



# The International Maritime Transport and Logistics Conference

## “MARLOG 12”

**Sustainable & Innovative  
Technologies**

Towards a Resilient Future

12 - 14 March, 2023 Alexandria - EGYPT



# Resilience of maritime transport chains – a macro perspective

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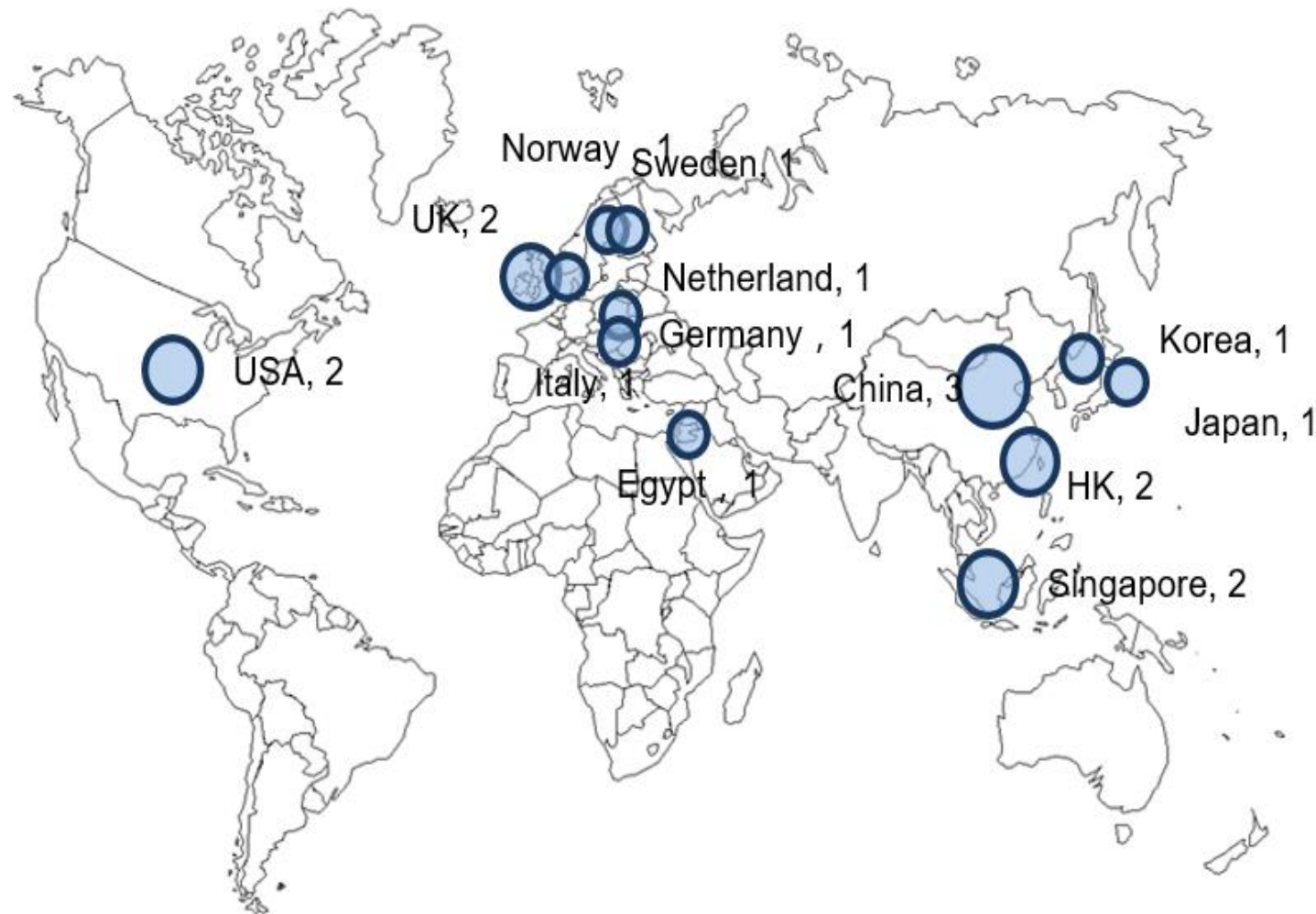
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- **Founded 2016 in Shanghai**
- **Vision: Platform for exchange and cooperation and promote solid interactions between shipping think tanks and the shipping industry**
- **Meanwhile 19 members from 13 countries**
- **Regular annual meetings**



# What GSTTA does



## Experts Visits

Each member site shall appoint an expert representative to visit and communicate from time to time and discuss the work related to the alliance.



## Plenary Meeting

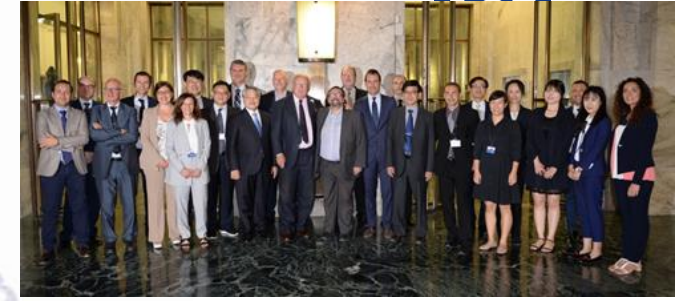
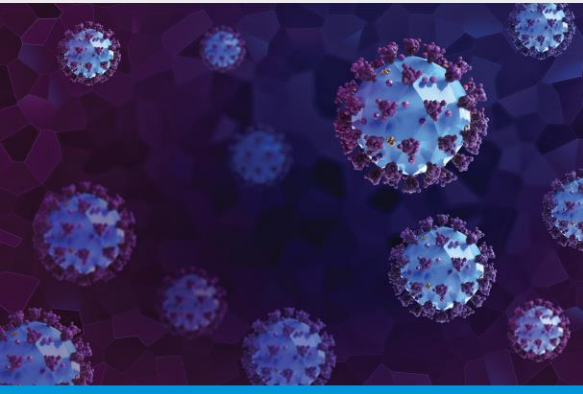
a plenary meeting will be organized every year and a journal will be produced accordingly. The speeches of the alliance members will be sorted into a volume.



