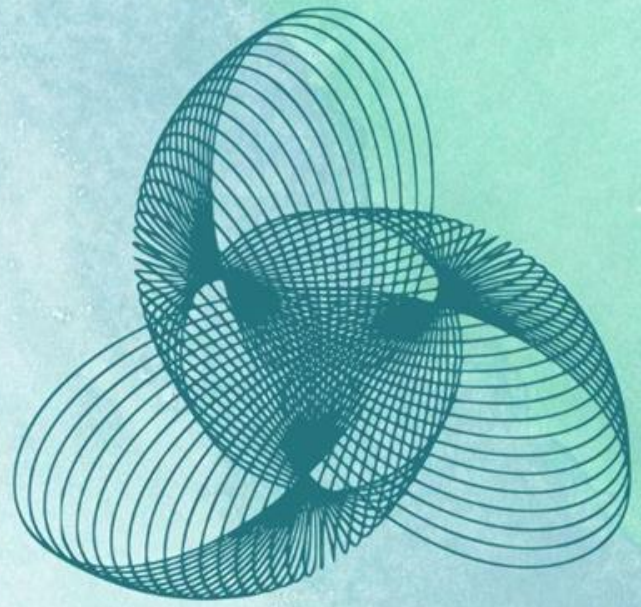
RINA

ZERO-EMISSIONS ENGINEERING



SEANERGY

the Sustainability EducationAl programme for greeNER fuels and enerGY on ports

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Module #8: Evaluating the energy and environmental performance of ports PART 1

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Introduction

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Course contents:

PART 1

- Key concepts about ESG
- ESG in ports: application in port of ESG concept and goals
- ESG KPIs and Energy performance evaluation
- E=Environment - the Life Cycle Assessment (LCA)
- LCA applied in ports
- Transparency and Traceability

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Terminologies

- **ESG:** Environment, Social and Governance
- **KPI:** Key Performance Index
- **LCA:** Life Cycle Assesment

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What is ESG?

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Environmental criteria addresses a company's operations environmental impact, and environmental stewardship

Social criteria refers to how a company manages relationships with and creates values for stakeholders

Governance criteria refers to a company's leadership & management philosophy, practices, policies, internal controls and shareholders rights

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What is ESG?

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ESG is used as a **framework to assess how company manages risks and opportunities that shifting market & non-market conditions create**. These shifts include changes to:

Environmental Systems

Social Systems

Economic Systems

ESG is **not about values**

ESG is **about the ability to create & sustain long-term value in rapidly changing world**, and managing the risks & opportunities associated with these changes.

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The history and Evolution of ESG

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ESG is often used interchangeably with corporate social resposibility or corporate sustainability, however **ESG encompasses much more**:

1980s

Environment, Health and Safety (EHS)
Based on the development of environmental & employee regulations

1990s

Sustainability
Focused on reducing environmental impacts beyond legal requirements

2000-2010s

Corporate Social Responsibility (CSR)
Corporate philanthropy and employee volunteerism used to align social issues

2020+

Environmental, Social & Governance (ESG)
Holistic concept related to competitive advantage and risk & reward management

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Key factors in ESG's growth

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MATERIALITY
ESG's influence on investor risk and returns

TRANSPARENCY
Greater transparency on how money is invested

REGULATION
Address both national & international threats (i.e. climate change)

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Environmental factors – environmental issues

Climate change

- Worsen both conventional & ESG-related risks
- Natural disasters due to rising temperatures present significant risks

Natural resource scarcity

- Changing environmental conditions have increased the depletiong of natural resources, which have become more important to stakeholders

Pollution & waste

- Can cause reputational risks, which influences R&D, retail expectations and client requirements
- Pollution can also cause health concerns that influence license to operate, which can have legal & regulatory ramifications

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Impact of environmental factors on companies

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Human risks

Labor force & social consequences

Labor force migration due to economic & health risks

Transition risks

Market & nonmarket changes

Local business that rely on this labour force deteriorate

Physical risks

Tangible, quantifiable impacts

Local infrastructure damaged by climate change

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Social factors

There are a wide-range of social factors to consider, including:

- Community engagement
- Employee training & education
- Responsible sourcing
- Diversity & equality

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Social factors – social issues

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Human capital management

- Skill labor shortage
- Uneven wage growth
- Technology & evolving market trends
- Natural disasters due to rising temperatures present significant risks

