Green Inland Ports

Green inland ports: Enabling Sustainable Management and Development of inland ports

Workshop Belgrade: 19 October 2023

Funded by the European Union

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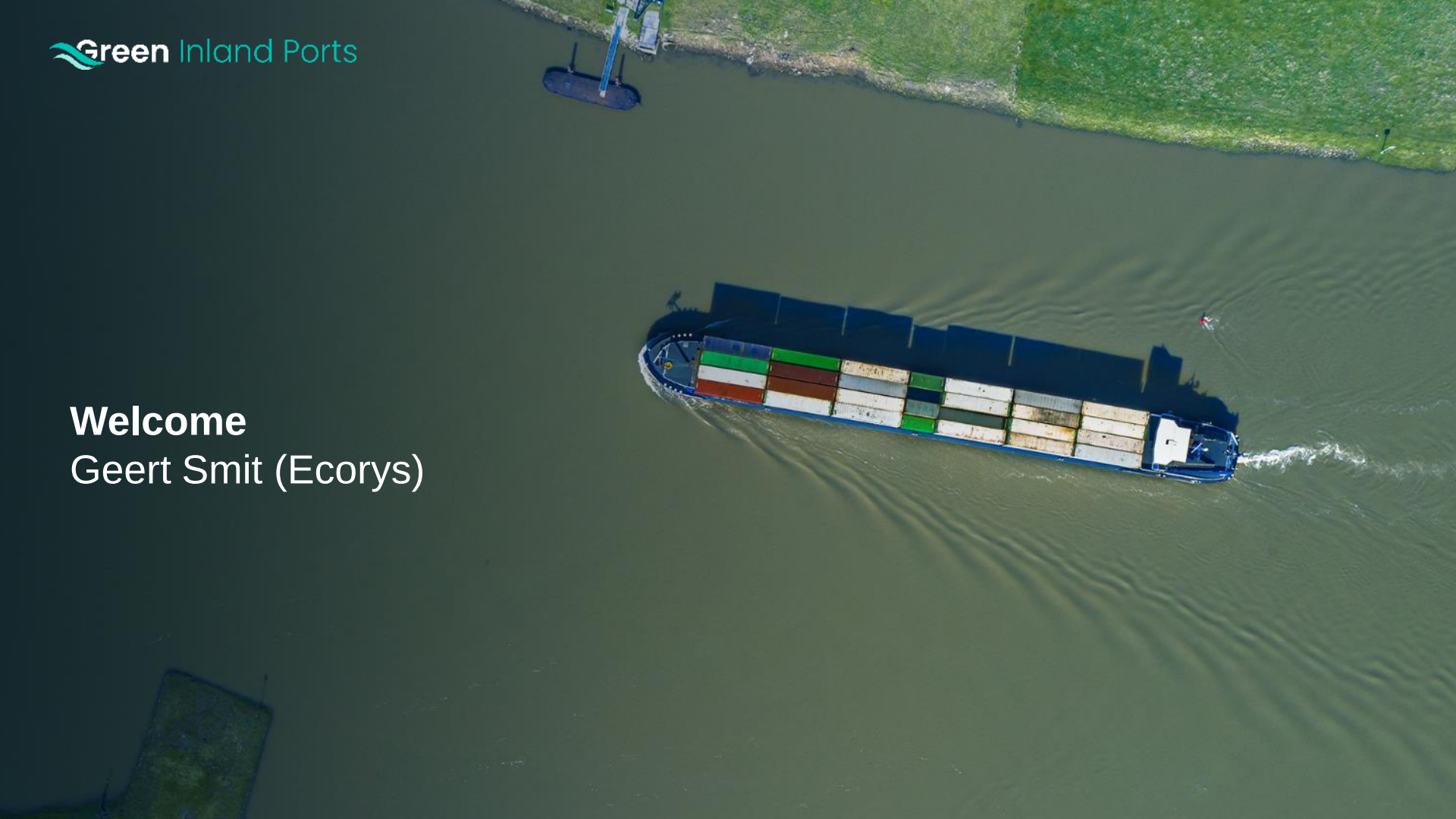

Welcome
Geert Smit (Ecorys)

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Agenda

Time	Agenda point	Presenter
14.00 – 14.05	Welcome by the moderator	Geert Smit (Ecorys)
14.05 – 14.10	Welcome and introduction speech	Turi Fiorito (EFIP)
14.10 – 14.25	Introduction to the project	Jasper Tanis (Ecorys)
14.25 – 14.45	Urban and short range IWT	Henrik Armbrecht (Planco)
14.45 – 15.35	Environmental impact of ports	Roy van den Berg (CE Delft) Sander Raphaël (CE Delft) Frank Stevens (ESL)
15.30 – 16.05	Coffee / tea break	
16.05 – 16.55	Digitalisation	Sasa Jovanovic (IC Consulenten/Prodanube) Frank Stevens (ESL)
16.55 – 17.00	Wrap-up and closure	Geert Smit (Ecorys)
17.00	Networking and drinks	

EFIP
European Federation of Inland Ports

Welcome

Turi Fiorito

The European Federation of Inland Ports (EFIP)

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Introduction to the project

Jasper Tanis (Ecorys)

Policy context

- Pilot project study proposed by the **European Parliament**
- Inland ports play a crucial role in reducing transport emissions and enable a modal shift, by providing access to maritime, rail, inland waterway and last mile road transport

Sustainable & Smart Mobility Strategy: Flagship 2

Creating zero-emission airports and ports

"Ports and airports are key for our international connectivity, for the European economy, and for their regions. In their transition to zero-emission nodes, the best practices followed by the most sustainable airports and ports must become the new normal and enable more sustainable forms of connectivity. Ports and airports should become multimodal mobility and transport hubs, linking all the relevant modes. This will improve air quality locally thereby contributing to improved health of nearby residents. Inland and sea ports have a great potential to become new clean energy hubs for integrated electricity systems, hydrogen and other low-carbon fuels, and testbeds for waste reuse and the circular economy."

NAIADES III (action plan for 2021 – 2027)

"'The Commission will launch a study on the impacts that the port activities of selected river and sea ports can have on the environment. The study will develop and implement specific tools, such as Environmental Management Systems, as well as port-specific action plans creating a nucleus for wide-scale roll-out of environmentally sustainable port management and operations."

Objectives, scope and timeline

Objectives

- Identify and evaluate the factors affecting the sustainable development of inland ports
- Propose solutions for the implementation of green objectives paired with their economic development

Geographical scope

- All TEN-T inland ports
- Connecting seaports where inland waterway transport is concerned

Timeline

- November 2022 – November 2025
- 9 regional workshops and a final conference

General methodology and approach

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

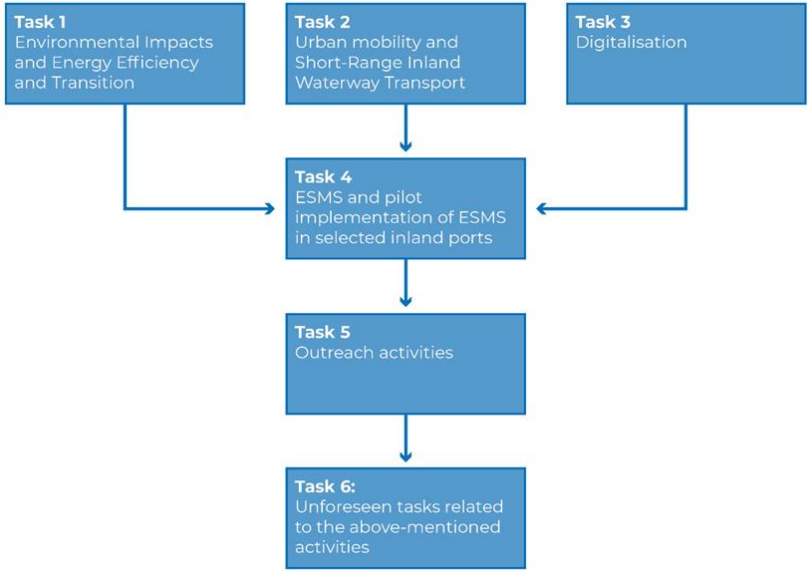
- Identify possibilities of adopting inland waterway transport for urban mobility and short-distance transport

Task 3 – Digitalisation

- Assess the role of digitalisation and propose solutions

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

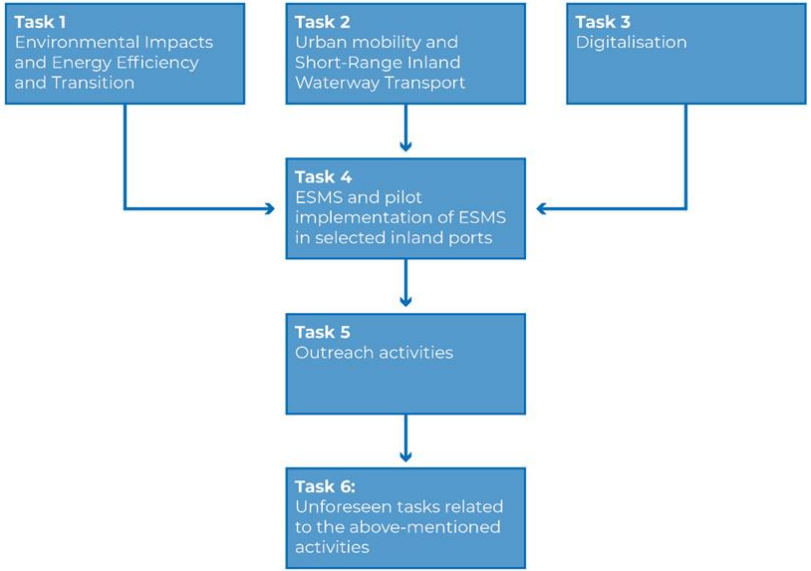
- Pilot projects of several inland ports for implementing the Environmental and Sustainable Management Systems (ESMS) tools and implement coordinated actions for sustainable port management and operation



