

The green port in digital cooperation

MIKAEL LIND

**CHALMERS UNIVERSITY OF TECHNOLOGY
RESEARCH INSTITUTES OF SWEDEN (RISE)**

MIKAEL.LIND@RI.SE

*Presentation held at Green and smart ports in
the Adriatic Ionian Region. The contribution of
the European territorial cooperation between
Italy, Croatia and Slovenia, 2022-06-06*

The maritime ecosystem is unique



- ▶ Oldest and largest **sharing economy**
- ▶ **Global**
- ▶ **Flat**
- ▶ **Self-organized**
- ▶ **Federated** and **democratic** governance
- ▶ **Asset intensive** with **high demands** on **optimized resource utilization**
- ▶ **Not allowing for one owner**
- ▶ **Episodic interactions**

Shipping is a self-organising ecosystem

- ← No single keystone organisation
- ← Distributed control
- ← Loosely coupled organizations adapting autonomously and organic



What is the need?

Connecting what happens@sea with what happens@shore

Enhanced predictability of movements and operations

Increased information transparency with direct and indirect stakeholders

Seamless integration with the multimodal transport chain

Engaged scholars and reflective practitioners joining the same discourse - maritime informatics

Upgrade of human capabilities in digitalisation

The Sustainable Port

The sustainable port is a node that generates value-creating services for its customers, owners and the outside world. The port is operated on a commercial basis and as a transport node, the port contributes to a sustainable use of the transport system by being an integral part of global, regional and local transport systems where different modes of transport are included and interact.



The Sustainable Port

with capabilities as transport node,
energy node, and digital node

- ▶ Window to all transport means
- ▶ Services for the stakeholder of the port
- ▶ Consumer and supplier of sustainable energy for the sustainable transport ecosystem
- ▶ Consumers and producers of information
- ▶ Enablers for transition towards a more sustainable transport ecosystem