Service safety

- Corporate reputation
- Regulatory fines

Human rights/Labour management

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Governance factors

Board quality, diversity and effectiveness:

- Qualifications
- Accountability measures
- Approach to counseling management
- Integration of ESG factors into business planning

Diversity, Equity and Inclusion (DEI) has become a critical benchmark for investors, who look for more comprehensive execution of DEI strategies

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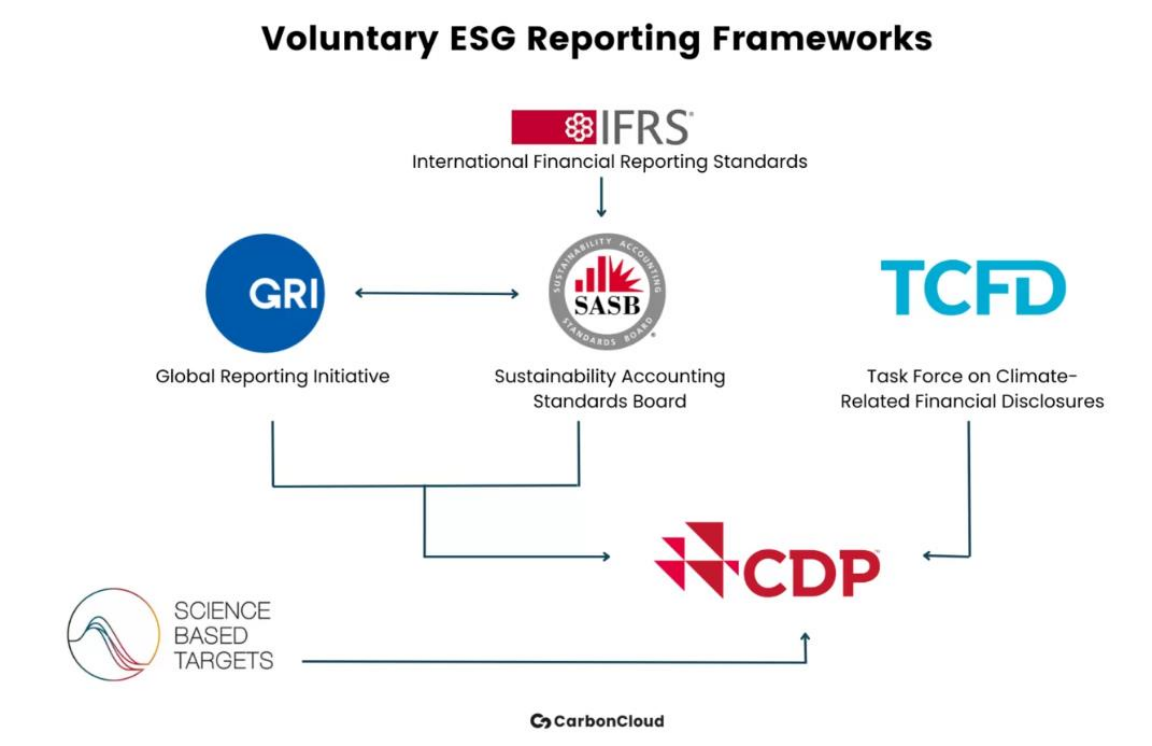
Governance factors

Reporting, transparency & business ethics

Through ESG Reporting Standards it could be possible to obtain:

- Investor confidence & valuations
- Consumer & stakeholder trust



Currently specific standard for seaports ESG reporting are not published yet!

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Governance factors

Investors will consequently have to make assumptions about management quality when company info is limited.

Leading & most credible disclosure frameworks are:

- Industry specific standards from the **Sustainable Accounting Standards Board (SASB)**
- Cross-industry recommendation from **Task Force for Carbon-related Financial Disclosures (TCFD)**
- The **Global Reporting Initiative (GRI)**

