





D1.6 Port of the Future concepts, topics and projects-consolidated versions

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770064







Document Status				
Deliverable Lead	Circle			
Internal Reviewer 1	n.a.			
Туре	Deliverable			
Work Package	WP1: "Port of the Future": definition of the concept			
ID	Port of the Future concepts, topics and projects-consolidated versions			
Due Date	1 st July 2018			
Delivery Date	11 th January 2018			
Status	Final version			
Dissemination Level	Public			

Document History			
Contributions	Port Expertise, Circle		
Final Version	Circle Port Expertise		





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This deliverable marks the conclusion of WP1-"Port of the Future": definition of the concept, leaded by Port Expertise.

WP1 started with an in-depth desktop analysis of the Concept, including EU policies. In order to arrive at a definition of the port of the future, indeed, the Consortium had to operate within the project's framework as defined in the grant agreement. A clear definition of a port was not supplied in the project proposal but to allow a focused desktop analysis, the following definition of a port was used: "An area on both land and water, whether on the sea or river, that provides facilities for shipping vessels to load and unload their cargo or to let passengers embark or disembark". It is, of course, the intention at the end of WP1 to come to a clearer definition. Further, on the scoping of the literature review in this WP, the following criteria were used:

- Maritime port areas are the main scope;
- The horizon in this 'Port of the Future' project is set at 2030. This is important in considering, for example, alternative energies. Where LNG is considered as a transition fuel in a 2050 horizon, in this context 2030 it is considered as a valid alternative to the classical carbon-based energy sources. It is considered to be capable of both cutting coal-based greenhouse gas emissions and giving way to an emissions-free future;
- Hinterland topics are considered in their connection to the port area;
- Considered transport modes are maritime, road, rail and inland waterway transport;
- Based on an initial 'input' list that was enriched by input from partners to the project

The development of a formal methodology for the desktop study is a critical success factor considering the comprehensive nature of the DocksTheFuture project. The three constituent elements of the assessment methodology are the information model, the work products and the workflow.

1. The information model

The DocksTheFuture project proposal already contains a number of information entities such as "projects and initiatives of interests", "topics", "aims", "KPI's" etc. We renamed or restructured some entities, defined additional entities, gave entities metadata and structured the entities in an information model. A few examples are 1- Renaming: "Projects and initiatives of interests" becomes "Inputs", in other words, the projects studies, white papers etc, and 2- Restructuring: "Topic" remains "Topic", however, we made it a taxonomy consisting of parent topics having child and grandchild topics, instead of a flat list as defined in the project proposal.

2. Work products are tools we use to perform the work. For this purpose,

Some assessors have been using Atlas to tag pieces of text in an input, an assessment template to fill out the result of an assessment, the assessment templates are imported in the DtF database. This database is the physical implementation of the information model. The database is then queried to deliver the results.

3. The main steps of the workflow are:

- Creating a list of possible inputs to be assessed;
- Define criteria select from that list the inputs to be assessed and how to assess, and define the priorities. This is done by grouping together inputs in assessment rounds;

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- Assess the inputs by filling out an assessment template. Those wishing to use Atlas can tag relevant sections of text in this tool;
- Review the assessment templates;
- Import the assessment templates into the DtF database;
- Query the DtF database to deliver the raw data to be included in this database

To support the desktop study, a DocksTheFutured database has been developed. Most if not all data in the first working package (D 1.1) is coming from that database. It is important to note that the DocksTheFuture database contains much more info than what is included in the first work package.

Inputs are the work products that are proposed by the DocksTheFuture partners and their subcontractors to be assessed. There are 340 inputs proposed of which currently 44 have been assessed. There are different type inputs assessed such as project, strategic port plans, scientific papers, etc. Twenty-six different types of inputs have been defined. The following table shows the top ten inputs by Type. Be aware that one input can belong to more than one category.

Туре	Number of inputs
Project	7
Report	6
Article	5
Port Strategy	3
Analysis	3
Scientific paper	3
Best practice	3
Book	3
Master thesis	3
Study	2
Proceedings	2
Case study	2
Implementation plan	2
Action plan	1
Other	1
White paper	1
Research project	1
Strategic vision	1
Website	1





The project proposal already addressed a preliminary research on the Port of Future concept, the definition of several Ports of the Future topics to be addressed and their related targets in 2030 and a preliminary list of projects that could be potentially clustered together with the RIA retained proposals:

- 1. Port infrastructure & management;
- 2. Accessibility and fulfilment of EU standards;
- 3. Integration in supply chain & synchro modality;
- 4. Environmental concerns;
- 5. Sustainability;
- 6. Safety and security;
- 7. Digitalization;
- 8. Port-city relation
- 9. Port governance;
- 10. Human element;
- 11. Relation with neighbouring countries.

As the assessment of the inputs progressed, additional topics were added, and the need for a classification of the various topics soon became apparent.

Specific topics:

- The port-city relation topic is still largely unattended in international studies. Subcontractor AIVP, therefore, provided a port-city checklist covering *spatial organization, environmental challenges, socio-economic development strategies and governance* and port city co-construction to facilitate the detection of port-city elements when assessing an input.
- $_{\odot}$ $\,$ We used the 17 UN SDGs as a checklist for sustainability.

Not all topics have been assigned as frequently. The following table shows the top 10 topic assignments. Be aware that in an assessment more than one topic can be assigned.

Number and name topic	Number of assessments
T60.10: Environmental sustainability	22
T120: Governance	13
T100: Port city relations	13
T60: Sustainability	12
T10.30: Other port infrastructure	10





he concept of "Port of the Future"	
T40: Standards and legal instruments	9
T10.40: Hinterland connections	9
T10: Infrastructure	9
T110.20: Education and training	8
T60.20: Economic sustainability	8
T70: Safety	8
T10.60: Industrial areas	8
T10.50: Logistic areas	8
T90: Digitization, digitalization and digital transformation	8

Within WP1, the other main following deliverables were produced:

- D1.2 Stakeholders consultation proceedings. A consultation of private and public stakeholders revealing their focus on sustainability and digitalization and digital transformation;
- D1.3 Maritime traffic analysis and forecast review Key Results
- D1.4 Analysis of macro-trends and perspectives. Amongst the most important trends affecting the ports of the future are the climate change, the use of alternative fuel, the growing population and urbanisation, introduction of new technologies, shift of trade to non-OECD countries, and the increase of public debt.
- D1.5 Port of the Future concepts, topics and projects draft for experts validation, a combination of D.1.1, D1.2, D1.3, D1.4 and D1.1 (the desktop analysis including EU policies). This document was intended to be reviewed by experts during a thematic workshop to become the final deliverable of work package 1: "Port of the Future concepts, topics and projects consolidated versions (D1.6, present deliverable).

The present deliverable is aimed at describing the workshop with experts, which took place in Oporto the 29th and 30th of October 2018 and the main outcomes coming from the experts.





2. Aim

This deliverable reports about the expert workshop "Docks The Future-Port of the Future workshop with experts" that was held at the APDL (Administração dos Portos do Douro, Leixões e Viana do Castelo) premises the 29th and 30th of October 2018.

The expert workshop is part of Work Package 1 "Port of the Future": definition of the concept, whose aim is to define consolidated "Port of the Future Concepts" based on preliminary activities (proposal preparation stage) and their review with the help of focused actions involving stakeholders and experts. The workshop with experts was conceived to validate the draft version of "Port of the Future" concepts, Port of the Future Topics and Projects and Initiatives of Interest for clusterisation to be used in the following WPs (Deliverable 1.5) as well as gathering a wide range of experiences and opinions from experts in different port fields (e.g. sustainability, digitalization, port-city relations etc).

Altogether 53 experts participated in the workshop, sharing their views during guided parallel sessions. The following chapter presents the details of the preparation of the workshop, its main features and the execution.





3. Preparation and execution of the workshop

3.1 Preparation of the workshop

The preparation of the workshop started early June and begun to take shape during the Technical Management Committee (TMC), which took place in Brussels the 25th of July. During the meeting the Consortium, indeed, discussed the format of the event, the agenda, the refinement of the list of experts already identified in the spring (based on the topic list extensively elaborated in Deliverable 1.1 - Desktop analysis of the concept including EU Policies - key results) and the best location for the workshop. The Consortium agreed on "clustering" the topics deriving from D1.1 (14) into the following main macro-categories in order to make both the workshop and the association of the experts to the sessions:

- Digitalization/ICT
- Environment
- Human element
- Funding/Financing
- Port-city relations
- Policy(integration into the logistics chain and infrastructure)

The above-mentioned list was subsequently further amended into the following list of topics (each topic representing a session):

- Digitalisation and digital transformation
- Environment and energy
- Human element
- Infrastructure / Accessibility and city port relation
- Financing and funding
- Policy (including neighbouring countries / peripherality)

During the summer, when the agenda, the expert and topic lists were consolidated, the experts were invited to the workshop. The agenda can be found in Annex I.

3.2 Profile of the participants

Participants were selected based on their expertise in the different previously mentioned fields. A wide range of experts attended the workshop. The full list of experts can be found in Annex II.

As it can be seen in Annex II, the representatives of illustrious associations, private enterprises and research institutions participated in the workshop. More specifically:

- Intesa San Paolo: Maritime & Mediterranean Economic Department, SRM- Centro Studi Gruppo Intesa San Paolo. SRM coordinated numerous researches on the economy of the sea, ports, interports, railways, logistics, infrastructures also in collaboration with national and international studies offices and university centres.
- ESPO- The European Sea Ports Organisation: the European Sea Ports Organisation is the principal interface between European seaports and the European institutions and its policy makers. ESPO represents the port authorities, port associations and port administrations of the seaports of 23 Member States of the European Union and Norway at EU political level. ESPO also has observer members in Iceland, Ukraine and Israel.





