



# DOCKS THE FUTURE

defining the concept of "Port of the Future"

## Projects Common Index: Evaluating port-related projects

A short introduction

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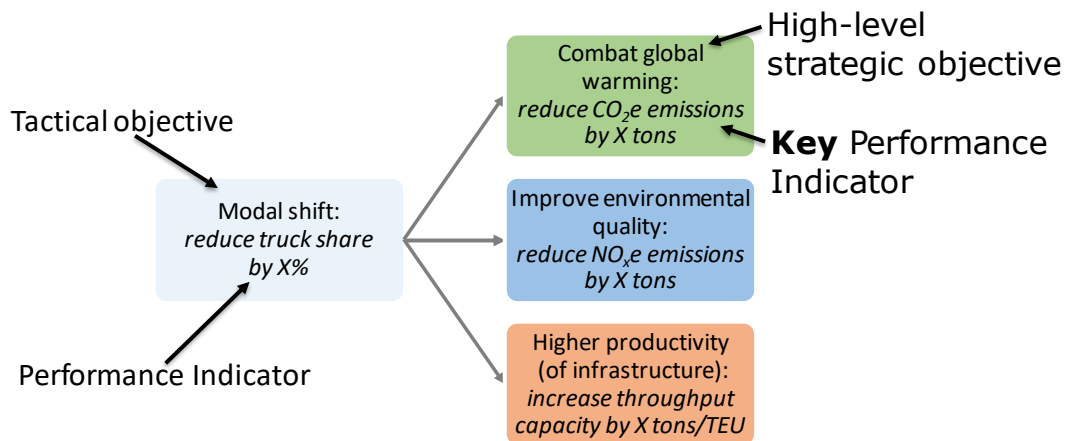
# 1. Introduction

Decision makers on all levels are liable to validate their respective decisions and present at least a general guideline or a strategic orientation. Although the concrete strategies may differ, similar aspects are to be tackled by the port management. The UN Sustainable Development Goals (SDGs) provide a framework of diverse goals for a sustainable future, but not all UN SDGs are equally important for the Port of the Future concept. The World Port Sustainability Programme provides a good framework for structuring port-related projects. The five focus areas presented there - Climate and Energy, Community outreach and port-city dialogue, Governance and Ethics, Resilient Infrastructure, and Safety and Security – are used for the Project Common Index (PCI) to group the most relevant UN SDGs. For each of these goals, KPIs are developed to allow measuring the contribution of a project to the different objectives.

## 2. High-level strategic objectives and KPIs

An analysis of a multitude of port-related projects (EU projects, port development projects, national port development plans, etc.) revealed a large variety of stated objectives. However, these objectives were not always directly to UN SDGs or other ‘strategic’ objectives. Rather, they often referred to some measurable results with an underlying objective which was not always stated.

Consider, for example, the objective ‘Modal shift’. Most actors would probably assume that a modal shift shall contribute to a reduction of greenhouse gases (e.g. by reducing the truck share). Others may rather think of air pollution in the port vicinity and again others may want to relieve the road infrastructure to reduce congestion. These ‘underlying’ objectives have been distilled from the projects’ ‘tactical’ objectives. For each high-level strategic objective, a KPI or a set of KPIs was deduced.



Based on this condensation of objectives, 17 high-level strategic objectives for port-related projects were retained. Finally, a synthetic 'aggregated KPI' indicates the contribution per each of the five areas.