## Cooperative

## GSTTA BOOK Impact of COVID-19 on Maritime Industry

Global Shipping Think Tank Alliance  
Edited by Young Tae Chang and Meifeng Luo



## GSTTA Website

The Secretariat builds the alliance and the development of the website. It regularly sends briefings to [gstta.org/](http://gstta.org/)

## GSTTA BOOK

**THE UNCERTAINTIES – EXPECTED IMPACTS  
ON THE MARITIME INDUSTRIES AND  
POSSIBLE COUNTER MEASURES**

Global Shipping Think Tank Alliance  
Edited by Burkhard Lemper and Sönke Maatsch



# Institute of Shipping Economics and Logistics



## About ISL

- Founded in 1954 in Bremen as private, non-profit foundation
- Since 1997 also in Bremerhaven



## Vision

- Combining tradition and modern science for the benefit of our costumers and partners

## Mission

- Being one of Europe's leading institutes for research, consulting and knowledge transfer in maritime logistics

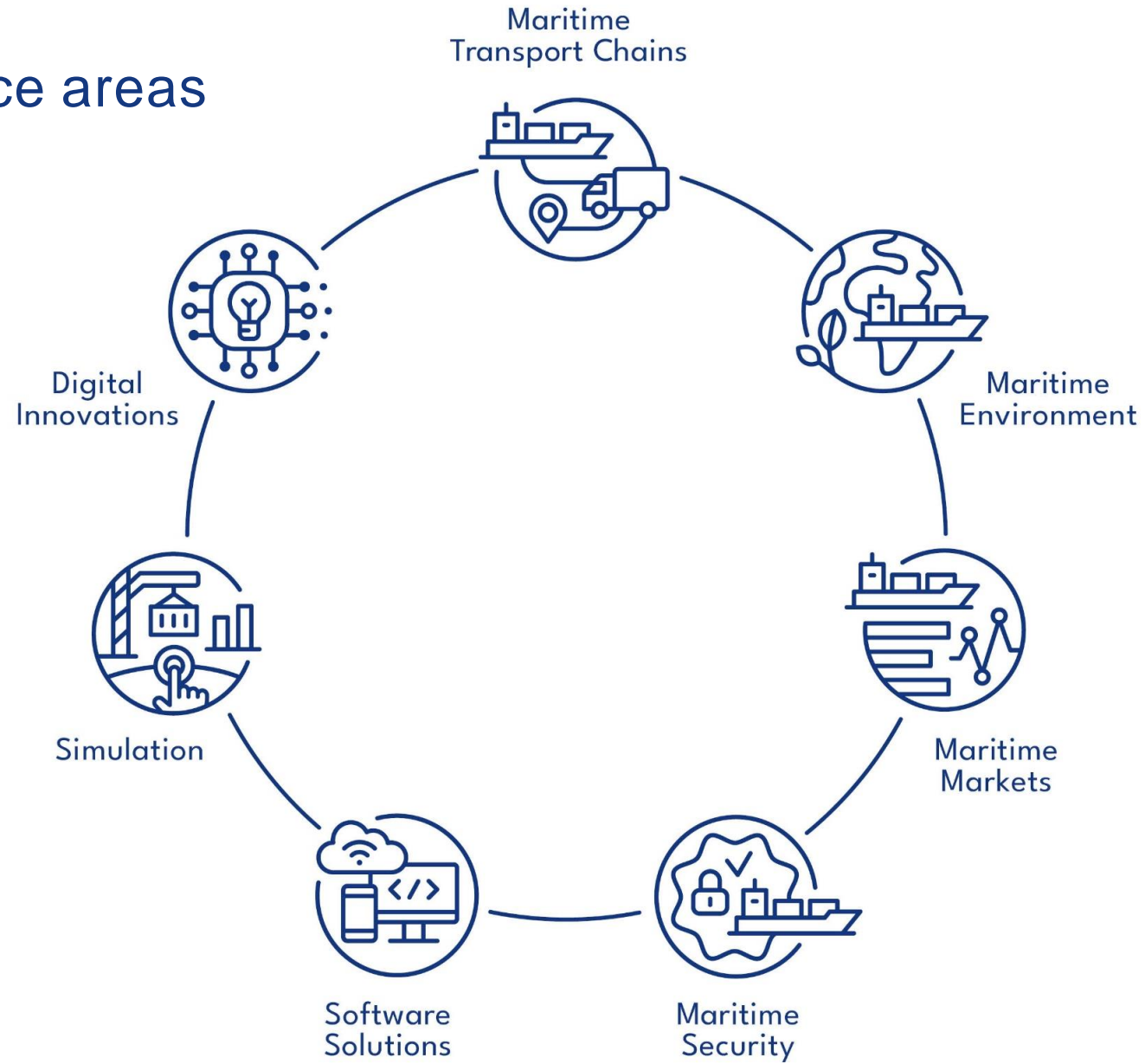


## ISL Offers

- Market analyses and forecasts, organises application-oriented innovative funded projects for maritime logistics and develops as well as integrates IT systems



# ISL competence areas



# ISL Competence Areas



## Maritime Markets

Analyses and forecasts within maritime economy



## Maritime Security

Security concepts and solutions



## Maritime Environment

Sustainability in the maritime sector, Maritime

Open Solutions



## Maritime Transport Chains

Optimisation of transport chains and logistics concepts



## Simulation

Analyses and optimisation of transshipment processes and freight traffic flows



## Digital Innovations

Digitalisation, Artificial Intelligence, IoT and Blockchain



## Software Solutions

Conception and development of individual solutions



# Resilience of maritime transport chains – a macro perspective





# Content

1. Resilience from a macro perspective
2. Vulnerability analysis of maritime ports
3. Economic impact of disruptive events
4. Conclusion



