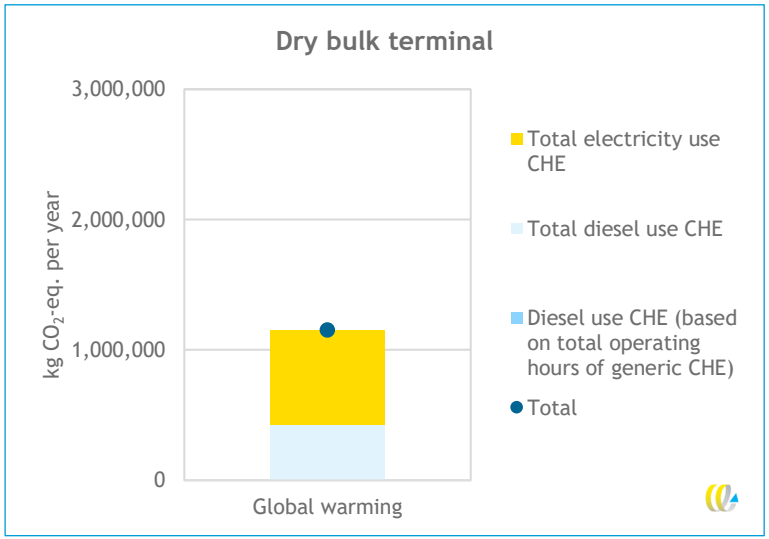
Use of the tool: results

For the whole port



Per terminal or module



What do you see as added value of the tool for your organisation?

0 responses

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How can we further improve the calculation tool?

All responses to your question will be shown here

Each response can be up to 200 characters long

Turn on voting in Interactivity to let participants vote for their favorites

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QUESTIONS & ANSWERS

Environmental Impact of Inland Ports

- **Question 3:** We use default data as we see that it is difficult to gather port specific data (i.e. energy consumption). Would it be of added value to include an option to also insert port specific data?

- **Question 4:** We want to validate the default data, which sources can we use?

Opportunity to raise your questions for us

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Development of Environmental Sustainable Management Systems

Ioanna Kourounioti, Panteia

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What is a Sustainable and Smart Inland Port

- **Sustainable** - Inland ports aim to *develop and execute practices* to **monitor and reduce** their negative environmental effects. Inland ports engage with their local communities and manage their operations in a way that ensures the equilibrium between environmental performance, operational and business efficiency and social responsibility.

- **Smart** – *Keep up to date* with **developments in freight transport and logistics** such as digitalisation, automation, new technologies (electrification etc,) and offering innovative services (such as fostering Inland Waterways (IWW) city logistics services).

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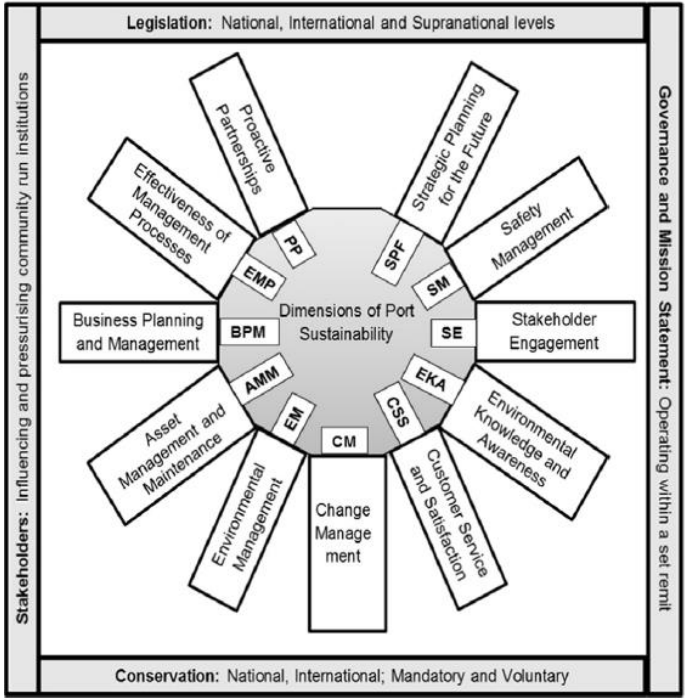
ESMS definition

- Set of processes and tools that:
  - **Monitors and manages** all environmental impacts of ports
  - **Assigns roles and responsibilities** to all staff, suppliers and stakeholders of the port
  - **Develops policies** to deal with environmental, societal and business issues
  - **Sets** quantifiable and measurable objectives and **targets**
  - Ensures the provision of **financial and human resources**
  - Ensures the **compliance** with the relevant **regulations**
  - Develops a clean and precise internal and external **communication plan** (for example environmental reports)
  - Ensures that the ports **keeps up to date** with all new technical solutions
  - Considers **business viability** as well as **social responsibility** to the surrounding society