WPSP areas	high-level strategic objectives	KPI name or type
Climate and Energy	Combat global warming (SDG 13)	reduction of port-related CO2-equivalent emissions [tons]
	Save natural resources (SDG 12)	waste reduction (plastic, dredging material) [tons]
Community outreach and port-city dialogue	Inclusive cities (SDG 11.3.2)	qualitative scale
	Land consumption (SDG 11.3.1)	former port area converted [square meters]
	Improve environmental quality (SDG 11.6)	reduction of emissions in port (noise, air)
	Good jobs (SDG 8.5)	qualitative scale
Governance and Ethics	Transparency (SDG 16.6)	qualitative scale
	Gender equality (SDG 5.5)	qualitative scale
	Equal opportunity (SDG 10.3)	port open to third-party operators [binary]
	Restrict corruption (SDG 16.5)	qualitative scale
	Green governance (SDG 15.9)	ISO 14001 [binary]
Resilient Infrastructure	Economic growth (SDG 8.1)	growth in port's throughput capacities [TEU, tons]
	Higher productivity (SDG 8.2)	savings due to optimization [Euro]
	Resilient infrastructure (SDG 9.1)	qualitative scale
	Account for resilience (SDG 13.2)	qualitative scale
Safety and Security	Reduce crime (SDG 16.1)	qualitative scale
	Safe working conditions (SDG 8.8)	qualitative scale

### 3. KPI definition and measurement

In order to make the KPIs comparable and generate aggregated KPIs, standardisation is required which is consistent among and within the WPSP 5 focus Areas. A five-point scale, ranging from one to five with one being the lowest and five being the highest score, has been selected for all KPIs. The KPIs are of either qualitative or quantitative nature and approached differently. In the end, five points indicate that a project is among those with the highest impact in that area. The remainder of the scale is built up between 0 (no impact) and the projects with the highest impact.

KPI	estimated effect	score	1	2	3	4	5
Name of KPI			low	low to medium	medium	medium to high	high

#### Qualitative KPIs

The score of a qualitative KPI of a specific project or measure is expressed according to the classification on a five-band scale. For qualitative KPIs only integer values between one (low

impact) and five (high impact) are considered. Specific characteristics are provided for each of the five stages, which build the framework for evaluation.

### Quantitative KPIs

The approach of measuring differs for each KPI, however, alignment in scaling guarantees the consistency among the different KPIs. For all quantitative KPIs we apply a scale where 1 additional point requires the respective effect to be 10 times higher. Here, decimal numbers as values are possible. For methodical reasons a score of 1 complies to a minimum threshold that needs to be achieved in order to maintain a score of 1 (or above). Decimal numbers between 0 and 1 are not counted.

## 4. Consolidation towards the Project Common Index

Firstly, the aggregated KPI per area needs to be generated. Each area contains a varying number of KPIs. Therefore, it is not possible to take an average of the KPIs to maintain the aggregated KPI for the area. Areas with more KPIs would be highly disadvantaged by this approach. To compute an aggregated KPI the following formula is applied:

$$\text{Aggregated KPI} = \alpha \times \text{value of highest scoring KPI} + (1-\alpha) \times (\text{sum of value of remaining KPIs} / \text{number of remaining KPIs})$$

$$\text{With } 0 \leq \alpha \leq 1$$

We refer to this approach as the standard Ports-of-the-Future-weighing. However, deviations from this are possible. The user is able to define a customized aggregation formula based on the user's (stakeholder's) preferences. The same methodology is applied when the aggregated KPIs of each area are further consolidated towards the 'Consolidated Objectives Index'.

The next step adds the monetary scope to the evaluation process. The Consolidated Objectives Index is divided by the respective costs of the *action*. When only one single measure of a project is evaluated, then only directly allocable costs must be considered. On the other hand, when a manifold project enters with its full costs all possible effects on the high-level strategic objectives must be considered.

$$\text{Cost-adjusted consolidated Objectives Index [per million Euro]} \\ = \text{Consolidated Objectives Index} / \text{allocable costs [in million Euro]}$$

After accounting for costs, Innovativeness and Transferability are evaluated, each with a five-band scale. These are particularly important for Port of the Future projects whose main role is to promote innovation in the EU port landscape. From the point of view of a single port authority looking for an efficient way to attain a certain objective in its own vicinity, Innovativeness and Transferability may not have a particular value and may hence be disregarded there.