General methodology and approach

Task 4 – ESMS and pilot implementation in selected ports

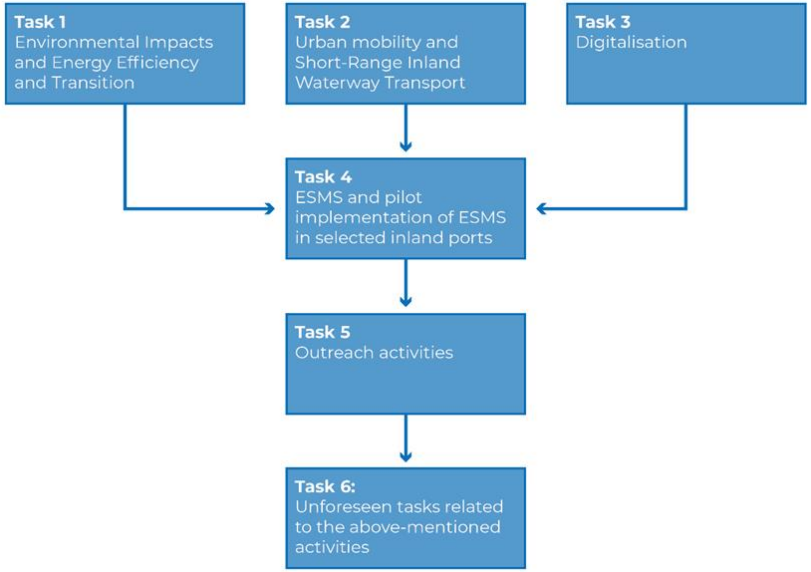
- ESMS = Environmental and Sustainable Management Systems
- Identification of the potential implementation projects
  - Call for expression of interest: https://green-inland-ports.eu/invitation-for-inland-ports-to-join-the-project-in-the-pilot-phase/
  - **10 pilot ports** where we will apply and test the ESMS tools
- Participation in the pilot phase
  - We help you to better understand your environmental impact
  - We provide you with tools to monitor and improve your environmental performance
  - You make a contribution to the outcomes of this project and the future European policy agenda
- Timeline of your contributions:
  - Engaged in first discussions starting the second half of 2024
  - Formal kick-off: January 2025
  - Duration: 8 months

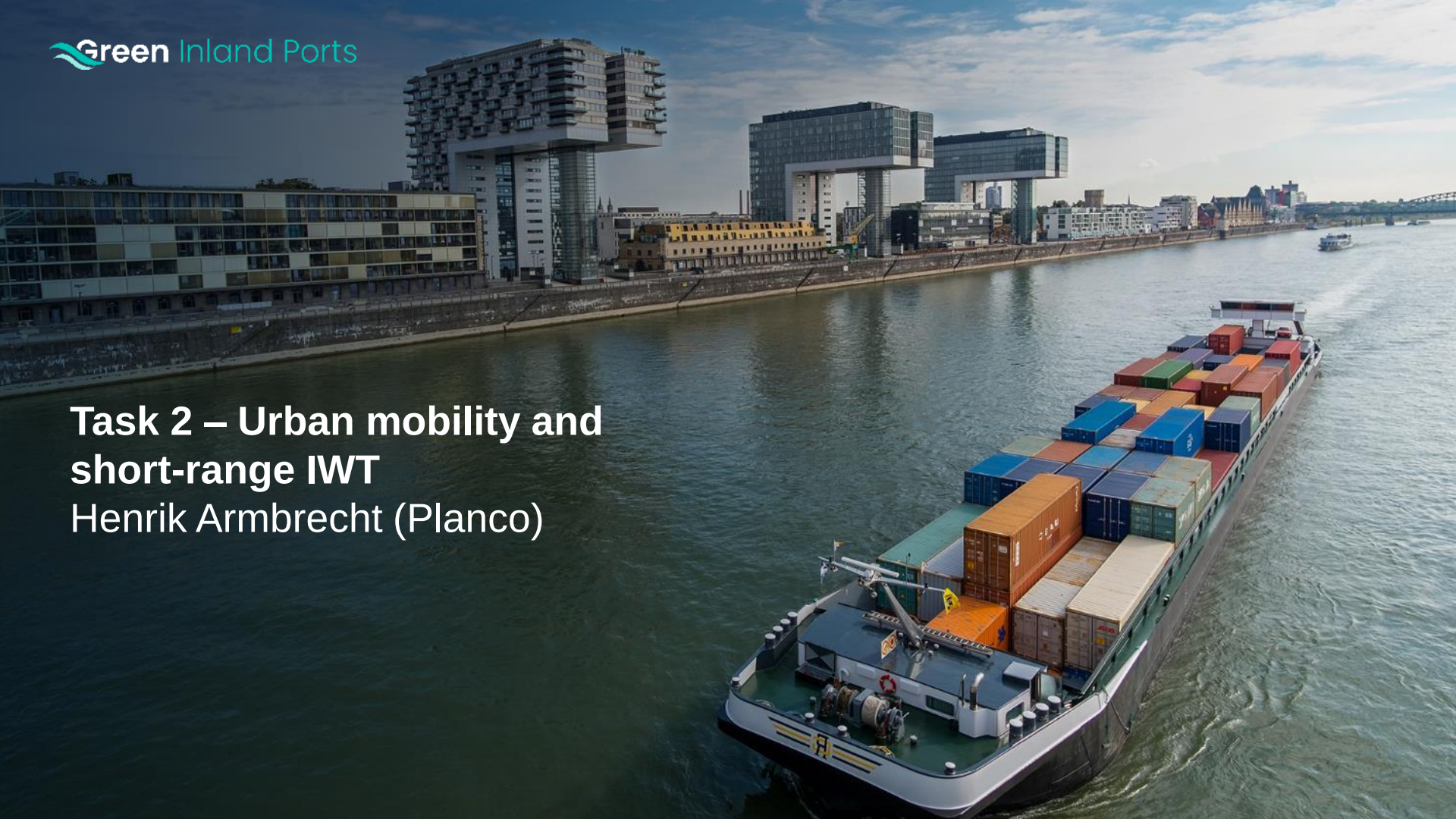


General methodology and approach

Task 5 – Outreach activities

- Knowledge sharing and identification of best practices
- 3 **Survey** rounds in 3 years
  - 1st Survey: completed first half 2023
  - 2nd Survey: first months of 2024
- Multiple **interview** rounds
- 9 **regional workshops** in 3 years
  - Workshop 1: 19 October – Belgrade – in conjunction with the EFIP Executive Committee meeting
  - Workshop 2: 23 & 24 November – Vienna – Danube Ports Days
  - 4 Workshops in 2024
- **Website:** https://green-inland-ports.eu/
- **Functional mailbox**: greeninlandports@ecorys.com





Task 2 – Urban mobility and short-range IWT

Henrik Armbrecht (Planco)

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Urban mobility and short-range IWT

Agenda

- Background
- Study approach and methodology
- Good Practice cases
- Next steps

Source: Port of Brussels

Background

Strong need to find **sustainable solutions** for urban mobility of passengers and freight

Diesel traffic jam

Source: Planco

Electric traffic jam

Background

- Sustainable management and development of inland ports
  - Adoption of new markets for IWT
  - Use of IWT for urban/short-range distribution and collection
- Contribution to a modal shift of (urban) road transport and mitigation of externalities
- New markets required to compensate for breakaway of traditional markets
- Inland waterway and port network serving inner-city locations
- Shortage of sites and conflicting interest in waterfront sites in cities
- Challenging business model and strong competition from road
- Restrictions for road traffic in cities driver for waterborne services
- Automatisation may allow for cost savings (crew reduction)

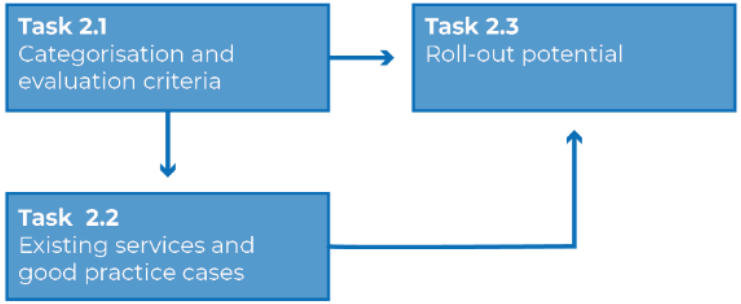
Source: Port of Brussels

Study approach and methodology

- Task 2.1 Structured analysis of urban and short-range services
  - Categorisation
  - Quick-Scan analysis
  - Evaluation criteria

- Task 2.2 In-depth analysis of 20 good practice cases
  - Selection of good practice cases
  - Evaluation of good practice cases
  - Lessons learnt for development of market segment

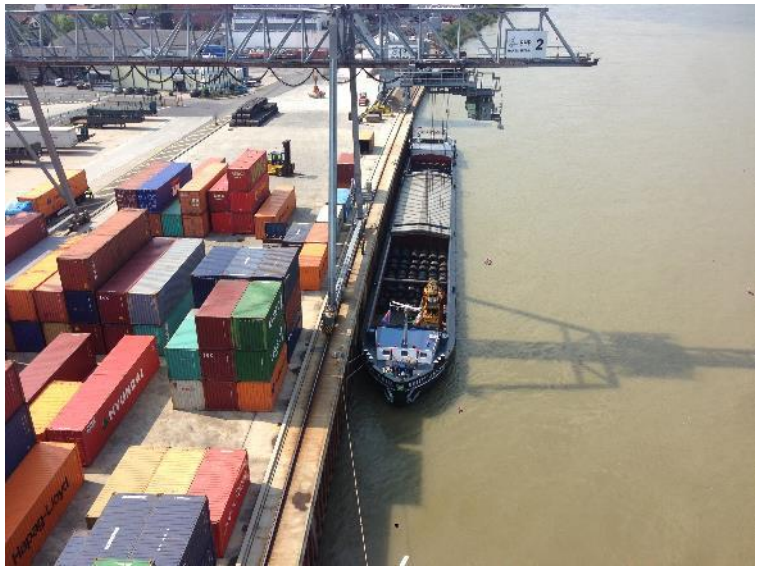
- Task 2.3 Perspectives for urban and short-range IWT
  - (Untapped) Potential for market segment
  - Market projections



Study approach and methodology

- Categorisation
  - Type
  - Spatial context
  - Market segment
  - Status
  - Waterway region

- Good Practice factors
  - Long-term operation
  - Feasibility
  - Impact
  - Innovative character



Source: Platz (Planco)

Evaluation criteria

- Administrative requirements
- Transport demand
- Infrastructure
- Vessel
- Logistics
- Competitive position
- Business model

Source: Platz (Planco)

Examples for Good Practice cases

Name	City / Region	Market Segment
Freight		
Retail Paris (B2B: Franprix; B2C: Box2Home)	Paris	Retail
Beerboat	Utrecht	Retail
Urban Logistic Solutions (ULS)	Strasbourg / Lyon	Parcels
Consolidation Centre	Brussels Region	Building Materials
Waste Collection Budapest	Budapest	Waste
Cargill / Kotug Cocoa	Amsterdam Region	Other
Alphenaar Heineken Boat	Rotterdam Region	Retail / Container
A-Swarm	Berlin	Mixed
Passenger		
Flying Boat / Commuter ferries	Stockholm	Passenger
HADAG	Hamburg	Passenger

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Next steps

- Analysis (incl. Interviews) of Good Practice cases
- Evaluation and lessons learnt
- Conclusions regarding the perspectives for urban and short-range IWT
- Projections and recommendations

Source: Breitenbach (HHM)

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Task 1 – Environmental Impacts, Energy Efficiency and Transition

Roy van den Berg (CE Delft)
Sander Raphaël (CE Delft)