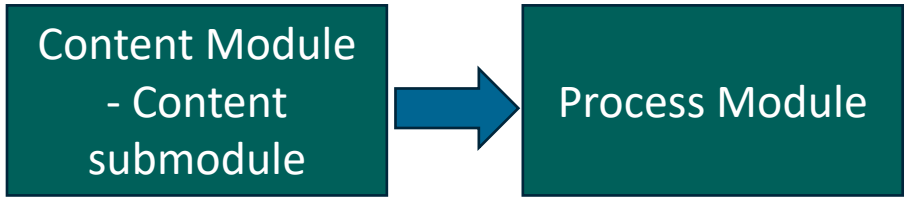


Dimensions and actors of a Port ESMS Source (Source: Kusznetsov, et al., 2015)

Development of ESMS for inland ports

The **criteria** for the development of the **ESMS system**:

1. **practica**l to use.
2. scope of application to different kinds of inland ports of different size.
    1. **Modular approach**
    2. **Qualitative where needed**
3. ability to indicate whether **sustainability goals** are met.
4. help inland ports **achieve their sustainability and business goals**.



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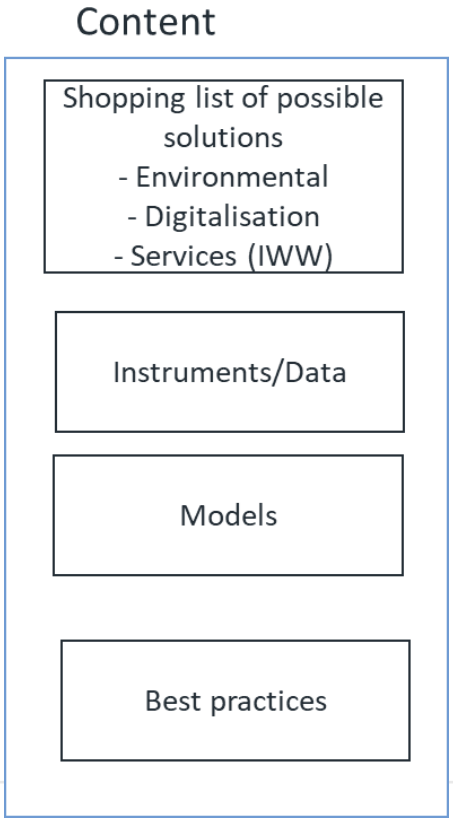
ESMS Content Modules

Content module consists of the following submodules

1. **Environmental** solutions for example (Solutions to decrease GHG emissions)
2. **Instruments / Data** – to monitor the current situation
3. **Models** – to:
   - Assess the current situation
   - Model the future effect of various policies
4. **Best practices** to learn from other inland ports



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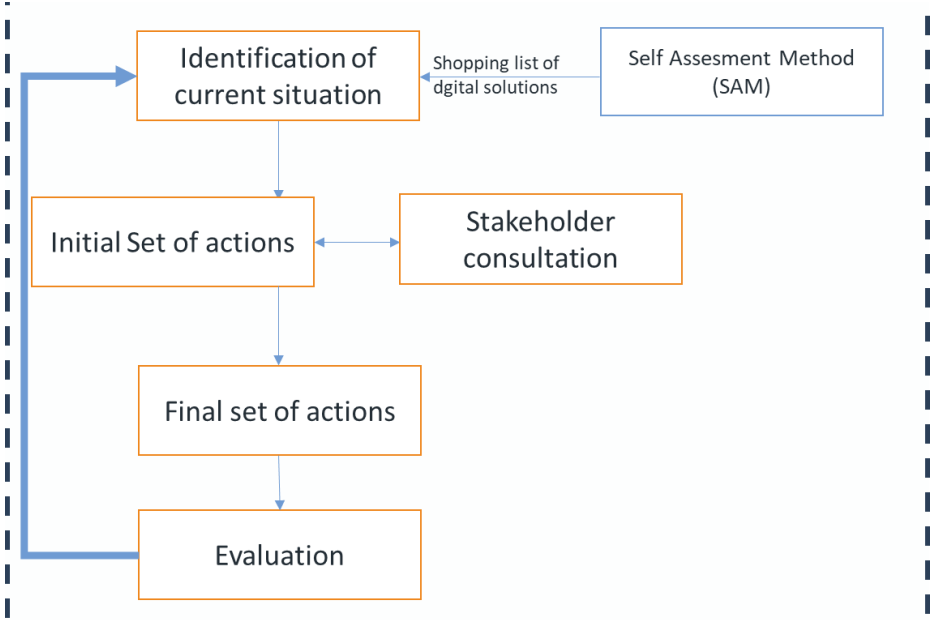
ESMS Process Module