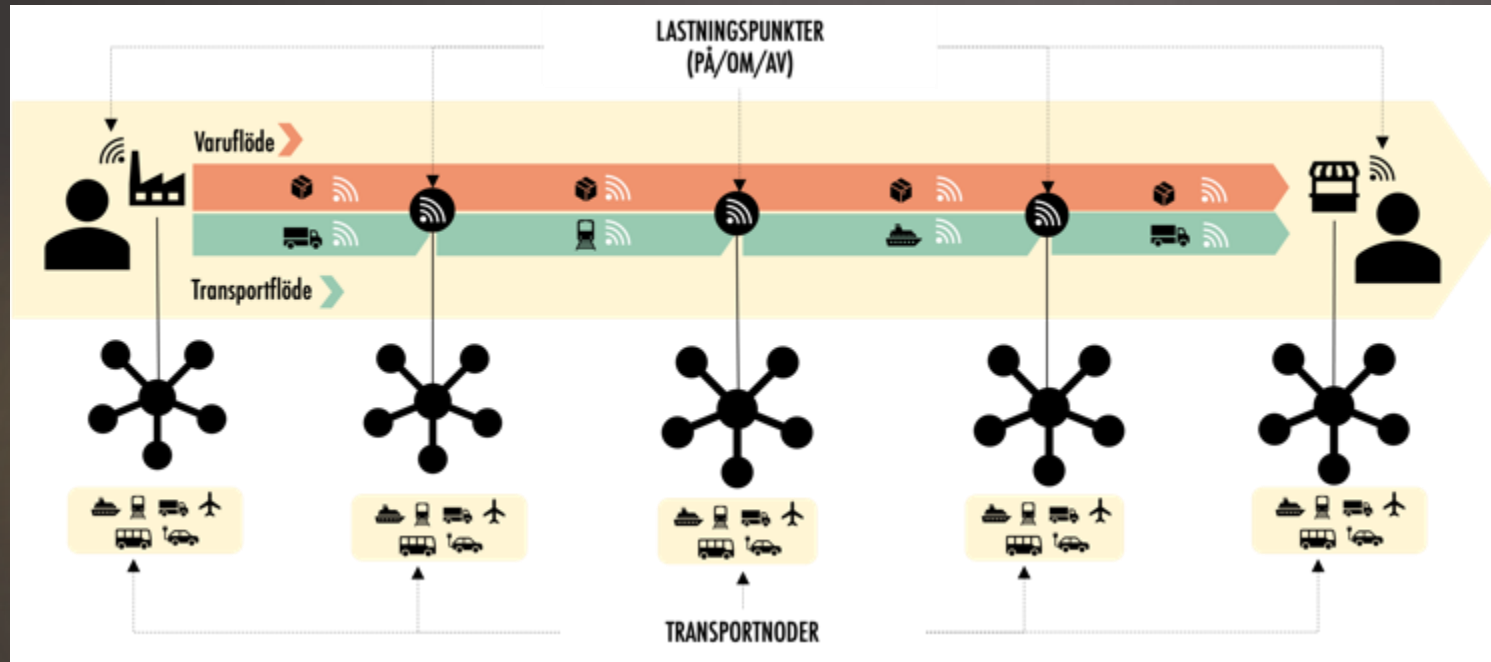


The port as a transport hub

The port as an energy hub

The port as a digital hub

The port as a **transport node**



Supply Chain Innovation

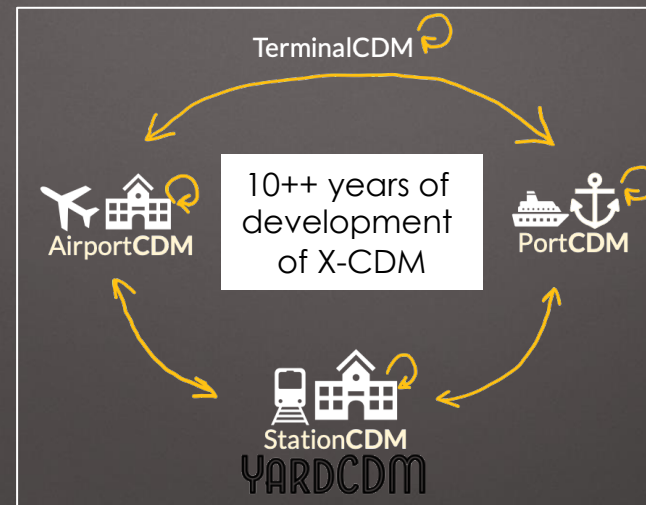
Sustainable ports



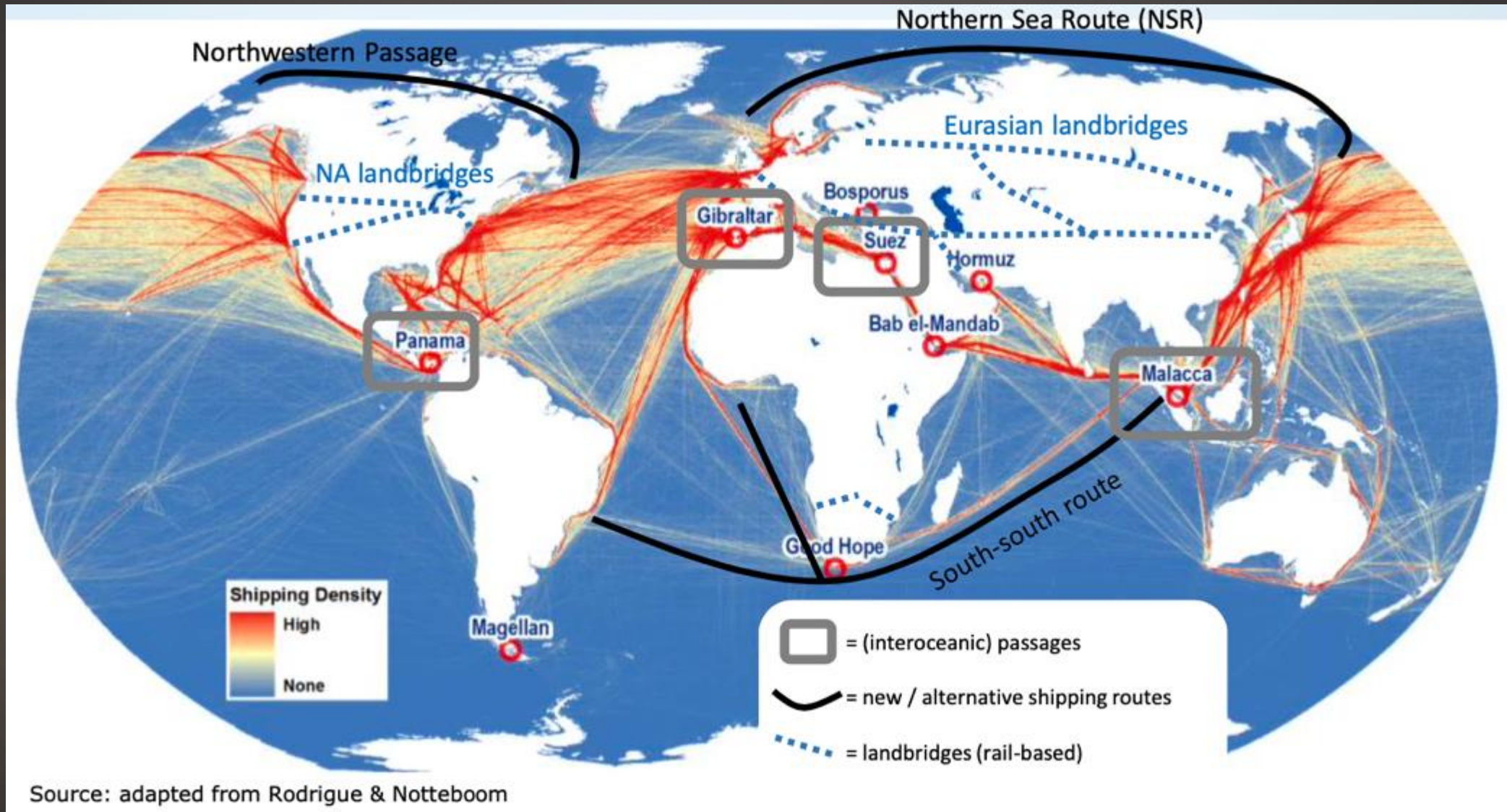
Situational awareness



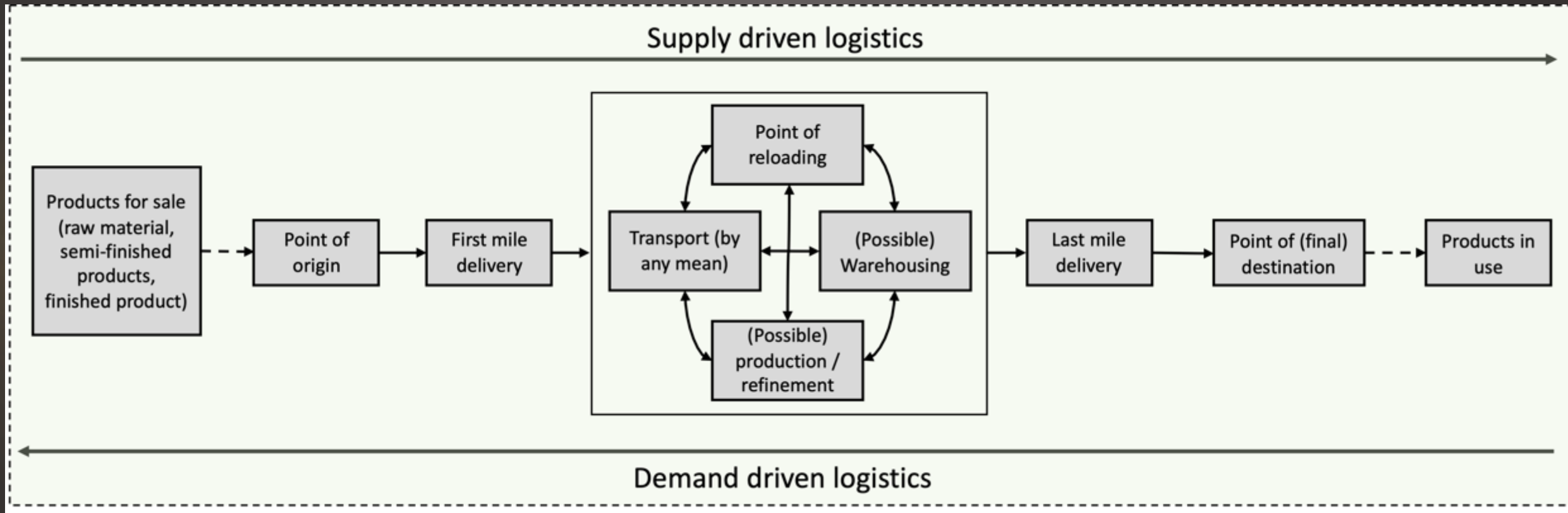
Seamless transports and logistics



The context

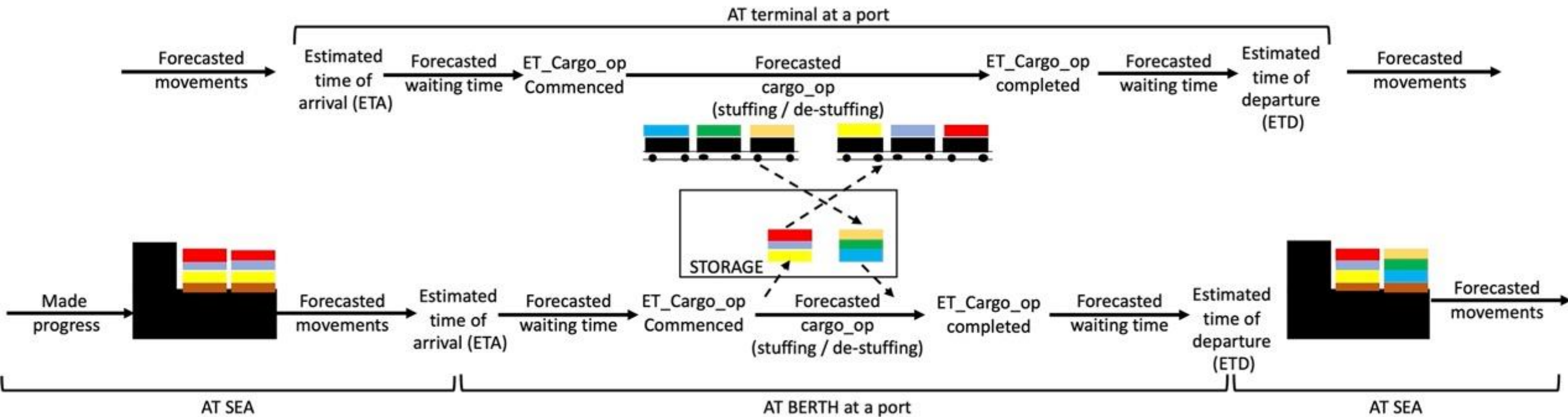


Maritime supply chains in context

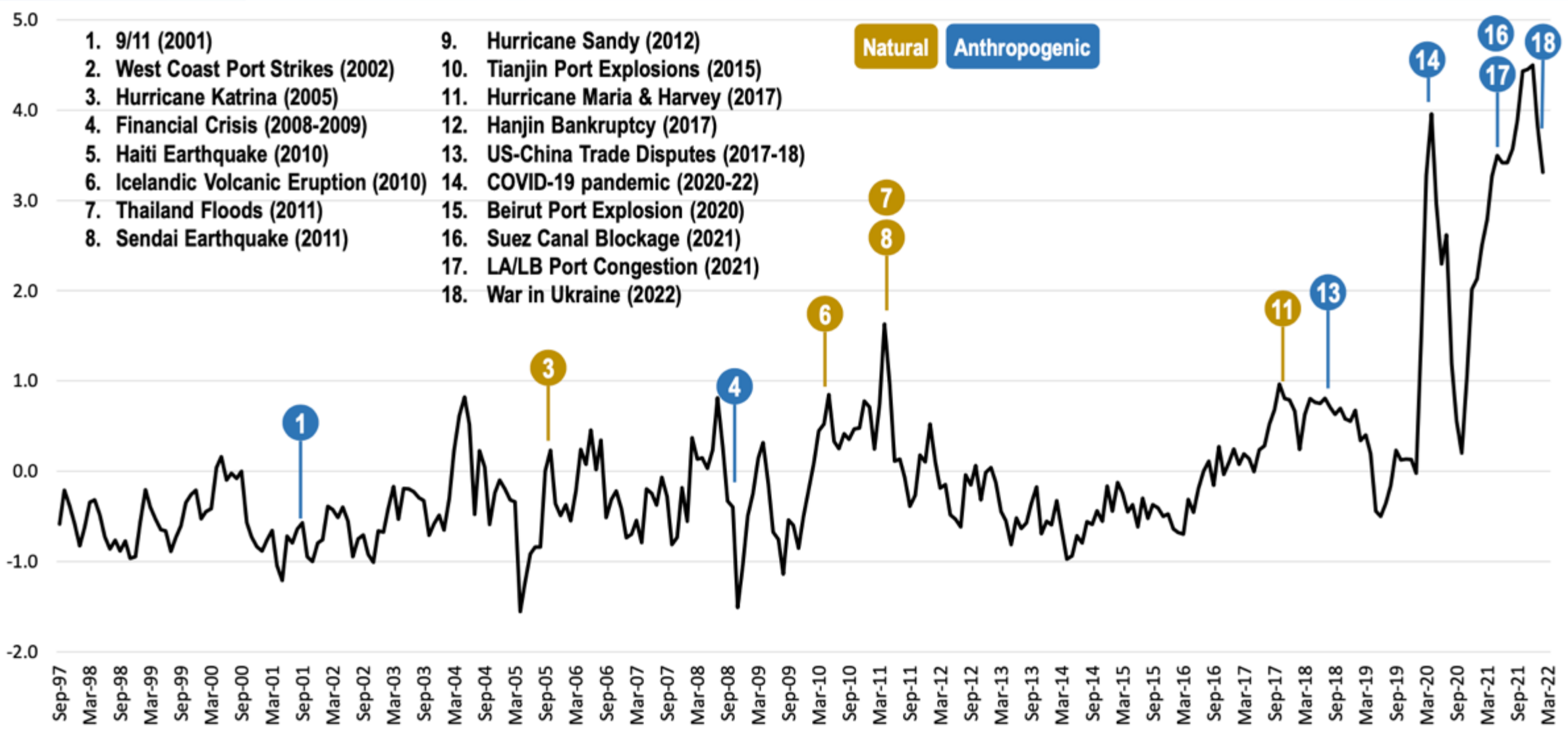


A port is thus a transport hub

- ▶ Even though that much transports are utilising the sea (90 %) it is very rare that the transport ends at the port



Global Supply Chain Pressure Index (GSCPI) and Major Supply Chain Disruptions



Source: own compilation based on Di Giovanni et al. (2022)

