



DOCKS THE FUTURE

defining the concept of "Port of the Future"

Project Adequacy Guideline

Deliverable 3.2

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1. Introduction: origins of the concept

The term 'adequacy' or 'level of adequacy' has been introduced in the 2016 Motorways of the Sea Detailed Implementation Plan.¹ It measures the distance between an objective that has been set at the political level and the state of a system, e.g. a port or a group of ports. It includes 'compliance' – a term regularly used in relation to the TEN-T Core Network Corridors – as a special case: when the objective is binary (compliance or non-compliance), the level of adequacy is simply the percentage of ports/sections that comply with that objective (e.g. ERTMS, ready for 740 m train length, etc.). For scaled variables, it measures the the status quo in relation to the target, e.g. the percentage achieved of a CO2 emissions reduction target.

Subtracting the level of adequacy from the target indicates the size of the gap. For binary compliance variables, the gap indicates the number of ports or length of sections that do not yet comply. These non-complying elements can be clearly identified and directly addressed. For scaled variables and objectives, this is generally not possible. Rather, the challenge is to identify measures that can efficiently narrow the gap between the status quo and the target. These can be in one specific place or "wider benefit" measures that help attaining objectives in various places at the same time.

2. Adapting the adequacy concept to Port of the Future: 'potential contribution'

The Port of the Future programme has a very explorative stance. Its aim is to identify innovative approaches and solutions. Though there are some clearly defined objectives (see Deliverable 3.1), it is difficult to set clear targets across all its different dimensions, at least within the programme.² In a way, the directions are clear, but we do not yet know how far we can go because we do not know the solutions yet. The scales generally do not have an upper ceiling. Without these targets, it is not possible to measure adequacy in percentage terms so the 'degree of adequacy' cannot be calculated.

According to the analysis of the Port of the Future concept and the selected clustered projects (see Work Package 2), projects and initiatives must contribute to high-level strategic goals in one or several of the following areas (see Deliverable 3.1):

- Climate and Energy
- Community and port-city dialogue
- Governance and Ethics
- Resilient Infrastructure
- Safety and Security

There are no explicit, quantified targets for the high-level objectives to be reached by the ports, but there are quantifiable or at least scalable KPIs for each one. Based on these KPIs, the 'potential

¹ see ec.europa.eu/transport/sites/transport/files/mos_detailed_implementation_plan_june2016_2.pdf

² Port of the Future can and will contribute to many targets set elsewhere, but it will only be one element among many.

'contribution' of a measure, a project or an initiative can be estimated. It indicates by how much it contributes to each high-level objective.

Given that Docks the Future is a quest for innovation and new technical solutions, a precise 'adequate' state cannot be defined beforehand. Rather, the scales on 'potential contribution' mostly do not have an upper ceiling (see Deliverable 3.3).

3. Potential contribution and transferability

The focus of Port of the Future being on developing and spreading innovations, the potential contribution is not limited to a single application. Rather, the evaluation must take into account the transferability of a measure to other ports.³

This includes a qualitative aspect (ease of transferability) and a quantitative aspect (number of ports to which it can be transferred). The qualitative aspects of a measure (see Deliverable 5.3 for detail) translate into a probability of transfer to ports in which that solution is applicable. Multiplying by the number of potential ports, we can conceptualise a multiplier for the single project's impact. The potential contribution is then the contribution of a project in one port times the number of ports that are likely to apply this solution. Or, more generally:

$$\text{Potential contribution of a new solution} = \text{contribution of pilot case} \times \text{potential number of cases}^4 \times \text{probability of use}$$

4. Transferability and innovativeness

There is hence also a link between transferability and innovativeness: A project simply applying an existing solution is not transferable at all, so the multiplier will be 1. However, this does not mean that innovativeness is an aim in itself (the more, the better). New solutions may build on existing ones and develop them further. For example, a cheaper way of producing certain technologies may bring these technologies from the pure pilot phase to serial production.

The aim of Ports of the Future is supporting innovation in the port industry in order to prepare it for current and future challenges. Innovativeness is hence not an objective by itself. Rather, innovation is a means to reach certain objectives. While other programmes like Motorways of the Sea concentrate on mature solutions in order to reach certain targets quickly, the innovative solutions the Ports of the Future focus on open up new opportunities. In the end, however, they must lead to measurable results (see Deliverable 3.1).

While the KPIs introduced in Deliverable 3.1 are designed to assess the potential contribution of an innovative action to the Ports of the Future objectives, they are generally applicable to all types of projects and initiatives including mature ones. However, the pure implementation of an existing technical solution in a port is limited to that port. Innovations will have a large potential impact if they open up opportunities in many ports. Innovativeness is hence a prerequisite for transferability.

5. Levels of Innovativeness

In order to measure the degree of innovativeness of a project, we can distinguish five levels:

³ Setting targets and – by that – defining an adequate state and a degree of adequacy would normally come after this step. Only after assessing different solutions and their practicability will it be possible to set realistic targets.

⁴ Including pilot case; 1 if not transferable

1. Very high: development of completely new technical solutions that could also have an impact on other sectors (e.g. invention of ISO container)
2. High: adaptation of existing technology from other sectors or uses to the port sector (e.g. electric AGVs)
3. Medium: Improvement of existing technical solutions (e.g. 'greening' container terminal operating systems)
4. Low: Innovations that make existing solutions more accessible, e.g. cost savings
5. None: implementation of existing technology (e.g. OPS installation)

Ports of the Future projects need an innovative aspect, even if it is only a low degree (levels 1-4). Other stakeholders evaluate innovativeness negatively. Therefore, innovativeness is kept as a dimension of its own in the evaluation process (see Deliverable 3.3) and also in the DSS tool (Deliverable 5.2).

6. Multiple objectives: programme-specific overall contributions

One limitation of adequacy, KPIs and potential contribution is the target/objective-specific scale. Docks the Future has multiple objectives and many projects and initiatives contribute to several objectives at the same time. Therefore, a re-scaling of objectives is necessary for comparison. With comparable scales, it will then be possible to compare the contribution between different objectives. A programme-specific weighing of objectives may then help to identify those projects that contribute most to those objectives which are relevant for the programme.

These questions will be addressed in Deliverable 3.3 (Projects Common Index) and in the Decision Support Tool (Deliverable 5.2).