1. **Determine the status**.
2. **Initial set of actions.** In this step an initial set of actions is set some of which go through a consultation with the local stakeholders to make sure that what matters to which stakeholder is addressed.
3. **The final set of actions is chosen.** A sustainability strategy is defined, with key themes, key strategies, key focus areas, targets, and actions.
4. **Evaluation stage.** Once the set of actions is presenting their impacts and effects are evaluated and assessed and the circle starts again (CBA or feasibility Analysis).



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QUESTIONS & ANSWERS

Development of Environmental Sustainable Management Systems - ESMS

- **Question 1:** What do you think is required for the ports to become smarter?
- **Question 2:** What do you think is required for inland port to become more business, social and environmentally sustainable?
- **Question 3:** What do you think is the added value / are the strongest points of the ESMS we presented?
- **Question 4:** What are the key points for the ESMS to be improved?

Opportunity to raise your questions for us

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COFFEE BREAK

See you at 11:20!

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Exploring innovative digital solutions for sustainable inland port development

Róbert Rafael, Pro Danube

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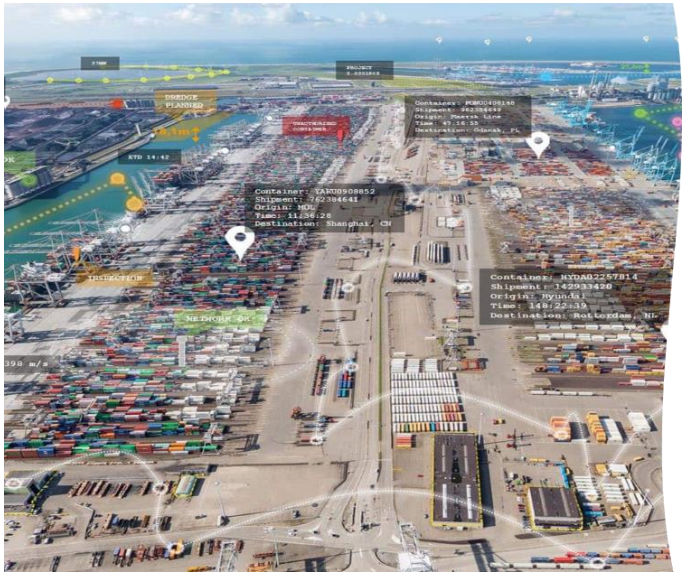
Objective and activities

Objective: assess the potential of digitalisation for greening port operations, for ensuring multimodality and for facilitating sustainable development of inland ports

Activities:

1. **Regulatory framework** addressing inland ports digitalisation
2. **Inventory** of port cooperation and collaboration systems
3. **Process optimisation** and **interoperability improvement**
4. Inventory of **good practices** at EU and international level
5. **Digitalisation Masterplan** for inland ports and terminals comprising of the lessons learned based on the above results, a gap analysis being rolled out currently and further interviews/inputs from stakeholders



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Regulatory framework addressing inland ports digitalisation

- There is (currently) **no European or international legislation** that specifically deals with the digitalisation of ports
- The legal framework consists of **more general a**cts, that also apply (or may apply) to digitalisation as it is put into practice in ports. This framework includes:
  - Privacy – GDPR
  - Data ownership
  - Liability for defective software
  - Liability of software users
  - Cybersecurity
- Results so far do not show any binding regulations at the European / Member State level

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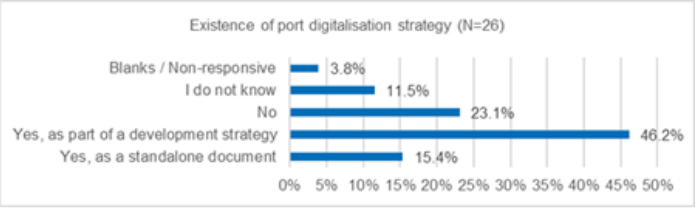
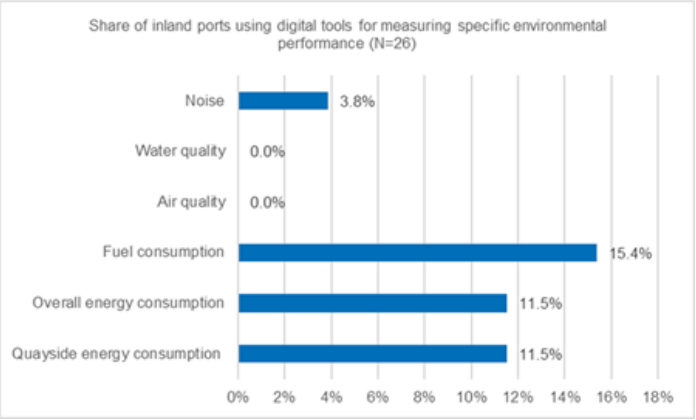
Inventory of port cooperation and collaboration systems