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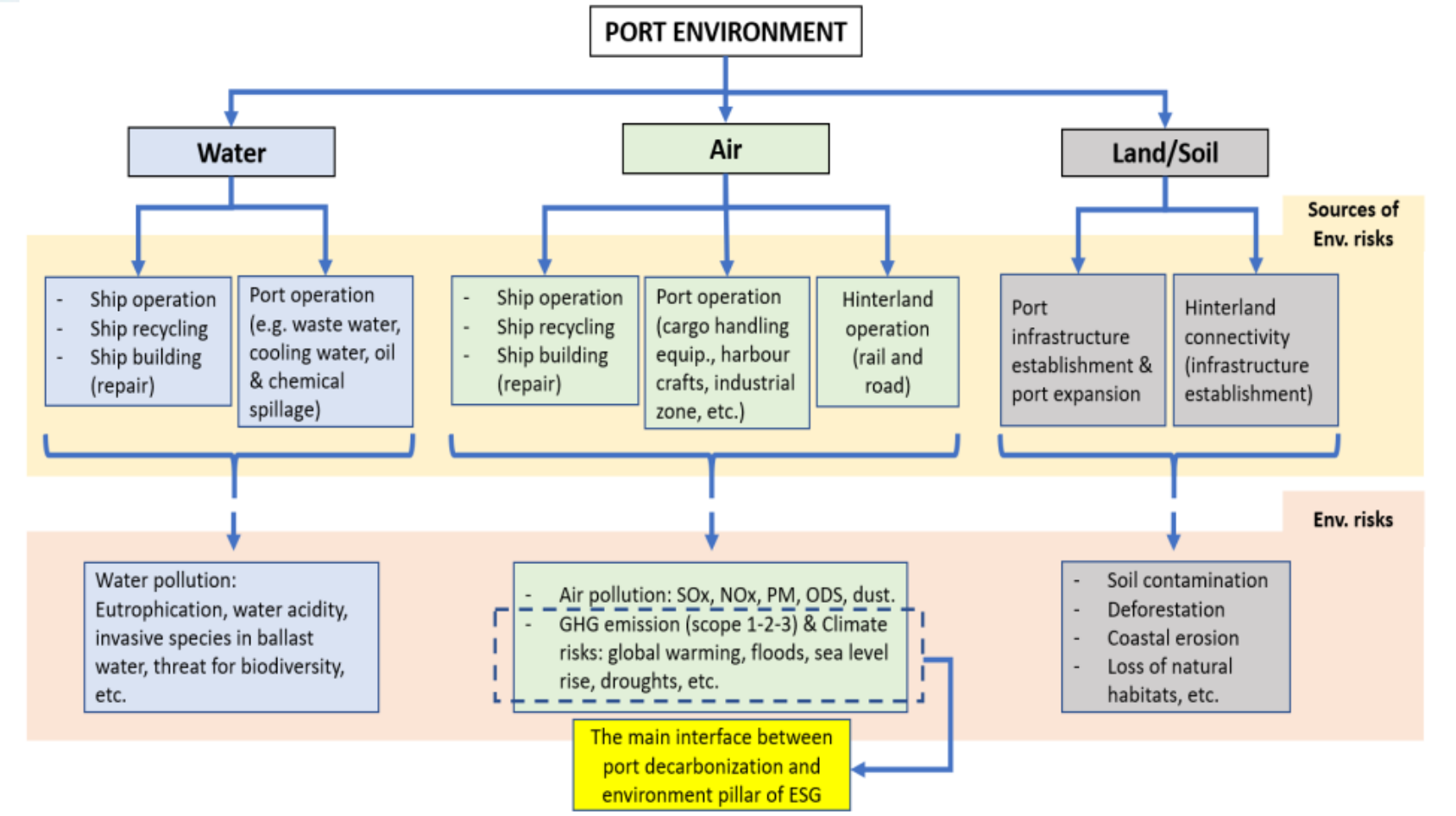
ESG in ports and goal setting

The ESG analysis of port energy transition necessitates defining a scope for this process and identifying the interface between the port ESG framework and the port energy transition.

Environmental aspects



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ESG in ports and goal setting

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Social aspects

SOCIAL NEEDS \ PORT SOCIETY GROUPS	Port authorities	Port workers (contractors)	Ship staff (in port)	Hinterland operators (in port)	Port visitors	Port Neighbouring residents	Global society	Notes
Health Management (air, water, soil, and noise pollutants)	✔	✔	✔	✔	✔	✔	Indirect (mainly local effect)	
Health Management (global warming, droughts, floods, and sea level rise due to **GHG emission**)	✔	✔	✔	✔	✔	✔	✔	Direct impact of GHG emission on society
Securing and Development of Human Resources (e.g. training)	✔	✔	✔	✔	✔	✔	✔	Training of managers and employers (ship-port-hinterland) to achieve CO2 reduction targets
Diversity & Inclusion (e.g. gender equality)	✔	✔	✔	✔	✔	✔	Indirect (mainly local effect)	
Respect for Human Rights	✔	✔	✔	✔	✔	✔	✔	
Stakeholder Engagement	✔	✔	✔	✔	✔	✔	✔	Cooperation between stakeholders for CO2 reduction
Relationship with the community	✔	✔	✔	✔	✔	✔	Indirect (mainly local effect)	
Safety and quality management	✔	✔	✔	✔	✔	✔	✔	It is assumed that safe and high quality port service does not increase the CO2 emission
Supply chain labour standards	✔	✔	✔	✔	✔	✔	✔	High skilled labour and managers to achieve CO2 reduction targets
Privacy and data security	✔	✔	✔	✔	✔	✔	Indirect (mainly local effect)	