- INESCTEC- Institute for Systems and Computer Engineering, Technology and Science: INESC TEC is a private non-profit research institution, dedicated to scientific research and technological development, technology transfer, advanced consulting and training, and pre-incubation of new technology-based companies. As an institution operating at the interface of the academic and business worlds, bringing closer together academia, companies, public administration, and society, INESC TEC typically applies the knowledge and results generated as part of its research in technology transfer projects, seeking value creation and immediate social relevance.
- CERTH- Centre for Research and Technology, Hellas: the Centre for Research and Technology-Hellas (CERTH) founded in 2000 is one of the leading research centres in Greece and listed among the TOP-20 E.U. research institutions with the highest participation in competitive research grants. CERTH has important scientific and technological achievements in many areas including: Energy, Environment, Industry, Mechatronics, Information & Communication, Transportation & Sustainable Mobility, Health, Agro-biotechnology, Smart farming, Safety & Security, as well as several crossdisciplinary scientific areas. CERTH is partner of the PIXEL project, one of the RIAs (Research and Innovation Action) founded under the Port of the Future H2020 call for proposal.
- Baltic Ports Organization: he Baltic Ports Organization is a regional ports organization inspiring and supporting its members while cooperating pro-actively with relevant partners. BPO was established on October 10, 1991, in Copenhagen, with an aim to facilitate cooperation among the ports and to monitor and improve the possibilities for shipping in the Baltic Sea region. The organization's mission is to contribute to economic, social and environmental sustainable development of maritime transport and the port industry in the Baltic Sea region, thereby strengthening its global competitiveness.
- Greenflow Enviornmental Services Inc.: Greenflow Environmental Services Inc provides waste management and air quality solutions for customers in the manufacturing and industrial sectors including but not limited to.
- AIVP-Association internationale Villes Ports: AIVP is the only international organisation that, for 30 years, has been bringing together all the public and private development stakeholders in port cities. AIVP has had the privilege of bearing witness to the changes underway in cities and ports the world over. AIVP has accompanied its members in the implementation of new strategies that allow them to more effectively face up to the changes that impact economic, social and environmental development in port cities: urban-port integration, global reorganisation of economic routes, the challenge of societal integration, the climate change, the energy transition, the development of the cruise industry, etc.
- Fraunhofer: Fraunhofer is Europe's largest application-oriented research organization and it is Coordinator of the Portforward Project, one of the RIAs (Research and Innovation Action) founded under the Port of the Future H2020 call for proposal.
- FEPORT: Since 1993, FEPORT represents the interests of large variety of terminal operators and stevedoring companies performing operations and carrying out activities over 400 terminals in the seaports of the European Union. FEPORT speaks on behalf more than 1200 companies. Its aim is to promote the interests of its members i.e. national associations and global multinational companies and to maintain constant dialogue with all EU institutional and non-institutional stakeholders.
- ALICE- Alliance for Logistics innovation through Collaboration in Europe: The European Technology Platform ALICE is set-up to develop a comprehensive strategy for research,



innovation and market deployment of logistics and supply chain management innovation in Europe. The platform will support, assist, and advise the European Commission into the implementation of the EU Program for research: Horizon 2020 in the area of Logistics.

- ALICE was created in the frame of WINN project having the European Green Cars Initiative (logistics section) and EIRAC, European Intermodal Research Advisory Council, as background and supporting initiatives. The European Commission officially recognized ALICE as a European Technology Platform in July 2013.
- Escolaeuropa- Intermodal Transport: is a European training center and a reference for intermodal transport and logistics, promoting sustainable logistics in Europe through innovative courses. Its aim is to promote intermodal transport as the basis for sustainable logistics in Europe. The first courses were organised in 2004 and were promoted by the Customer Service Department of the Port of Barcelona with the collaboration of Grimaldi Lines and the Ports of Rome and Lazio. In 2006 the Escola was formally founded in the shape and form as it is known today by the Ports of Barcelona, Rome and Genoa, as well as the shipping companies Grimaldi Lines and Grandi Navi Veloci. The courses were born out of our desire to seek formulas through which professionals and students from the transport sector could have the opportunity to gain a practical and realistic view of the operations.
- PortExpertise is an independent business consultancy for maritime and port professionals combining traditional project methodology with in-depth knowledge of ports and terminals related projects.
- LRQA: Lloyd's Register Quality Assurance (LRQA) is the world's leading provider of independent assessment services including certification, validation, verification and training across a broad spectrum of standards and schemes, with recognition from over 50 accreditation bodies around the world
- SEAbility: SEAbility Ltd. is active in the fields of intermodal Freight Transport (road, air, sea), shipping agencies, and logistics. SEAbility's philosophy is dedicated to the non-stop development of specialised services, related to connectivity issues, data handling and security with the capacity and flexibility to meet its client's specific needs and add tangible value to their business operations. SEability is partner of the Corealis project, one of the RIAs (Research and Innovation Action) founded under the Port of the Future H2020 call for proposal
- Fórum Oceano -Associação da Economia do Mar (Association of Maritime Economy) is a private non-profit corporate body, which aims to promote the Maritime Economy. Fórum Oceano is the merger, by incorporation, of two Portuguese associations Oceano XXI – Association for the Knowledge and Economy of the Sea (established in 2009) with AFEM – Association Business Forum of the Sea Economy (established in 2010), occurred in July 2015.
- Aitec intl: Aitec is a technological centre which most important aim is to get, promote and spread the technology, contributing for the industry development in their technological innovation processes. Aitec is an International Technological Centre, and his main action area is Europe and in particular Spain, Portugal and Poland.
- TU Delft: Delft University of Technology is a public legal entity in accordance with the Higher Education and Research Act (WHW). The main tasks include providing scientific education, conducting scientific research, transferring knowledge to society and promoting social responsibility. The university has been designated as a 'public benefit institution.
- AMT-Autoridade da Mobilidade e dos Transportes: AMT is a public-law legal entity in the nature of an independent administrative entity, with administrative, financial and





management autonomy, as well as its own assets. AMT's mission is to regulate and supervise the mobility, land, river, rail and infrastructure sectors as well as services of general economic interest.

- XLAB is an R&D company with a strong research background in the fields of distributed systems, cloud computing, security and dependability of our systems, information visualization (medical, 2D, 3D GIS, sensors) and image processing (3D reconstruction, segmentation, GIS data fusion). XLAB is partner of the Pixel project.
- Prodevelop is the result of a start-up created in 1993 under the umbrella of the European Centre for Business and Innovation (CEEI) in the Technology Park of Valencia. Right from the start it directed its efforts towards Geographical Information Systems and the application of this technology in the port sector. Prodevelop is partner of the Pixel project.
- Kedge Business School- Kühne Logistics University. Kühne Logistics University is a private university that focusses on logistics, supply chain management, and management. t was founded by the Kühne Stiftung (Kuehne Foundation) which is based in Schindellegi, Switzerland. The contracting body is the Kühne Logistics University GmbH. The non-profit foundation supports education and further education as well as research and science in transport and logistics. KLU comprises two departments: "Logistics" and "Management and Economics", and it spans the whole gamut of university education and executive education, from bachelor's degrees and two master's programs to the structured PhD program.
- Irish Maritime Development Office (IMDO): The Irish Maritime Development Office (IMDO) is Ireland's national dedicated development, promotional and marketing agency for the shipping and shipping services sector. The IMDO is the Irish government agency which provides support to national and international maritime businesses in Ireland. It is the aim of the IMDO to be the focal point for maritime business in Ireland. The IMDO provides government and industry with a range of information and reporting across the sector and works with international businesses to help them set-up or expand in Ireland. The IMDO is also Ireland's designated Shortsea Shipping Agency and provides independent advice and guidance on EU funding initiatives.
- Universitat Politecnica de Catalunya (UPC): it is the largest engineering university in Catalonia, Spain.
- Fundación Valenciaport: The Valenciaport Foundation for Research, Promotion and Commercial Studies of the Valencian region (Valenciaport Foundation) is a non-profit private entity. It has been conceived to further expand the reach of the logistics-ports community by serving as a research, training and cooperation centre of excellence. The Valenciaport Foundation manifests an initiative of the Port Authority of Valencia (PAV), in collaboration with various other associations, companies and institutions. The Valenciaport Foundation projects in well over twenty countries, principally located in Europe, the Far East and Latin America.
- Transtejo Soflusa | Entre as margens do Tejo: is a ferry company operating between Lisbon, on the north side of the Tagus River, to the south side of the river at Trafaria, Porto Brandão, Cacilhas (Almada), Seixal, Barreiro and Montijo. The company operate various types of ships such as catamarans and conventional vessels constructed in Portugal, Singapore.
- The European Federation of Inland Ports: EFIP: EFIP, a promoter of inland ports, brings together nearly 200 inland ports and port authorities in 18 countries of the European Union, Switzerland, Serbia and Ukraine. EFIP highlights and promotes the role of European inland ports as real intermodal nodal points in the transport and logistic chain, combining inland waterway transport with rail, road, and maritime transport.





- Kombiconsult: Consultant of the intermodal logistics industry, its consulting services are aimed at strengthening the intermodality of the logistics industry and thereby increasing the productivity and environmental friendliness of freight transport. Its consulting approach is characterized by combining practical experience, technological know-how and market knowledge with scientific methodology. This ensures creative, customizable solutions.
- Deltares: Deltares is an independent institute for applied research in the field of water and subsurface. Throughout the world, it works on smart solutions, innovations and applications for people, environment and society. Its focus is on deltas, coastal regions and river basins.
- Erasmus University Rotterdam: is a Dutch university based in the city of Rotterdam .The university has seven faculties and focuses mainly on studies in three areas: Law, Medicine and Economics. The Rotterdam School of Management is based there.

3.3 Agenda and conduct of the workshop

The workshop took place during two days, the 29^{th} of October from 2 pm to 6.30 pm and the 30^{th} of October from 9 am to 2.10 pm

Workshop day 1 took place at APDL (Administração Dos Portos do Douro e Leixões sa). After the welcoming form the project consortium, 2 parallel sessions on the six pre-identified topics took place during the afternoon. 5 breakout sessions (each grouping together a number of topics), were carried out in 2 rounds, resulting in 10 breakout sessions in total. The high-level objectives of the thematic workshop in general and more specific of the breakout sessions were:

- To review D1.5- Port of the Future concepts, topics and projects draft for experts validation, on its accuracy, completeness, correctness, consistency and relevance for the "ports of the future" concept;
- 2. To come to a general agreed and actionable definition of ports of the future, including among others the key characteristics of a port of the future;
- 3. To get the experts 'opinion on whether or not WP1 can be closed and other DocksTheFuture work packages depending on it can be initiated;
- 4. To learn as much as possible from the practical cases experts are involved in.

Each of the 2 times (round A and B) 5 breakout sessions there were following roles:

- 1. Experts were invited to give their professional opinion on D1.5, advise on how to improve the work in the DocksTheFuture project and enrich the work with some best practices from their own sector or profession;
- 2. A moderator for each session guided the review process, structured and visualised ideas, suggestions and remarks proposed by the experts by using the appropriate tools;
- 3. A scribe for each session took note of all the discussion by filling out a review report. Scribes were also asked to prioritize the proposed actions and as well as focusing on interdependencies between topics, measures and tactical objectives
- 4. Rapporteurs were one of the experts and he or she who prepared, together with the scribes and moderators, a presentation for the plenary sessions on day 2. While the review report captures the details of the breakout session, and the recommended actions to improve D1.5, the presentation for the plenary had more a helicopter view and a vision for the future by 2030





















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The workshop continued the following day with a different format. Day 2, indeed, consisted in presenting the results and the main outcomes in the form of 3 key messages from the parallel





defining the concept of "Port of the Future" sessions of Day 1. During day 2, presentations from the following experts on their vision of the Port of The Future were also given:

- TU Delft Jill Slinger
- Deltares Wiebe De Boer
- Transport regulator prospective João Carvalho
- Port city relation AIVP
- Baltic Port Organisation- Bogdan Oldakowski
- Med Ports Association Jordi Torrent
- Maritime trends Alessandro Panaro
- Women in transport Gemma Molero























3.4 Materials provided to the experts in preparation of the workshop

In order to guarantee the best execution of the workshop, two documents were sent to experts:

- 1. D1.5 Port of the Future concepts topics and projects draft for experts validation
- 2. DTF_Guide_thematic_sessions_workshops

Since D1.5 is a 267 pages document, the guide for thematic sessions aimed at guiding and helping them to review it in the most efficient and effective way.