Large 3PL's



At home, anywhere in the world



Digital players

Theo Notteboom

MONEY / ECONOMY

Walmart, Target and More Charter Private Ships To Combat Great Depression-Level Supply Chain Issues



Large retailers

Forwarder resurrects the Ellerman brand to create new British liner

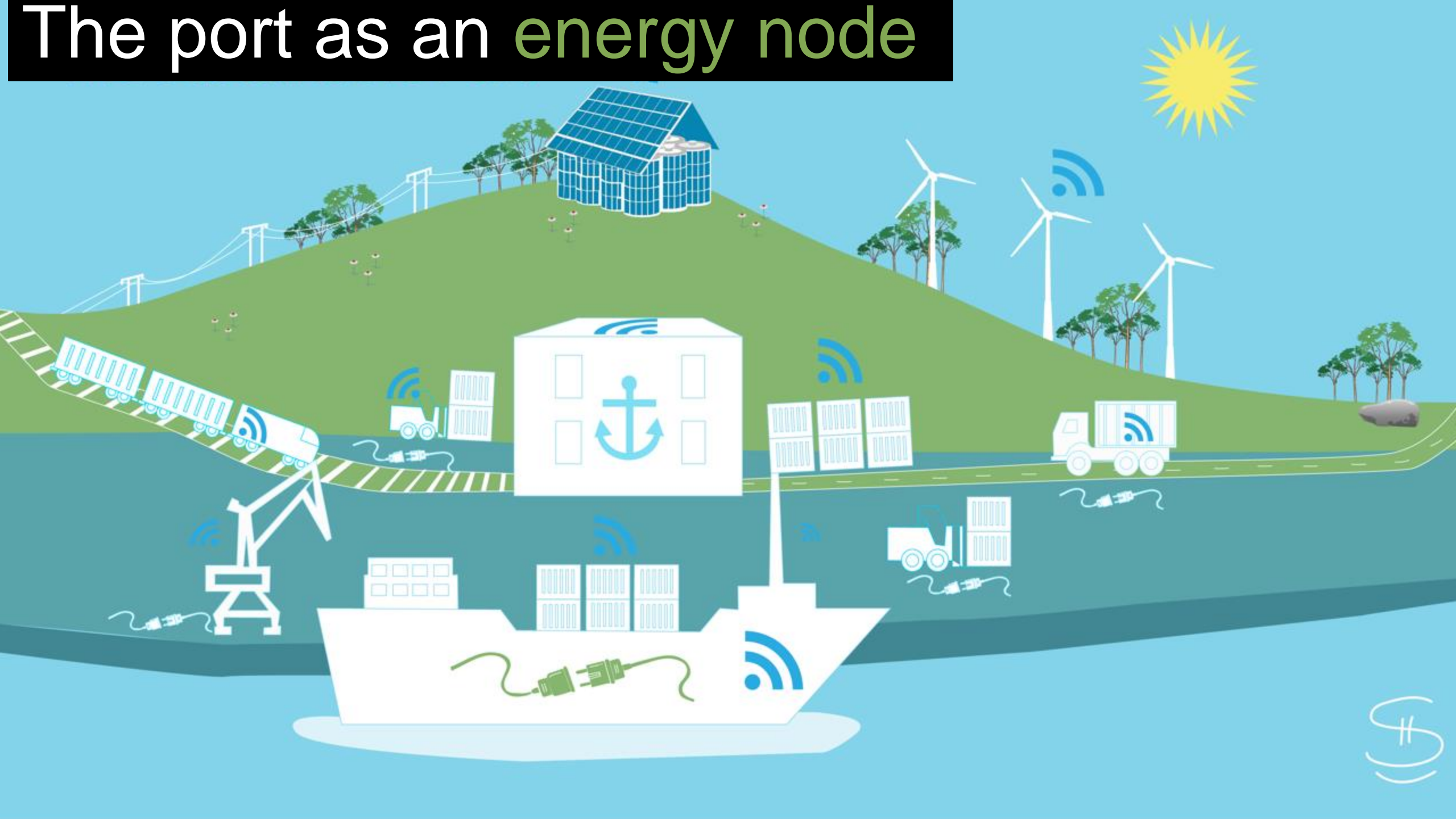
Jan Chambers - February 2, 2022



Container analysts at Alphaliner have provided details on a new British shipping line. UK-based forwarder Universe, which had chartered some ships last year, has gone a step further, creating a dedicated liner subsidiary, Ellerman City Liners.

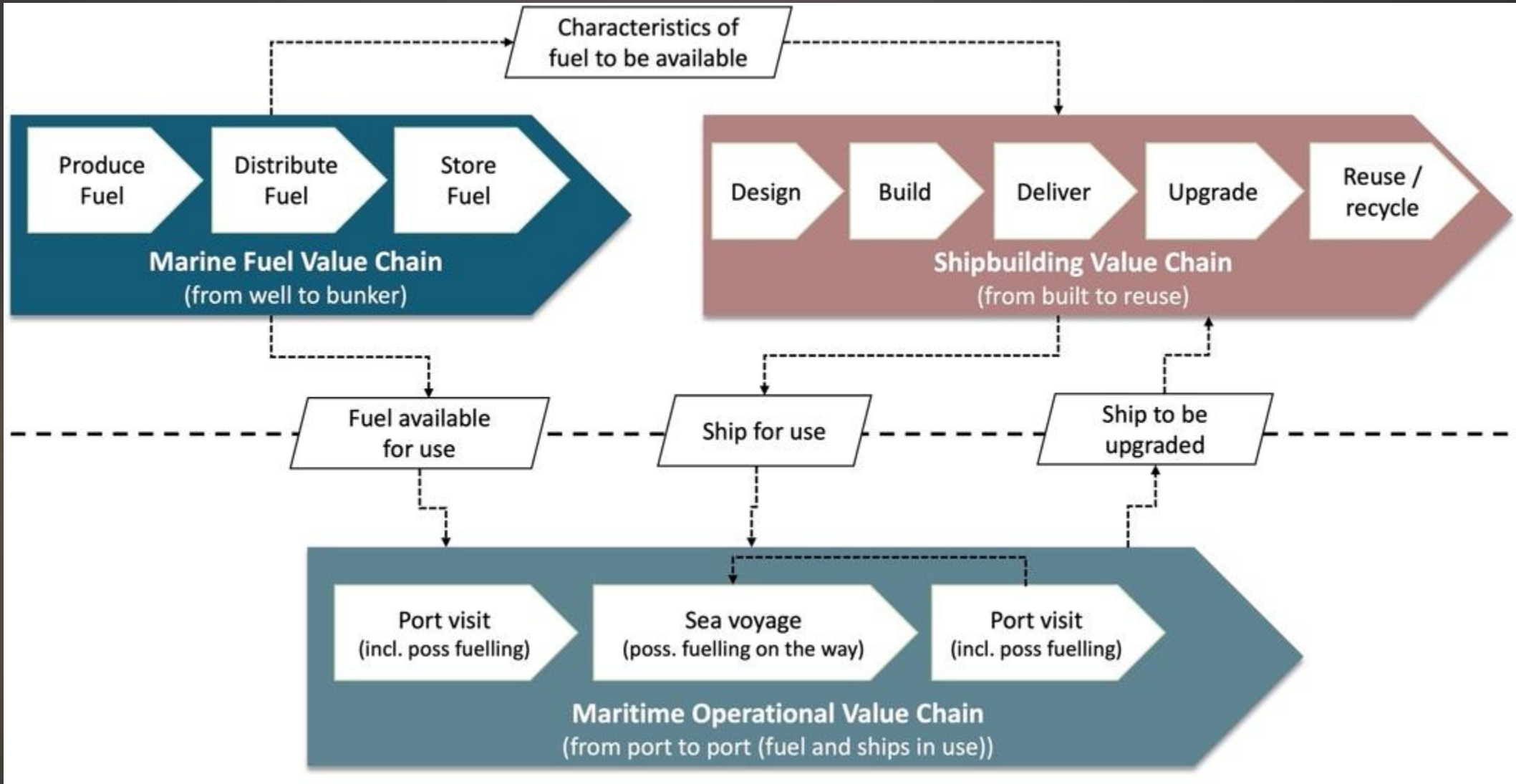
Ship ownership and fleet deployment: How far will other players go?