✔ these are the society needs for different society groups engaged in ports
✔ in these cases there is some sort of GHG footprint in society needs

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Case study – Port of Rotterdam (Netherlands)

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Safe and healthy environment

- Flood risk management
- Truck stops
- Discount for clean shipping
- Nature in the port
- E-noses (to track down noxious or hazardous emissions)

Climate and energy

- Wind and solar power in the port, installation of LED lamps
- Thermal recovery and Carbon Capture Storage
- Port Authority's carbon footprint calculation and reduction

Port of Rotterdam

People and employment

- Social agreement, port welfare committee and specific project involving young people, researchers and training sessions

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Case study – Port of Valencia (Spain)

All port activities generating commercial and economic growth are regulated by the PAV's Environmental and Energy Policy , which lays down the general environmental principles and continuous improvement objectives ensuring that port activities are respectful with the environment.

Main on going activities :

- Carbon footprint monitoring and reducing
- Set zero emissions goal by 2030
- Water quality monitoring
- Prevention and control of spills
- Air quality monitoring
- Noise quality control network
- Dedging

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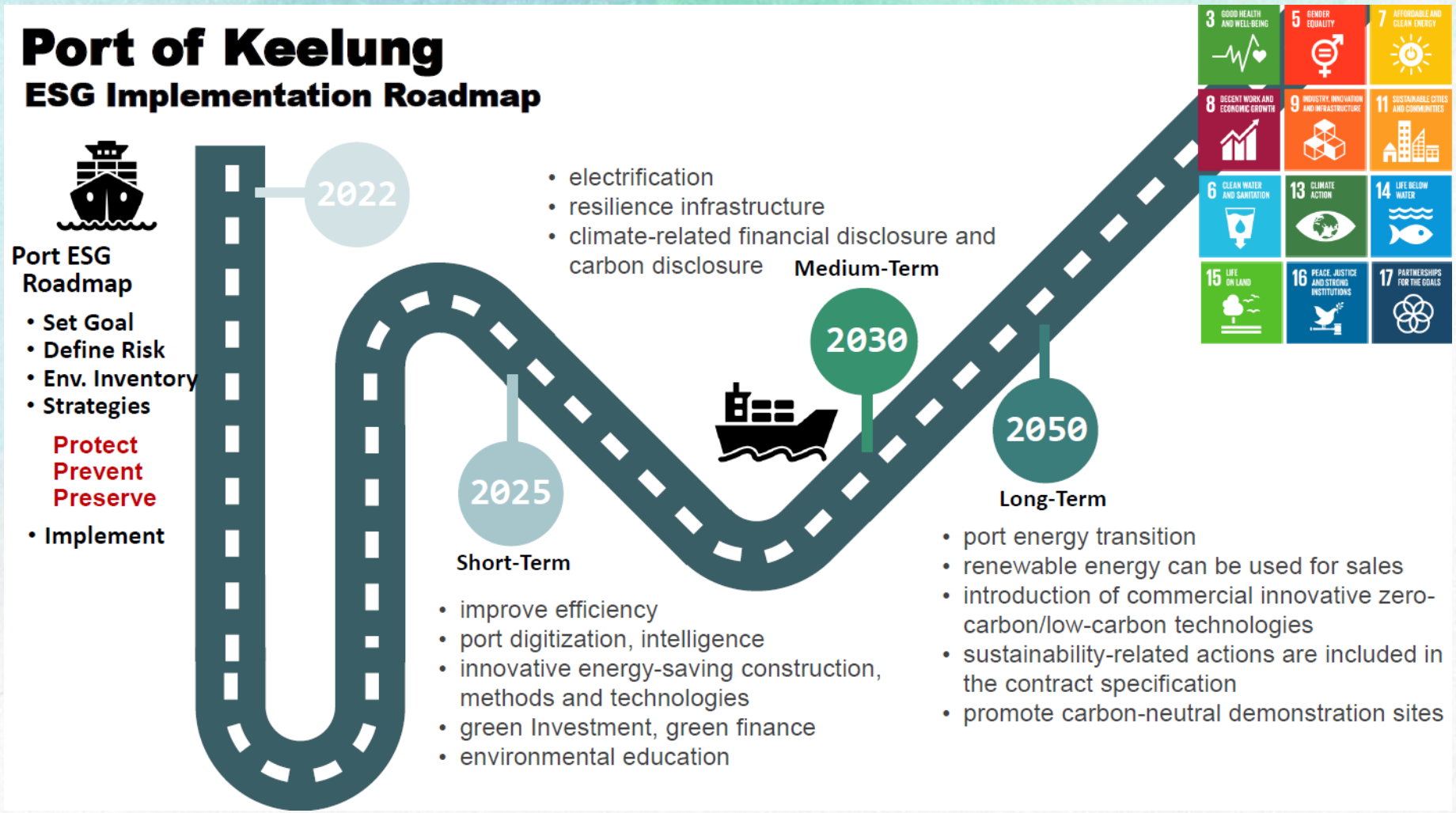
Case study – Port of Keelung (1/2) (Taiwan)



