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Climate and energy the next hurdle of our maritime industry

Prof. Dr. Indra Vonck – presentation FEPORT conference 1 December 2022

MAKING AN IMPACT THAT MATTERS since 1845

“What you do makes a difference, and you have to decide what kind of difference you want to make”

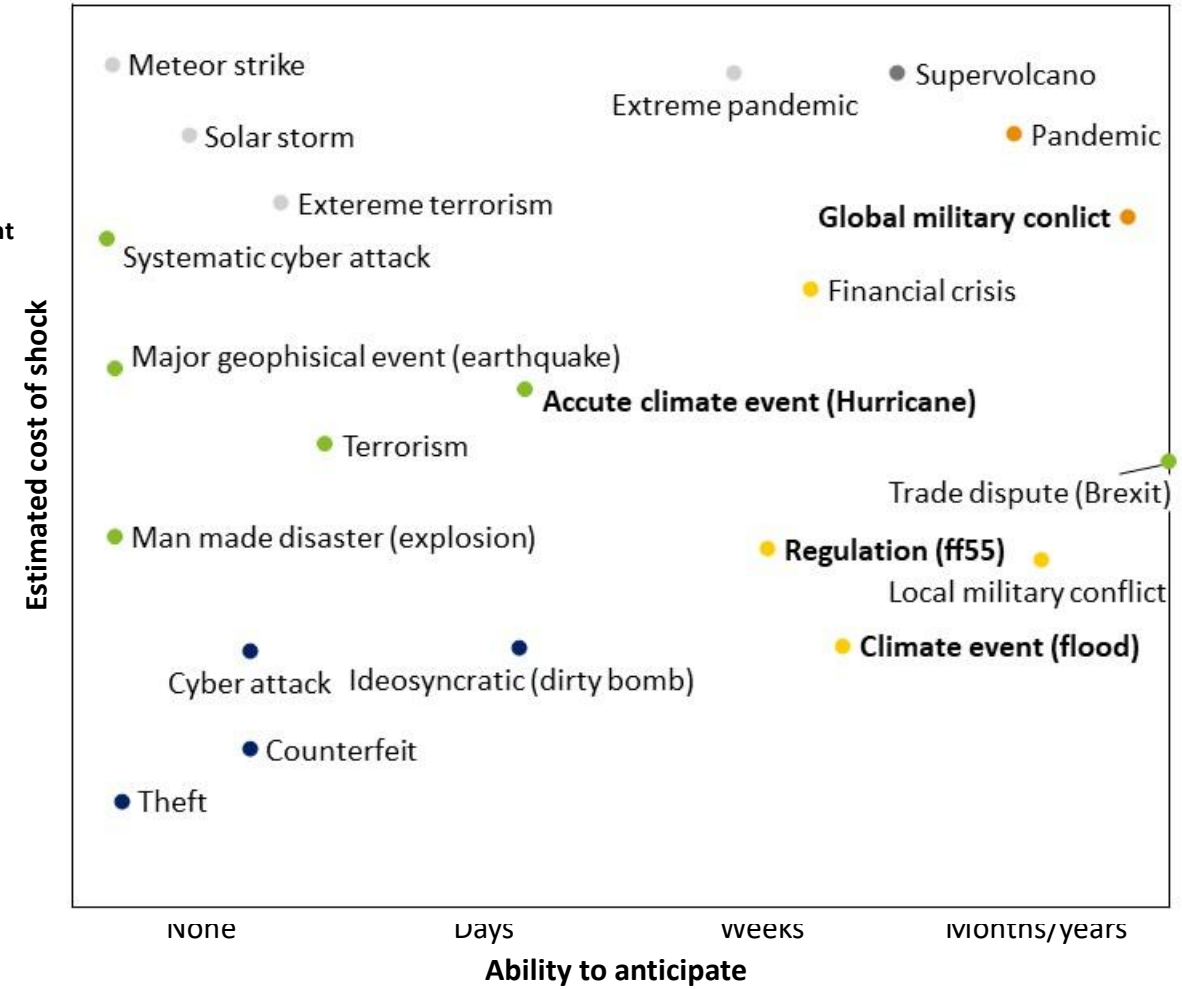
- Dr Jane Goodall

The maritime industry has **always been at the forefront of countering uncertainty by providing critical infrastructure** and guaranteeing stable environments for trade