The port as an energy node

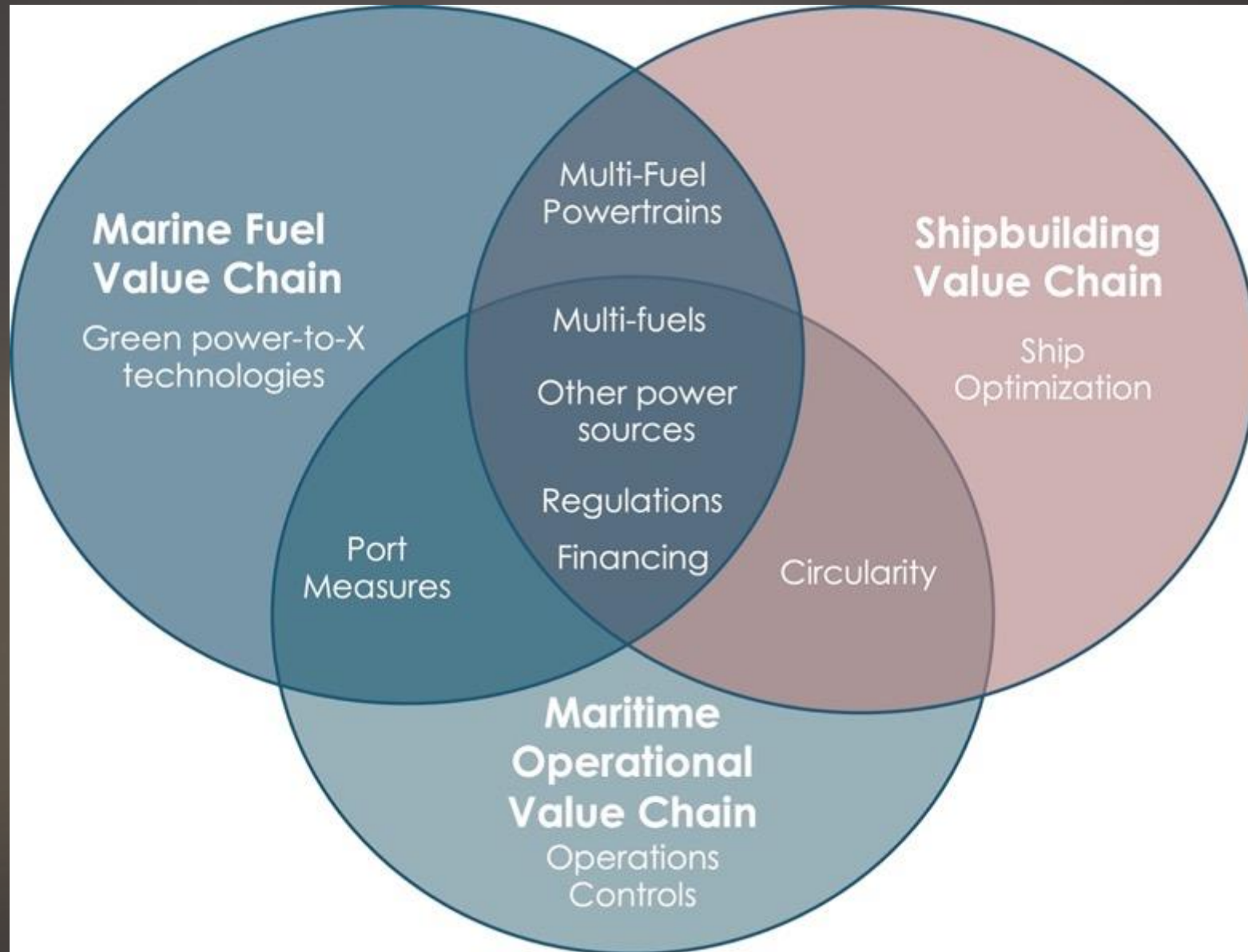


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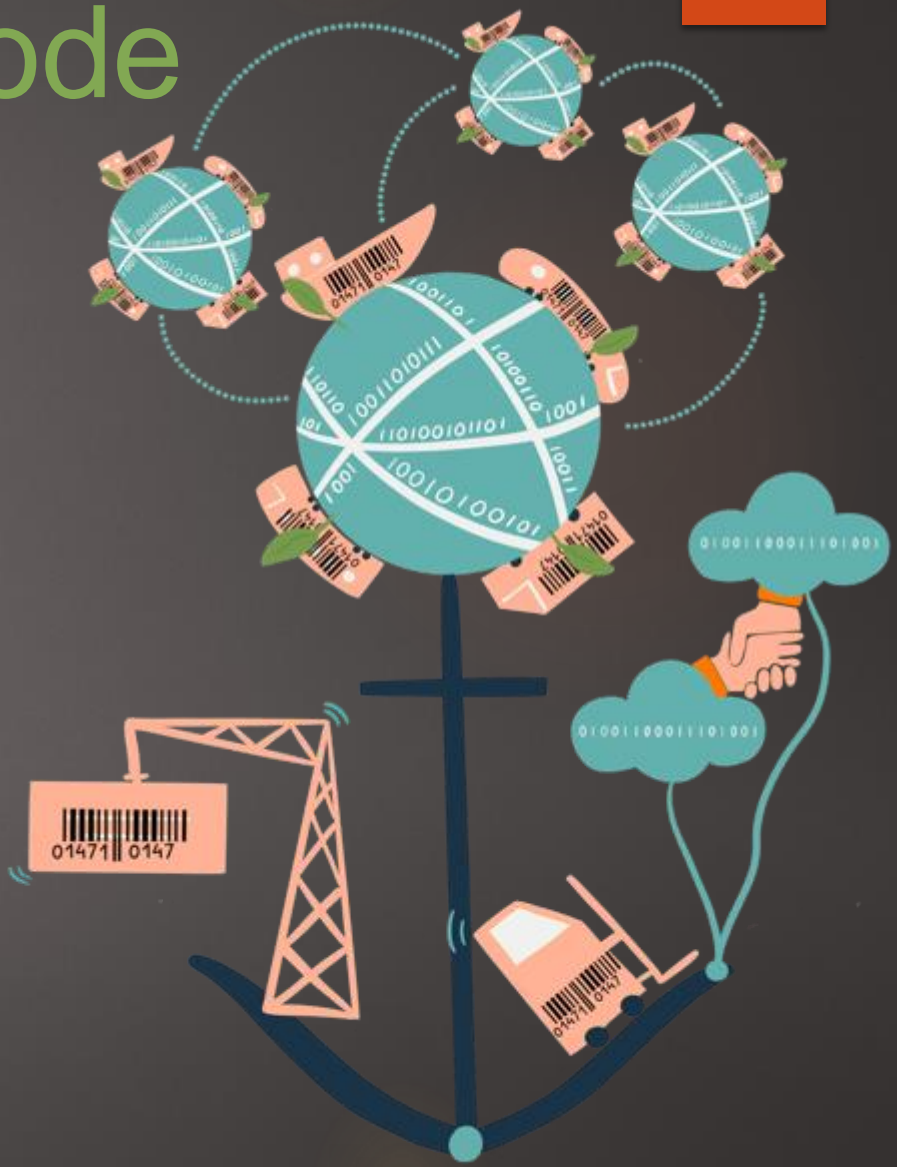
The port as an energy node



Many enablers contribute to decarbonisation where ports have a role

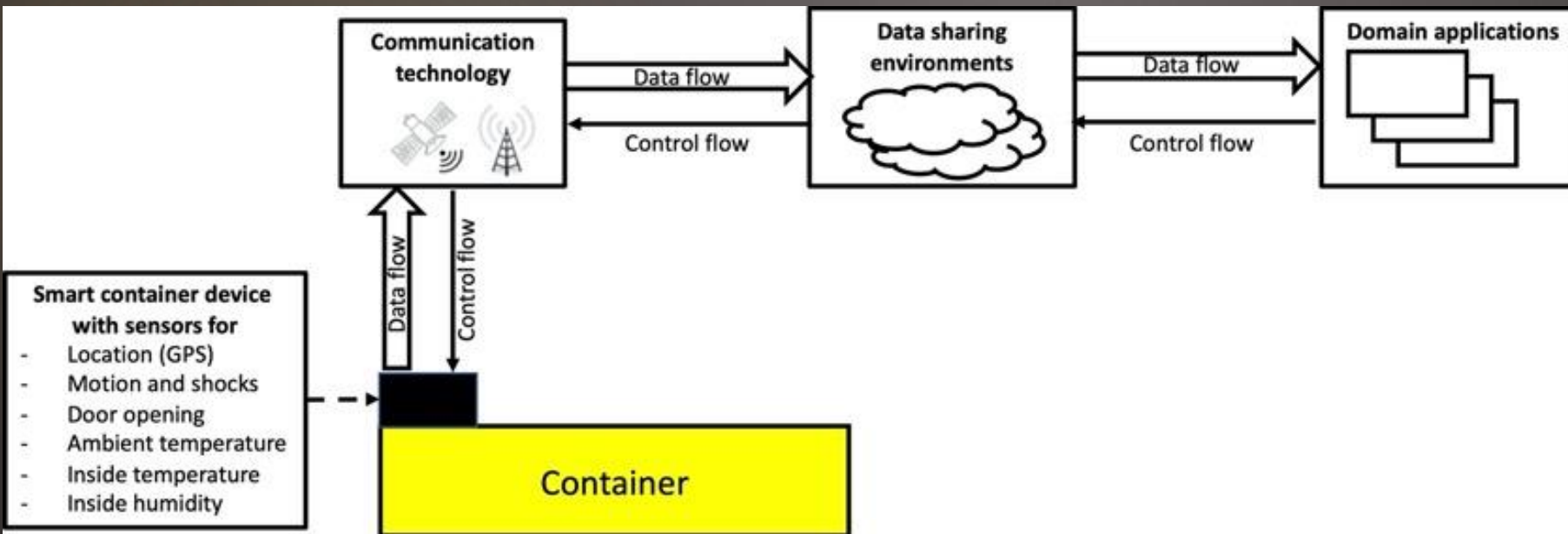
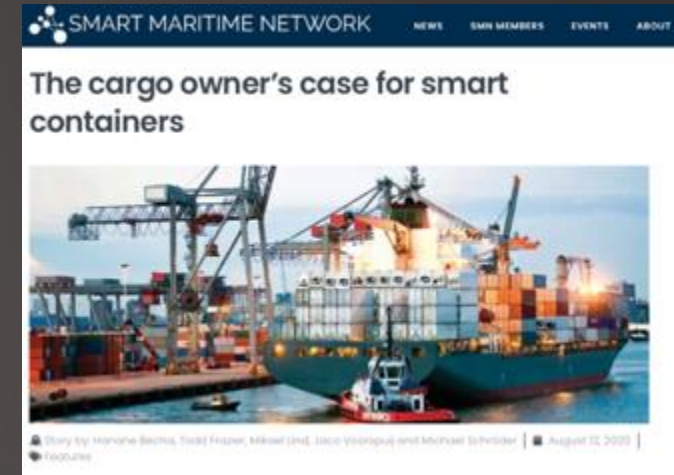


The ports as a Digital Node



Ports may inform others ...