The guide explained:

- The nature and the objectives of D1.5. This deliverable, indeed, merges the outputs of 4 tasks executed with reference to Work Package 1 ("Port of the Future": definition of the concept) i.e. a desktop analysis, a stakeholder consultation, analysis and forecast of the maritime traffic and analysis of macro trends and perspectives in the maritime sector.
- The objectives of workshop with experts: i.e.
 - 1. To review D1.5 on its accuracy, completeness, correctness, consistency and relevance for the "ports of the future" concept;
 - 2. To come to a general agreed and actionable definition of ports of the future, including among others the key characteristics of a port of the future;
 - 3. To get the experts' opinion on whether or not WP1 can be closed and other DocksTheFuture work packages depending on it can be initiated;
 - 4. To learn as much as possible from the practical cases experts are involved in.
- Roles foreseen during the breakout sessions (please refer to the paragraph "agenda and conduct of the workshop")
- Detailed agenda and timeline of the breakout sessions
- Approach: the experts were especially invited to express their ideas in an as direct as possible but polite way. It was pointed out that focus is on reviewing deliverable D1.5 but the moderator could have chosen to elaborate on certain points whenever appropriate.
- Sections of D1.5 are recommended to be read in preparation to the participation of each breakout session.
- Explanation of the checklists completed and filled out by the scribes during the breakout sessions





4. Outcomes from the workshop

The "Thematic workshop with experts" is task 5 of DtF WP1. It consisted of plenary sessions at one hand and 5 BoS (Break-out sessions) on the other hand:

- 1. Digitalization and digital transformation;
- 2. Sustainability;
- 3. Port-city relations;
- 4. Infrastructure;
- 5. Means of transport and accessibility;
- 6. Competition, cooperation and bridging R&D.

The BoS were organised in 2 rounds, each round with different participants. The GA (Grant Agreement) uses specific wording concerning this workshop: "to solve work related problems...", "validate desktop and data analysis...", "review ...", "providing material and or ideas...", "Final version of concepts, topics and projects for clusterisation...". It also states that the outputs of tasks 1 to 4 are a draft version to be submitted to the experts and based on their feedback a final version will be issued. Considering this task description, it was very clear that this is a structured review of the deliverables of WP1, consolidated in D1.5, and not a kind a free exchange of ideas in the form of a brainstorming with experts.

The input of the workshop is document D1.5 and the output after **verification** and **validation**¹ is document D1.6, which is an update of D1.5.

With a "Structured review" perspective in mind a guidance document for the breakout sessions was written both for the DtF team and for the participants (DocksTheFuture-GBE-20180CT18-Update of guide for the breakout sessions of the thematic workshop-34- Annex III). This note contains the high-level objectives of the thematic workshop in general and more specific of the breakout sessions. As already mentioned, this note contains the high level objectives of the thematic workshop in general and more specific of the thematic workshop in general and more specific of the thematic workshop in general and more specific of the breakout sessions

- 1. To review D1.5 on its accuracy, completeness, correctness, consistency and relevance for the "ports of the future" concept.
- 2. To come to a general agreed and actionable definition of ports of the future, including among others the key characteristics of a port of the future.
- 3. To give your opinion on whether or not WP1 can be closed and other DocksTheFuture work packages depending on it can be initiated

¹ Verification means "Checking conformance with the requirements". In the context of DtF verification of WP1 means "Does D1.5 contains what we promised to deliver in the GA". 2. Validation means "Fit for its intended use". In the context of DtF "intended use" means 3 different things for 3 stakeholder perspectives.

For the DtF team. The objective of WP1 is to set the baseline for all the other work packages (WP4 and WP6 are only partly affected). So this is a dependency analysis, which implies that the scope and action plan of each WP is defined in more detail than what is described in the GA. The question, to the WP2, WP3 and WP5 leaders is "Can you do your thing with the current outputs of WP1", these outputs being mainly D1.5 and the DtF database

^{2.} For the RIA project. We should align with the RIA projects on the high level concepts and to a bare minimum this is the definition of ports of the future and the updated topic list.

^{3.} For the external parties including but not limited to the participants of the Porto event. The question here is "Is the current output of DtF fit for your intended use?"





4. As DocksTheFuture team we would like to learn as much as possible from the practical cases you are involved in.

4.1 Results

4.1.1. Coverage of the checklist

This section answers the question if the checklist used for the BoS sufficiently covers the scope of WP1. D1.5 and the DtF database contains a list of 16 topics, some of which are further divided in child topics and grandchild topics in total 55. Besides the predefined topics there was also one additional topic on occupational health not yet processed. DocksTheFuture-GBE-20180CT18-Update of guide for the breakout sessions of the thematic workshop-34.docx contains a mapping between BoS and the topic list (Section Topics by break out session). The list of breakout session was updated to cover as many level 1 topics as possible. From that perspective, all topics were covered and certain topics were actually covered in more than one BoS.

Summary

This section answers the question if the items defined in the checklist were discussed sufficiently in a way that we can act upon the suggestion made by the experts. In quality assurance speak one would call this "Operating effectiveness" (Have we done what we promised to do in our process assets).

A summary of the break-out sessions	checklists	in which	scores	have b	been	calculated	as fo	llows
is presented below:								

Score	Description
10	An answer is given that is related to the question asked and that answer is at least partly actionable, in other words, we can act upon it in the context of DtF. The fact that we give it a high score does not automatically means that the DtF team agrees with the assertions made nor that all actions would be taken.
3	SOME answer is given, however the answer is not directly linked to the question asked, the answer is incomplete or unclear or it is not actionable, in other words there is very little we can do with it in the context of DtF.
0	No answer given, the answer is completely irrelevant, only a reference is set to another question or the point has been mentioned but the participants did not have any specific comment. When an answer is given that has nothing to do with the question asked, then the answer is replaced by "Not covered".

Max score	Digitalization and digital transformation	Sustainability	Port- city	Infrastructure, means of transport and accessibility	Competition, cooperation and bridging R&D and implementation	Total





Total		29.6%	48.8%	55.0%	23.8%	14.0%	34.2%
Part I	100	32.0%	46.0%	43.0%	20.0%	3.0%	28.8%
Part II	100	36.0%	33.0%	59.0%	36.0%	23.0%	37.4%
Part II	300	12.0%	86.0%	75.0%	10.0%	16.0%	39.8%

4.1.2 Consolidated answers- explanation of the tables

11	Quality of D1.5 section desk top study
Question	 Overall assessment of the quality of task 1, the desktop study <u>D1.5 section 8.2</u>; <u>D1.5 section 9.1.6.1</u> contains a long of inputs that have been considered for the desktop study and the once that have actually been assessed. Are there any fundamental inputs that you would like to propose for assessment? Please propose additional projects, books white papers, etc that are essential to complete our vision about ports of the future.
Quantitative	3 46%
Consolidated answer	 Port-city gives the following clear recommendations for additional studies to be considered. Exploring the conditions for inclusive port development: the case of Indonesia - https://doi.org/10.1080/03088839.2018.1472824 ; https://ec.europa.eu/transport/themes/urban/urban_mobility/urb an_mobility_actions/sump_en (Sustainable Urban Mobility Plan); Port sustainability program of Antwerp 2018 (https://www.sustainableportofantwerp.com/en/) (already assessed); http://www.eltis.org/sites/default/files/trainingmaterials/enclose_d5_2_sulp_methodology_final_version_0.pdf (Guidelines for developing and implementing a sustainable urban logistics plan)

14	Quality of D1.5 section macro trends, overall
Question	 Overall assessment of the quality of task 4, macro trends <u>D1.5 section 6.5</u>; DocksTheFuture is a project for the future, so it is important that we try as much as possible to know where we are heading at. Are there macro trends currently not covered under <u>D1.5 section 6.5</u>? Are the currently defined macro trends, evident based? Do they as far as possible and as far as needed for DocksTheFuture correctly set the scene for the ports in 2030?
Quantitative	3 60%
Consolidated answer	 We have a good overview of trends, but the impact of these trends on the ports of the future is not analysed. E.g. bigger ships> more dredging cost, autonomous ships -> adapt quay walls; Recommended to look at ESPO environmental reports and what happens outside the EU to define trends; The type of expertise, skills, and jobs necessary in the port are changing (e.g. automation is related to losing jobs); Port economy is becoming a knowledge-based economy; therefore, ports are
	 now competing with other sectors to attract new talents (e.g. an IT expert); Circular economy;





ining the	concept of "Port of the	Future"	
5	14	Qualit	y of D1.5 section macro trends, overall
		•	Economy of scale has reached or is going to reach its limit;
		•	Increasing conflicts between port and cities in terms of traffic congestion,
			pollution, mass tourism and rise of cruise companies. For instance the port of
			Malta can accommodated up to three-four cruise ships but the city cannot accommodate the tourists;
		•	Social unpredictability (instability) and inclusion problems due to the growing differences between poor's and riches:
			anterences between poor 5 and nenes,
		•	Aging infrastructure;
		•	Remote piloting of ships.

Question D1.5 section 5 "Ports of the future defined" contains a definition of the port of the future. This definition defines the scope of the whole project. • The definition of the geographical and functional delimitation, so the services, of the port? • Are the key characteristics of a port in 2030 complete, specific and actionable? If not, can you update or add missing elements to that definition; • Can you provide us with a definition of ports of the future from literature, academic world or your projects? Quantitative 3 • The statement "services with minimum negative impact" is wrong. It should be no negative impacts or focus more on the positive impacts;	20	Ports of the future definition		
 The definition of the geographical and functional delimitation, so the services, of the port? Are the key characteristics of a port in 2030 complete, specific and actionable? If not, can you update or add missing elements to that definition; Can you provide us with a definition of ports of the future from literature, academic world or your projects? Quantitative The statement "services with minimum negative impact" is wrong. It should be no negative impacts or focus more on the positive impacts; 	Question	<u>D1.5 section 5 "Ports of the future defined"</u> contains a definition of the port of the future. This definition defines the scope of the whole project.		
 Are the key characteristics of a port in 2030 complete, specific and actionable? If not, can you update or add missing elements to that definition; Can you provide us with a definition of ports of the future from literature, academic world or your projects? Quantitative 3 60% Consolidated answer The statement "services with minimum negative impact" is wrong. It should be no negative impacts or focus more on the positive impacts; 		• The definition of the geographical and functional delimitation, so the services, of the port?		
 Can you provide us with a definition of ports of the future from literature, academic world or your projects? Quantitative 3 60% Consolidated answer The statement "services with minimum negative impact" is wrong. It should be no negative impacts or focus more on the positive impacts; 		• Are the key characteristics of a port in 2030 complete, specific and actionable? If not, can you update or add missing elements to that definition;		
Quantitative 3 60% Consolidated answer • The statement "services with minimum negative impact" is wrong. It should be no negative impacts or focus more on the positive impacts;		• Can you provide us with a definition of ports of the future academic world or your projects?	from literature,	
 Consolidated The statement "services with minimum negative impact" is wrong. It should be no negative impacts or focus more on the positive impacts; 	Quantitative	3 60%		
 Consider port and the city as an integrated ecosystem instead of 2 separate things; A port of the future is proactive and promotes innovation; The port of the future is prepared for the climate change; Do not formulate from the client or stakeholder perspective but from the society as a whole; Include services going beyond the pure maritime and transport services; 	Consolidated answer	 The statement "services with minimum negative imparts be no negative impacts or focus more on the positive Consider port and the city as an integrated ecosystem things; A port of the future is proactive and promotes innovat The port of the future is prepared for the climate chan Do not formulate from the client or stakeholder perspesociety as a whole; Include services going beyond the pure maritime and 	ct" is wrong. It should impacts; instead of 2 separate ion; ge; ective but from the transport services;	
Consider port clusters.		• Consider port clusters.		