Shocks in the maritime industry

More frequent — Less frequent

Not occurred



3 TYPES OF RISK

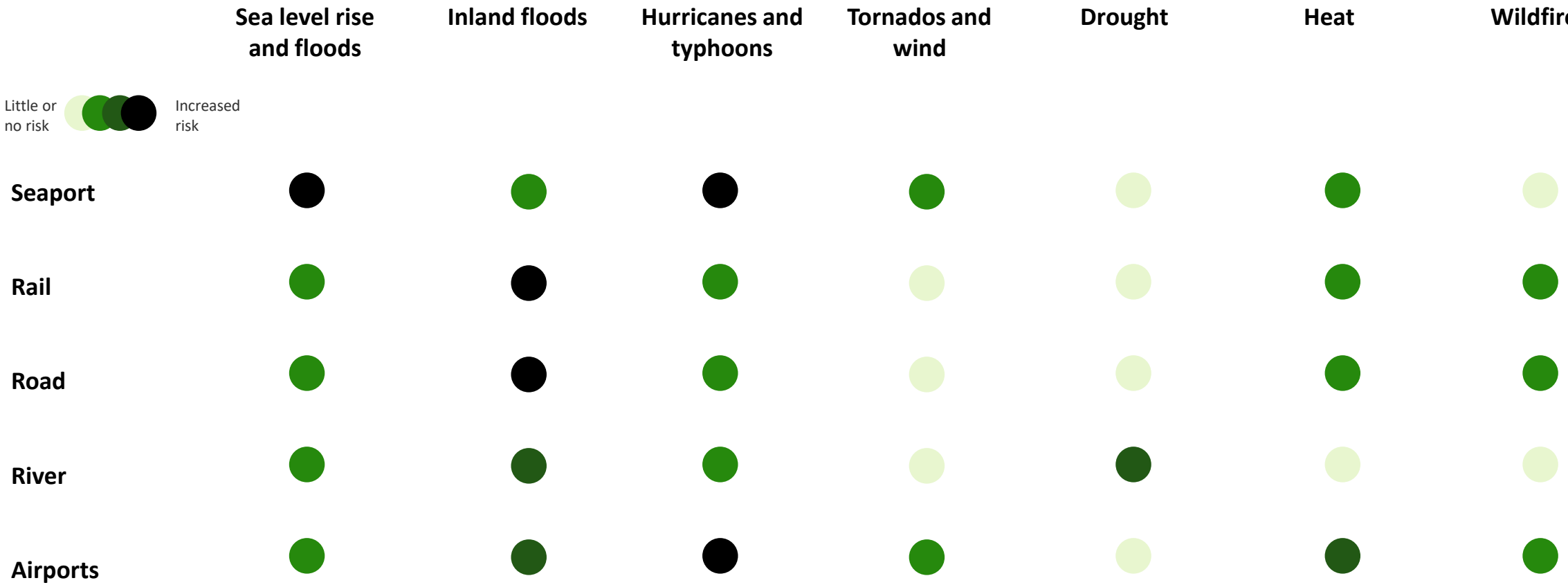
Physical risks can be event-driven (acute) or represent longer-term shifts in climate patterns

Transition risks arise from policy and market changes

Climate change opportunities can be realized as consumer preferences for products or services change

Looking at the physical risks the seaports are amongst the most vulnerable links in the supply chain

Environmental shocks in the maritime industry



Risk: future potential losses; lossed are asset dammage or destruction; source dawson et al 2016, New york times 2016, Mobile association 2018, ¨relando 2019, Pyatklova 2019, Xi, 20&§, Federal communications commission,Mckinsye anaysis, Deloitte analysis

Each of the risks bring a **direct effect to both operations and infrastructure**

Impact of environmental shocks in the maritime industry

	Operations	Infrastructure
Heat waves	• Lower periods of possible infrastructure construction or operations • More reefer energy required	• Deformation of rail tracks • Deformation of roads
Rising sea level **Intensity of percipitation**	• Higher interruption of surrounding transport network • Flooding of terminals • Interruptions of ship approach	• Increased flooding • Erosion of infrastructure • Changes in harbor approaches
Increase in storm intensity	• Evacuation of coastal areas • Debris on road and infra	• Higher probability of infrastructure failures • Greater damage to port infrastructure • More significant flooding of hinterland infrastructure
Increase in arctic temperature	• Longer shipping season • Ice free norther ports • Alternative to suez	• Limited