- ▶ Concerns for the clients
 - ▶ Where is my shipment?, When will my shipment arrive?, What conditions are my goods in?, How have my goods been treated along the supply chain?
 - ▶ ... but also as a driver for enhanced situational awareness



Data Sharing for Greener Transport in Sustainable Supply Chains

The self-organized ecosystem of multi-modal transport leads to unnecessary GHG emissions



Figure 1. The self-organized transport ecosystem is composed by multiple transport modes and transport nodes operated by multiple parties across the globe. PUBLISHED JUN 3, 2021 12:44 AM BY MIKAEL LINDB ET AL. [By Mikael Lind, Jaime Luezas Alvarez, Sandra Haraldsson, Henrik Mulder, Lasse Nykänen and Guido Piccoli]

THE LOADSTAR

MAKING SENSE OF THE SUPPLY CHAIN

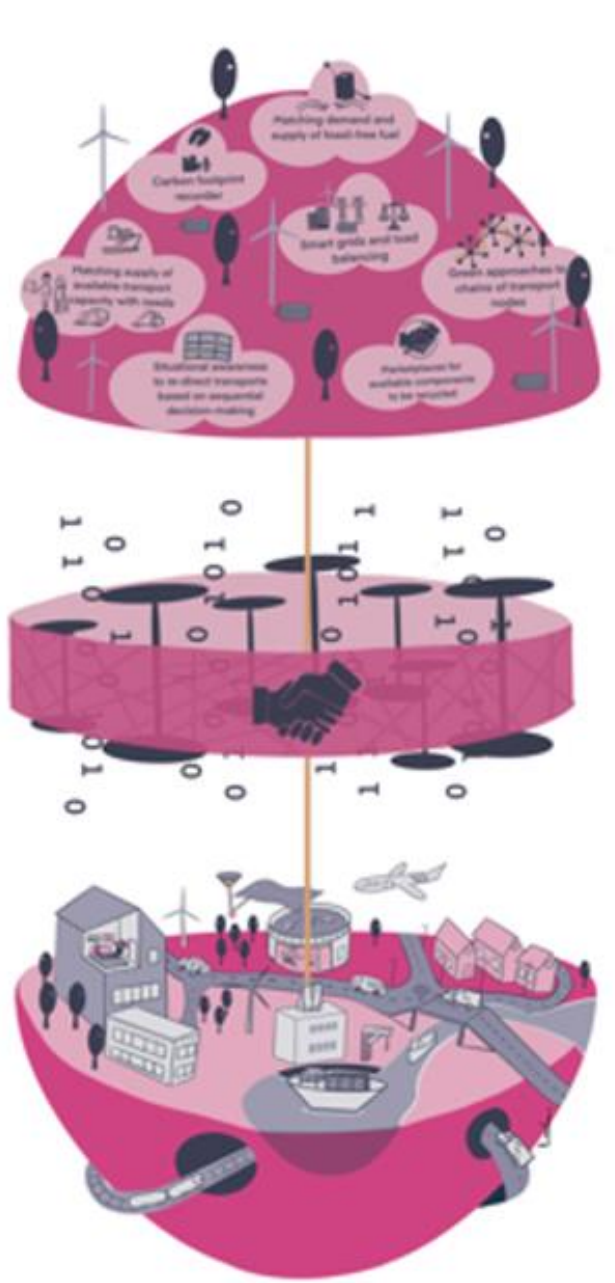
Digital data sharing for green transport - a FEDERATED approach



GLEC: *incy* across their customers' supply chains

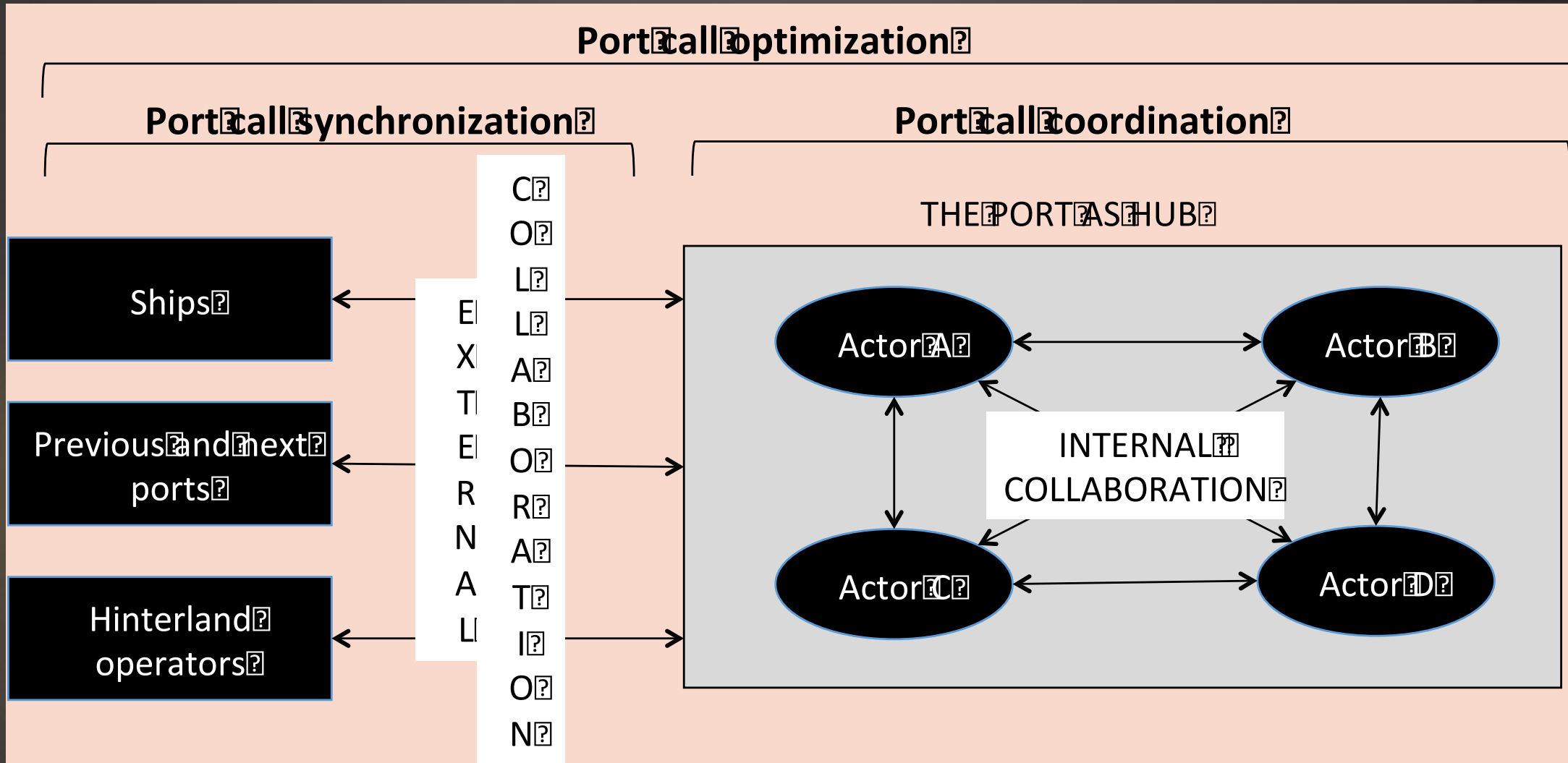


By Mikael Lind, Jaime Luezas Alvarez, Sandra Haraldsson, Henrik Mulder, Lasse Nykänen and Guido Piccoli. PUBLISHED JUN 3, 2021 12:44 AM BY MIKAEL LINDB ET AL.

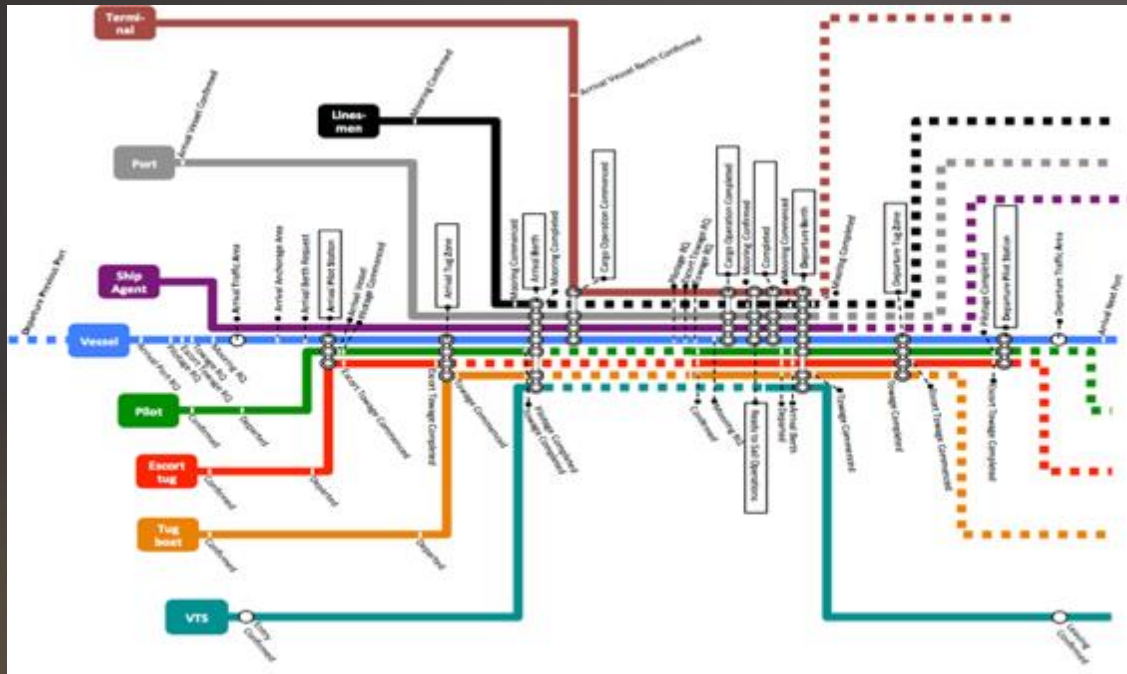


Effects in the supply chain requires digital collaboration example of greening services