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Case study – Port of Keelung (2/2) (Taiwan)

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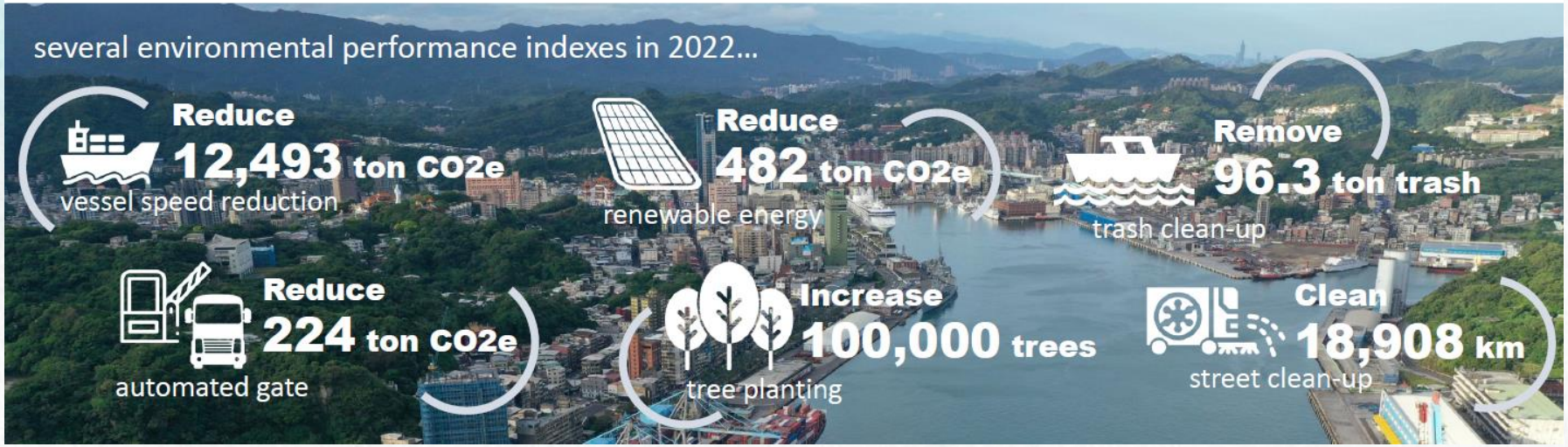
Port of Keelung - ESG Implementation Benefits and Impacts

- Integrate port and urban development, and reduce the city and port conflicts
- Respond to future climate and environmental uncertainties
- Reduce the risk of environmental impacts
- Reach the 2050 Port Carbon Neutral
- Collaborate with the shipping industry, and revitalize the economy
- Increase the diversity and possibility of port-city development
- Validate port corporate social responsibility and sustainable management value



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ESG performance: issues and KPIs

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The development of a method for quantifying the ESG performance of international ports is expected to **accurate the environmental impact**, use of renewable energies, diversity and inclusion in the staff and board of directors, sustain financial and operational results, as well as narrow the port-city relationship, among other important indicators for modern investors.