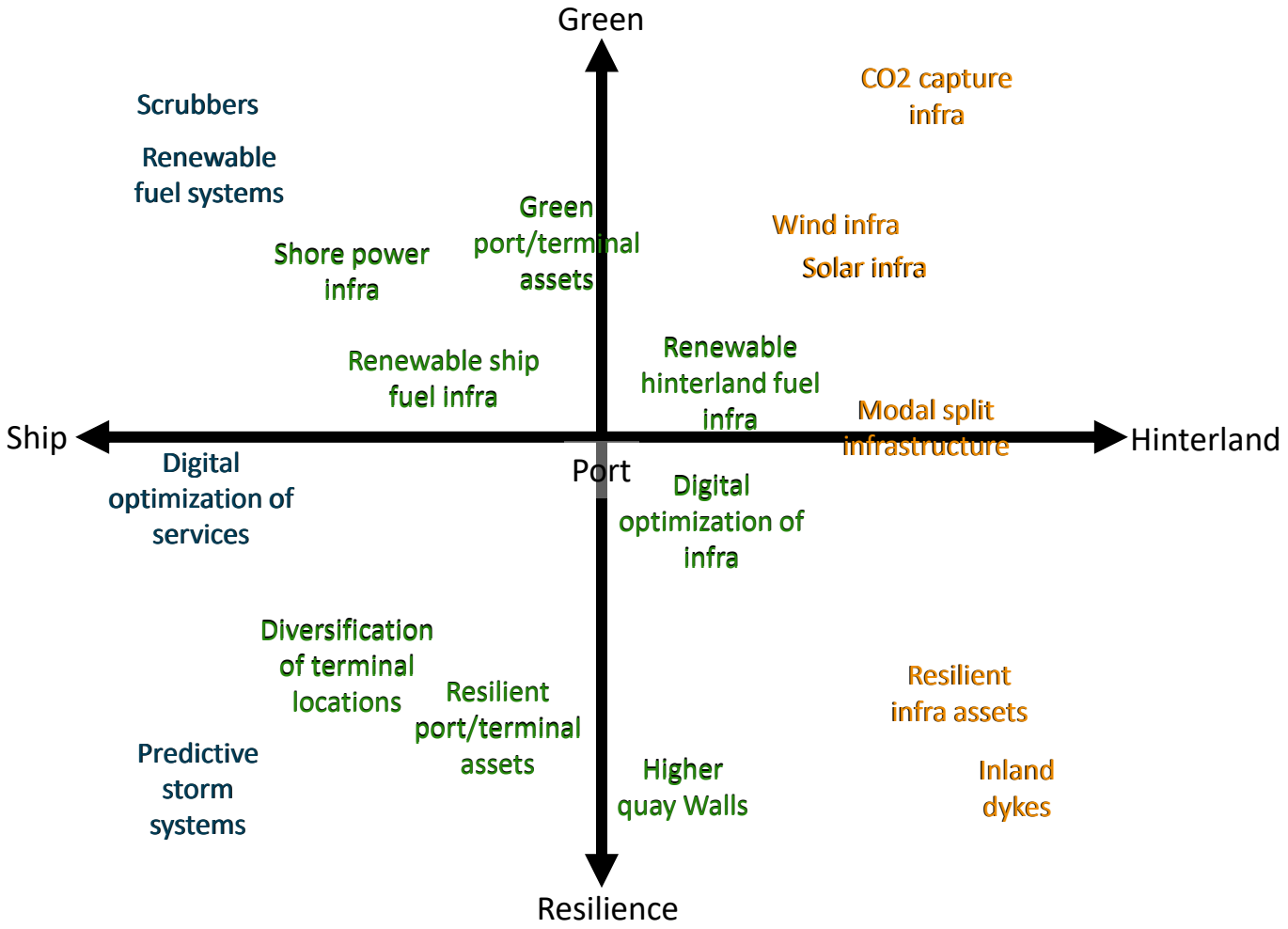
The vulnerability to physical risks **drives the need for investments** both on the private and public side