# Complexity of maritime transport chains



## Organisations

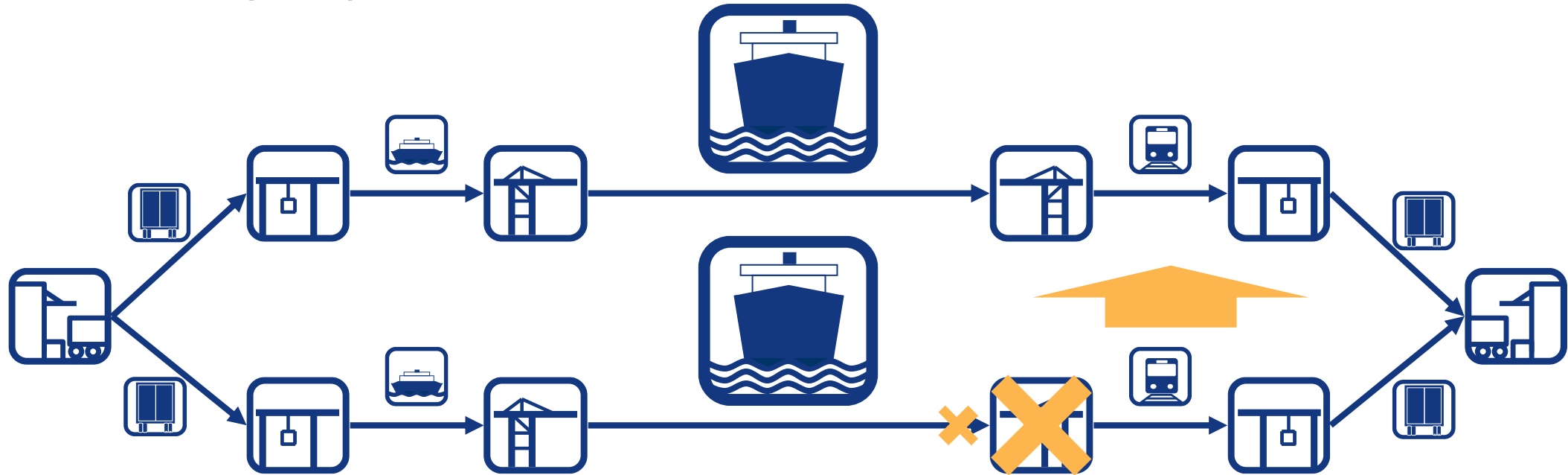
- Liner operator
- Feeder Operator
- Seaports/Port authorities
- Seaport terminal operators
- Forwarders/transport operators
- Inland terminal operators
- Shipper
- Consignee
- ...

- Various modes of transport
- Various means of transport
- Various cargo handling facilities

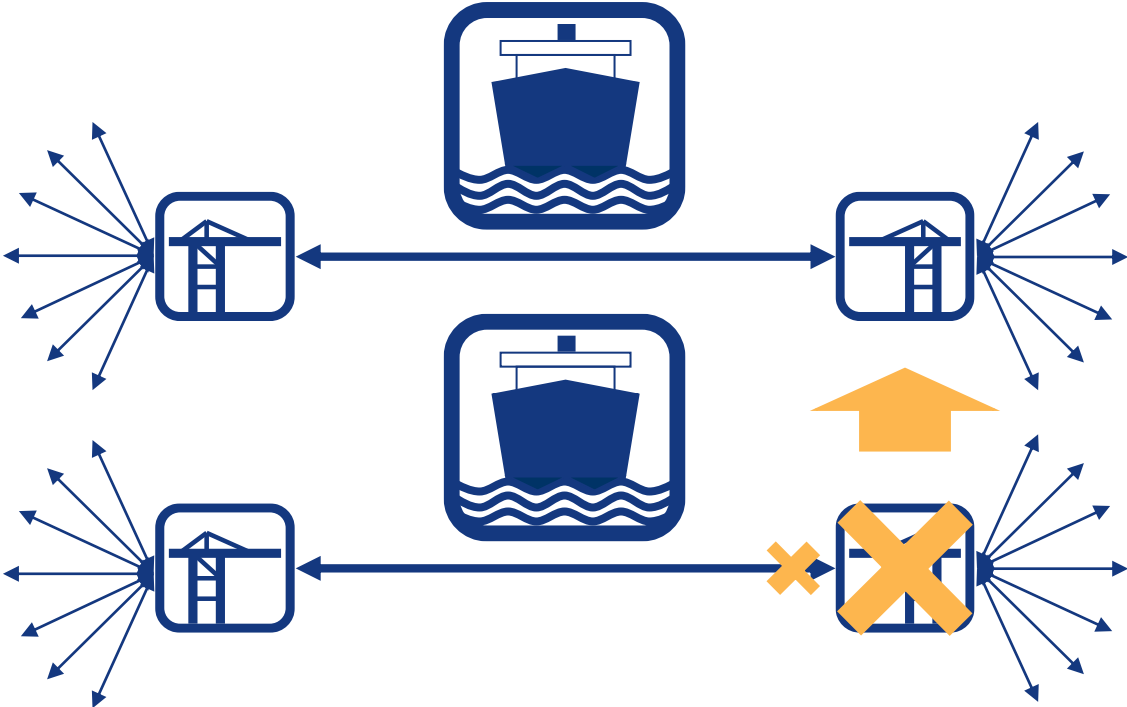
- Numerous IT systems
- Customs administration
- ...