- The Deliverable dealing with the inventory is ready and will be published soon with the following content:
  - Introduction
  - Port digitalisation technologies and platforms and their potential use in greening
  - Cybersecurity aspects
  - Digitalisation of environmental management tools in ports
  - Selected digitalised Environmental Management Tools
  - Port digitalisation in practice – results of the 1st survey
  - Further digitalisation needs and potentials
  - Conclusions





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Process optimisation and interoperability improvement

Key considerations and challenges related to **process optimisation** in port digitalisation:

- Integration of systems
- Data security and privacy
- Interoperability
- Legacy infrastructure
- Employee training
- Real-time data processing
- Scalability
- Regulatory compliance
- Cost-Benefit Analysis
- Sustainability

Problems, needs, issues, and challenges related to **interoperability of various digital tools** for ports:

- Diverse ecosystem
- Legacy systems
- Data silos
- Lack of standards
- Complex integration
- Data security and privacy
- Real-time communication
- Regulatory compliance
- Scalability
- Stakeholder collaboration
- Change management
- Budget constraints

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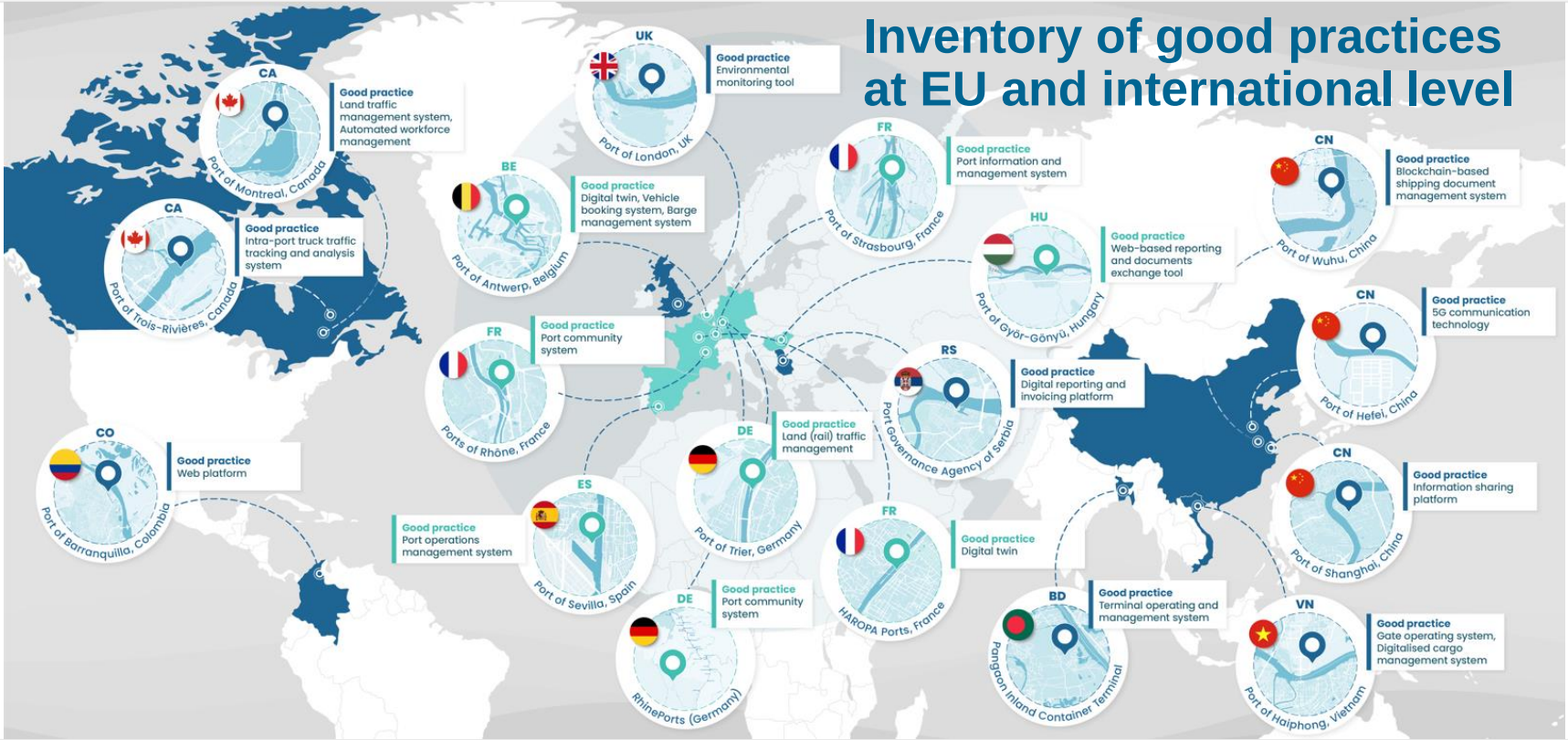
Inventory of good practices at EU and international level