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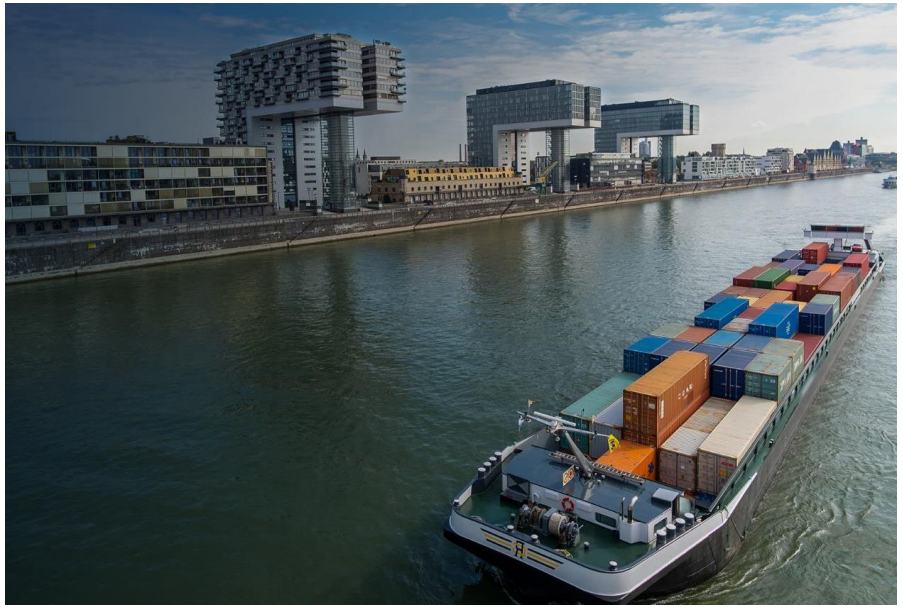
Task 1 – Environmental impacts

Goal: create insight in environmental impact of inland ports, the role of legislation and possible measures to reduce emissions

1. Environmental impacts of port activities
2. Review existing legislation and identification of gaps and obstacles
3. Challenges for implementation of environmental legislation and measures
4. Overview of good practices
5. Environmental performance mapping



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Overview of activities of inland ports

Emissions

1. Emissions to water
   - Transshipment and storage of goods
   - Vessels
   - Infrastructure
   - Maintenance
2. Emissions to air
3. Emissions to soil
4. Sound
5. Light pollution

Good practices

Definition and goals of the good practices

Identification of good practices through:

- Literature review;
- Interviews;
- Survey.

A factsheet will be made for each good practice based on:

- Interviews;
- Further literature research.

Category	Count
Community	1
Offices and employees	1
Energy generation	3
Environmental management	11
Industry	6
Cargo handling	9
Maintenance	3
Port operations	4
Port vessels & fuel	8
Waste management	4
Water management	6

Good practices – Examples factsheets

Installation of on shore power supply (OPS)

- Category: Port vessels and fuel

Natural development

- Category: Environmental management

Spill prevention

- Category: Loading/unloading/transhipment of cargo

Categories factsheet
Description
Aim and goals
Ports where good practice has been implemented
Stakeholders involved
Realized/potential impact
Possible obstacles of good practice
Key learnings

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Good practices

Category	Good practices already identified
Community	• Strong stakeholder understanding
Offices and employees	• Mobility plan for employees of the port area
Energy generation	• Ports being an "energy hub" • Public steam network and/or heat recovery network • Solar power or other alternatives to clean energy generation
Maintenance	• More elaborate requirements for underwater cleaning • Re-use of sediments in multiple ways • Limit dredging activities to when necessary
Port operations	• Port operator training • Port management model by one "company" • Developing knowledge-intensive business site • Engagement of sustainability trainees
Waste management	• Waste collection system • Collecting reasonable amounts of grain residuals for farmers • Floating bins waste management

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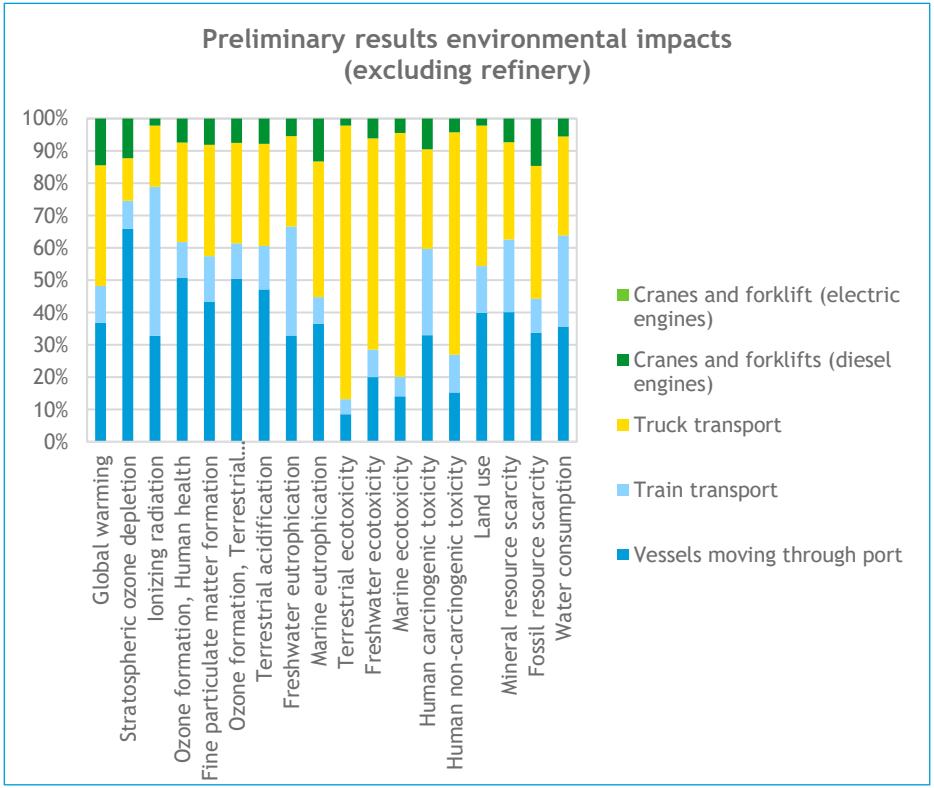
Preliminary results case study

- Use of Life Cycle Analysis model
- Refinery is major contributor to environmental impacts
- When scope is 100 km pre- and end haulage: impact of transport would be dominant
- Relative contribution of different emitters on 18 so-called midpoints



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Preliminary results case study

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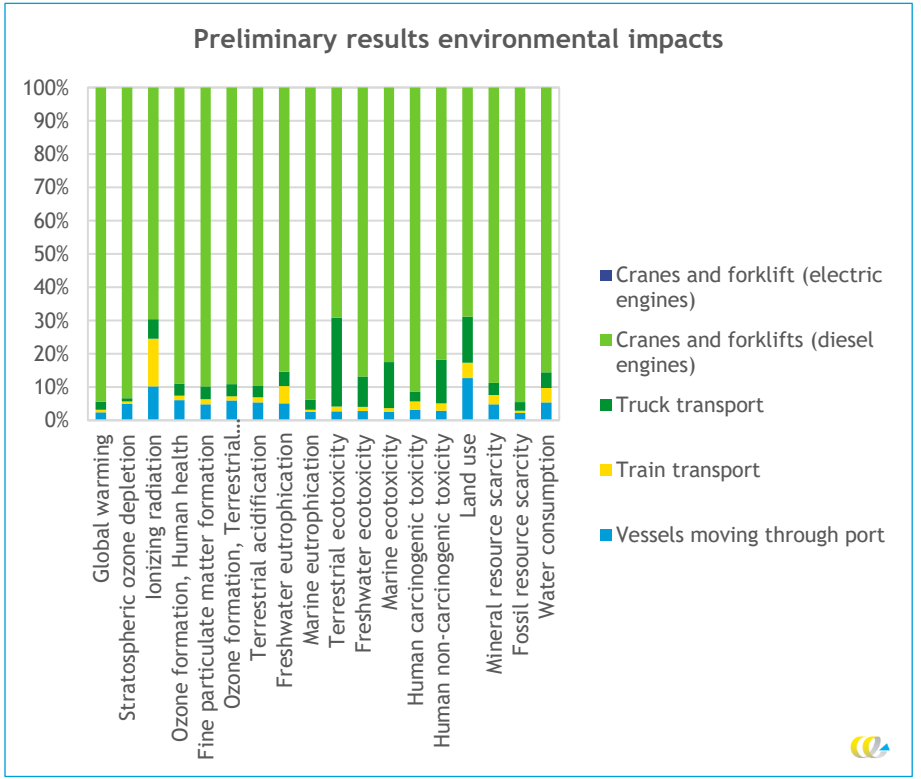

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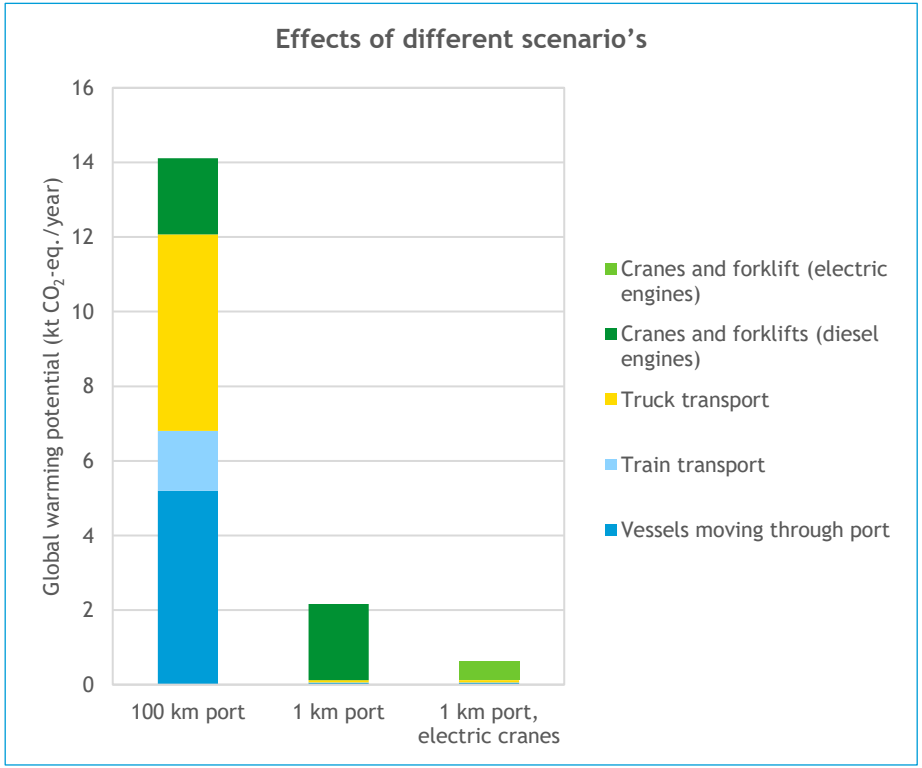
- When scope is adjusted tot 1km pre- and end haulage: impact of cranes becomes dominant
- Absolute impact: electrification of cranes can have a significant impact



Task 1 – Environmental Impacts, Energy Efficiency and Transition

Frank Stevens (Erasmus School of Law)

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The legal framework

- Ports and port activities clearly have an impact on the environment

- Q1 – Is there a legal framework, or are (inland) ports the legal Wild West where anything goes?