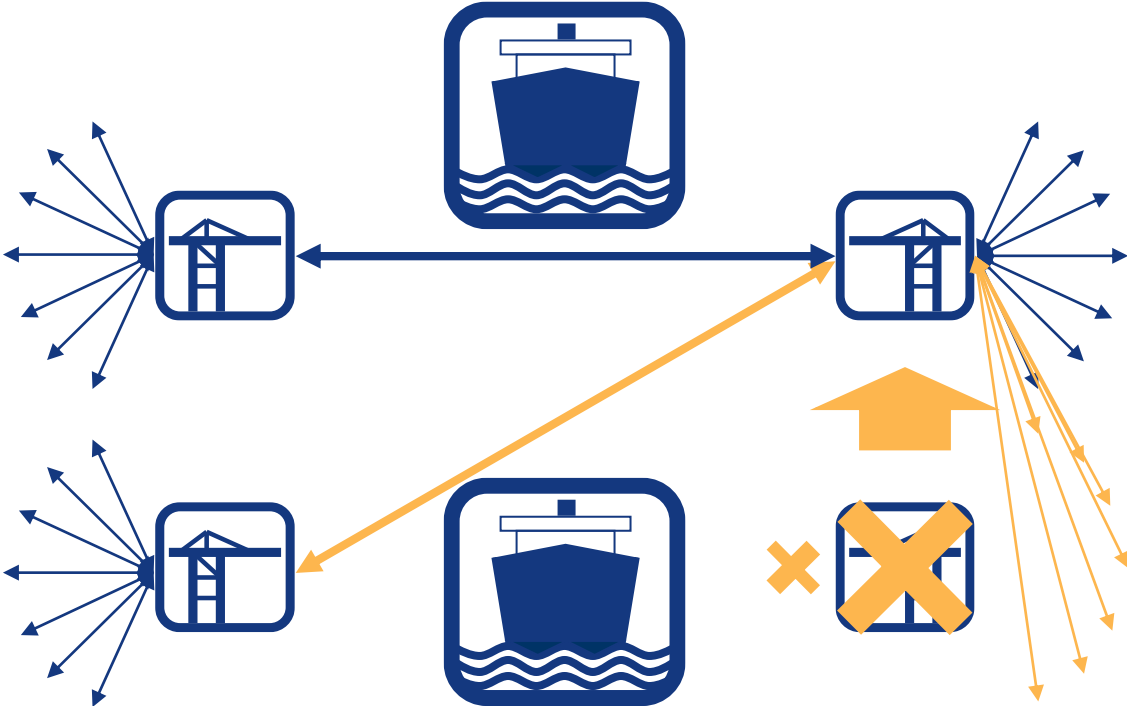
# The micro perspective



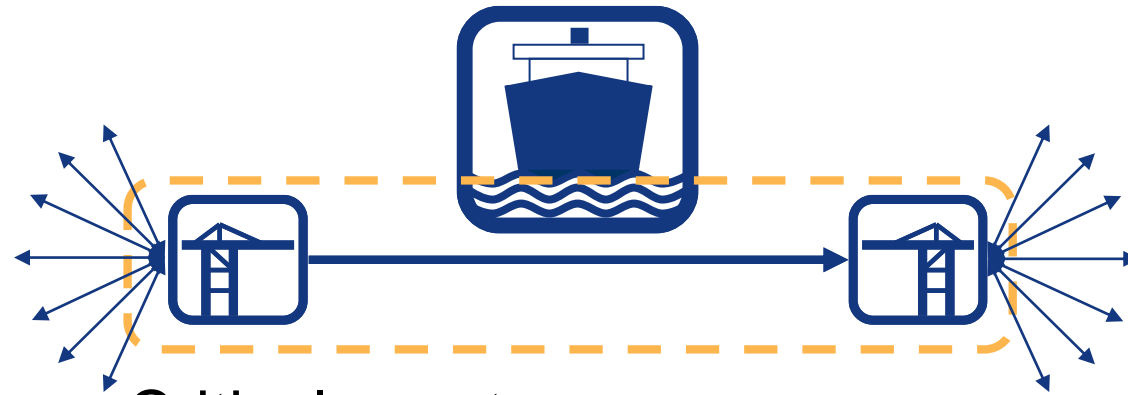
# The macro perspective



# The macro perspective



# Vulnerability of maritime transport chains from a macro perspective



Critical assets:

- Seaports and Seaport terminals
- Sea routes, sea canals and port approaches
- Port-hinterland connections

## Content

1. Resilience from a macro perspective
2. **Vulnerability analysis of maritime ports**
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## What makes a port vulnerable?

- **Vulnerability as ‘product of probability and consequence’** (Mattsson/Jenelius) vis-à-vis a given disruptive event
- Disruptive events: Can we foresee the unforeseeable?  
*“You never know where, you won't know how  
When you least expect it, expect the unexpected” (Dog Eat Dog)*
  - Climate change: extreme weather events “increasingly probable”
  - Cyber attacks: danger known, race between attackers and defenders
  - Pandemics: rare, unforeseeable events, but future events probable
  - Trade sanctions: varying country-specific risks
  - Accidents: Beirut ammonium nitrate explosion, Ever Given, ...
- Probability: single events’ probability low, but high probability that ‘some day, something will happen’
- Damage: depends on local conditions (infrastructure, PCS, TOPS, trades, etc.)