40	Domain model for port of the future	
Question	 information model for the ports of the future has been defined (<u>See D1.5</u> <u>ctions 7 and 11.1.1 "The information model"</u>). The results of among others the sktop analysis and have been stored in a relational database. Do we agree with the statement that this is actually a domain model for the port of the future concept? Are the information entities and their relations correctly defined and sufficiently populated? 	
Quantitative	2 12%	
Consolidated answer	 Include list of actors and business rules in the domain model; Call it an ecosystem; Foresee the possibility to tailor the information model according to the capabilities of ports and different business models. 	





50	EU policies and legislation	
Question	<u>D1.5 section 5</u> is about "EU policies and legislation". Please indicate if we are missing some policies or legal frameworks that are fundamental for ports of the future	
Quantitative	2 12%	
Consolidated answer	Map policies and legal instruments to the list of topics; The sustainability BoS references to the list of additional studies mentioned under question 11	

60	Planning horizon 2030, overall		
Question	What is your vision about putting the planning horizon for ports of the future in 2030?		
Quantitative	4		26%
Consolidated answer	•	Setting the same target for everything is difficult. E.g. for ICT investments 5 years is a long time but for infrastructure and sustainability we should look further in the future. We expect from the EU to set the long direction; 2030 is may be very close by, but on the other hand, we can set tangible objectives.	

100	Gaps, main challenges, preconditions and external factors		
Question	What are the current gaps, main challenges, preconditions and external factors to be successful concerning [Breakout session]		
	Consider legal, technological, financial business processes, human element factors and standardization.		
Quantitative	5 86%		
Consolidated answer	 Preconditions We need to have the business processes and the actors and business rules defined end to end; Ownership of exchanged data must be defined; Data must be exchanged in a secured way; Interoperability of ICT systems and harmonization of business processes especially within a sector; Establish a legal basis for trusted exchange of data; Define clear objectives for data exchange; Have a good balance between society, ecology end economy. 		
	 Gaps Government is not capable of following the digitalization trend; Insufficient training of actors in the business processes; The public is insufficiently aware of the functioning of a port; The port cities are not ready for global networks in terms of accessibility, interoperability, and synchronization between local/regional and core networks; Overcome chicken and egg problems (example LNG fuel); Ports cannot comply with certain legislation because the infrastructure is not ready e.g. on delivering waste waters. Challenges Avoid vendor lock-in; Take into account the capabilities of SME. 		
	 External factors Digitalization is driven by the private sector; Bigger ships; Less public funding; Urbanization; 		





defining the concept of "Port of the Future" **100 Gaps, main challenges, preconditions and external factors**

International trade agreements

110	Tactical objectives		
Question	<u>D1.5 section 9.1.6.3</u> defines a number of tactical objectives linked to topics or subtopics. Be aware that some of these tactical objectives are linked to more than one topic. Tactical objectives are or should be made SMART by defining KPI's or other measures to them. Please review the list of tactical objectives applicable to [Breakout session].		
	 Are these tactical objectives really tactical objectives or are they rather solutions? Are these tactical objectives for 2030 or are they already realised in most of the ports? 		
	 Are these tactical objectives generic or specific for certain port profiles (size, cargo type)? What are the critical KPIs or metrics or at least categories of metrics such as operational, financial, quality, safety etc. that you recommend to measure progress in the ports concerning [<i>Breakout session</i>]? What is the recommend practice for reporting about metrics (static/dynamic, absolute values/benchmark, use of tools and platforms, etc.? Would the tactical objectives for [<i>Breakout session</i>] improve customer 		
Quantitative	2 26%		
Consolidated answer	 The tactical objectives currently in D1.5 has not been assessed in any BoS; Objectives and KPI's for digitalization and digital transformation should be defined; Objectives and KPI's for safety and security should be defined Objectives and KPI's for cooperation and supply chain integration should be defined; Main attributes of KPI's such as measurable, simple, actionable etc should be defined; KPI's should be dynamic in nature, meaning that dashboards should show evolution. The trend is more important than the current value. 		

100	Baadman		
120	коастар		
Question	What essential elements should be contained in a strategic plan or roadmap for <i>[Breakout session]</i> ? Be aware that names of these plans differ by <i>[Breakout session]</i> e.g. "Strategic ICT plan" for digitalization and digital transformation or "sustainability plan" for sustainability.		
Quantitative	2	26%	
Consolidated answer	 Create a common development and defining educational and research p external people in the port with spe students, researchers, common peo social networks with labs, research Experts clearly advised that there sl and where possible adapt these roa 	26% Create a common development and a common culture of both port and city by defining educational and research paths with improving the accessibility of external people in the port with specific spatial allocation. This should involve students, researchers, common people by realizing (physical and not virtual) social networks with labs, research centres, recreation spaces, etc.; Experts clearly advised that there should be a strategic roadmap for each port and where possible adapt these roadmaps to ports across Europe.	





121	Resistance against change		
Question	Change management. What resistance against change do we encounter and what techniques can we use to overcome this resistance.		
Quantitative	3	60%	
Consolidated	Switch from top-down management	to network management;	
answer	 Use a common language and clear definitions of concepts; 		
	 Education and training; 		
	 Describe business processes; 		
	 Transmit a green image and show s 	uccess stories;	
	Make a clear business case and interview.	ernalise external costs;	
	 Involve stakeholders. 		

140	Technology		
Question	 What are the main technologies that will affect ports in 2030 concerning [Breakout session]? Be aware that what is currently new might be completely outdated by 2030. Also what currently is a mature technology is not something we recommend for the future. Referencing Gartner's hype cycle, we should assess technologies that are at the "slope of enlightenment"; What new technologies might have a disruptive nature? What current jobs or businesses can we expect to be most affected by what technology trends? What opportunities? What business models will fundamentally change as a consequence of new technology 		
Quantitative	4	80%	
Consolidated answer	 Major technology chance might com Look at different platforms (NxtPort Look at industry 4.0 and see how th Focus on (ICT) education and trainin Completely new business models a of the introduction of new technology to a goal. e.g. The use of technology infrastructure, avoid congestion; We need to define the applicability vehicles would be feasible on termi between islands; The more a port is specialised the r automation; Automation needs a minimum volution. More data available also means that available, quicker; 	 Major technology chance might come from small start-ups; Look at different platforms (NxtPort, Port+, PierNEXT, The Docks; Look at industry 4.0 and see how this would affect ports of the future; Focus on (ICT) education and training; Completely new business models and business processes as a consequence of the introduction of new technology; The introduction of new technology is not an end goal but just a means to get to a goal. e.g. The use of technology could lead to a more effective use of infrastructure, avoid congestion; We need to define the applicability of new technology. E.g. autonomous vehicles would be feasible on terminals, for small barges, but probably not between islands; The more a port is specialised the more opportunities there are for automation; Automation needs a minimum volume; ICT platforms should not be stand-alone islands bu integrated in a federated architecture; More data available also means that we would have better statistics 	





As a consequence of new technologies, operational processes will run faster, • so administrative processes should also run faster.

150	Risks	
Question	What are the risks of the to-be situation concerning [Breakout session]?	
Quantitative	1	20%
Consolidated answer	 Growing conflicts between ports and cities; An identified risk is the conflict deriving from the different planning levels of ports and cities (e.g., involving trucks in short sea shipping is good for society but bad for the urban congestion); An identified risk is the conflict deriving from the benefits of the long term period versus the short term period (e.g. loss of jobs in the short period due to automation but environmental improvement in the medium-long period); 	

160	Topic interdependencies and human element	
Question	Define interdependencies between the topics covered in [Breakout session] and all other topics covered in the other breakout sessions What are the essential human elements concerning [Breakout session]. Consider lack of qualified people, resistance against change, training, etc.	
Quantitative	3 18%	
Consolidated answer	Consider lack of qualified people, resistance against change, training, etc. 18% Most if not all feedback is given concerning the human element topic (T110), and to a smaller extent with governance (T120) while the interdependencies with other topics are hardly covered. Training should be according to the port strategy and visions. For C levels this should be about megatrends, so that they know what the future will bring. For operational profiles it should be on the use of new technology, newly automated business processes, new roles, specialized skills, safety, security, etc.; There are several levels of technology knowledge; New type of workers will require new forms of education and training. E.g. persons able to analyse data. Involve other actors in addition to port and city in the planning process. Among them: city council, education institutes (port training school), metropolitan or even regional transport authorities (depending on the ports) and road operators, environmental agencies, citizen committees The social dimension is still the most important and human are the most valuable asset for ports. Therefor introduction of new technology should be human centred strive, we should strive for gender equality and for good relations with the labour force. In the end we want a good work life balance	





170	Key message to the EU		
Question	 What do we expect from the EU concelegislation, funding, architecture frame and B2G/G2B interaction; Do the current strategic documents from sufficiently cover the needs of the port. What is the key message we would like concerning [Breakout session] 	rning [Breakout session]? Consider e.g. eworks, building blocks, standardization, om the EU concerning [Breakout session] ts in 2030; e to transmit to the EU policy makers	
Quantitative	4	38%	
Consolidated answer	 EU should develop one common visi will be taken over by external players Making the pollution costs clear; Provide more incentives and funds a EU cohesion on all transport system approach; Publish open data. 	EU should develop one common vision and strategy or else our supply chains will be taken over by external players and countries; Making the pollution costs clear; Provide more incentives and funds among others for greening ports; EU cohesion on all transport system and an integrated multi-modal transport approach; Publish open data.	

180	Best practices	
Question	Define best practices concerning [Breakout session]	
Quantitative	2	20%
Consolidated answer	 Best practices have only been defined in t Collaboration with the city can be a more ambitious (e.g., Vancouver is the city); Ports sand cities have to cooperate and views of both the actors (CODE COLLABORATION - COORDIANTION); Concerning the green energy, the pothe city 	he port-city BoS. very important factor for the port to be a very green city and the port adapted to in development to integrate the needs VELOPMENT - COOPERATION - ; ort of Antwerp produces clean energy for

Digitalization and digital transformation

200.10	Impact of digitalization and digital transformation on other topics	
Question	Digitalization and digital transformation are not a final goal in itself. On what topics would digitalization and digital transformation have an impact? Consider e.g. smart traffic management, multi and synchro modality, safety, security, sustainability, mobility	
Quantitative	1	30%
Consolidated answer	Some information has been however the question asked is not really answered with the exception of:	





he	concept of "Port of the	ture"
	200.10	npact of digitalization and digital transformation on other topics
		The impact of digitalisation and digital transformation on other topics depends upon many factors including the sector concerned, the business model, the roles of the actors in the international supply chain; We need to assess this impact from different angles: business, technology and legislation.