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ESG performance: materiality matrix

List of material issues regarding the environment (linked to social and governance aspects) in the form of an **ESG materiality matrix.**

	Environment – Social	Environment - Governance
Material Subjects	Minimizing impacts of air, water, soil and noise pollution on society groups including port authorities, port workers, ship staff, hinterland operators, port visitors, and neighboring residents	Systems according to ISO 50001 and ISO 14001, Port Environmental Review, Transparency and environmental reporting (ESG or Sustainability report)
	Facilitate the stakeholders' dialogues about environmental issues	Waste and Hazardous substances Management
	Social impact assessment of environmental projects	Ocean health and biodiversity conservation
	Environmental awareness	Green procurement and supply chain

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ESG performance: KPIs and energy performance

KPIs	Environment	
	Port decarbonization strategy in a major part of the port policy	Energy intensity (e.g. grCO_2/TEU) is measured
	Significant environmental aspects in port have been identified	Record of annual management review is available
	Significant energy users in port have been identified	Set of procedures and criteria to select green contractors and suppliers
	Energy baseline has been established in the port	Port has adopted the ISO 50001, ISO 14001 or PERS framework as guideline
	Specific CO_2 reduction targe has been set	Decarbonization is a major part of the port clean air action plan
	Internal audit plant is set (In the EnMS or EMS framework) and record of the latest energy audit results	Record of water consumption particularly if it is product of freshwater generators and not from natural resources

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ESG performance: KPIs and energy performance

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Energy (electricity and fuel) consumption are data to be collected to conduct a Life Cycle Assessment!

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ESG performance: best practices

Best practices	Environment	
	Economic	**Technology**
	Green loans for decarbonization projects	Installation of advanced and accurate measuring devices for monitoring and metering of energy consumption
	Economic models: maritime energy contracting or energy supply contracting	Port and other interlinked bodies digitalization
	R&D investment and market consultation for decarbonization projects	Adoption of green technologies
	Economic collaboration of shipowner-shipper-port-technology provider to invest and run the infrastructure of the port	Development of renewable energy harvesting infrastructure and required infrastructure for alternative fuels

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ESG performance: best practices

Best practices	Environment	
	Safety	**Security**
	Developing contingency plans to handle fire and oil & chemical spills at port	Ensured energy security/resilience in port
	Accountability: establishment an ERT (emergency response team)	Ensured cyber security for critical infrastructures in port

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Conclusions and take-home message

Learning objective n° 1: discuss, and apply key concepts and techniques related to environmental, social, and governance = ESG in port operations

ESG is not about specific values, ESG is about the ability to create & sustain long-term value in rapidly changing world, and managing the risks & opportunities associated with these changes.

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Conclusions and take-home message

Learning objective n° 2: define and learn from two land and in-land case studies of European ports that have successfully carried out ESG evaluation and commitment

Each port applies ESG concepts and sets goals as it sees fit, in accordance with its specific context. The important thing is to take action!

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Conclusions and take-home message

Learning objective n° 3: distinguish the level of energy performance in port operations and identify energy demand to conduct the LCA

Among the different KPIs related to ESG performance evaluation, the energy consumption monitoring is important not only to improve the energy efficiency system and set and Energy Monitoring System, but provide useful information to conduct the Life Cycle Assessment (LCA) of the port.

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- Port of Valencia (https://www.valenciaport.com/en/sustainability/environmental-policy/)

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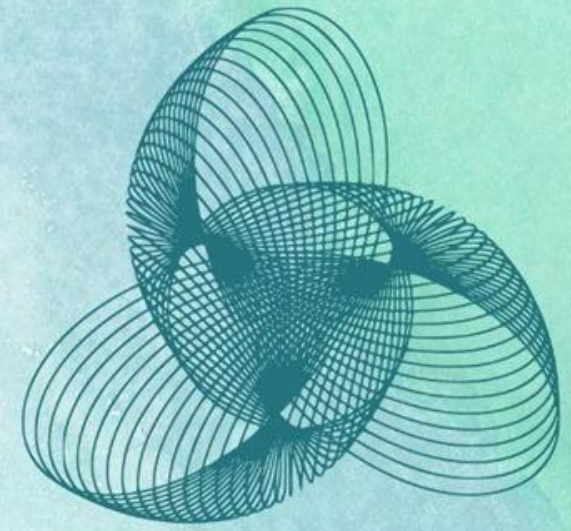

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