# Vulnerability of European seaports

## Focus on economic vulnerability

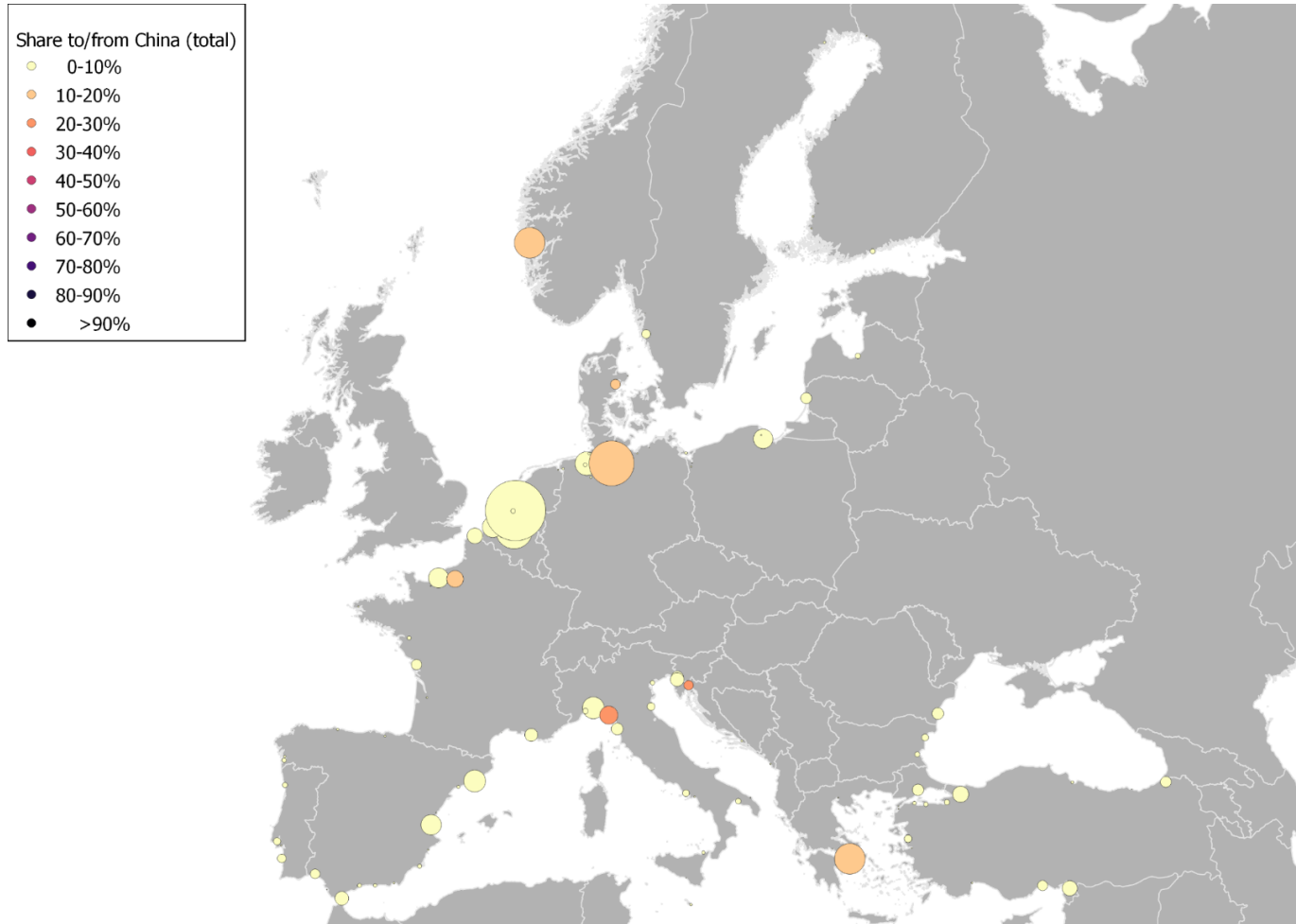
Many unforeseen events hit specific transport chains or trades:

- March 2021: Ever Given blocks Suez Canal trade
- February 2022: Russian invasion of Ukraine: trade with Russia and Ukraine
- April 2022: Shanghai lockdown: China trades

... what next?



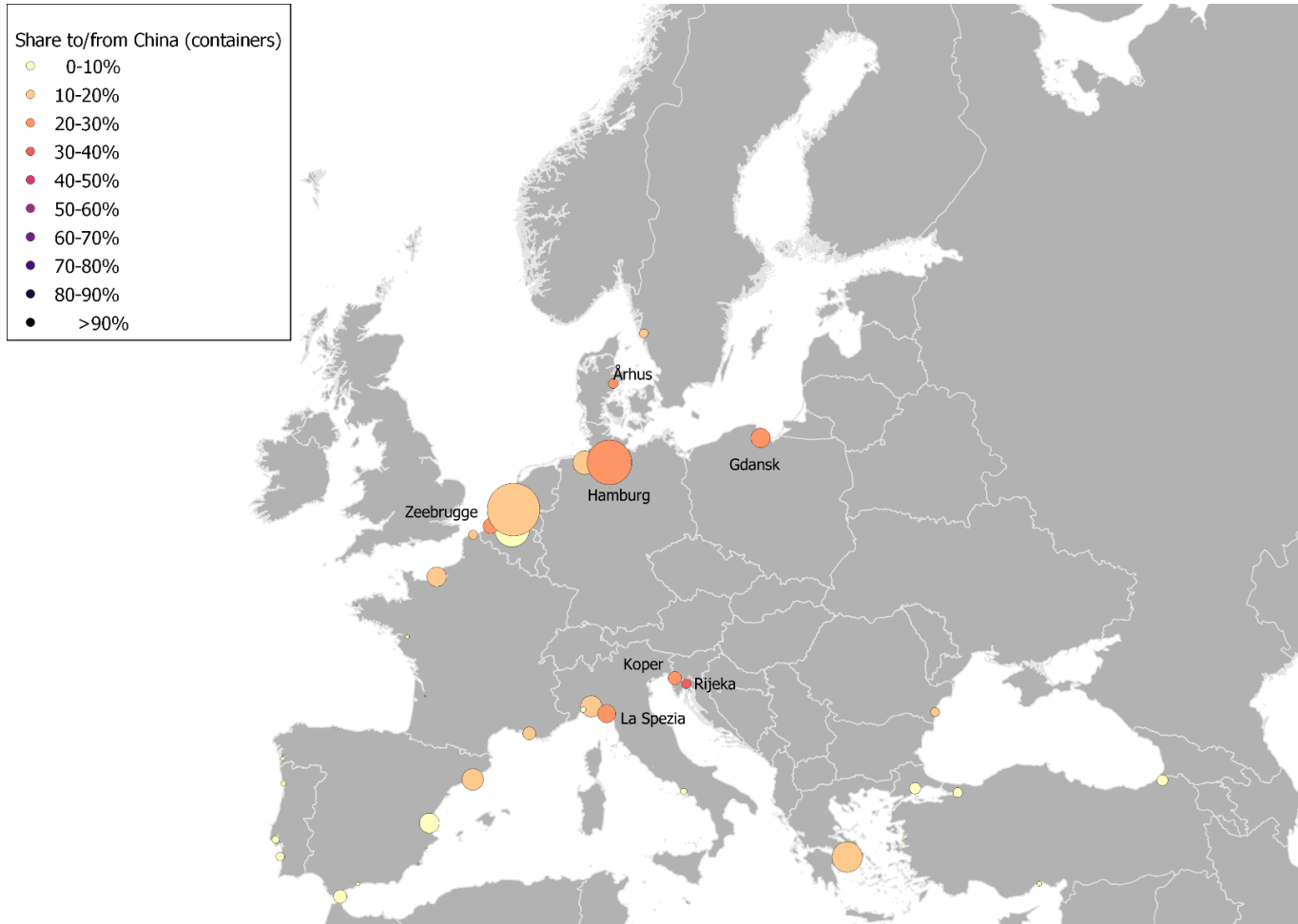
# How exposed are ports to macroeconomic developments?



