



With Input from



Ports: Green gateways to Europe

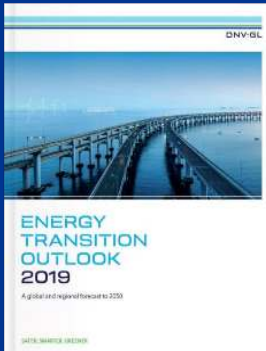
10 Transitions to turn ports into decarbonization hubs



The vital role of ports



Insights from DNV GL's Energy Transition Outlook



Share of fossil fuels will decrease from 85% today to 56% by 2050
Solar PV and wind will provide 63% of electricity

Existing technology can deliver the 1.5°C target
We predict a rapid energy transition – but it will not be fast enough.

We need extra ordinary policy action to meet the Paris goals

Ports as the front runners of the energy transition



Emissions from water transport will rise

Today transport accounts for one-third of the overall EU CO₂ emissions.

Road transport is responsible for **72%** of the overall transport CO₂ emissions, water transport for **14%**, and air transport for **13%**.

However, it is estimated that due to CO₂ targets imposed on vehicles the relative contribution of water transport will increase significantly if emissions from water navigation are not tackled in time.

Ports: the front runners of the energy transition

Port Authorities:

Decarbonize operations and reduce energy costs

Maritime sector:

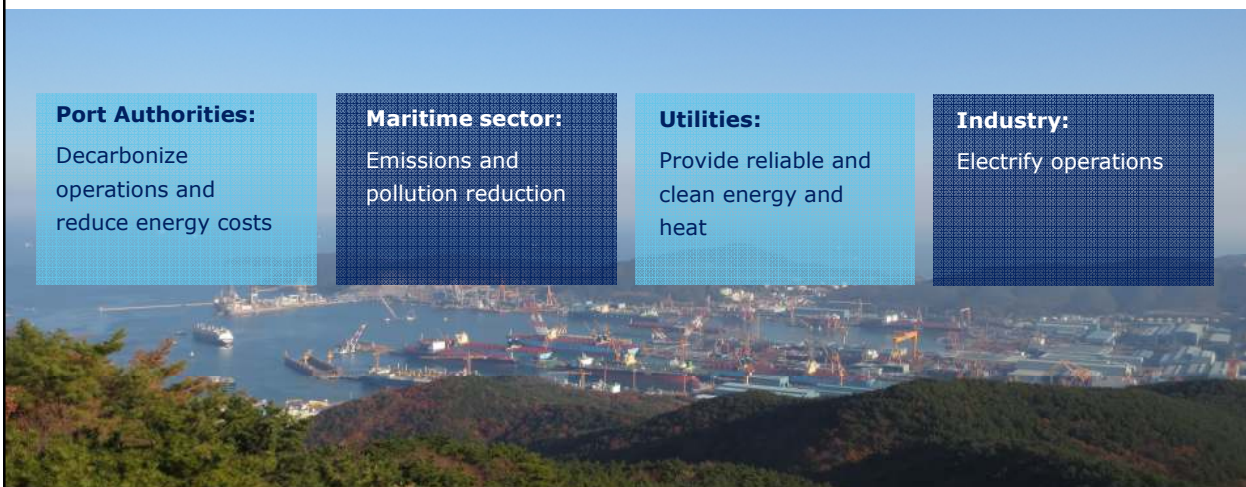
Emissions and pollution reduction

Utilities:

Provide reliable and clean energy and heat

Industry:

Electrify operations



Ten Green Transitions towards decarbonization



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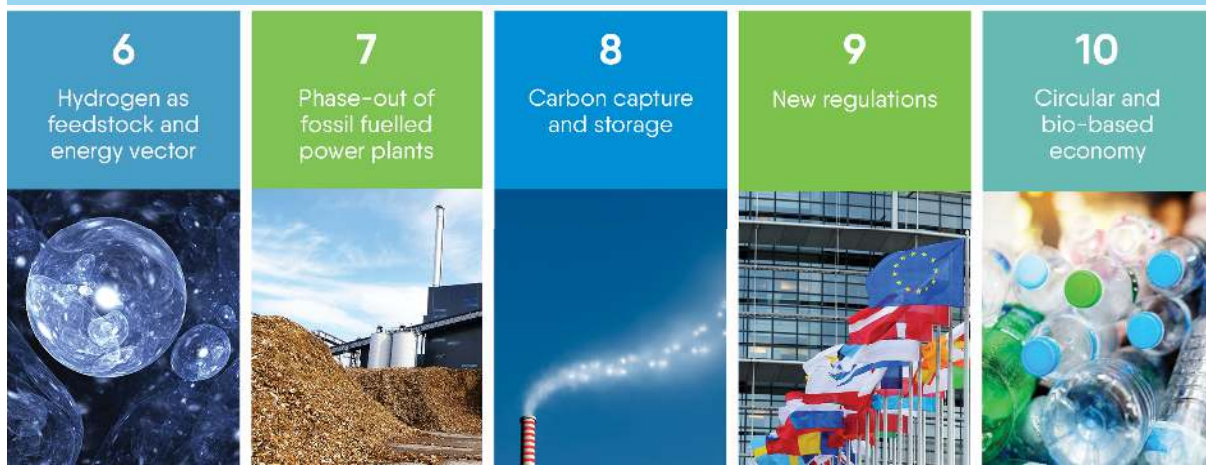
The Ten Green Transitions towards decarbonization