  - E.g. cranes, stackers, straddle carriers, …
  - Emission limits?

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The legal framework

- Legally relevant categories of port activities:
  - Emissions to air
    - Directive 2010/75/EC on industrial emissions, Directive (EU) 2015/2193 on emissions from medium combustion plants, Regulation (EU) 2016/1628 on emission limits for non-road mobile machinery, Directive (EU) 2016/802 relating to the sulphur content of certain liquid fuels, Regulation (EU) 2019/1242 setting emissions standards for heavy-duty vehicles, Directive 2008/50/EC on ambient air quality, ...
  - Emissions to water
    - Water Framework Directive 2000/60/EC, Marine Strategy Framework Directive 2008/56/EC
  - Emissions of energy (noise, light)
    - Environmental noise Directive 2002/49/EC
  - Waste
    - Waste Framework Directive 2008/98/EC, Directive (EU) 2019/883 on port reception facilities, CDNI Convention
  - Use of space (ecosystems, biodiversity)
    - Habitats Directive 92/43/EEC, Birds Directive 2009/147/EC, Convention on Biodiversity

The legal framework

- Q2 – Is the framework complete, or are inland ports missing legal tools?
- "gaps"

- Q3 – Does the existing legal framework create difficulties for inland ports?
- "obstacles"
  - Application & interpretation
    - Laws (int'l / EU / national / regional) blocking green developments, e.g. no space available for AF infrastructure
    - Laws have different (contradictory) objectives
  - Implementation of Directives at national level
    - "gold-plating", stricter implementation than required
  - Competition with non-EU ports

The legal framework

- Ports are communities: port "authority", port users, stakeholders, neighbouring city, ...
  - Preliminary question: which entity is competent to do what?
  - More specifically: what legal powers does the port authority have?

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Coffee and tea break

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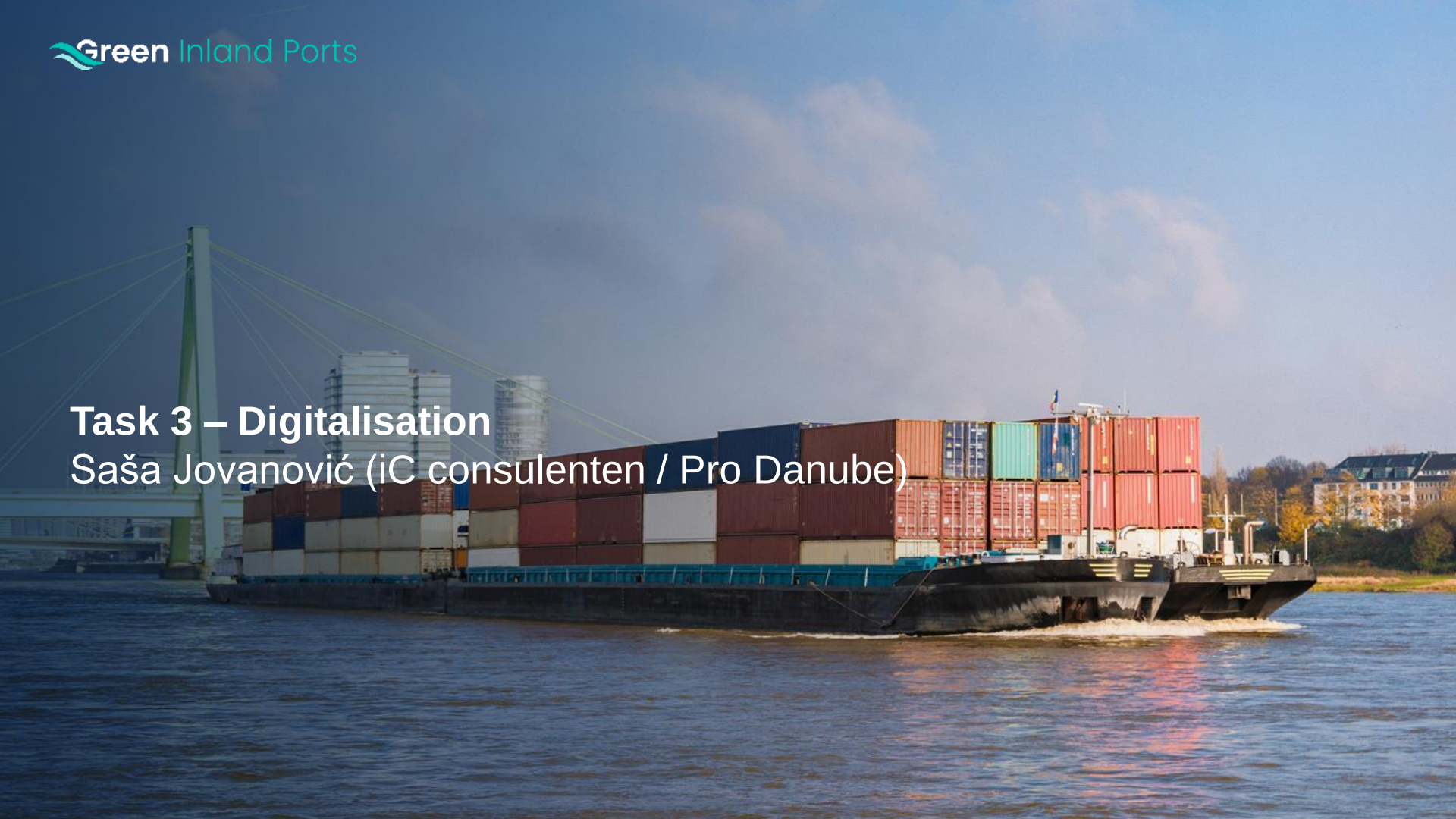

Task 3 – Digitalisation

Saša Jovanović (iC consulenten / Pro Danube)

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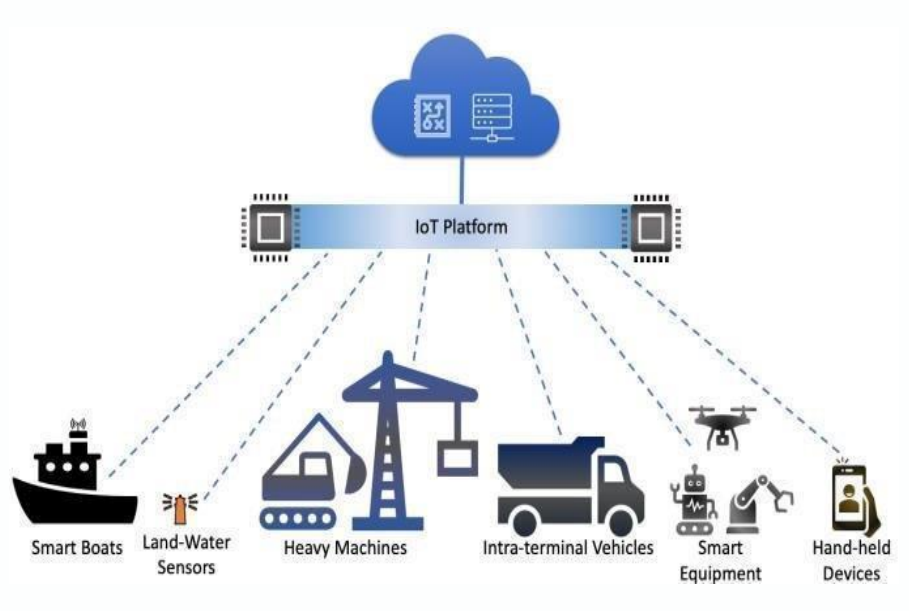
What is digitalisation?

- A process of applying and integrating available digital tech into port processes and activities to improve port management & operations.
- It is of utmost importance for an enhancement of operational efficiency.
- **Goal**: to improve efficiency & effectiveness of services, streamline operations, reduce risks, costs, and environmental footprint.
- Preconditions:
  - **Robust IT infrastructure**: stable, reliable & fast internet, advanced networking systems, adequate server and data storing capacity, modern hardware & software.
  - **Data sharing**: agreements, guidelines & protocols between various stakeholders as data owners.
  - **Cybersecurity measures**: mitigation of cyberthreats.
  - **Standardised data formats**: formats such as EDI (Electronic Data Interchange), XML (eXtensible Markup Language), JSON and UN/CEFACT XML-based UNCEFACT XML and UN/EDIFACT.
  - **Trained labour**: creation of “cyber-aware“ and “cyber-competent“ workforce.
  - **Stakeholder collaboration**: governmental organizations (customs, police, etc.), port authorities & operators, forwarders &, land carriers, etc.
  - **Clear digitalisation strategy**: definition of goals & scope of digitalisation



Source: https://www.researchgate.net/publication/348269178

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Main drivers of port digitalisation

- Efficiency and productivity
- Competitive advantage
- Supply chain optimisation
- Regulatory compliance
- Reduction of environmental footprint

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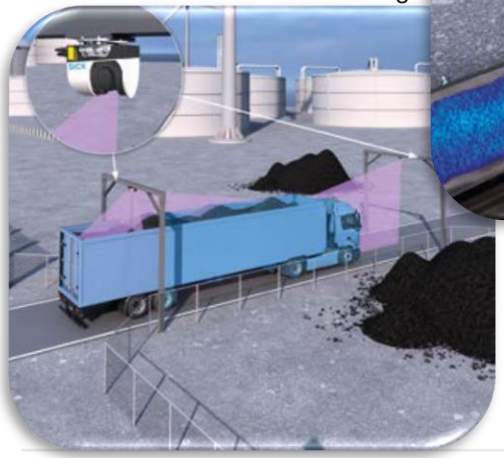
Sensors and devices as building blocks of digitalisation