## Impact of Covid-19 lockdowns in China:

- Traffic to/from China reaches 26% in Rijeka (Croatia) and 24% in La Spezia (Italy)
- Share below 20% in all other European ports including „China hub“ Hamburg (16%, higher if including feeder traffic)

# How exposed are ports to macroeconomic developments?

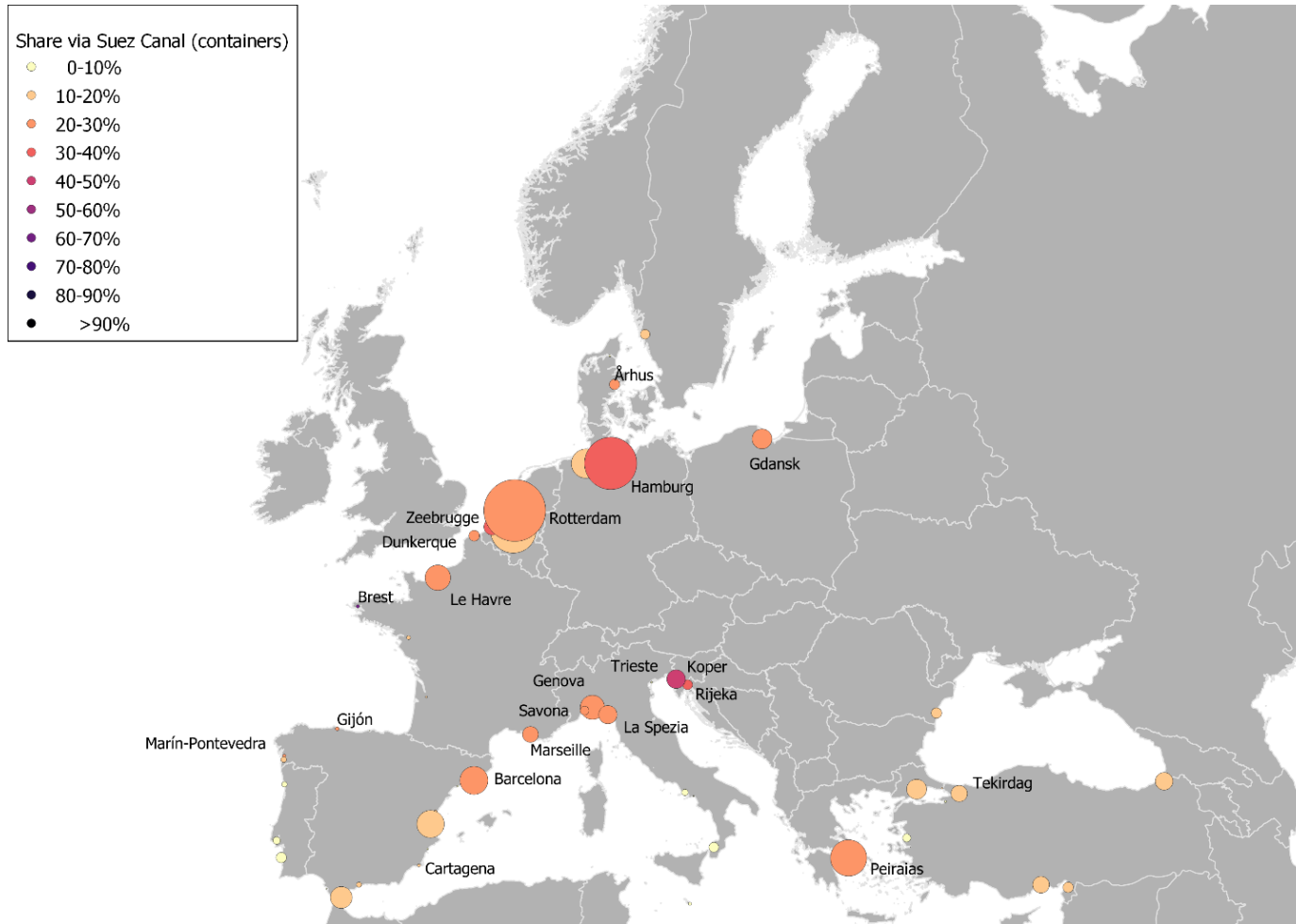


## Impact of Covid-19 lockdowns in China:

- When only looking at **container traffic**, shares go up
- Single ports:
  - Rijeka: 32%
  - Zeebrugge\*: 30%
  - La Spezia: 28%
- Hamburg: ~26%
- ...
- Piraeus\*: 19%