200.40	EU digital agenda	
Question	What is your opinion about the EU digital agenda (digital single market, interoperability and standards, trust and cybersecurity, ultra-fast internet, research and innovation, digital literacy, benefits for the society	
Quantitative	1	30%
Consolidated answer	More regulation and enforcement by the EU.	

Sustainability		
300.10	Are 17 UN SDG's indivisible	
Question	Concerning the 17 UN SDG's, do you consider these all applicable to ports, in other words are they indivisible or can ports only focus on some of them? If they are all applicable, are some more important than other? Do you dispose of a "translation" between these very generic goals for "the whole world" to SMART goals for the ports of the future?	
Quantitative	1	100%
Consolidated answer	 The port should not deal with sustain the rest but apply a holistic approace management systems based upon in frameworks such as ISO 26000, AA Ports and their stakeholders should scope for them. Affordable and clear communities (11), life below water of considered most relevant. Striving frargets would be inefficient; A prerequisite for successful implementation and approximate approximate and approximate and approximate ap	inability as something separate from all ch by developing an integrated internal standards, best practices and 1000 or GRI; I define which of the 17 UN SDG's are in on energy (7), sustainable cities and (14) are amongst those that are for all 17 UN SDG's and 169 concrete mentation of UN SDG's is stakeholders

300.20	Planning horizon 2030, by BoS	
Question	The horizon of DocksTheFuture is 2030 bu much further away. Do you consider this a technology that is at mid-term the only fea the longer term.	It the horizon for sustainability planning is s a risk? Consider e.g. the promotion of sible solution but not a solution at all for
Quantitative	1	100%





300.20	anning horizon 2030, by BoS
Consolidated answer	2030 Is a risk as changes continue beyond it. focusing ion 2030 can make you blind for that;
	Ports should be adaptive to any changes, independent of the time horizon.

300.30	Impact macro trends on strategic decision	s of the port
Question	How do macro trends influence port opera energy use/optimization and environmenta	tions and strategic decisions relative to al footprint?
Quantitative	1	30%
Consolidated answer	Macro trends do influence operations and strategic decisions; Ports need to be flexible and allow for multi-functional use of space and infrastructure.	

300.40	Making the business case of sustainable investments	
Question	aking the business case of sustainable investments. Is it correct that in many ses a sustainable solution would be more costly than a traditional investment and this is the case how can sustainable projects get financed?	
Quantitative	1 100%	
Consolidated answer	 This is an old fashioned way of seeing things. We should change the view of ports to not to look as sustainability as a cost; The regulator should enforce certain investments; Sustainable investment are not necessarily more costly, they can be economically beneficial, especially in the long-term; Make stronger concession agreements and include KPI's about sustainability; Make a life-cycle analysis. In the short-term sustainable investment can be more costly but not in the long-term. 	

300.50	Sustainable investments with maximum return	
Question	What environmental and/or energy investment have the biggest positive impact on both corporate results and environmental footprint	
Quantitative	1	100%
Consolidated answer	 Circular economy; Industrial symbiosis; Energy efficiency management; Fund transition to the renewable energy; Implement an energy management in operations based upon ISO 50001; Work with nature instead of protect against it. 	





400.10	Spatial organisation	
Question	Spatial organisation.	
Quantitative	1	100%
Consolidated answer	A port affects a wide area of typically 200 km radius. Therefore the port not only needs structures for loading/unloading but, being often nodes of the transport networks (TENT-T), it needs support infrastructure for the territory and their interoperability and synchronization. In this view, the problem is more relevant for port inside cities	

400.30	Socio economic development strategies	
Question	Socio-economic development strategies.	
Quantitative	1	100%
Consolidated answer	 Common education path and possil Training could be a tool for improving in finding port-related jobs); Youngsters should be shown the potthem in their studies and job search 	bly shared physical space; ng social inclusion (for instance by helping ssibilities of career in ports, to orientate n.

400.40	Governance and port-city co-construction	
Question	Governance and port-city co-construction.	
Quantitative	1	100%
Consolidated answer	Promote co-development;The port must invest and be an activity	ve actor in order to become a public good.





Infrastructure, means of transport and accessibility

500.20	Modal split	
Question	What are key measures to shift cargo off th	ne road (modal split)?
Quantitative	1	30%
Consolidated answer	Continuation of investments of terminal operators in hinterland rail services and investments of port authorities in inland port infrastructures.	

500.40	Use of ICT to reduce congestion	
Question	How can information technology be used to	o reduce congestion?
Quantitative	1	30%
Consolidated answer	ICT can be used for a better time scheduling along the logistic chain, in order to reduce congestions in the hinterland.	

600.50	Cooperation with and knowledge transfer to neighbouring countries
Question	 How should the EU or its members states cooperate with other countries? What about knowledge transfer to and from neighbouring countries? What countries should the EU cooperate with?
Quantitative and score	1 30%
Consolidated answer	 Unified EU Voice about mature ideas; How to plan the infrastructure - to expand and too cooperate with other non-countries (Russian ports - some common things with the Baltic sea) and it is a be exported of oil, gas and coal and consumer stuff; Cooperation between ports but investments in the size of ports and vessels. However, ship-owners they only do CBA in the sea side, so they both cooperate ship-owners and Ports in the CBA); Promotion of more logistics spaces - to stablish a package of logistic across countries; Cooperation with the third countries.

600.100	Financial instruments	
Question	What financial instruments do you know of topics mentioned above?	f to stimulate cooperation concerning the
Quantitative	1	30%
Consolidated answer	CEF Blending;EIB.	





5. Recommendations for the future

Lessons learned and subjects to be explored

The workshop was very intense, productive and allowed the DTF consortium to gather interesting feedback from the experts. This first experiment requires us, however, to observe also the weaknesses at organizational and methodological level to refine and improve the execution of future interactions with experts. It is necessary, indeed, to analyze the weaknesses in the organization of the meeting as a cue for improvement for subsequent events

A criticism made by many experts regards the length of the document provided for the preparation of the workshop (Deliverable 1.5). Despite the detailed explanatory guide, many considered it complex to prepare for the workshop based on a document so extensive and full of content. One the most lessons learned is therefore that, in the future, more easily legible documents should be sent, maybe in the form of executive summaries.

As for the content point of view, important themes of in-depth study and recommendations emerged for the future course of the project both during the workshop and in the last months, especially from interactions between the Consortium and important stakeholders such as IMO (the International Maritime Organization). To name, but a few:

- Since the type of expertise, skills and jobs necessary in the port are changing, it was recommended to further analyse the impact of automation on the job
- In-depth analysis of the following subjects related to the port of the future:
 - Autonomous vessels
 - Energy management
 - o Internationalization

Development of **autonomous means of transport**, across land, air and sea, indeed, has recently gained substantial attention and have implications for ports and logistics firms. Already there are special autonomous trucks within ports to move containers. There are advantages of investing in driverless vehicles. Safer transport is at the main focus as research shows that up to 90% of road traffic accidents are originated from human errors by the drivers. Furthermore, autonomous systems always monitor and adapt to varying traffic and weather conditions, and doing all this with more speed, and safety than human drivers. It increases the efficiency of transport while lowering the environmental impacts due to less fuel consumption. In the maritime industry, the Rolls-Royce estimates a reduction of fuel consumption by up to 20%. As a result of the elimination of accommodation on a crewless vessel, overall operating expenses will be cut by around 40%. KONGSBERG is also developing autonomous/unmanned / self-driving ship control systems. Kongsberg projects have a focus on integrated sensor technology, and automated collision avoidance.

The second topic of interest emerged concerns **energy management** in ports. Recent years have witnessed the term 'energy management' increasingly being used within a wide spectrum of industrial sectors worldwide. According to a report from the International Energy Agency (IEA) in 2017, Energy production and energy use accounts for two-thirds of the world's greenhouse gas (GHG) emissions. To counteract, energy management and improving energy efficiency has gained a significant attention and is becoming a top priority, particularly after the entry into force of the





Paris Agreement in 2016. Ports can play an important role in reducing energy consumption thought operational, technological and managerial solutions. According to the International Energy Agency report in 2017, the total world energy consumption will rise 28% by 2040, and ports as the main gateways between countries contribute notably to the high demand of energy. In response, resource management is becoming crucial for the sustainable development of ports and to reduce air emissions pollution.

The improvement of energy efficiency policies and strategies, indeed, is one of the most costeffective ways to currently improve the security of supply, reduce energy-related emissions. In addition, it assures the affordable energy prices, and improve economic competitiveness. For this purpose, the Energy Efficiency Directive (EED; Directive 2012/27/EU) entered into force on in 2012. The EED establishes a common framework of measures across the Member States to ensure the achievement of the EU's 20% headline target on energy efficiency by 2020, and to pave the way for further energy efficiency improvements beyond this date. The target is to enhance efficient use of energy in supply and demand side and explains requirements of energy audits and energy management systems. This covers both large as well as small and medium-sized enterprises (SMEs). Whilst large enterprises are required to be subject to an energy audit by 5 December 2015 and at least every four years thereafter

Raising the environmental profile of European ports and promoting excellence in port environmental management and performance is one of the European Ports Policy's key priorities. The need for well-connected port infrastructure, efficient and reliable port services and transparent port funding is profound. The European Sea Ports Organisation is the principal interface between European seaports and the European institutions and its policy-makers. Since 1996, it has been monitoring the main environmental concerns of European port authorities in Europe. *"Reducing the Energy Consumption"* is the second biggest priority out of a list of 34 environmental issues for European Ports since 2016. The link between carbon footprint and climate change that has become an important driver of environmental and energy policies at ports over recent years.

This has led to 57% of the European ports to develop energy efficiency programmes. However, this percentage will likely increase, considering the focus that the EC on efficiently addressing port externalities as highlighted in the European Ports Policy. Furthermore, the International standard ISO 50001 paving the way towards efficient port energy management. According to the ISO organization and European standards, ports are starting to develop energy management plans (EnMPs), either at a port authority or at a terminal operator level, as part of their overall "green" port policy (Boile, Theofanis, Sdoukopoulos, & Plytas, 2015).

In May 2014, the European Commission (EC) released its *Energy Security Strategy* in which it developed a set of short- and long-term measures in order to ensure a stable and abundant supply of energy for European citizens and the economy. The European Council endorsed 30% energy efficiency improvement targets (Boile et al, 2015). Ports are increasingly developing policies and practices to reduce the carbon footprint of the ports and their stakeholders. These strategies range from monitoring tools to investments in renewables and carbon-free energy, the development of visions to decarbonise the industry in the port.

Why is Energy Management important for EU Ports?