Temperature measurement of bulk cargo

Environmental perception on terminal tractors

Volume measurement of bulk cargo



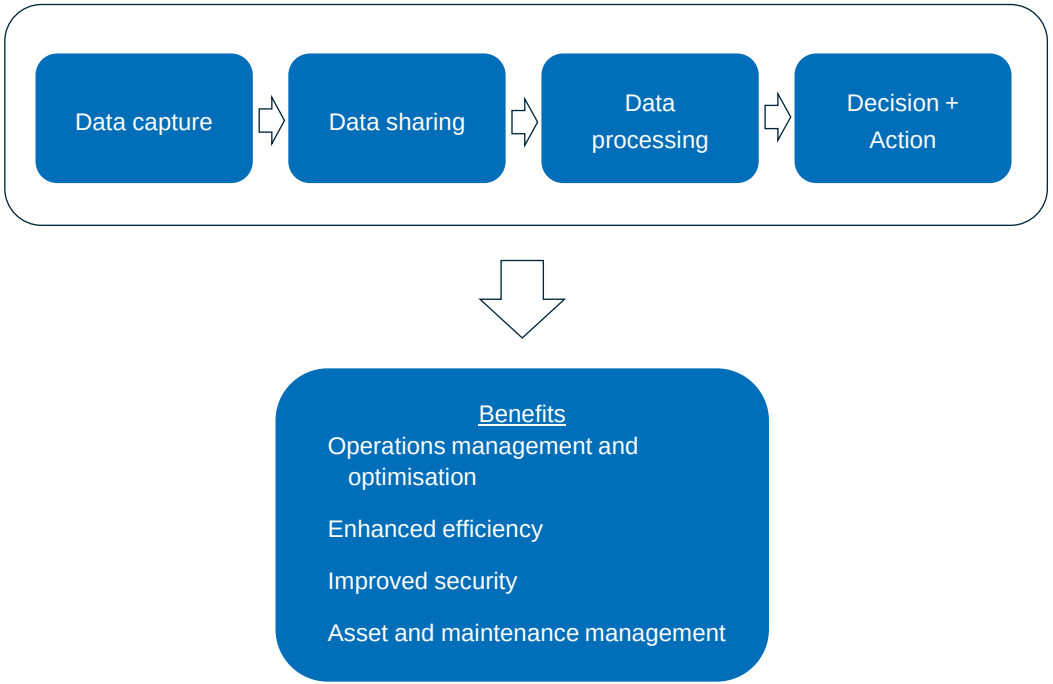
Object detection on ship loaders

All illustrations courtesy of www.sick.com

Advanced port digitalisation technologies

Internet of Things (IoT)

- "*Network of devices such as sensors and embedded systems connected to the Internet, thus enabling physical objects to collect, transmit and exchange data*."
- IoT sensors can be literally placed anywhere.
- Movable and unmovable objects
- Cranes, quay walls, cargo handling equipment
- Tracking vehicle accumulation
- Congestion management
- Gate management
- Environmental monitoring



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Blockchain technology

- Shipment prepared, ID created.
- Info on shipment and involved parties entered into the blockchain (app or platform).
- All parties validate the info.
- **Block 1 created**.

- Carrier (freight forwarder) initiates the next step in supply chain.
- Relevant info entered into the blockchain.
- All parties validate the info.
- **Block 2 created**.

- Loading port takes over the shipment, initiates the next step.
- Relevant info entered into the blockchain.
- All parties validate the info.
- Smart contract initiated and shipment released.
- **Block 3 created**.

- Cargo taken over and carrier by shipping line.
- Relevant info entered into the blockchain.
- Progress info added – ETA, delays, etc.
- All parties validate the info.
- **Block 4 created**.

- Unloading port unloads the cargo.
- Relevant info entered into the blockchain.
- All parties validate the info.
- Smart contract triggers the next step, shipment cleared & released to land carrier.
- **Block 5 created**.

- Land carrier (freight forwarder) performs its step.
- Relevant info entered into the blockchain.
- All parties validate the info.
- Smart contract triggers the next step and shipment released to receiver.
- **Block 6 created**.

- Retailer/receiver, receives the cargo.
- Relevant info entered into the blockchain.
- All parties validate the info.
- Smart contract fulfilled.
- **Block 7 created**.

- **Parties in the supply chain**: manufacturer, shipper, freight forwarder, land carriers, shipping line, port, customs, sanitary authorities, bank, retailer, receiver, etc. All-time access to info in blocks.
- **Relevant info**: shipment ready at the factory, weight and/or volume, pre-haulage completed, delivered at port, loaded, in transit, vessel ETA, position, insurance paid, freight paid, customs cleared, etc.
- **Smart contract**: Self-executing contracts with the terms of the agreement directly written into code. They automatically enforce and execute the terms of the contract when predefined conditions are met, providing a decentralized and automated way to facilitate, verify, or enforce the negotiation or performance of a contract.

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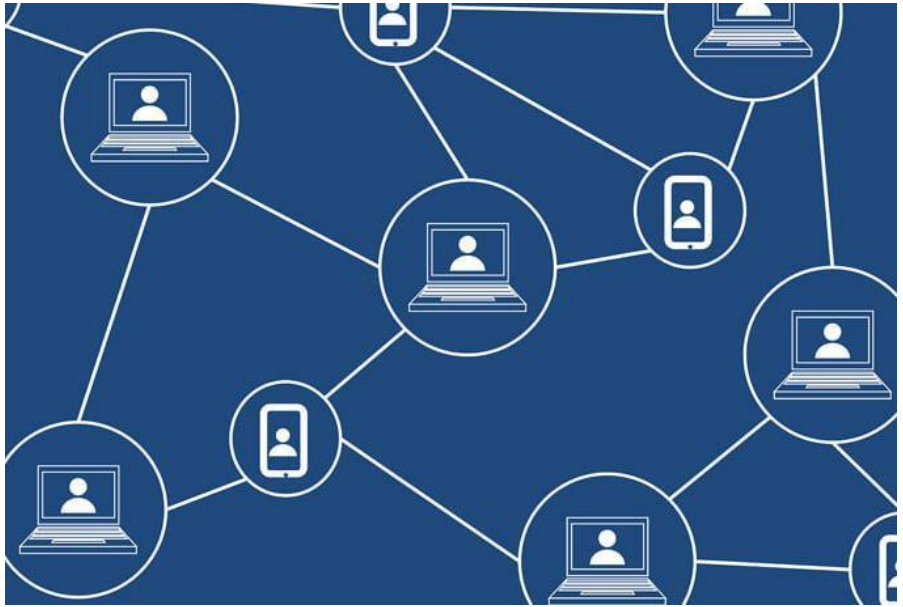
Blockchain advantages for ports

- **Trust**: usage & sharing of info happens with a consensus of all parties.
- **Security**: extremely secure & encrypted data, blockchain-based identity management system can verify the identities of people and vehicles entering/exiting the port, preventing unauthorized access.
- **Effectiveness**: time savings, streamline and automate the trade finance processes in a port, smart contract can be used to automatically trigger payment once the given conditions are met.
- **Visibility**: enables tracking and tracing of various cargoes in real time, facilitates the exchange of information.
- **Network expansion**: scalable, compatible with IoT devices and Digital Twins, users can connect individually in a decentralised way.
- **Integration of supply chain flows**: entire multimodal supply chain (physical, financial and information) flows can be integrated as the info is shared between all participating parties.



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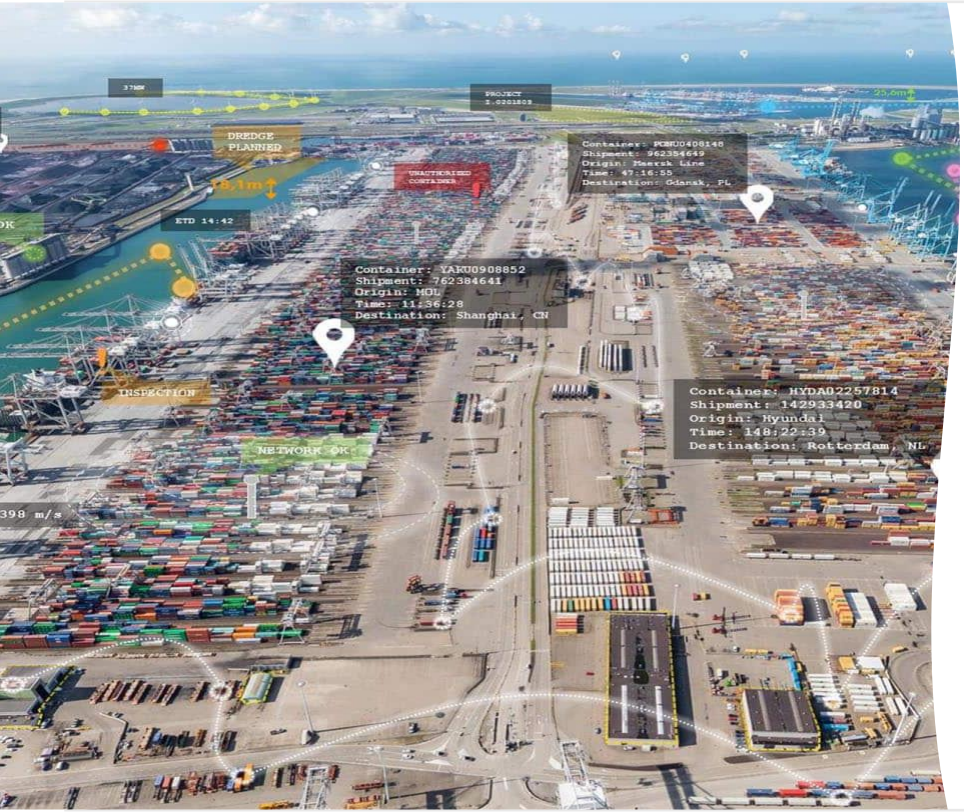

Big data analytics

- **Large volume of data**, both structured and unstructured, generated during day-to-day port operations.
- **Analysed** for insights that lead to better decisions and strategic business moves.
- **Example of data gathered and used**: number and features of vessels in ports, type of cargo handled & stored, productivity of cranes & handling yard equipment, traffic density of land means of transport in ports, ETA, demurrage and laytime, loading/unloading times, structural loads of quay walls or quayside cranes, distances between objects, area dimensions, water depth, environmental data, etc.
- Data collection done by IoT sensors and devices, RFID sensors and tags, and GPS systems facilitating real-time data collection, enabling accurate insights into port operations.
- **Used for**: operational efficiency, cargo handling & inventory management, maintenance and safety, port layout planning, environmental performance management, etc.