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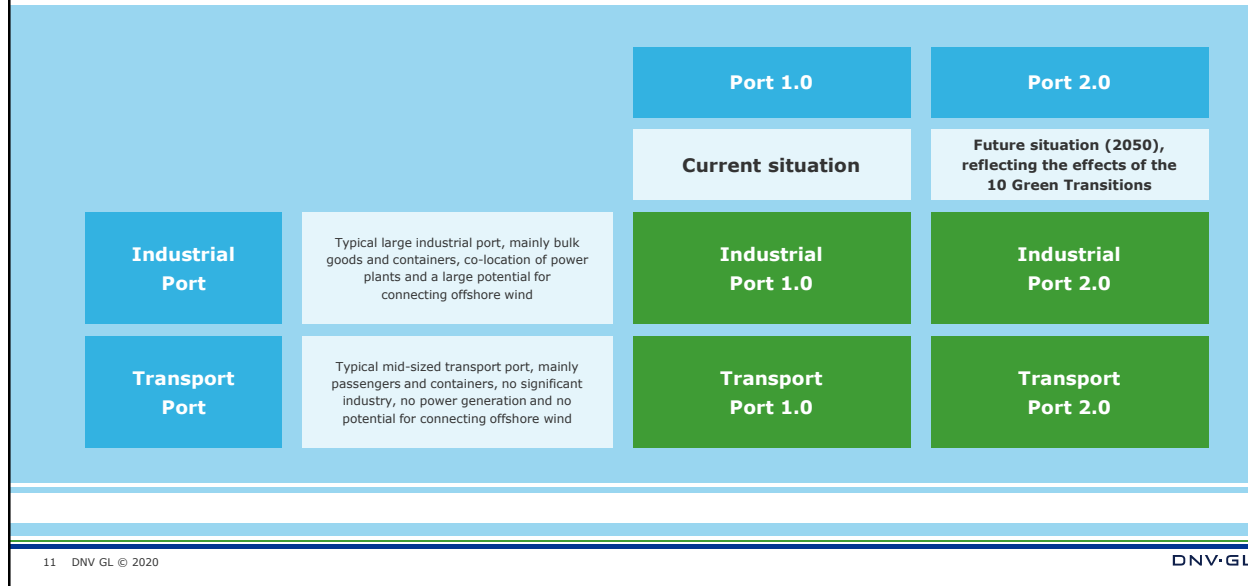
The Ten Green Transitions towards decarbonization