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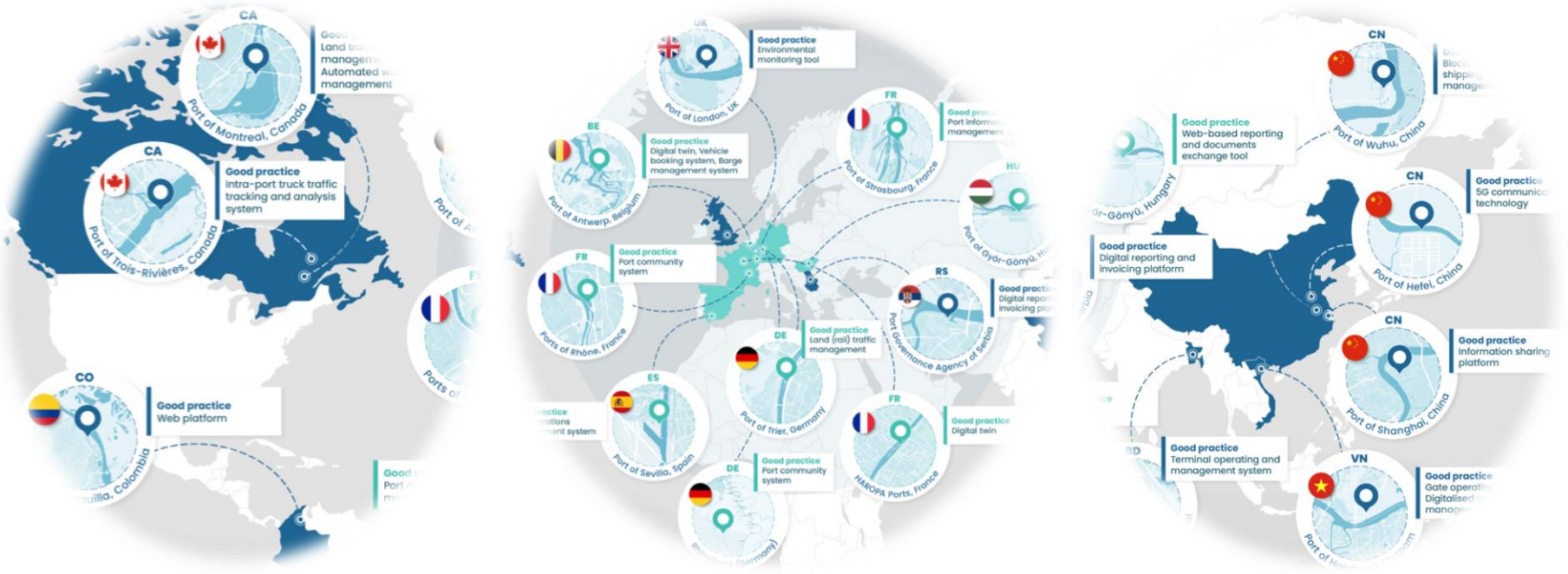
Inventory of good practices at EU and international level