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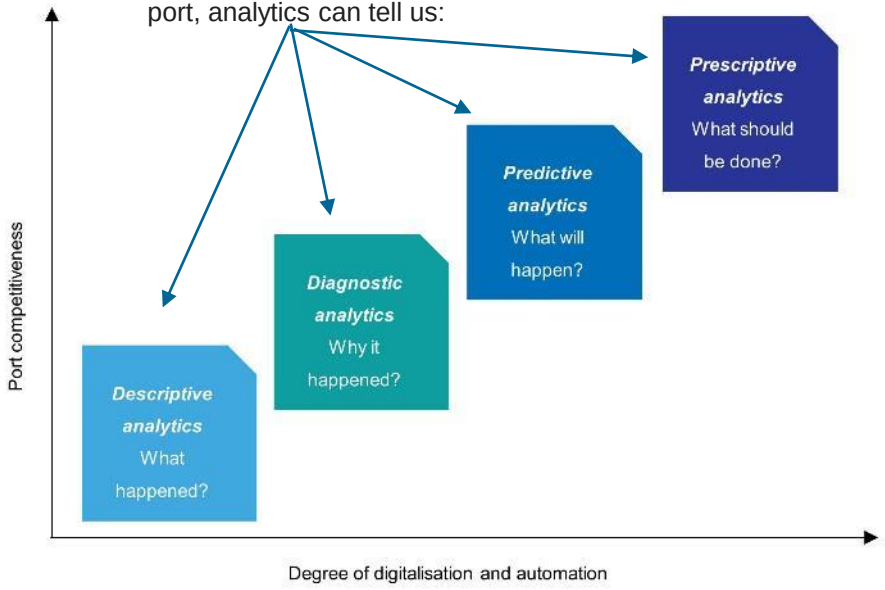
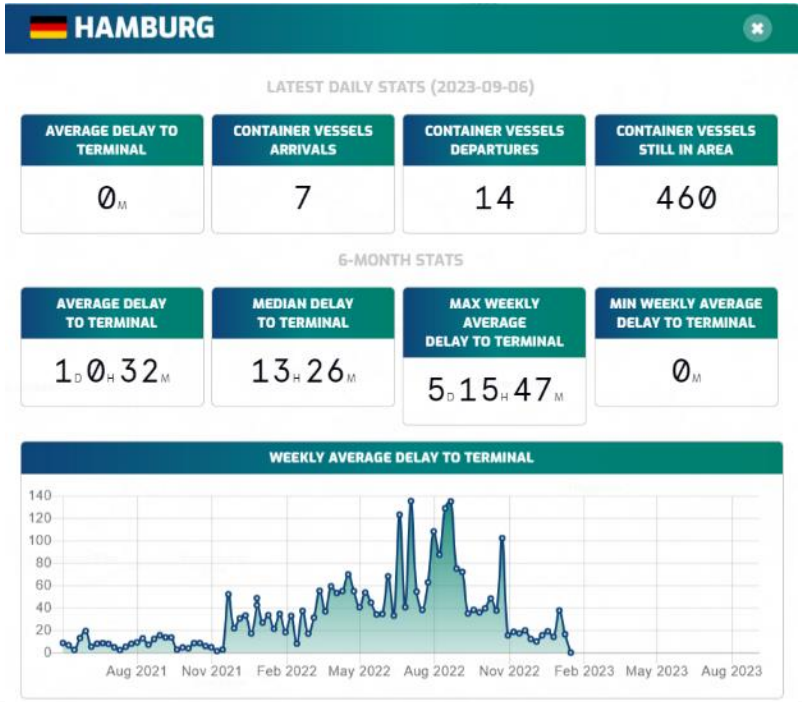
Data analytics and business intelligence

When analysing any event in a port, analytics can tell us:



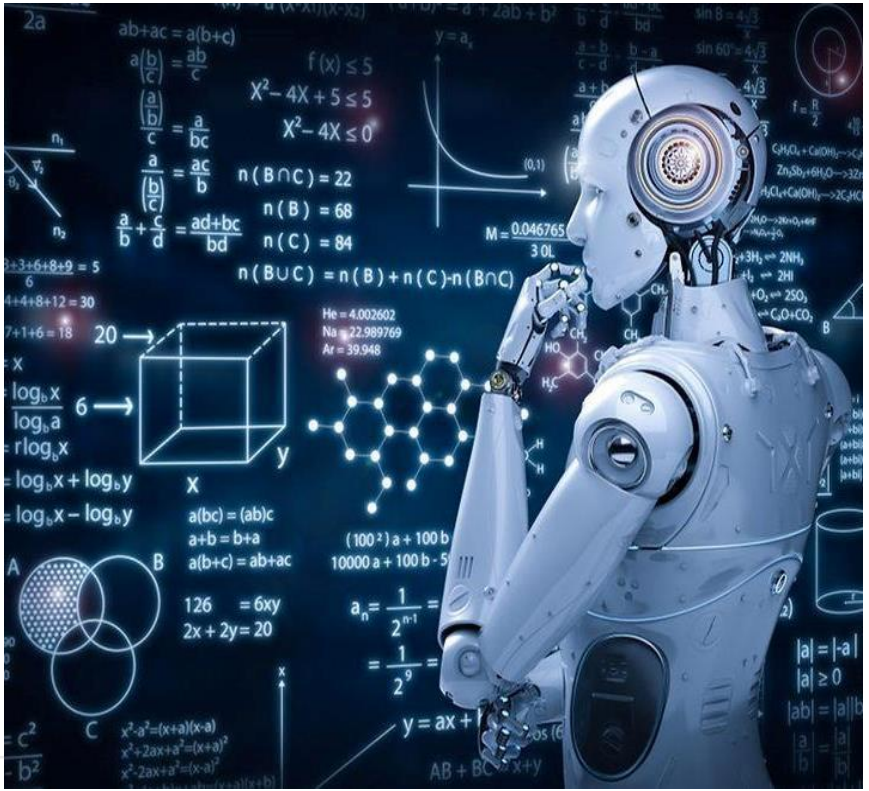
Example of data analytics platform interface



https://spire.com

Artificial intelligence

- "*Simulation of human intelligence in machines (hardware and software), allowing them to execute tasks that would otherwise require human intelligence*."
- **Tasks**: problem-solving, learning, reasoning, recognising patterns, understanding human language, and making, suggesting and explaining decisions.
- Uses IoT devices, big data, blockchain and other technologies to perform tasks it is programmed to do.
- **Cargo management**: cargo handling optimisation, predicting or managing arrival times, identifying priority shipments and suggesting optimal storage and loading strategies → reduced congestion, faster turnaround times.
- **Predictive maintenance**: monitors conditions of port infrastructure and equipment in real-time, enabling predictive maintenance to prevent breakdowns and accidents, thus reducing costs and increasing efficiency.
- **Traffic management**: AI algorithms analyse vessel & vehicle movements to optimise traffic flows within port areas, minimising congestion and emissions, maximising efficiency.
- **Environmental monitoring**: suggesting environmentally friendly practices and strategies, thus directly assisting in environmental footprint reduction.



https://www.kio.tech/en-us/blog/do-humans-and-ai-think-alike

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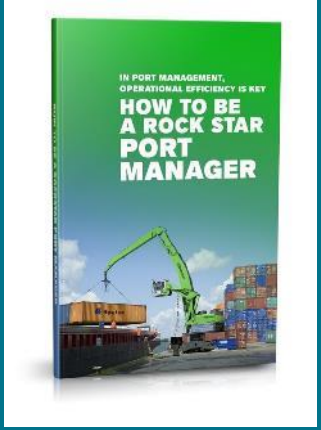
Automated and autonomous ports

Digitalised port	Use of digital technologies and tools, data, and information systems.
Automated port	Mechanisation and robotics of physical tasks, activities and processes in the port, to assist human labour.
Autonomous port	Higher degree of independence for machines & systems in decision-making and operations, human involvement reduced/excluded.

Goal:



improve the overall port management and operations

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Automated guided vehicles (AGV)

Remotely operated STS cranes

Autonomous grab ship loader

Benefits of inland port automation

- **Efficiency and speed enhancement**: significantly reduces loading/unloading time & enables faster turnaround time for vessels and trucks. Reduces congestion & dwell time.
- **Cost reductions**: long-term cost-savings. Reduces the cost of labour, fuel and energy, errors-caused costs. Results in improved financial sustainability.
- **Environmental sustainability**: reduces energy consumption by optimising the use of equipment → lower emissions.
- **Improved safety**: manual labour significantly reduced, especially in potentially hazardous tasks → labour safety increased, risk of accidents reduced.
- **Resilience**: automated systems can operate continuously, in adverse conditions, increasing resilience to disruptions caused by weather or unforeseen events.

Digital Twins for ports

- Digital Twin - a virtual representation of a physical facility.
- Digital copy of virtually everything in the port: buildings, light poles, fences, quay walls, bollards, cranes, mobile equipment, winds, tides, currents, water levels, cargoes, etc.
- Created using the data & input from sensors, IoT devices, cameras, physical plans and drawings, and other sources.
- Uses technologies like Big Data, Data Analytics, 5G Networks, Machine Learning, Blockchain, air- & waterborne drones, etc.
- Analysing real-time data and simulating the behaviour of the physical port.
- Revolutionising the entire process of data capture, analysis and interpretation.
- In the European inland ports, only the Port of Trier on the Moselle in Germany reported using the Digital Twin technology for its operations and management.

Advanced Port Information & Control Assistant (APICA)
https://www.youtube.com/watch?v=kLLTNRPgLe8

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Port Community Systems (PCS)

- Port Community System - an electronic platform which connects the multiple systems operated by a variety of organisations forming a seaport or inland port community.
- Neutral and open electronic platform enabling intelligent and secure exchange of information between public and private stakeholders.
- Creates a network of shipping agents, shippers, freight forwarders, transporters, terminals, logistics platforms, and public entities.
- Information sharing
- Cargo tracking
- Booking and reservations
- Document management
- Customs integration
- Real-time notifications
- Billing and invoicing
- Performance analytics, etc.