\* ports with COSCO terminals

# How exposed are ports to macroeconomic developments?



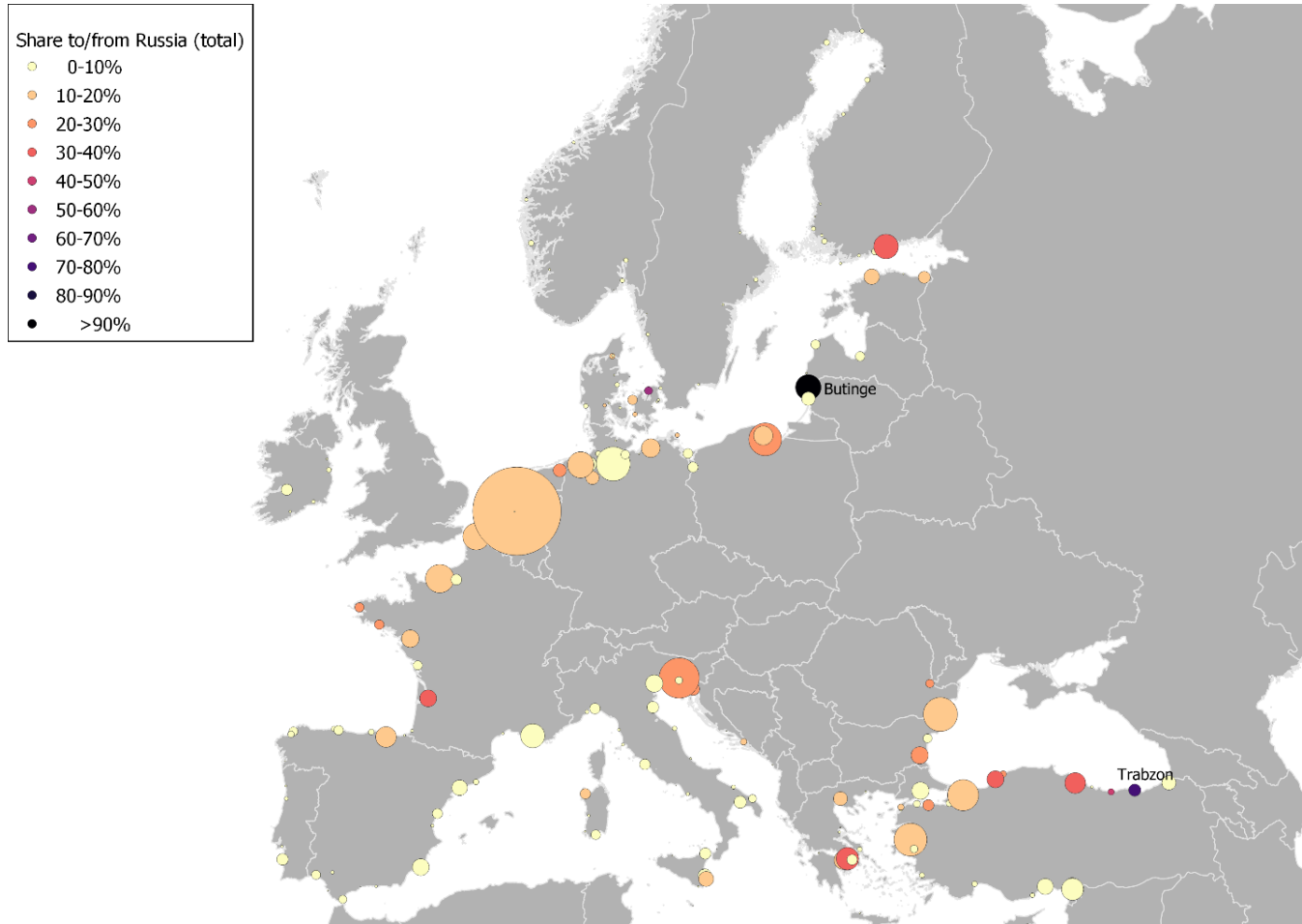
## Impact of Suez Canal disruption (container):

- Koper: 44%
- Rijeka: 35%
- Hamburg: 34%
- Zeebrugge\*: 33%
- ...
- Piraeus\*: 27%