Two related Collaboration Processes



Processes for collaborative alignment



- ▶ Empowered situational awareness
- ▶ Pieces of information needs to be brought together
- ▶ No one sits on the whole truth

A foundation to move **from** coordinating based on physical presence **to** virtual coordination

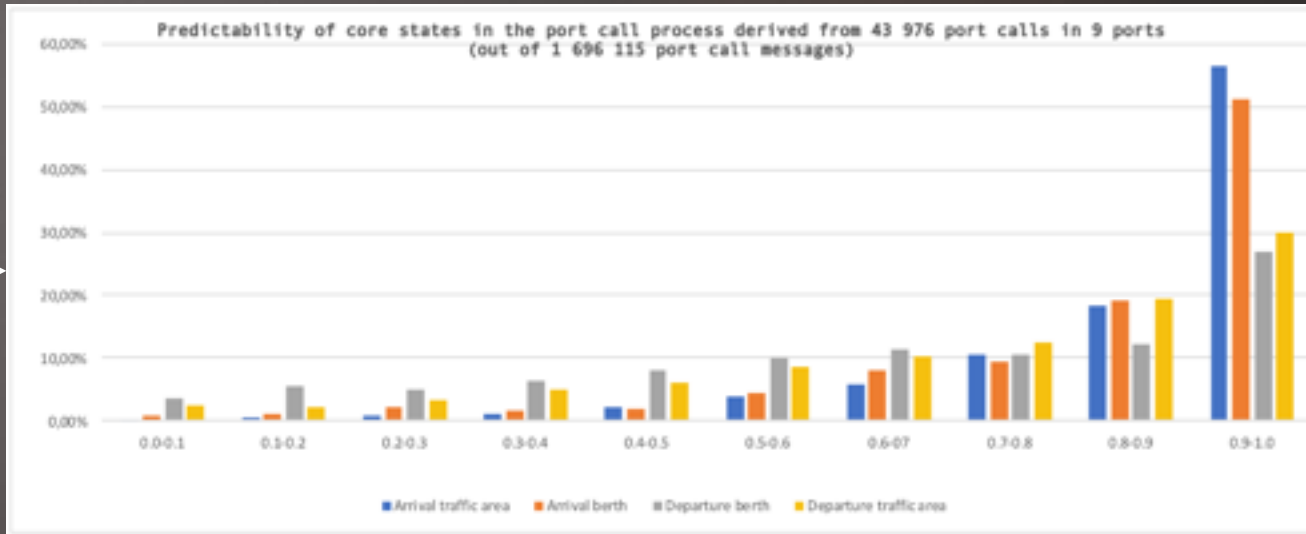
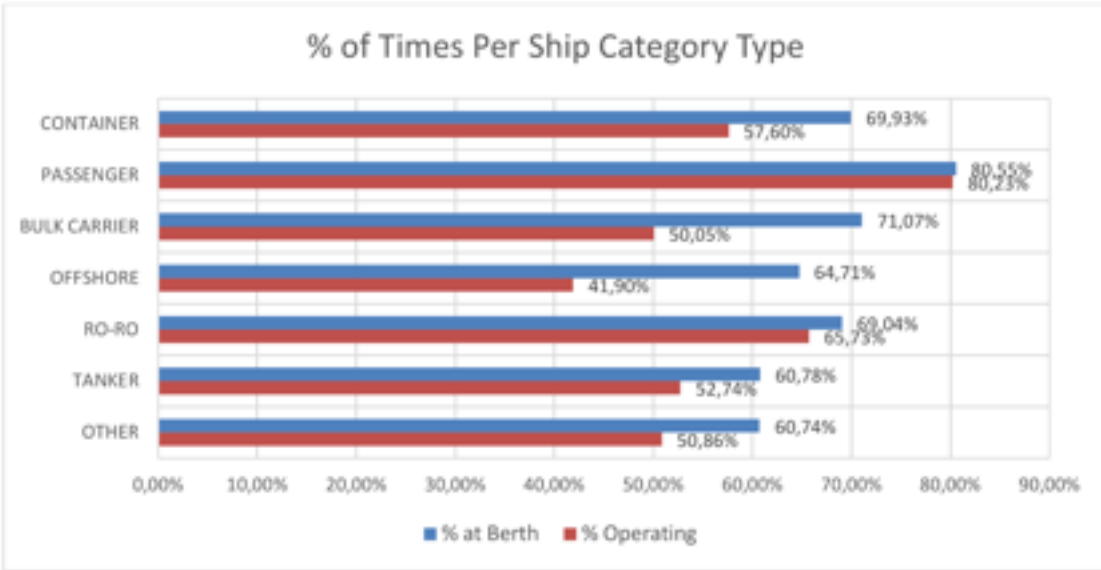
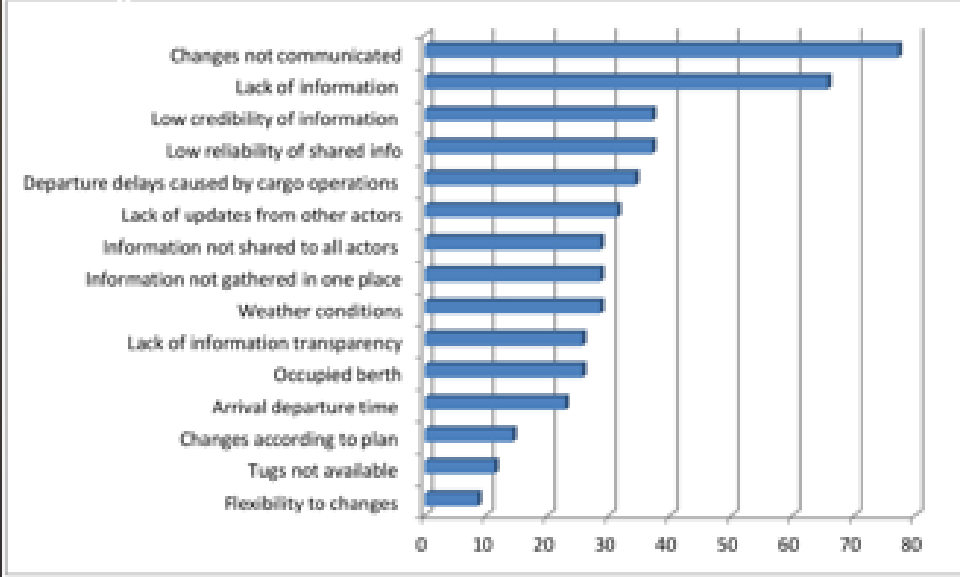
Improvement potential?

Unproductive time in port visits

- operating time / time at berth is too low
- time at berth / total turnaround time is too low

Lower predictability in the latter phases of the port call process

Biggest challenges to planning and realizing a port



Source: Lind M., Ward R., Bergmann M., Haraldson S. (2019) How to boost port call operations, Insight no 10, Global Maritime Forum (<https://www.globalmaritimeforum.org/news/how-to-boost-port-call-operations>)

Welcome to the “appointment economy”

Published January 1st 2020



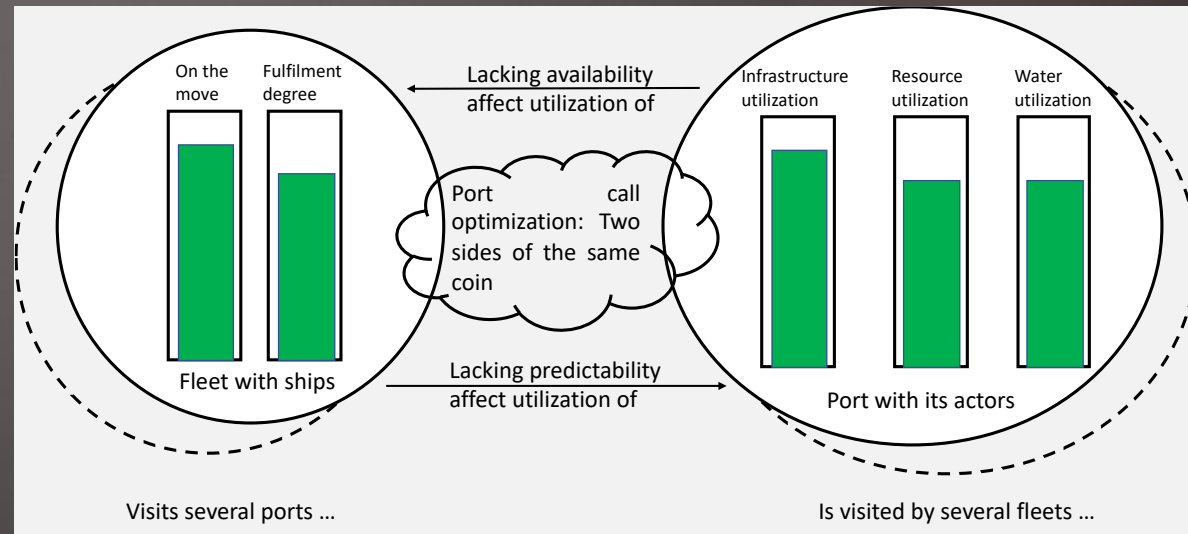
Otto Schacht • 1st
EVP Sea Logistics, Kuehne + Nagel
18h • Edited •

US Coast Guard Video last week above LGB/LA. This morning another 29 container vessels waiting, 221.000 TEU. In Oakland 9. I was looking on our platform [#SeaExplorer](#) every morning at one specific 14.800 TEU vessel, it finally got a berth after waiting 14 days!!!, now discharge operations will probably last for 5-7 days. So almost 3 weeks in LA/LGB. All this has major consequences for supply chains.