Source: Port Economics, Management and Policy

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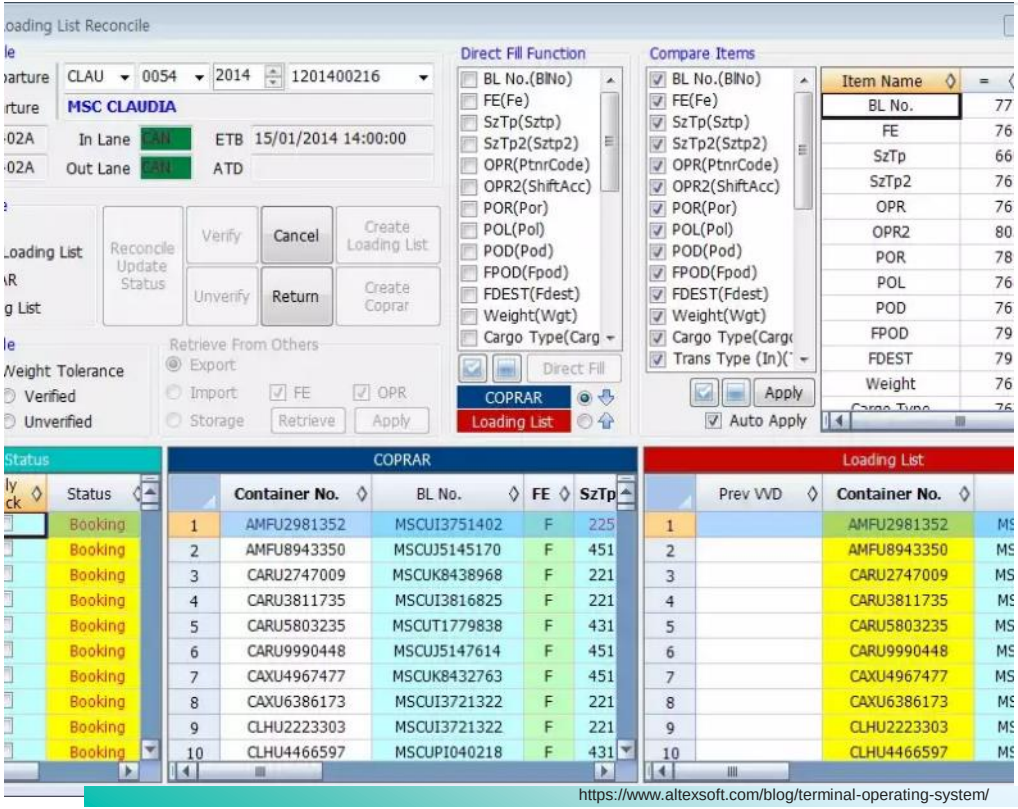


https://www.altexsoft.com/blog/terminal-operating-system/

Terminal Operating Systems

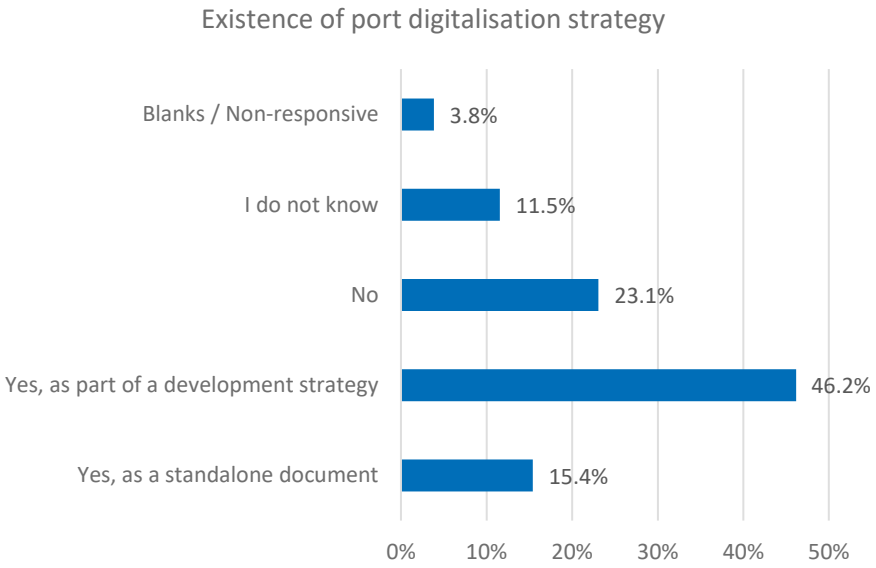
- Software solutions designed to manage and optimize the operations of port terminals.
- Planning components (examples):
  - Resource allocation (berths, quay cranes, yard space, equipment, etc.)
  - Vessel scheduling
  - Equipment control & monitoring
- Operational components
  - Real-time monitoring of operations
  - Documentation and reporting
  - Billing and invoicing
  - Integration with other platforms and PCS
  - User access control
  - Environmental monitoring

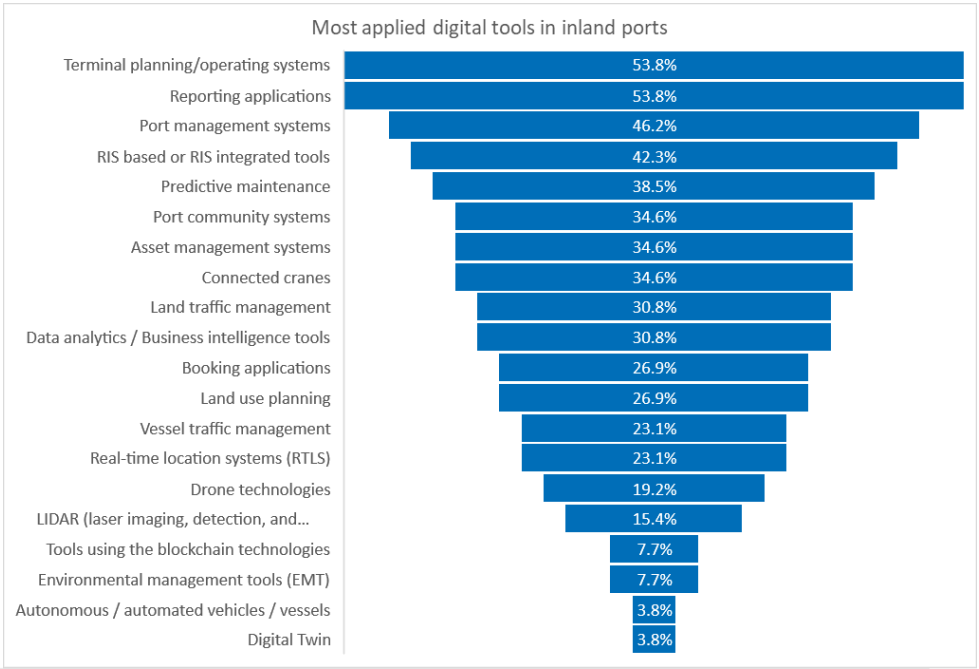
Digitalisation of environmental performance measurement

- Environmental Management Tools (EMT) - a set of instruments, methodologies, and systems used by ports to manage and monitor their environmental performance.
- Digitalizing Environmental Management Tools (EMT) in inland ports – advantages:
- Efficiency and automation: Digital EMT systems automate data collection, analysis, and reporting processes, saving time and reducing the risk of errors.
- Real-time monitoring of environmental parameters through various sensors for the measurements of air/water quality, noise, etc.
- Regulatory compliance: digital EMT systems can assist in ensuring compliance by providing a structured approach to data management, reporting, and documentation.
- Transparency and stakeholder communication
- Integration with other port operating systems creating a holistic approach to operations.

Source: Oizom

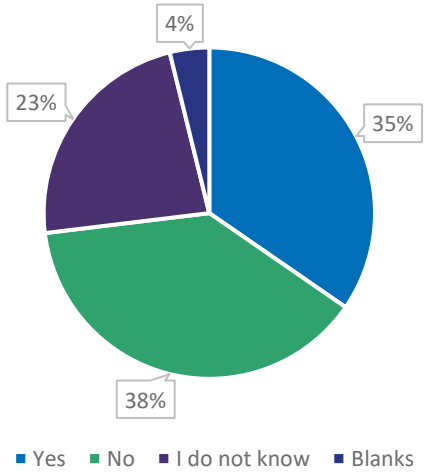
Port digitalisation in practice – survey results



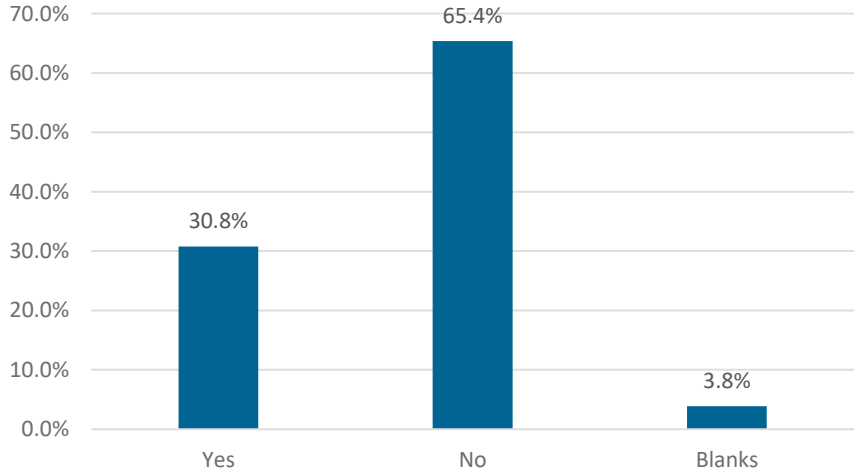


Port digitalisation in practice – survey results

Existence of legislation requiring inland ports to report on their environmental impact

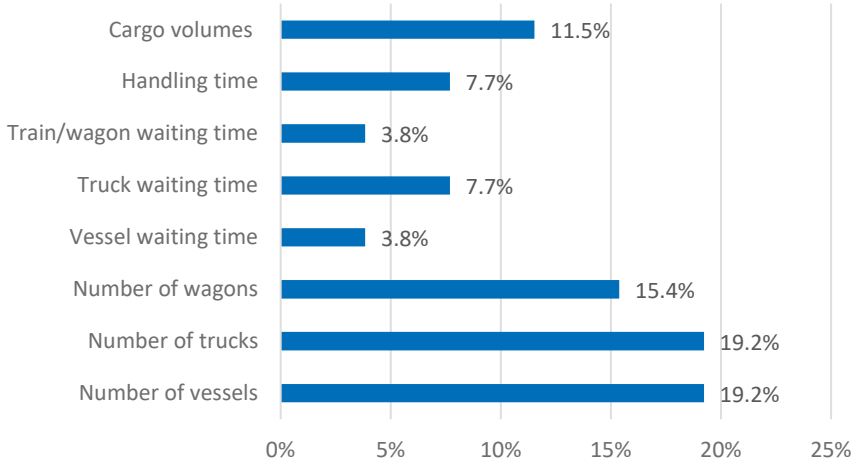


Environmental reporting or environmental performance measurement using digital means