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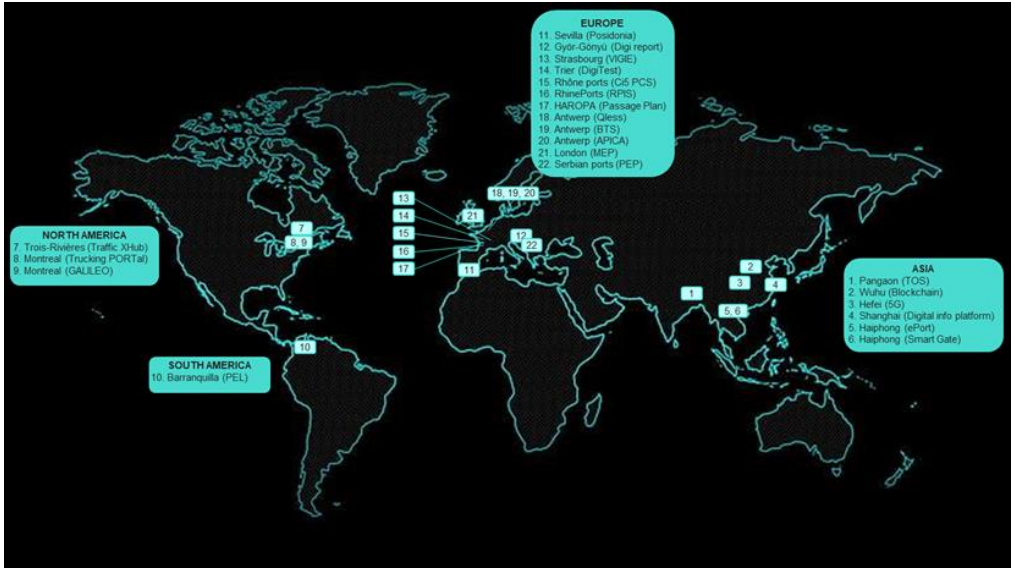
Inventory of good practices at EU and international level

- Large numbers of ports **in and outside of the EU** have been approached
- **Factsheet** for each good practice:
  - Location of the port: (geographical location – city/town, country)
  - Inland waterway (on which the port is located)
  - Category of digital tools (port community system, digital twin, automation, port information system, IoT applications)
  - Stakeholders involved (port authority, port operators, shipping companies, forwarders, cargo owners)
  - Description of the good practice
  - Realised/potential impact



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Digitalisation Masterplan for inland ports and terminals

- Executive summary
- Introduction
- Digitalisation vision
  - Strategy
  - Roadmap
  - Action plan
- Digitalisation guidelines
- Digital ports landscape mapping the B2B, B2G and G2G processes in ports and terminal operations
- Toolbox for self-assessment tools for digital readiness and environmental conformity
  - Tool for digital readiness self-assessment of inland ports
  - Tool for assessing the environmental conformity of ports
- Conclusions

What do you consider as main barriers for the development and implementation of digital tools?

0 responses

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QUESTIONS & ANSWERS

Gaps and barriers in the development and implementation of digital tools

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- **Question 2:** What do you miss from the digitalisation progress of ports?
- **Question 3:** What barriers are hindering and / or delaying the progress?
- **Question 4:** What would you recommend as next steps? Feel free to think about technical/functional, organisational/HR/workforce and legal topics!

Opportunity to raise your questions for us

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Determining the potential of sustainable, urban and short-range IWT based on lessons learnt from good practice cases

Max Weinhold, Planco

Name	City	River Basin	Segment	Status
Highway A26	Linz	Danube	Building Materials	Operational
Grand Paris Express	Paris	France (excl Rhine)		Operational
Consolidation Centre	Brussels	Rhine		Operational
Waste Collection Budapest	Budapest	Danube	Waste	Operational
Invotis IV (Bek & Verbrug ship waste collection)	Rotterdam	Rhine		Operational
Lille Waste	Lille	France (excl Rhine)		Operational
Retail Paris	Paris	France (excl Rhine)	Retail	Operational
Beerboat	Utrecht	Rhine		Operational
DHL Berlin / Amsterdam	Amsterdam	Rhine	Parcels	Operational
A-Swarm	Berlin	East-West		Pilot/Living Lab
ULS	Strasbourg/ Lyon	Rhine	Mixed	Operational
Cityport of Utrecht (Logistic Hub-Project)	Utrecht	Rhine		Operational
City Barge	Leiden, Delft	Rhine		Operational
Green Wave Avatar	Ghent/ Hamburg	Rhine/East-West		Operational
Kotug E-push convoy (Cargill cocoa supply)	Amsterdam Region	Rhine		Operational
Alphenaar Heineken Boat	Rotterdam Region	Rhine	Container	Operational
Flying Boat/ Commuter ferries	Stockholm	Remote	Passenger	Concept/ Operational
HADAG	Hamburg	East-West		Operational
Waterbus	Rotterdam	Rhine		Operational
Mahart – BKK Boat Service	Budapest	Danube		Operational

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Findings on key success factors

- Success factors in cases of freight IWT
    - Environmental zones and truck limitations promote competitive position of IWT.
    - Stipulations or incentives in tender contracts can promote IWT.
    - Stakeholder cooperation is essential e.g. for developing transshipment sites.
    - Serving major clients helps in efficient cargo capacity utilisation.
    - Tailored solutions
        - On-board cranes increase infrastructure independent transshipment.
        - Micro hubs serve as transshipment points for last mile operation.
- Success factors in cases of passenger IWT
    - Added value by offering better transport connections is vital for as part of public transport.
    - Stakeholder cooperation can help to implement the service as public service obligation.
    - Integration into the public transport network.
    - Passenger boats offer touristic value increasing its demand.