Climate change maritime (infra) investments

Shipper investment

Terminal/port investment

Hybrid/public investment



Note: conceptual, to be validated with interviews

European regulation is pushing for decarbonisation and a shift to net zero fuels

	Application 2017 (2018 publication)	2021 (2022)	2023 (2024)	2024 (2025)	2025 (2026)	2026 (2027)	2028 (2029)
Financial Statements	**Account for climate / Sustainability impacts in the Financial Statements**						
Management Report							
> NFRD	**Transposed in local jurisdictions**			1/1/2024 - **CSRD entry into force**			
> CSRD				**Sustainability reporting in accordance to ESRS**			
Affected companies				●	●	●	●
Standards				ESRS (or equivalent standards[3] for non-EU entities)		Possibility of applying simplified standards	ESRS or equivalent[3] (or other standards to be developed by EFRAG)
Reporting level				At (consolidated) entity level (exemption for subsidiaries if reporting is incl. in the consolidated reporting of its parent)			At ultimate (consolidated) non-EU parent company level
Assurance				Limited assurance requirement		Limited assurance standards (by EC < 01/10)	Reasonable assurance standards (by EC < 01/10)
> EU Taxonomy		**Taxonomy information to be included in publication /Management Report**		**Taxonomy information to be included in the Sustainability /ESG reporting** (as part of the Management Report)			
		●	●	●	●	●	●
		CCM & CCA (FY21: eligibility & qual. info; FY22: alignment & qual. info)	Full implementation and disclosure on all 6 env. objectives	**'living document'** (to be complemented over time depending on future events /technological progress)			

Registrant type

- ● Large entities within the meaning of the Accounting Directive **already subject to the NFRD[1]**
- ● All large entities as defined in the Accounting Directive, **based in the EU or listed on an EU regulated market[2]**
- ● All **SMEs listed on an EU regulated market.** Possibility to defer until 2028 (opt-out).
- ● **Certain non-EU entities** (> €150M turnover in EU)

The EU aims to be climate neutral by 2050 and in order to reach this goal it defined an ambitious action plan

EU regulations affecting the maritime industry

The European Green Deal

- Overarching policies in 10 action areas
- Defined to cut 55% of GHG emissions by 2030
- Make the EU climate neutral by 2050
- Turn sustainability challenges into opportunities

Just looking at the FF55 package we see a lot of **risks and opportunities** arising for the European seaport and terminal industry

Impact of FF55 on the maritime industry

	Captive container[1]	Container transshipment	Passengers/Cruise	Fossil fuels	Renewable fuels	Investments in infrastructure	Competitive position EU ports
AFIR Alternative Fuel Infrastructure Regulation	→	→	→	→	↗	↓	↘
FEUM FuelEU Maritime	↘	↘	↘	↓	↑	→	↘
ETD Energy Taxation Directive	↘	↓	↘	↓	↑	↘	↘
RED Renewable Energy Directive	↘	↘	↘	↓	↑	↘	↘
CBAM Carbon Border Adjustment Mechanism	→	→	→	↓	↑	→	↘
ETS Emissions Trading System	↘	↓	↘	↓	↑	↘	↘

New investments in shore power infrastructure and possibly LNG

Emissions from shipping must be reduced, more expensive fossil fuels within the EU

More expensive fossil fuels

Less demand for fossil fuels

Limited decrease in cargo flows due to shift to renewables potential loss transhipment