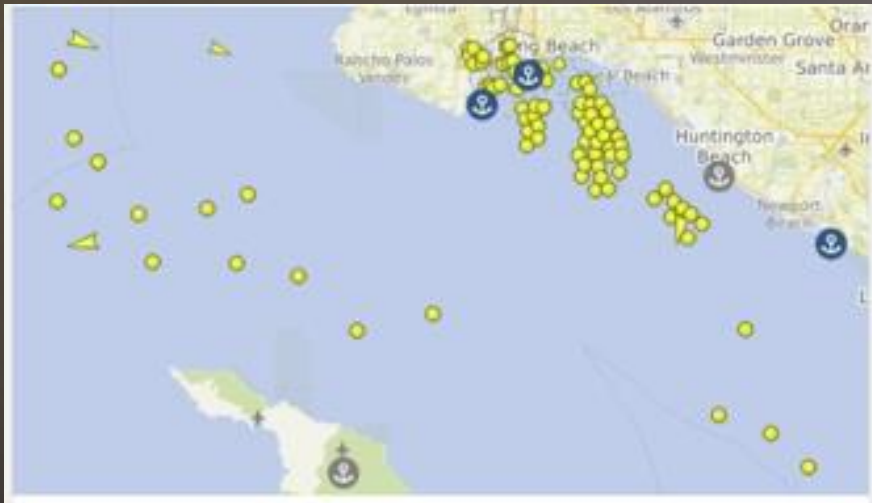
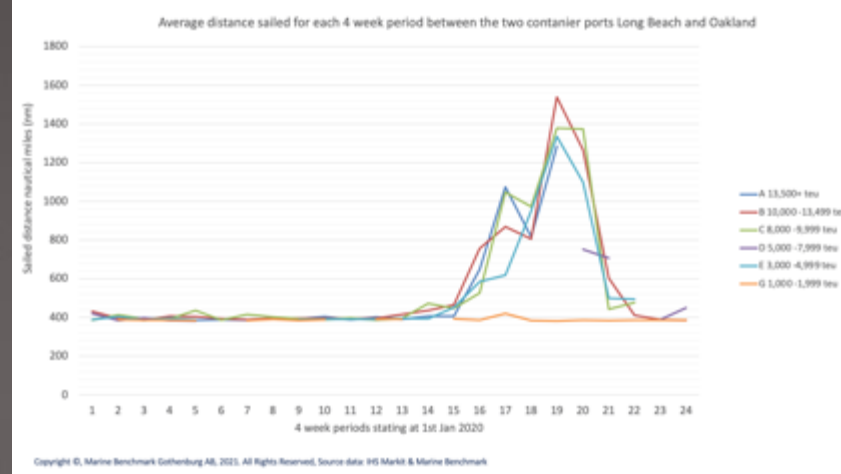
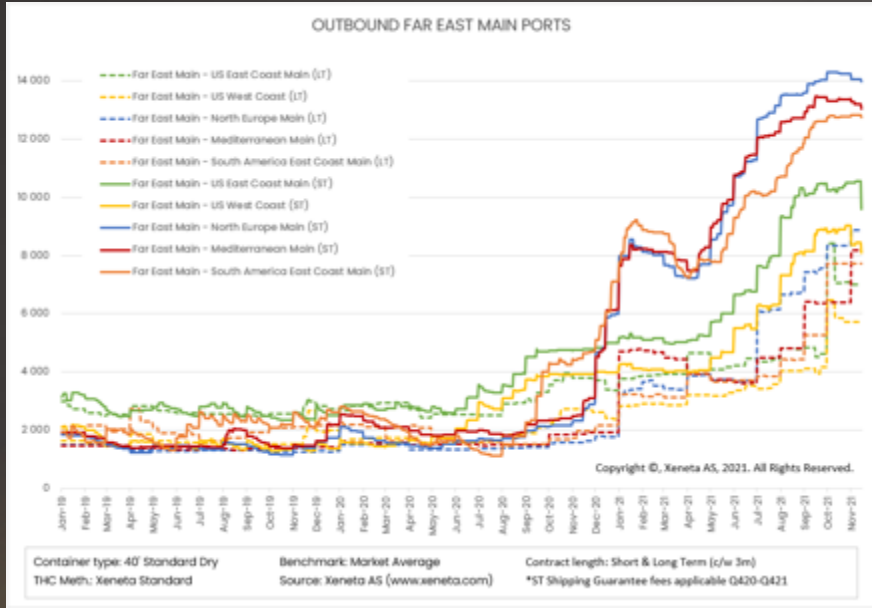


The maritime appointment economy

- ▶ A self-organised ecosystem implies distributed coordination
- ▶ Just-in-time shipping, (elastic) slot management, virtual arrival clause (BIMCO) and virtual queue tickets is high on the agenda
- ▶ Market places for trading appointments??



Emerging situation in the Asia – Pacific Route



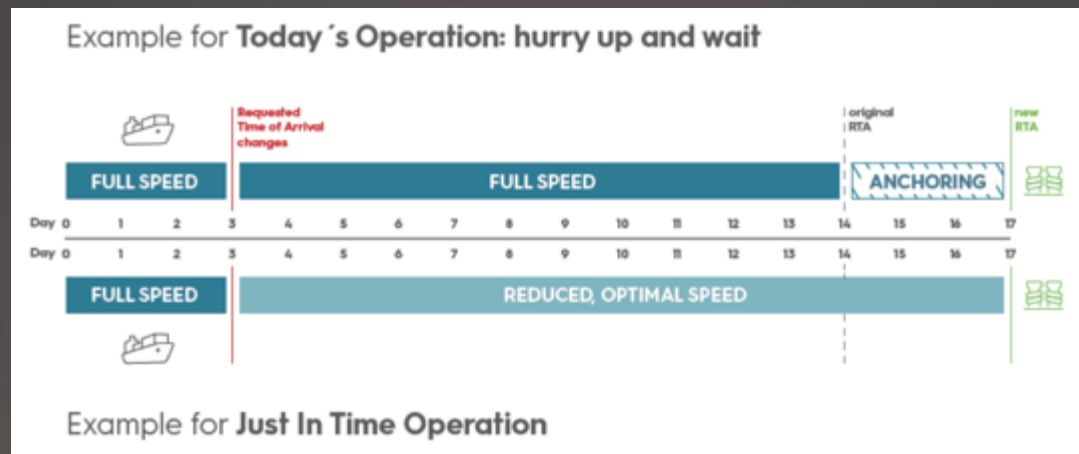
The Maritime Executive
 INTELLECTUAL CAPITAL FOR LEADERS

How Time Slot Management Could Help Resolve Port Congestion

Port of Los Angeles. The image

PUBLISHED JUN 29, 2021 6:18 PM BY MIKAEL LIND ET AL.
 [By Mikael Lind, Wolfgang Lehmann, Jan Hoffmann, Lars Jensen, Theo Notteboom, Torgömr Rysdbergh, Peter Sand, Sandra Haraldsson, Rachael White, Hansane Beche and Patrik Berglund]

Challenging just-in-time arrival



<p>A: When ideal steaming speed possible</p>	<p>Slot time port visit (previous port)</p>	<p>Optimal speed to destination</p>	<p>Slot time port visit (port of destination)</p>	<p>Ideal scenario with optimal speed to destination</p>
<p>B: When delayed from previous port</p>	<p>B1: Slot time port visit (previous port)</p> <p>B2: Slot time port visit (previous port)</p>	<p>Enhanced speed to destination (in relation to case A)</p> <p>Optimal speed to destination</p>	<p>Slot time port visit (port of destination)</p> <p>Slot time port visit (port of destination)</p>	<p>Delay from previous port but slot time is kept in port of destination resulting in added fuel and environmental cost</p> <p>Delay from previous port and moved slot time port of destination (same)</p>
<p>C: When port of destination is constrained</p>	<p>C1: Slot time port visit (previous port)</p> <p>C2: Slot time port visit (previous port)</p> <p>C3: Slot time port visit (previous port)</p>	<p>Optimal speed to destination</p> <p>Optimal speed to destination</p> <p>Optimal speed towards destination (to intermediate anchoring)</p>	<p>Slot time port visit (port of destination)</p> <p>Anchoring</p> <p>Slot time port visit (port of destination)</p> <p>Anchoring</p> <p>Optimal speed to destination</p> <p>Slot time port visit (port of destination)</p>	<p>Extended slot time at previous port (waiting for when it would be ideal to depart)</p> <p>Extended slot time at previous port (waiting for when it would be ideal to depart)</p> <p>Anchoring at intermediate location on the way to port of destination</p>