A Port Energy Management Plan (PEMP) is a crucial tool to address environmental objectives by structuring an in-detailed analysis of the current energy consumption in the port area and subsequently propose potential energy-saving solutions. The primary objective is to maximise the profit and to minimise the cost in a low-carbon economy systematic approach. In detail there are





three groups of specific objectives to achieve by Energy Management System application in EU Ports:

1- To meet the following European Directives and strategies at local and regional levels:

- Energy Efficiency Directive (EED; Directive 2012/27/EU)
- Directive 2014/94/EU on the deployment of alternative fuels infrastructure
- Europe 2020: A European Strategy for Smart, Sustainable and Inclusive Growth
- European Energy Security Strategy, published in 2014 by EU Commission.

2- To address environmental concerns:

- Reduction in energy consumption and consequently CO2 Emission from port activities.
- Defining goals that result in the reduction of port-related Air Pollutant Emissions and the health cost on local communities in port-city
- Raising the environmental profile/performance of ports and promoting innovation in sustainability.
- To reduce the energy consumption and improve the air quality which is currently the top priority of EU Ports according to ESPO 2016 Report.
- Improving environmental, energy and port performance in a systematic and standardised approach.
- Future proofing against the effects of climate change.

3- To support the port sustainable growth through:

- Reduced energy consumption bills and its related cost savings.
- Reduction in Capital investments to meet the growing energy demand in the future.
- Improvement in the competitiveness through reduction of operational costs and increased supply reliability.
- Being cost-effective with environmental regulations.
- The increase of efficiency and port performance.
- Improving port's market position.

The energy management framework helps the Port Authorities to establish systemic energy management and to make all energy-related processes more efficient. It facilitates the documentation of all energy consumption and the reveal the potential for saving energy. It will lead to economically, environmentally and socially sustainable port that is well aligned with all local, national and European policies. Within this process, the active participation of all key port community stakeholders and use of best practices in energy policies are the important prerequisites. Finally, through the port's energy management system, goals will be set to address the follows :

Resiliency: ability to sustain business continuity during a power outage and resume operations after a catastrophic event.

Availability: access to energy sources that are required in order to meet present and future power demand of port operations through energy generation, transmission and distribution.

Reliability: availability of high quality and consistent energy able to meet predicted peaks in demand.

Efficiency: reductions in energy demand through management practices and technologies that maximize operational productivity and cost-effectiveness.

Sustainability: integration of energy efficient practices and renewable power generation to minimize the depletion of natural resources.





Finally, the third subject emerged of great interest was the **internationalization of ports and the relationships between EU and Neighbouring Countries.** Recognise the cross-border nature of ports and the maritime cross-border dimension which has the potential to link a port not only with their neighbours but with all other maritime Member States as well as highlight the importance of the maritime connections of the EU with its neighbouring countries is one of the main subjects that the project should look at in the next months.





6. Annex I- Agenda of the workshop



DocksTheFuture: Workshops with Experts

Traning Center of Port of Leixões, Portugal

29th – 30th of October

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770064







DocksTheFuture: Workshops with experts

Agenda

Jointly organised by





Day 1 - 29th of October 2018

14:00 - 14:15 Opening Session by APDL (President or Board Member)

14:15 – 14:45 Welcome, DocksTheFuture Presentation & Workshop Methodology by Alexio Picco (Project Coordinator, Circle spa)

14:45 - 16 :15 Parallel sessions on six identified topics

- a. Digitalisation
- b. Environment and Energy
- c. Human element
- d. Infrastructure / Accessibility and city port relation
- e. Financing and funding
- f. Policy (including neighbouring countries / peripherality)
- 16:15 16:30 Coffee Break
- 16:30 18:00 Plenary session (1 rapporteur per each session 10 plus discussion)
- 18:00- 18:30 Conclusions of day I (PortExpertise)

18:30 – 20:00 Visit to the Control Center, Port of Lexiões and Cruise Terminal followed by a Port cocktail

Day 2 - 30th of October 2018

09:00 – 9:15 Introduction – Alexio Picco (Project Coordinator, Circle spa) & Peter Bresseleers (PortExpertise)

9:15 – 10.30 Port of the future vision – session one (3 to 4 ppt plus interaction

- 10:30 10.45 Coffee Break
- 10:45 12.00 Port of the future vision session two (3 to 4 ppt plus interaction)
- 12:00 12:30 Plenary Session
- 12:30 13:00 Closing by Portuguese Minister of Sea, Ana Paula Vitorino (tbc)
- 13:15 14:10 Lunch

Practical Information

Port of the Future concepts, topics and projects-consolidated versions







Address: APDL: Avenida da Liberdade, 4450-718 Leça da Palmeira

Contacts

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Annex II- Participant List
 8.

Docks The Future

Workshop with experts APDL, 29th October 2018

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Droogs Mary	ether (APOL)	
Name	Company	Session
Alessandro Panaro	Intesa San Paolo	Infrastructure, means of transport and accessibility
Anne-Rieke Stuhlman	ESPO	Competition, cooperation and bridging R&D and implementation
Antonio Gaspar 🕜	INESCTEC	Digitalisation and Digital Transformation
Aristos Halatsis	CERTH, PIXEL project	Infrastructure, means of transport and accessibility
Bogdan Ołdakowski	Baltic Ports Organization	Sustainability
Carlos Cardoso	Greenflow	Sustainability
Carlos Moreno	AIVP	Port City relations
Charles HAINE	AIVP	Port City relations
Christian Blobner	Fraunhofer, PORTFORWARD	Digitalisation and Digital Transformation
Conor Feighan 🧑	FEPORT	Infrastructure, means of transport and accessibility
Dirk 't Hoof	ALICE	Digitalisation and Digital Transformation
Eduard Rodes 🥑	Escolaeuropea	Competition, cooperation and bridging R&D and implementation
Edwin Lock	Port Expertise	Infrastructure, means of transport and accessibility
Elena Cervasio	LLRQA	Sustainability
Elena Kirkigianni	Seability, Corealis project	Digitalisation and Digital Transformation
Federico Ferreira	Forum oceano	Sustainability
Gemma Molero	Aitec intl	Competition, cooperation an bridging R&D and implementation
Greta Marini 🧳	AIVP	Port City relations
Jansen Maurice Ø	AIVP	Port City relations
Jill Slinger	TU Delft	Competition, cooperation an bridging R&D and implementation
Joao Carvalho 👩	AMT	
Joao Pita Costa	XLAB, Pixel project	Digitalisation and Digital Transformation
Jose Anselmo	Icloud	Competition, cooperation an bridging R&D and implementation
José PAGES SANCHEZ	AIVP	Port City relations
Miguel A. Llorente Carmona	Prodevelop, PIXEL project	Digitalisation and Digital Transformation
Michele Acciaro	The Klu Org	Sustainability
Paul Brewster	Imdo	Infrastructure, means of transport and accessibility
Pierre Cariou	Kedgebs	Infrastructure, means of transport and accessibility
Roberto Cinquegrani	PORTFORWARD	Competition, cooperation and bridging R&D and implementation







*1



Co-funded by the Horizon 2020 programme of the European Union

Rosa Maru Darbra 🛛 🗸	Upc	Sustainability
Roudaina ALKHANI 🛛 😹	AIVP	Port City relations
Rudy Hemeleers	PPMB process	Digitalisation and Digital Transformation
Salvador Furio	Fundacion ValenciaPort	Competition, cooperation and bridging R&D and implementation
Sara Ribeiro	Transtejo	Sustainability
Tom DAAMEN	TU Delft	Port City relations
Turi Fiorito	Inlandports	Competition, cooperation and bridging R&D and implementation
Uwe Sonderman 🛛 🧔	Kombiconsult	Infrastructure, means of transport and accessibility
Vicente del Rio 🛛 🥏	Fundacion Valencia Port	Competition, cooperation and bridging R&D and implementation
Wiebe de Boer	Deltares	Sustainability

CALLA FEREDINA	APOL
HAULICE JANSEN	ELASNUS UNVERSING
DIOGO NAGALHEAS	APOL
MANUELA SOAKES TERESA Silva	A POL.
FRANCISCO SANATUA	APPL.
Lufs dias	14
MALTA SA' LENO.	1 7
NUNO LOPES	
ANTÓNIO URBANO	6
MANUEL TEIXEIRA.	
VASCO SILVA	APOL.
Filige Months	4
Hugo Bastes Migal Dis	4
2	





9. Annex III- Guide for the breakout sessions of the thematic workshop

DOCKSTHEFUTURE	Docks The Future
PORT EXPERTISE PORT & MARINE SERVICES	Mechelsesteenweg 271 (1.1) 2018 Antwerp – Belgium Contact: +32 3 808 4 345 <u>http://www.portexpertise.com/</u>
Date report	October 18, 2018
Date meeting	October 10, 2018
Location	Antwerp
Participants	Gilbert, Joris and Peter (partial)
Το	Beatrice Dauria, Circle Alexio Picco, Circle Peter Bresseleers, PortExpertise Joris Claeys, PortExpertise Ana-Paula Mesquita, Magellan Ana Vaz Raposo, Magellan Hilda Ghiara, Unige Nicola Sacco, Unige Sönke Maatsch, ISL Holger Kramer, ISL
Сору	-

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Author(s)	Gilbert Bentein, PortExpertise
	g.bentein@portexpertise.com
	With input from Joris Claeys, PortExpertise
	j.claeys@portexpertise.com

Subject: Guide for the breakout sessions of the thematic workshop

Guide for the experts

The purpose of this document is to prepare you to the breakout session of the DocksTheFuture thematic workshop organised in Porto, October 29 and 30. The deliverable to be reviewed is *D1.5 Port of the Future concepts, topics and projects - draft for experts validation,* you receive as annex of this document.

D1.5 is very extensive document so this guide might help you to review it in the most efficient and effective way. This review guide consists of the following main sections:

Main structure of the guide

- 1. The section "Project summary and objectives" defines where we are with the DocksTheFuture project and what we the outputs and outcomes of the breakout sessions are;
- 2. The section "Roles, agenda and approach" defines the practical arrangements of the breakout sessions;
- 3. The section "Topics by breakout session" defines the scope of each breakout session and what sections of D1.5 are recommended to be read before the event;
- 4. The section "Review checklist and report" defines the expected output of the breakout sessions.

Breakout and plenary sessions

As per <u>Table 2: Topics by breakout session on page 54</u> there are 5 breakout sessions each grouping together a number of topics. For each breakout session we foresee 2 rounds, resulting in 10 breakout sessions in total.