Increased demand for renewables may require suitable infrastructure

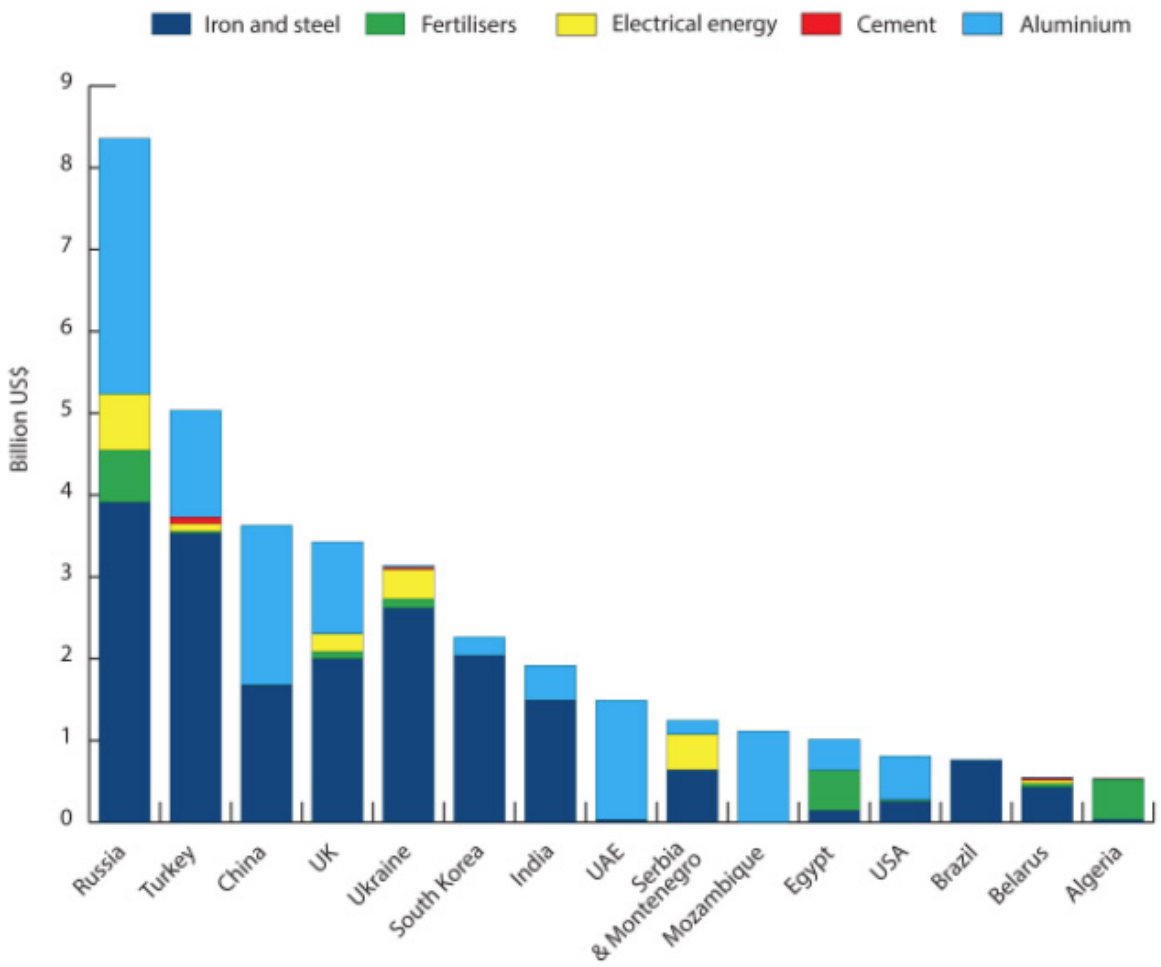
Concerns steel iron, cement, fertilizers, aluminum and electricity, these goods are not transported in containers

Emissions from shipping must be reduced, more expensive fossil fuels within the EU

↑ Opportunity ↗ Limited opporutnity → No impact ↘ Limited risk ↓ Risk

CBAM allone is affecting some core commodity flows

EU imports covered by CBAM for most exposed countries



Focus on **construction related commodities**

Main trading parties already part of **current sanctions/conflicts**

All these trends are **putting pressure on the maritime industry** to evolve and improve

Impact of physical and transition risks on the maritime industry

Relocation of production due to new regulation	Increasing pressure on infrastructure investments	Increasing expenses for administration and knowledge
Income relocation Estimates indicate that as much as $4.6 trillion in trade flows may be rebalanced across geographies[1] **Growth (trade-income) slowdown in Europe** Where pre 2008 GDP growth levels were around 4% YOY today they are lower	**Increased investments** The combination of increased regulation (FF55) and increased community pressure drives both shippers and ports to invest in greener solutions Climate change is forcing adaption and expansion of current nautical infrastructure **Income shift** Shift from fossil fuel economy to a renewable economy	**Ports are expected to invest in knowledge and quality** Ports are expected to have a greater knowledge in cluster and stakeholder management and specialized topics regarding energy transition and other “new economy” activities.