Maritime informatics

an emerging discipline responding to global concerns

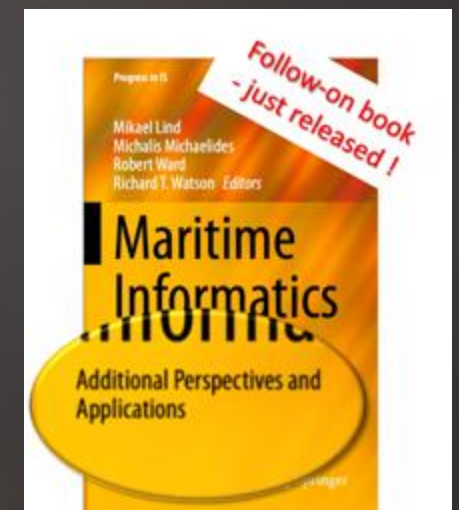
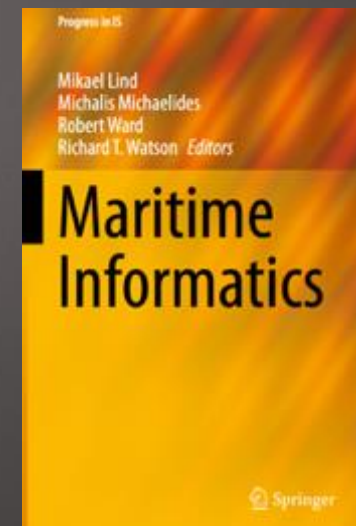
- ▶ Balancing capital productivity and energy efficiency
- ▶ Responds to organisational, global, and humanitarian concerns
- ▶ Three focus areas:
 - ▶ **Digital Collaboration**
 - ▶ **Digital Data Sharing and Decision-Making**
 - ▶ **Data Analytics**



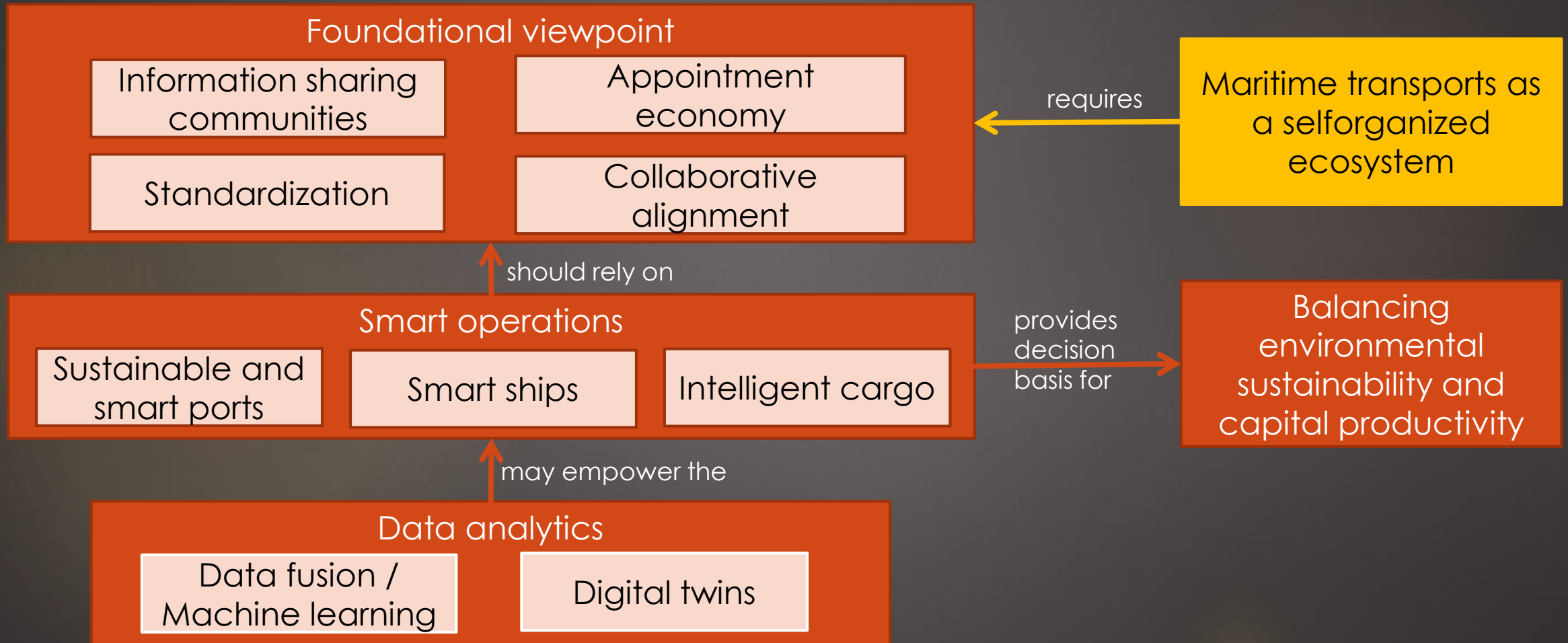
The application of information systems to increase the efficiency, safety, ecological sustainability, and resilience of the world's shipping industry



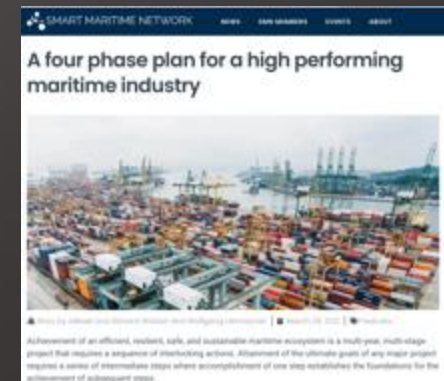
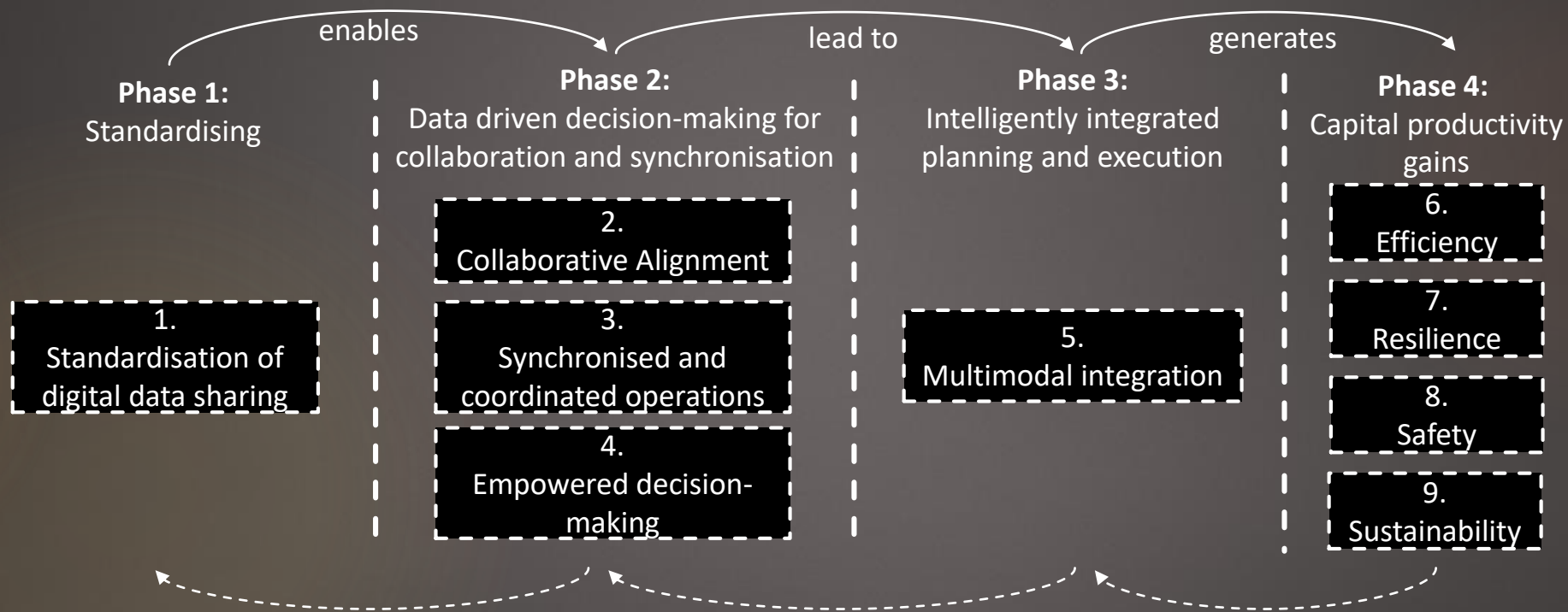
www.maritimeinformatics.org



Applicational areas of maritime informatics



What is at focus and desired – Maritime Informatics enablers and effects



Concluding remarks:

THE MARITIME SECTOR IS TRANSFORMING ...



From

Fragmented situational awareness

Low information quality

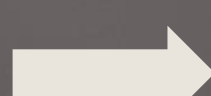
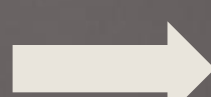
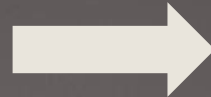
Lacking planning horizons

Unstructured information exchange

Sub optimized operations

Unnecessary waiting times

Low IT maturity



To

Common situational awareness

High and reliable information quality

Predictable operations

Standardised data exchange

Mature collaboration culture

Just-in-time operations

**Enhanced IT-systems and third-party
innovation opportunities**

Thank you!

Mikael Lind
Research Institutes of Sweden (RISE)
Chalmers University of Technology

(Mikael.Lind@ri.se)