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Objective: Determine roll-out potential for urban and short-range IWT

- Approach by market segment and commodity
  - Urban: Parcel, Retail, Building material, waste
  - Short-range: container, mixed (hinterland)

- Lessons learnt from good practice cases
  - Transport volume and development in good practice cases
  - Potential for waterborne logistics in market segments

- Determination of market potential
  1. Estimation of urban and short-range transport volumes within reach of inland waterways (all modes)
  2. Scenarios for potential modal share of IWT

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Preliminary Methodological Pipeline on the Estimation of Roll-out-Potentials

1. Population Figures

Estimation of the population in the area affected by Ten-T harbours.

2. Average transport volumes

Per capita quotas within market segments.

3. Urban IWT volumes

A modal share is to be applied within the transport volumes.

4. Growth Scenarios

Growth scenarios on freight volumes.

Potential figures for urban and short-range IWT

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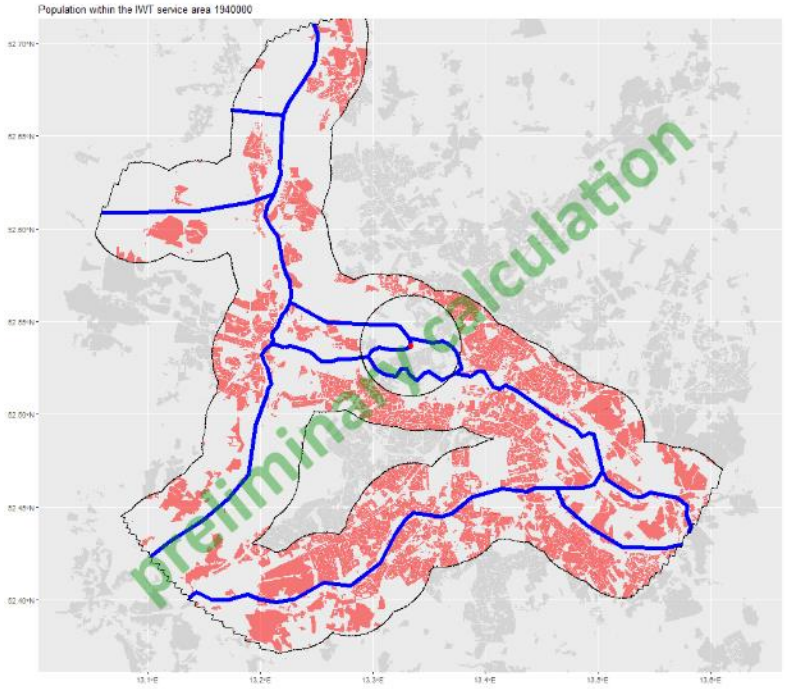
Objective: Determine roll-out potential for urban and short-range IWT

- Using estimations based on population densities and waterway infrastructure.
- E.g. per capita quotas for parcel shipments to determine total parcel volume.
- Application estimated market share to obtain urban and short-range IWT volumes.



What is the maximum last mile distance landside for the implementation of urban waterborne logistic?

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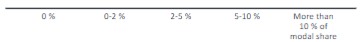
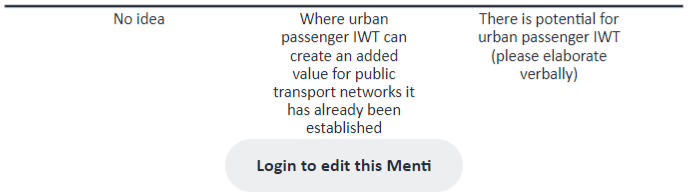
you see for urban IWT services? What modal share do you expect for IWT in urban freight

What potential do you see for short-range IWT services? What modal share do you expect for IWT in short-range freight transport by 2030?



What is your view on the potential for urban passenger IWT (public transport)?