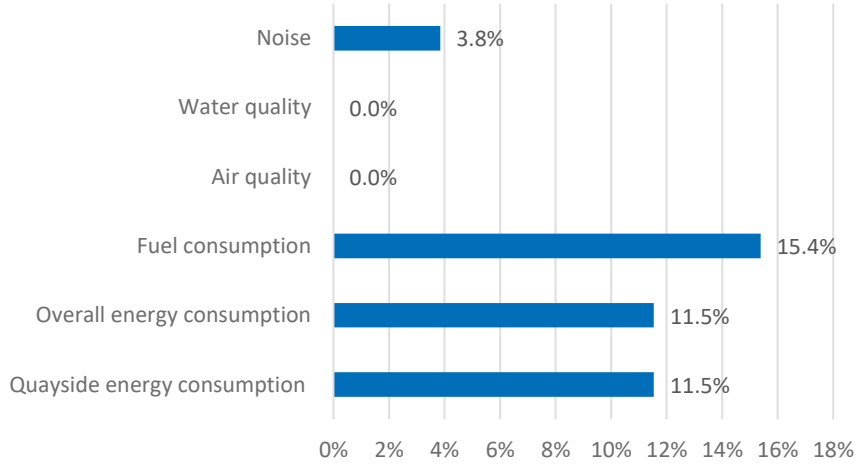


Port digitalisation in practice – survey results

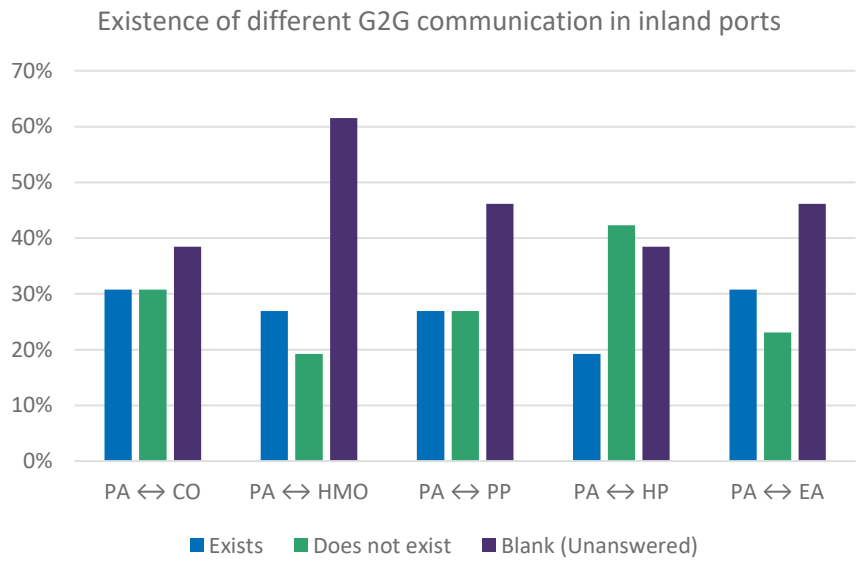
Share of inland ports applying **digital** tools in operational KPI measurements

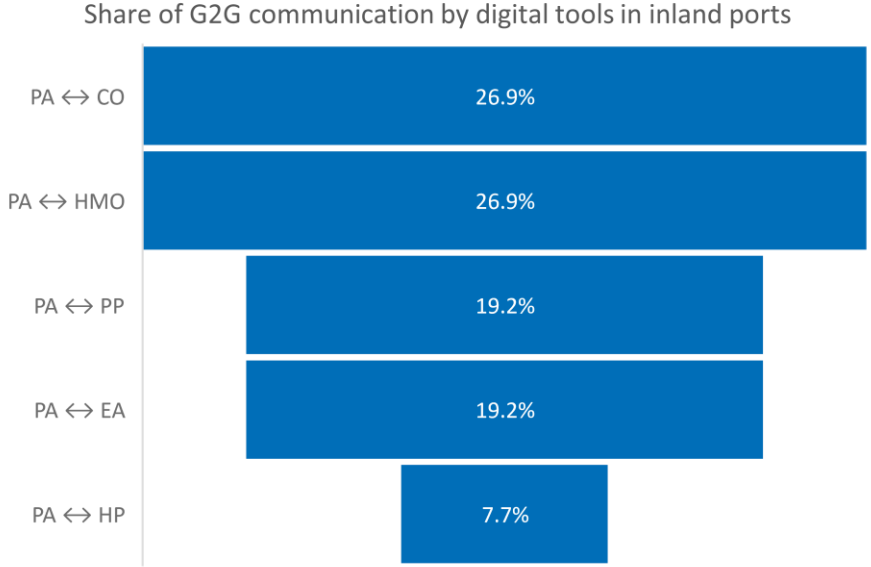


Share of inland ports using **digital** tools for measuring environmental performance



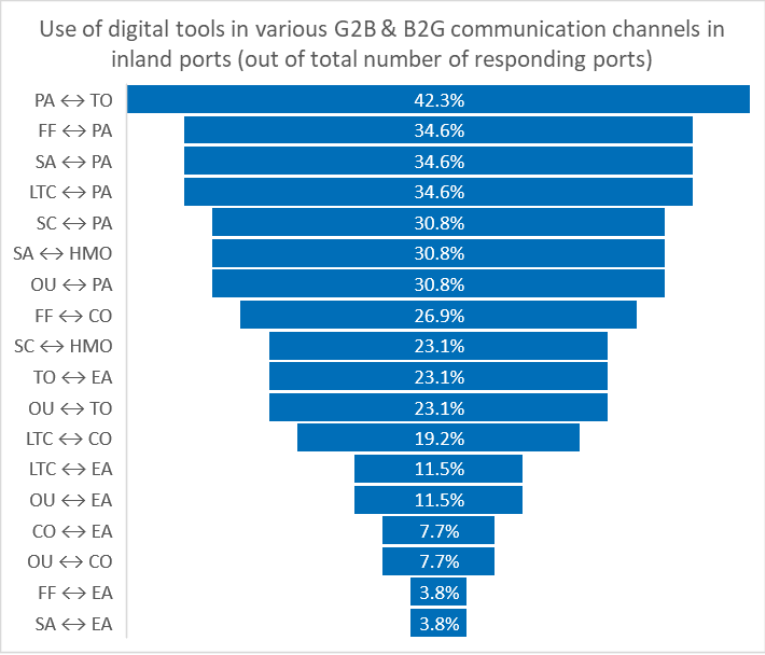
Port digitalisation in practice – survey results

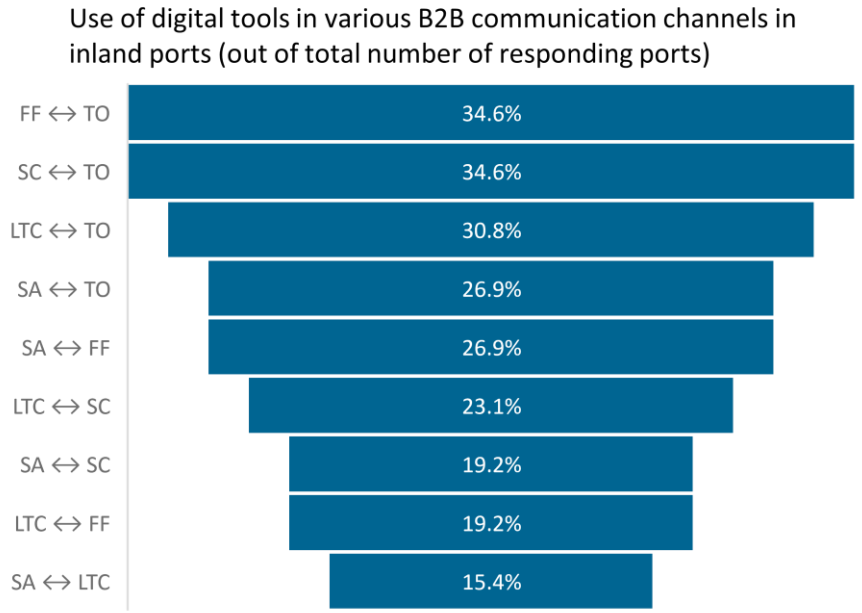




G2G = Government to Government (communication between various public authorities)
PA = Port Authority, CO = Customs Office, HMO = Harbour Master Office,
PP = Port Police, HP = Harbour Pilot,
EA = Environmental Authorities, CO = Customs Office

Port digitalisation in practice – survey results





Our partners

ECORYS CE Delft Panteia DANUBE Erasmus University Rotterdam EICB

G2B = Government to Business (and vice-versa; B2G) communication between public/private independent companies and public authorities (and vice-versa)
TO = Terminal Operator, SC = Shipping Company (acting as ship owner/operator/manager…)
FF = Freight Forwarder (acting on its own or on behalf of the cargo owner
SA = Ship (or port) Agent, LTC = Land Transport Companies (rail and road transport operators)
OU = Other port users

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Ongoing + planned digitalisation measures in inland ports (example)

FR	Syndicat Mixte Docks Seine Nord Europe Escaut (Port authority)	Cargo community system and berthing application
FR	Ports of Lille (Port authority)	Realtime monitoring of operational activities, predictive maintenance of engines and warehouses, digital twin, environmental surveillance, production & use of energy, drone surveillance and inter-operability of different IT systems throughout the supply chain.
FR	Compagnie Nationale du Rhône (Port authority)	Clear follow-up of all transport modes, precise statistics on different types of freight, automation and facilitation of some procedures (customs, etc.), tracking shipping documents, need of single platform to track freight with official documents.
NL	Havendienst gemeente Utrecht (Port authority)	Cargo community system and berthing application
VN	Port of Haiphong (Port operator)	Port operating system and port community system
DE	Hafen Trier (Port authority)	Digital Twin and port railroad infrastructure management system,

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Task 3 – Digitalisation

Frank Stevens (Erasmus School of Law)

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The legal framework

- Many possibilities, many different technologies …
- Also (many) legal questions

- Privacy (GDPR - Regulation (EU) 2016/679)
  - Very broad scope
  - *any* information relating to an identified or *identifiable* natural person
  - Rights for the 'data subject', obligations for the 'data controller'

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The legal framework

- Data 'Ownership' - Rights to Data
  - Can a terminal disclose (expected) arrival times of barges to third parties?
  - Can a carrier disclose cargo information to third parties?

- Solutions:
  - Contract
  - EU initiatives
    - European Strategy for Data (COM(2020) 66 final) - create a 'European Data Space'
    - Open Data Directive (EU) 2019/1024
    - Data Governance Act (Regulation (EU) 2022/868)
    - Proposal for a 'Data Act' (COM(2022) 68 final), access to and re-use of data generated by IoT products

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The legal framework

- User liability
  - Port digitalisation is often about *sharing* data
  - What if the shared data turns out to be incorrect and causes damage?

The legal framework

- Liability for defective software
  - Software in general
    - Well-known issue, legal rules more or less established
  - AI applications
    - Recent developments
    - Legal implications not clearly understood yet
    - EU initiatives

The legal framework

- Liability for defective software
    - Blockchain
        - Lada, Volvo and Ferrari are all cars … but it does make a difference which one you're driving …
        - Many different blockchains … which one are you dealing with?
        - Who (and how) verifies the identity of the users?
        - Who verifies and guarantees the security? Proof of Work, Proof of Stake, …
    - Digital Twins
        - Who verifies and guarantees that your digital twin is a ***perfect*** twin?
- Technical issues, but if you get them wrong and there is loss or damage, someone will be held liable ...

Wrap-up and closure

Upcoming activities:

- Findings from the workshop today
- Invitation to join the Danube Ports Days in Vienna
- Expression of interest to be part of the pilot phase / visit our website : https://green-inland-ports.eu/
- Provide input in upcoming surveys and interviews

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- Introduction to the project – Jasper Tanis: jasper.tanis@ecorys.com
- Urban and short range IWT – Henrik Armbrecht ha@planco.de
- Environmental impact of ports:
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  - Frank Stevens: f.stevens@law.eur.nl
- Digitalisation:
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  - Frank Stevens: f.stevens@law.eur.nl

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Networking and drinks