Risk of lower income

Risk of increased responsibilities and role

Certainty of higher expenses

On the opportunity side the energy transition is pushing a new demand for green molecules

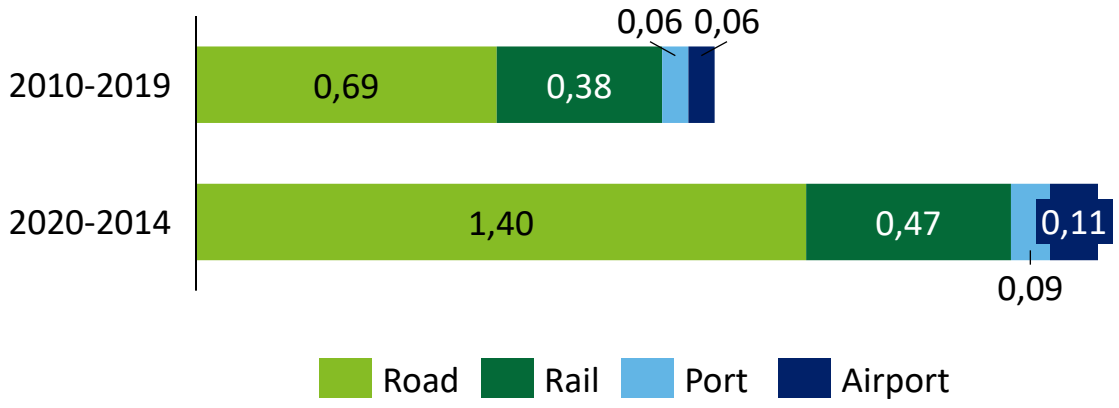
Maritime industry perspective on alternative fuels

Fuel	Part of future mix? (% participants)	Engine type	View on technology maturity	View on applicability to shipping	Advantages	Disadvantages
Green Hydrogen	65%	Combustion	Medium	Medium	Cross-sector applications – possibly faster R&D	Cost Relatively low energy density Cryogenic storage conditions Need for renewable electricity Inefficiency in conversion/production
		Electric (fuel cell)	Low	High	Less space for engine and better specs than combustion	
Green Ammonia	55%	Combustion	Medium	High	Relatively high energy density Already developed experience	Cost Toxicity
		Electric (fuel cell)	Low	High	Less space for engine and better specs than combustion	
Biofuels	10%	Combustion	High	Low	Easy to implement in current engines	Limited feedstock, unlikely to be available, large difference between types of biofuels, difficult to check compliance
Methanol	10%	Combustion	Rarely mentioned	Rarely mentioned		
Batteries	< 5%	Electric	High	Medium (ship size dependent)	Mature technology	Extremely low energy density Size and weight of batteries
Nuclear	< 5%	Heat	Medium	Low	Mature technology	Very high investment, social aversion, rarely mentioned by decisionmakers

ource: Decarbonising Shipping – All hands-on deck, Shell and Deloitte, 2021

From now until 2040, **approximately $2 trillion in transport infrastructure investments would be needed every year.**

Average required annual spend in transport infrastructure development ($tril)



Must have dimensions

Resilient to climate change impact and in line with transitional demands

Inclusive towards all modes of cargo and in its use and operation

Innovative using the optimal technologies at the current disposal maximizing flexibility and productivity

Driving trends

- **Growing demand**
- **Urbanization**
- **Climate change**
- **Stimulus plans**

Note: global infra outlook 2021

Conclusions

- The maritime industry will **always be plagued by (increasing) disruption**, either predictable or volatile and more in particular **is strongly affected by climate change**
- Due to the nature of our interconnected globalized logistics our **underlying supply chains are even more vulnerable**
- The vulnerability to physical risks **drives the need for investments** both on the private and public side
- Transition risks like those induced by policy changes such as **European regulation push for decarbonisation** and a shift to net zero fuels
- The shifting landscape is generating a **risk of lower income, risk of increased responsibilities and a certainty of higher expenses**
- **Opportunities arise** from new markets and infrastructure developments

About Deloitte Port Advisory

Deloitte Port Advisory, part of Deloitte North South Europe, is exclusively focused on port-related organizations such as port authorities, shipping lines, terminal operators, service providers, lobby organizations, semipublic governments, etc. The group consists of a network of port experts with very broad expertise and uses an international network of port professionals within the global Deloitte organization.

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Indra Vonck leads the Deloitte Port Advisory team. He has a PHD in Maritime economics (specialisation port development) from the university of Antwerp and Solvay Business School Brussels and is tenured professor at the University of Brussels

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