Green Inland Ports

WRAP UP & CONCLUSIONS

Next steps

Task 1 – Environmental impacts and Efficiency and Transition

- Validation of the tool presented today and its default data
- Publication on the Green Inland Ports website in a user-friendly format

Task 2 – Urban mobility and Short-Range Inland Waterway Transport

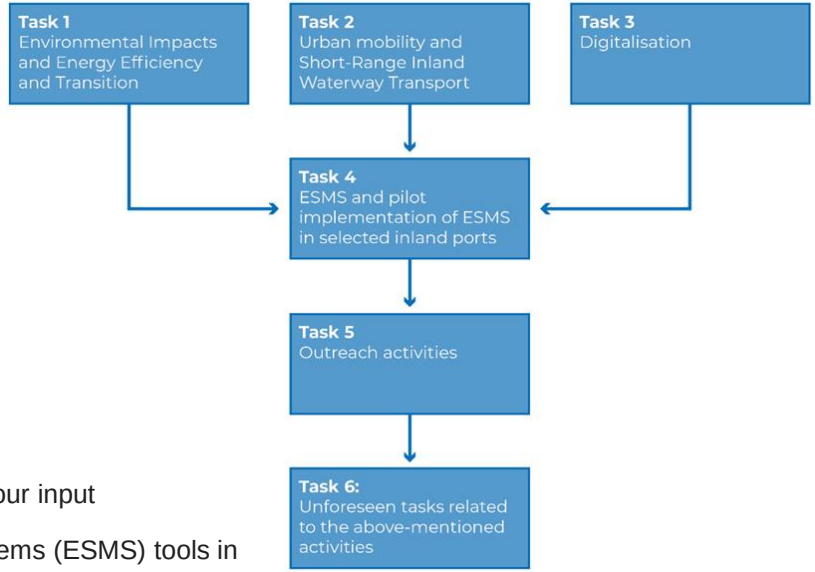
- Publication of good practices and lessons learnt on the website
- Analysis for the identification of the roll-out potential of these services

Task 3 – Digitalisation

- Publication of good practices and potential of digital solutions on the website
- Drafting of digitalisation masterplan

Task 4 – ESMS and pilot implementation of ESMS in selected inland ports

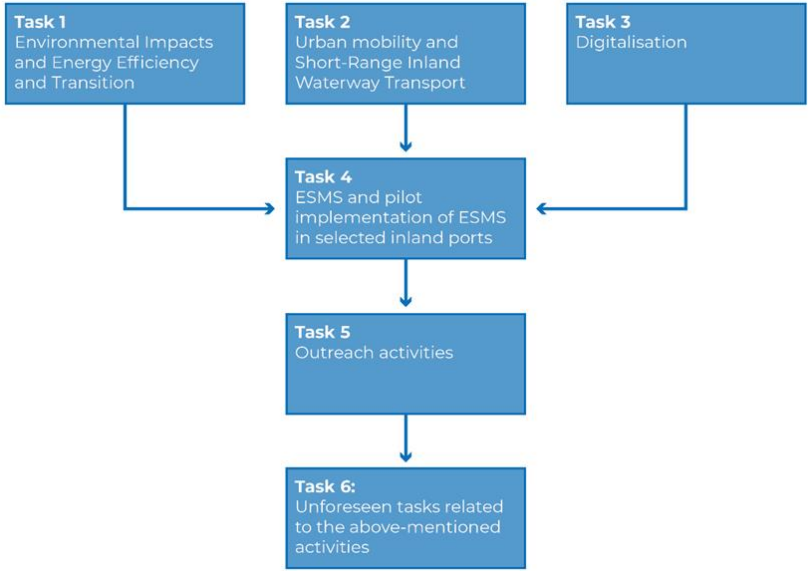
- This year: Finalisation of a self-assessment methodology & ESMS tools using your input
- Next year: Implementation of Environmental and Sustainable Management Systems (ESMS) tools in pilot projects from several inland ports



Next steps

Task 5 – Outreach activities

- Knowledge sharing is key to this project
- Green inland ports will take part in several **events after the summer**:
  - MAGPIE Port-Citizen & Green Inland Ports workshop: 17 & 18 September (Wesel, Germany)
  - Danube Port Days: 29 – 30 October (Budapest, Hungary)
- **Events in 2025** connected to the pilot projects
- Opportunity to provide your views in an **interview**
- **Final survey round in 2025** in relation to ESMS tools
- **Website:** https://green-inland-ports.eu/
- **LinkedIn**: https://www.linkedin.com/company/green-inland-ports
- **Functional mailbox**: greeninlandports@ecorys.com



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Share your feedback

Please feel free to reach out with us at greeninlandports@ecorys.com

We would like to hear your feedback on the event!

Please complete this **short questionnaire**