- 1. For round A, the experts will be assigned by DocksTheFuture project team to one of the breakout sessions based upon their professional background;
- 2. For round B, the experts are to propose 2 additional breakout sessions, different from the one they assigned to in round A. The expert indicates its primary and secondary choice and the project team will then balance these choices over the different round B breakout sessions;
- 3. During the plenary on day 2, the rapporteurs of the breakout sessions jointly present the main conclusions, recommendations, actions and their vision for the ports of the future in 2030. The participants to the plenary will get the opportunity to interact with the rapporteurs and the DocksTheFuture project team





The 4 sections of this guide mentioned above describe how we will proceed during the breakout sessions. However if applicable and feasible and in order to speed up during the sessions we propose and kindly ask also some actions before and after the breakout sessions

- 1. Before the breakout session
 - a. Submit your primary and secondary choice for round B of the breakout sessions;
 - b. Read the applicable sections of document D1.5 as defined in Table 1: List of main topics <u>Table 3: Relevant sections of D1.5 by breakout section on page 56</u>);
 - c. You might consider answering some of the questions raised in the review checklist (see section 0 on page 56);
 - d. Submit or reference additional information especially of practices, projects and real life cases and your ow experience relevant for DocksTheFuture.
- After the breakout session. Please give your feedback not later than Friday November 16, 2018
 - a. The DocksTheFuture will write the review report and you will get the opportunity to give your feedback on that;
 - b. Submit or reference additional information especially of practices, projects and real life cases and your ow experience relevant for DocksTheFuture.

Project summary and objectives of the review

See https://www.docksthefuture.eu/

The DocksTheFuture project aims at defining the vision for the ports of the future in 2030, covering all specific issues that could define this concept. The project is structured in 6 work packages and you are as an expert involved in the review of the results of the first work package "**Port of the Future: definition of the concept**". The outputs of 4 tasks of WP1 have been merged together in the document *D1.5 Port of the Future concepts, topics and projects - draft for experts validation (D1.5),* the document that is subject to your expert review. The 4 tasks executed are a desktop analysis, a stakeholder consultation, analysis and forecast of the maritime traffic and analysis of macro trends and perspectives in the maritime sector.

The high level objectives of the thematic workshop in general and more specific of the breakout sessions are:

- 1. To review D1.5 on its accuracy, completeness, correctness, consistency and relevance for the "ports of the future" concept;
- 2. To come to a general agreed and actionable definition of ports of the future, including among others the key characteristics of a port of the future;
- 3. To give your opinion on whether or not WP1 can be closed and other DocksTheFuture work packages depending on it can be initiated;





4. As DocksTheFuture team we would like to learn as much as possible from the practical cases you are involved in.

The output of each breakout session is among others a review report (<u>see section 0 on page 56</u>) in which you advise the DocksTheFuture team on further improvements on their work. The DocksTheFuture team will then consider relevant and feasible recommendations to update document D1.5 to D1.6 Port of the Future concepts, topics and projects – consolidated versions, which is the final delivery of work package 1 and serves as the baseline for all the other DocksTheFuture work packages.

A methodology has been defined to perform the "desktop analysis" task of WP 1 (<u>D1.5 section</u> <u>6.2.1 Methodology summary</u> and <u>section 9.1.1 Assessment methodology</u>) This methodology resulted in an information model consisting of a number of information entities such as topics, measures, tactical objectives, gaps, risks, KPI's, etc. which together define the port of the future concept. The information is stored in a relational database that is structured according to that information model.

One of the key entities of the information model is the list of topics. You can find the full list of topics and subtopics in <u>D1.5 section 9.1.6.2</u>.

ID	Name
T10	Infrastructure
Т20	Means of transport
Т30	Accessibility
Т40	Standards and legal instruments
Т50	Integration in the supply chain
Т60	Sustainability
Т70	Safety
Т80	Security
Т90	Digitization, digitalization and digital transformation
T100	Port city relations
T110	Human element
T120	Governance
T130	Incident management

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ID	Name
Т900	Cooperation
T901	Competition
Т910	Bridging R&D and implementation

Table 1: List of main topics

Roles, agenda and approach

Roles

Each of the 2 times (round A and B) 5 breakout sessions will have the following roles

- **1. Experts** are invited to give their professional opinion on D1.5, advise on how to improve the work in the DocksTheFuture project and enrich the work with some best practices from their own sector or profession;
- 2. The moderator guides the review process and structures and visualises ideas, suggestions and remarks proposed by the experts by using the appropriate tools;
- 3. The scribe takes note of all the discussion by filling out the review report (<u>See section 0 on</u> <u>page 56</u>). The scribe will also prioritize the proposed actions and focus on interdependencies between topics, measures and tactical objectives. At the end of the breakout session the scribe present a summary of the review report to make sure that the essentials of the breakout session are captured;
- 4. The rapporteur is one of the experts and he or she who will, together with the scribes and moderators prepare a presentation for the plenary sessions on day 2. While the review report captures the details of the breakout session, and the recommended actions to improve D1.5, the presentation for the plenary will be more a helicopter view and a vision for the future by 2030;

Agenda

- 1. Initiating the breakout session (Moderator, 10min)
 - a. The agenda
 - b. Objectives of the breakout session;
 - i. Proposed updates to D1.5;
 - ii. A clear definition of ports of the future;
 - iii. Initiating next work packages of DocksTheFuture;
 - iv. Your feedback on practical cases relevant to DocksTheFuture.
 - c. Clear scoping of ports of the future
 - i. Geographically (e.g. including hinterland, including port city, etc...);
 - ii. Actors and services in scope;
 - iii. Planning horizon is 2030.
 - d. Explain the topics that are in scope of this breakout, the approach that will be followed;





- e. Explain horizontal topics: human element, financing and funding, standards and governance;
- f. Practical arrangements and review roles. Appoint rapporteur, parallel rounds, reporting to the plenary;
- g. Review report and feedback.
- 2. Round table (All, 10 minutes);

The participants introduce themselves with focus on relevant experience for DocksTheFuture and a short message for DocksTheFuture;

3. Structured review (All, 40 minutes)

The structured review consists of answering the questions formulated in <u>section 0 on page</u> <u>56</u> applicable for this breakout session. The proposed actions will be prioritized by the DocksTheFuture team in "nice to have" and "need to have". It will be further split into 2 parts:

- a. General points applicable to all breakout sessions;
- b. Specific points applicable to the current breakout session.
- Open discussion (All, 20 minutes) The participants can suggest focus points related to ports of the future not covered under the "structured review";
- 5. **Conclusions** (All, 10 min) finalize the wall paper and review report by ordering the post-its and adding additional points such as gaps and essential comments or notes). Agree on the key elements of a definition of ports of the future vision 2030;
- 6. **Prepare the presentation for the plenary** (Rapporteur, moderator and scribe) Prepare for the presentation for at the plenary session at day 2.

Approach

- 1. We are all have a different background, so do not imply things but say what you have to say in an as direct as possible but polite way and without beating about the bush;
- 2. Every idea, opinion, suggestion is a good one and we respect each other's views. You help the DocksTheFuture project much more with constructive criticism than with applause;
- 3. The time available for each breakout session is rather limited. Our interventions are in scope of the "ports of the future" subject and our horizon is 2030. Our interventions are short and to the point so that we leave room to the other participants to also make their point;
- 4. DocksTheFuture is a coordinating and support action, so especially when the discussion is about technological solutions, do not delve too deep in implementation details.
- 5. The focus is on reviewing deliverable D1.5, so at the least the points mentioned in the review checklist must be covered but the moderator can choose to elaborate on certain points whenever appropriate;
- 6. The moderator may use different techniques to lead the review process, including e.g. brainstorming, open and closed questions, voting, confronting, etc.;





- 7. All points made or all actions proposed will be registered in the review report even if the scribe, the moderator or other experts disagrees with the point made. Rejected actions will be motivated by the DocksTheFuture team. Actions will be prioritized in "need to have" and "nice to have"
- 8. The experts can choose to make their suggestions anonymous or on name;
- 9. The experts will get the opportunity to update the report after the thematic workshop;

Topics by breakout session

The 2 rounds of 5 breakout sessions that are part of this thematic workshop have been structured according this topic list (see *Table 1: List of main topics on page 50*) by clustering certain topics together. These 10 sessions cover all topics, however certain topics are covered more than once because they are horizontal. We would like the experts to give particular attention to the horizontal topic T110 Human element because there is a bidirectional dependency between this topic and all the other topics.

Breakout session title and description Topics				
Digitalization and digital transformation	T90 and its subtopics			
In the information model, topic T90 is actually called Digitization, digitalization and digital transformation.	T40			
• Digitization is creating a digital (bits and bytes) version of analog or	T50			
physical things such as paper documents, microfilm images, photographs, sounds and more. So, it's simply converting and/or	Т70			
representing something non-digital into a digital format. We consider digitization as a pure technological issue and less relevant for this	T80.20			
review;	T110			
• Digitalization is the automation of existing manual and paper-based processes, enabled by the digitization of information. So basically it is doing the same thing as in the past but using ICT;				
• Digital transformation is about changing business operations, business models and even revenue streams and new business opportunities.				
For this review we consider digital transformation as the most relevant part				
Sustainability	T60 and its subtopics			
This topic covers all aspects of the traditional 3P perspective on sustainability and consequently topic T60 has 3 subtopics:	All other topics			
Planet is about environmental sustainability;				
Profit is about economic sustainability;				
People is about social sustainability.				
In other words the impacts of initiatives to improve the environment should on the economy and on the social welfare should be assessed. The 3 subtopics				





Breakout session title and description	Topics
are further subdivided in subtopics. E.g. environmental sustainability has subtopics on alternative energy, waste management and pollution.	
The united nation sustainability guidelines have been used as a reference in our work.	
Considering the 3P dimension all other topics are linked to this topic.	
Port city relations	T100
This is how the port infrastructure and port activities can be integrated with the city and its surroundings. This topic covers many subjects already covered	T10 and its subtopics
in other topics, however looked at from the perspective on how the port activities affect the city and its surrounding. This consists of infrastructure	T60 and its subtopics
and spatial organisation, sustainability, safety, security, human element and	770
The checklist items for port city are taken from a checklist developed by AIVP	Т80
The AIVP checklist is a hierarchy of 3 levels deep. In view of the limited time	T110
foreseen for each breakout session we only consider the 4 level 1 items. The general question is "Have we covered these 4 level 1 items in a sufficient detail in D1.5" and if not what corrective actions do you propose.	T120.10
The participants to this breakout session can find the full checklist in $\underline{D1.5}$ section 9.1.3	
Infrastructure, means of transport and accessibility	T10 and subtopics
• Topic T10 is about the physical infrastructure, the spatial organisation of the infrastructure, about the services to maintain the infrastructure but not	T120.10,
about the services that use the infrastructure. It also includes smart infrastructure. This topic has 4 subtopics respectively for sea side	T60 and subtopics
infrastructure, maritime terminals, other port infrastructure and hinterland	T100
 Topic T20 is about the means of transport, currently limited to seagoing ships. 	T20 with subtopic T20.10
Topic T30 is about accessibility of all transport means to and from the	T30 and subtopics
ports. It also covers TEN-T networks, smart traffic management and multi and synchro modality. This topic has strong links to infrastructure to make	770
ports accessible, to sustainability, safety, security, and digitalization and business to governance processes to get clearance for access.	Т80
	Т90
	T110





Breakout session title and description	Topics
Competition , cooperation and bridging R&D and implementation	T900 and subtopics
This breakout session covers most topics however from the perspective of cooperation or competition. Also the transfer from R&D projects to	T901
implementation projects can be considered as a form of cooperation. In this breakout session we assess if ports should cooperate on this topic or if they	T910
can differentiate their services from their competitors on this topic. We also	T10 and subtopics
discuss how the transfer from R&D to operational projects can be better arranged. The cooperation between the port and the port city is not covered in this breakout session, because we devote a separate breakout session to it.	T30 and subtopics T40
Topic T900 cooperation has 2 subtopics: T900.10 cooperation between	T50
Mediterranean and neighbouring countries and T900.20 cooperation between ports. T900.10 is also about a mechanism of knowledge transfer	T60 and subtopics
to and from the EU to these countries. We also consider the perspective of smaller ports, islands and deserted areas concerning these topics and the	Т70
cooperation between different actors in the supply chain (multi and synchro modality) and the TENT corridors from the "cooperation"	Т80
perspective;	Т90
Topic T901 competition mirrors topic T900 cooperation. In many cases cooperation and completion do not exclude each other. Neighbouring	T110
countries and ports can cooperate or compete on about all topics covered in DocksTheFuture;	T130
• Topic T910 bridging R&D and implementation is about developing transferability mechanisms to facilitate the application of H2020 results in CEF projects. This transferability mechanism applies to all topics covered in DocksTheFuture.	