\* ports with COSCO terminals



# How exposed are ports to macroeconomic developments?

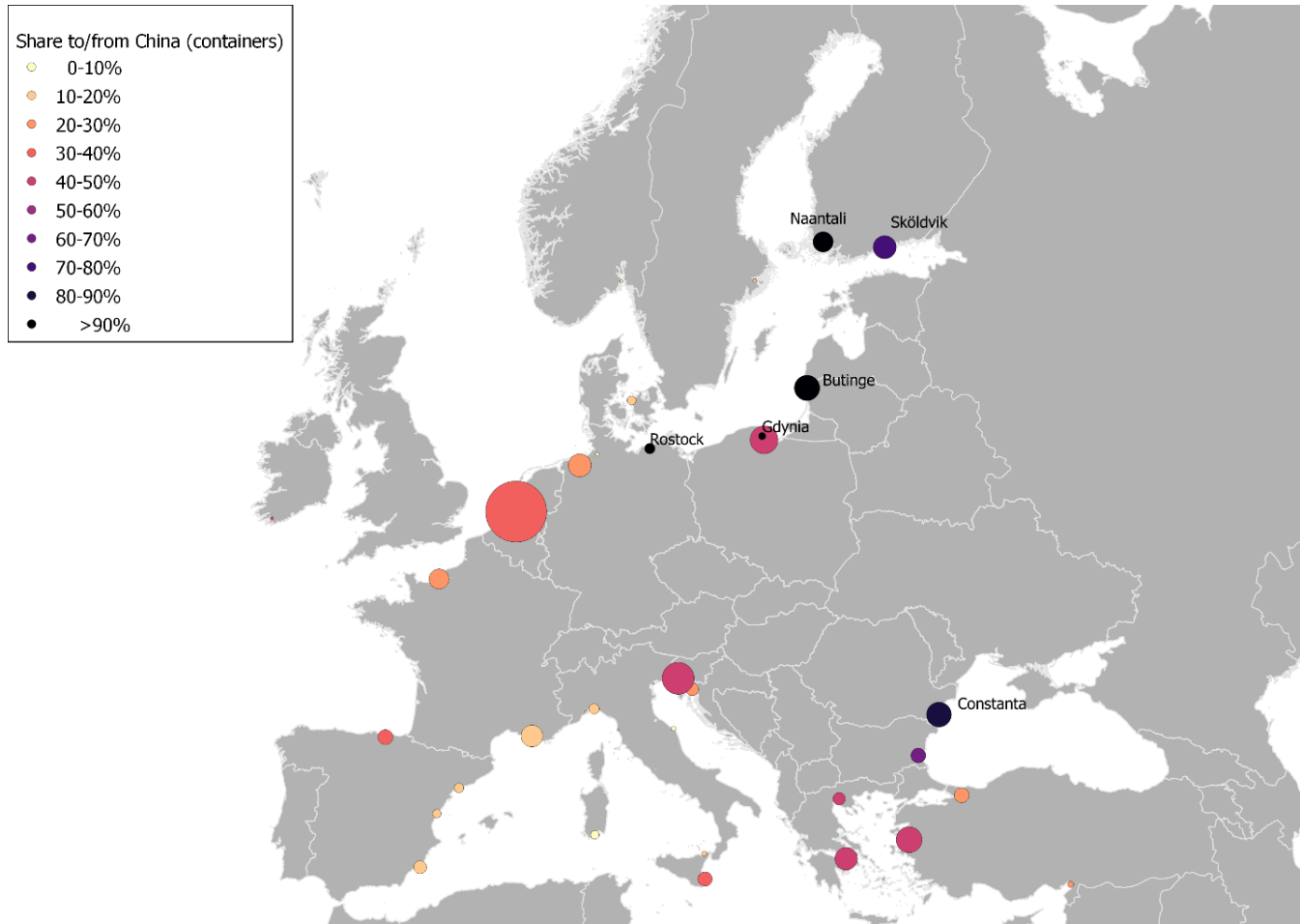


## Russia trade embargo (total trade):

- Butinge: 94%
- Trabzon: 76%
- ...
- Nordenham: 36%



# How exposed are ports to macroeconomic developments?



## Russia crude oil import embargo:

- Naantali, Rostock: 100%
- Butinge: 94%
- Gdynia: 93%
- Constanta: 81%
- ...
- Rotterdam: 36% = 23 million tonnes

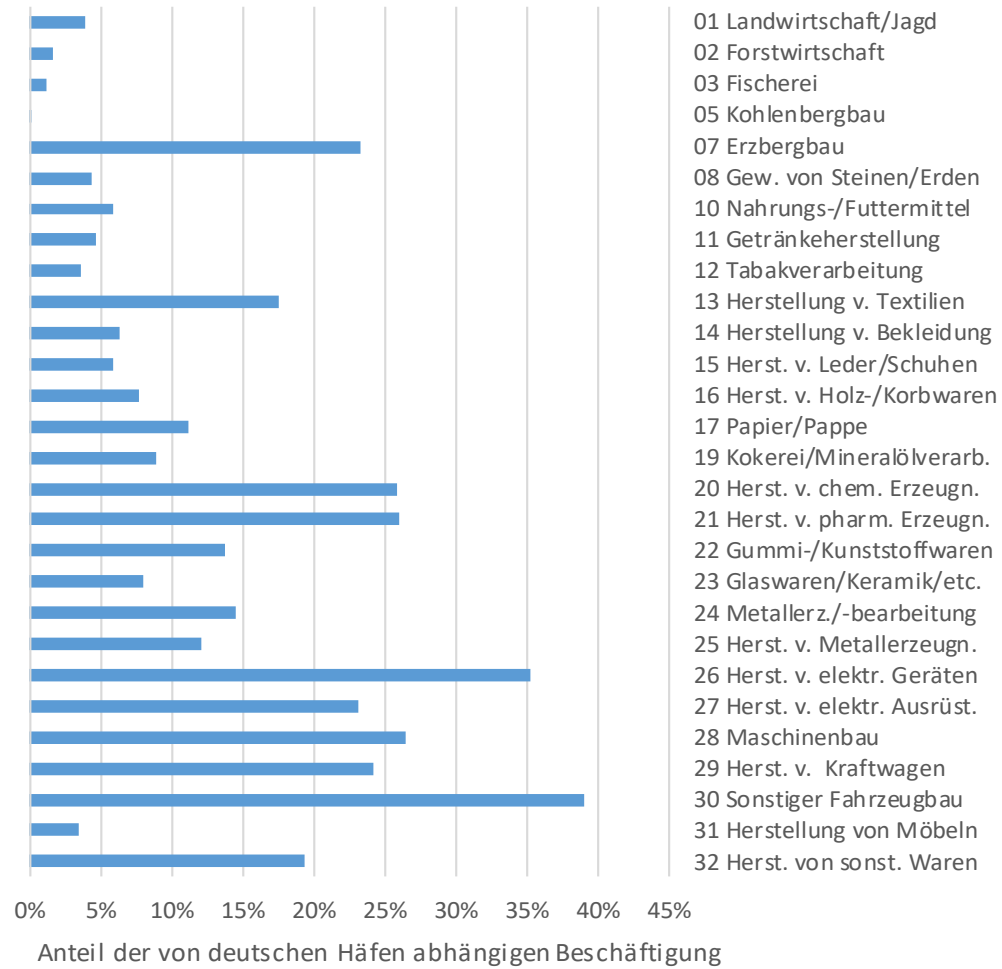


# Content

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# How exposed is the economy to disruptions of maritime transport chains? – Example Germany



- Share of employment related to exports via German ports reaches up to 38% (Production of vehicles other than cars)
- Dependence on ports (total) even higher (Rotterdam, Antwerp, Trieste, Koper and others already play a role)
- Even smaller ports like Emden (not a European core network corridor port) in total safeguard more than 100.000 direct employments.





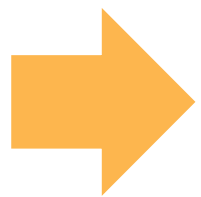
# Content

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## Conclusion

- Resilience is looked at mostly from a micro-perspective
- Diversification of transport chains works here ceteris paribus.
- Macro perspective rarely taken into account, but
- Major disruptive events blocking maritime transport chains may have severe economic consequences.



**Ports and public authorities – besides all good and necessary competition - must cooperate to improve resilience by better planning for disruptive events**



Thanks for your attention!