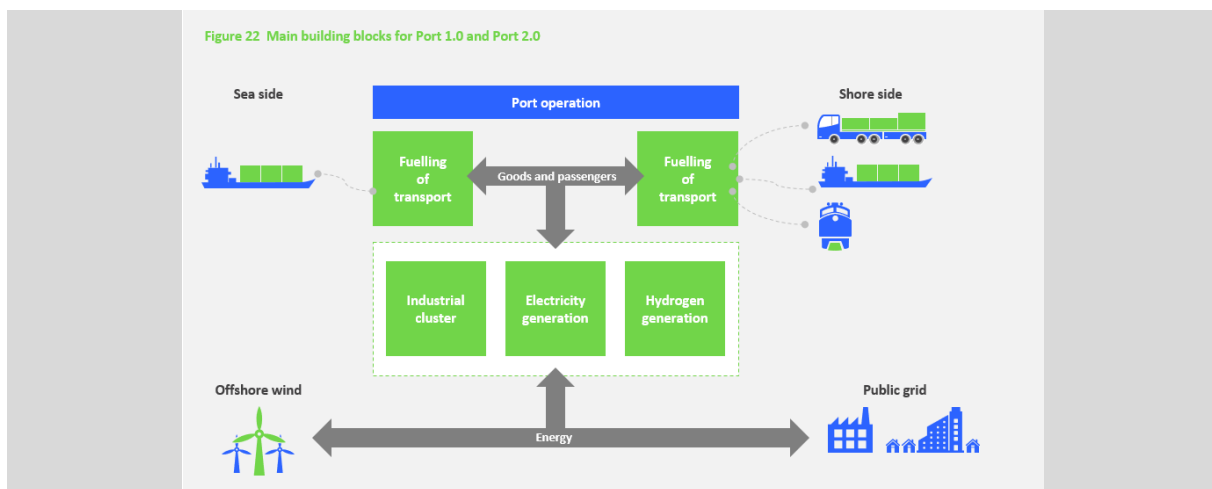
Ports of the future



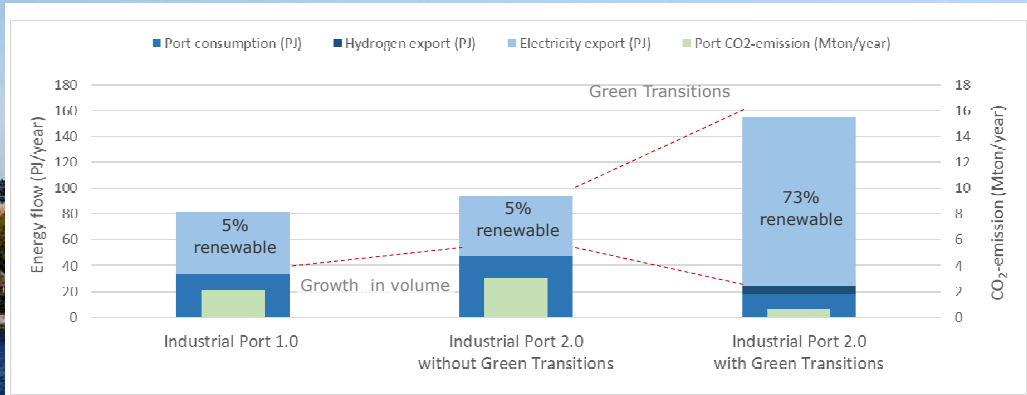
Defining 'typical' ports



Quantifying the effects of the 10 Green Transitions

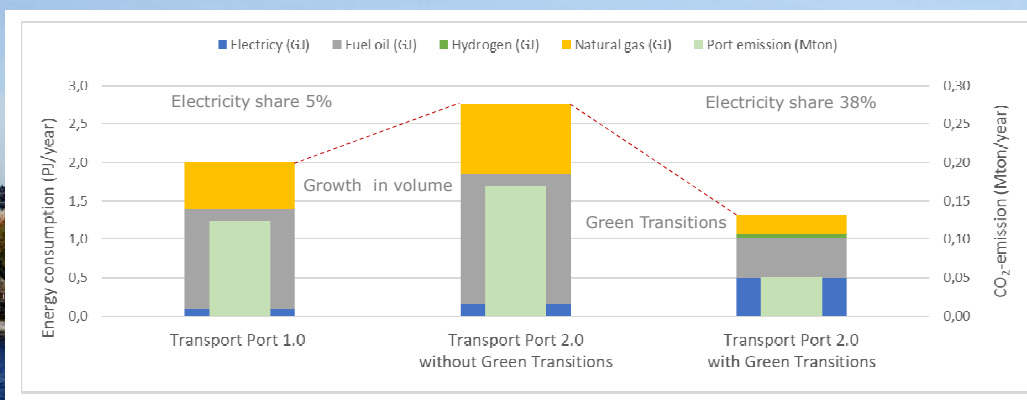


Industrial Port 2.0: renewable energy hub and exporter



INDUSTRIAL PORT: Comparison of energy flow (consumption/export) and CO₂-emission

Transport Port 2.0: efficiency measures can have a big impact



TRANSPORT PORT: Comparison of energy consumption and CO₂-emission



Impact of the Green Transitions on the power sector

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Power sector plays key role in turning ports into energy hubs



Ports are the natural landing point for the huge planned capacity of offshore wind.

Electrification of industries could mean up to 50% decrease of 'fossil cargo'.

Electricity will become the main carrier for port activity.

We need a regulatory environment to ensure sustainable provision of Public Private Partnerships (PPPs) to accelerate the green transition.

Policy recommendations

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Recommendations to turn Ports into frontrunners of the energy transition

1 Standardization of shore power should be stimulated and barriers to adhere to the standards should be removed

2 Stimulate further electrification of port-connected activities for early movers

3 Funding research, development and innovation

4 Funding environment attracting investments

5 European coordination for environmentally friendly incentives and fees for maritime through ports

6 Facilitate and support stakeholders' dialogue

7 Enable ports to continue to facilitate the interaction between dispatchable and renewable power generation

8 Support the initial investments for hydrogen production through electrolysis at ports

9 Implement a fair way to share benefits of avoiding unnecessary grid investments with stakeholders to which this can be attributed

10 Mandate port authorities, in coordination with DSOs, to facilitate the development of a port energy infrastructure across multiple energy carriers

11 Develop and implement a structured way of solving inconsistencies in legislation and tax regulation

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