Table 2: Topics by breakout session

The following table defines what sections of D1.5 are recommended to be rea in preparation to your participation of breakout section.

- 1. The sections marked with *** are what this breakout session is all about;
- 2. Sections marked with ** contain information that is strongly linked to the scope of the breakout session, mainly because there are interdependencies. Furthermore these sections should only be read for the part that is in scope of the breakout session. E.g. in the breakout session on digitalization and digital transformation you should also read the topic T40 on standards, but only as far as "ICT standards" are concerned;
- 3. Sections marked with * are relevant to understand the approach followed in the project, but are strictly speaking not subject of the review.





D1.5 Section	Digitalization and digital transformation	Sustainability	Port-city relations	Infrastructure, means of transport and accessibility	Competition , cooperation and bridging R&D and
1: Executive summary	**	**	**	**	**
3: Introduction	*	*	*	*	*
4: Ports of the future defined	***	***	***	***	***
5: EU policies and legislation	**	**	**	**	**
6.2.1: Methodology summary	**	**	**	**	**
8.2.1: Inputs and assessment	*	*	*	*	*
6.2.3.1: T10 Infrastructure		*	**	***	**
6.2.3.2: T20 Means of transport		*	**	***	
6.2.3.3: T30 Accessibility	**		**	***	**
6.2.3.4: T40 Standards	**	**		**	**
6.2.3.5: T50 Integration in the supply chain	**			**	**
6.2.3.6: T60 Sustainability	**	***	**		**
6.2.3.7: T70 Safety	**	**		**	**
6.2.3.8: T80 Security	**			**	**
6.2.3.9: T90 Digitization, digitalization and digital transformation	***	**		**	**
6.2.3.10: T100 Port city relations		**	**	**	
6.2.3.11: T110 Human element	**	**	**	**	**
6.2.3.12: T120 Governance	**	**	**	**	**
6.2.3.13: T130 Incident management	**	**		**	**
6.2.3.14: T900 Cooperation					***
6.2.3.15: T901 Competition					***

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D1.5 Section	Digitalization and digital transformation	Sustainability	Port-city relations	Infrastructure, means of transport and accessibility	Competition , cooperation and bridging R&D and
6.2.3.16: Bridging R&D and implementation					***
6.2.4: Tactical objectives	**	**	**	**	**
6.2.5: Measures	**	**	**	**	**
6.3: Stakeholder consultation	**	**	**	**	**
6.4: Traffic analysis and forecast	**	**	**	**	**
7: Conclusions and recommendations	**	**	**	**	**
9.1.1: Assessment methodology	*	*	*	*	*
9.1.3: Port-city relation checklist	*	**	***	**	
9.1.6.1: List of inputs and assessments	*	*	*	*	*
9.1.6.2: List of topics	**	**	**	**	**
9.1.6.3: List of tactical objectives	**	**	**	**	**
9.1.6.4: List of measures	**	**	**	**	**

Table 3: Relevant sections of D1.5 by breakout section

Review checklist and report

Each item of the checklist gets a unique number that will also be used in the review report so that actions can be tracked to it. The review checklist is structured in 3 main sections:

- 1. **Part I: The same content and structure for each session**. So exactly the same checklist items are covered in each breakout session. This part of the checklist will only covered in round A, so we need 5 results in the review report. The item numbers are in the range 10 to 99;
- 2. Part II: The structure is the same but the content need to be customized. E.g. all breakout sessions will discuss about vision and objectives but the vision and objectives are different in a breakout session about digitalization and digitalization than in a breakout session about sustainability. This part of the checklist will be covered in round A and round B, so we get 10 answers on each checklist items. It is structured as follows.





- a. Current gaps, so in other words what is it that we want to solve. This defines the as-is situation and the gaps;
- Tactical objectives and strategic vision. This defines the to-be situation. (See D1.5 section 6.2.4, 9.1.4 and 9.1.6.3 for a definition and more info about tactical objectives
- Main business trends we need to take into account to define a vision about ports in 2030;
- d. New and matured technology that may have an important impact on ports in 2030;
- e. Risks linked to the to-be situation;
- f. Horizontal issues including funding and financing, human element and international and European legal instruments;
- g. Key message to the EU policy makers;
- h. Best practices from your own experience.

The item numbers are in the range 100 and 199

3. **Part III: Specific checklist items for a given breakout session**. The item numbers get different numbers by breakout session.

During each breakout sessions we will first cover the general points applicable for all sessions followed by the specific points for that session. Of course your assessment is not just a good or bad but contains concrete suggestions for improvement. Also indicate your priority: either "nice to have" or "need to have". Be specific and make your suggestions actionable.

	Checklist part I applicable to all breakout sessions	
10	How do you assess the quality of D1.5. Quality meaning readability, relevance, completeness, consistency, brevity, etc. Please formulate concrete actions. Be aware however that D1.5 is just an intermediate deliverable of the project to be completed	
D1.5 is a	D1.5 is a merge of the outputs of 4 tasks. Assess each task separately according to the criteria defined under review item 10	
11	 Overall assessment of the quality of task 1, the desktop study <u>D1.5 section 8.2</u>; <u>D1.5 section 9.1.6.1</u> contains a long of inputs that have been considered for the desktop study and the once that have actually been assessed. Are there any fundamental inputs that you would like to propose for assessment? Please propose additional projects, books white papers, etc that are essential to complete our vision about ports of the future. 	
12	Overall assessment of the quality of task 2, the stakeholder consultations <u>D1.5 section 6.3</u>	
13	Overall assessment of the quality of task 3, traffic analysis <u>D1.5 section 6.4</u>	
14	• Overall assessment of the quality of task 4, macro trends <u>D1.5 section 6.5;</u>	





	• DocksTheFuture is a project for the future, so it is important that we try as much as possible to know where we are heading at. Are there macro trends currently not covered under <u>D1.5 section 6.5</u> ? Are the currently defined macro trends, evident based? Do they as far as possible and as far as needed for DocksTheFuture correctly set the scene for the ports in 2030?
20	<u>D1.5 section 5 "Ports of the future defined"</u> contains a definition of the port of the future. This definition defines the scope of the whole project.
	 The definition of the geographical and functional delimitation, so the services, of the port?
	 Are the key characteristics of a port in 2030 complete, specific and actionable? If not, can you update or add missing elements to that definition;
	• Can you provide us with a definition of ports of the future from literature, academic world or your projects?
30	Work package 1 is the project scoping. Can we on the basis of the work performed so far initiate the next work package(s)? If not what are fundamental corrective actions before we
	move to the next work packages? (See <u>https://www.docksthefuture.eu/project/</u> for more info on the next work packages.
40	An information model for the ports of the future has been defined (<u>See D1.5 sections 7 and</u> <u>11.1.1 "The information model"</u>). The results of among others the desktop analysis and have
	been stored in a relational database.
	• Do we agree with the statement that this is actually a domain model for the port of the future concept?
	• Are the information entities and their relations correctly defined and sufficiently populated?
50	<u>D1.5 section 5</u> is about "EU policies and legislation". Please indicate if we are missing some policies or legal frameworks that are fundamental for ports of the future
60	What is your vision about putting the planning horizon for ports of the future in 2030?
	Checklist part II to be customized by breakout session
100	What are the current gaps, main challenges, preconditions and external factors to be successful concerning [Breakout session]
	Consider legal, technological, financial business processes, human element factors and standardization.
110	<u>D1.5 section 9.1.6.3</u> defines a number of tactical objectives linked to topics or subtopics. Be aware that some of these tactical objectives are linked to more than one topic. Tactical





	objectives are or should be made SMART by defining KPI's or other measures to them. Please review the list of tactical objectives applicable to [Breakout session].
	• Are these tactical objectives really tactical objectives or are they rather solutions?
	• Are these tactical objectives for 2030 or are they already realised in most of the ports?
	 Are these tactical objectives generic or specific for certain port profiles (size, cargo type)?
	• What are the critical KPIs or metrics or at least categories of metrics such as operational, financial, quality, safety etc. that you recommend to measure progress in the ports concerning [Breakout session]?
	• What is the recommend practice for reporting about metrics (static/dynamic, absolute values/benchmark, use of tools and platforms, etc.?
	• Would the tactical objectives for [Breakout session] improve customer satisfaction?
120	What essential elements should be contained in a strategic plan or roadmap for [Breakout session]? Be aware that names of these plans differ by [Breakout session] e.g. "Strategic ICT plan" for digitalization and digital transformation or "sustainability plan" for sustainability.
121	Change management. What resistance against change do we encounter and what techniques can we use to overcome this resistance.
130	Checklist item 15 about macro trends <u>D1.5 section 6.5</u> reviews these trends from a general point of view, so in other terms answers the question what are the main trends?
	• This checklist item is about the impacts of these trends for a future vision of [Breakout session]. In other words, in order to fix a vision for the ports in 2030 concerning [Breakout session] what trends should we take into account and how important are these trends. Give a score high, medium low.
140	• What are the main technologies that will affect ports in 2030 concerning [Breakout session]? Be aware that what is currently new might be completely outdated by 2030. Also what currently is a mature technology is not something we recommend for the future. Referencing Gartner's hype cycle, we should assess technologies that are at the "slope of enlightenment";
	 What new technologies might have a disruptive nature? What current jobs or businesses can we expect to be most affected by what technology trends? What opportunities?
	What business models will fundamentally change as a consequence of new technology
150	What are the risks of the to-be situation concerning [Breakout session]?
160	• Define interdependencies between the topics covered in [Breakout session] and all
	other topics covered in the other breakout sessions
	• What are the essential human elements concerning [<i>Breakout session</i>]. Consider lack of qualified people, resistance against change, training, etc.





170	 What do we expect from the EU concerning [Breakout session]? Consider e.g. legislation, funding, architecture frameworks, building blocks, standardization, and B2G/G2B interaction; Do the current strategic documents from the EU concerning [Breakout session] sufficiently cover the needs of the ports in 2030; What is the key message we would like to transmit to the EU policy makers concerning [Breakout session]
180	Define best practices concerning [Breakout session]
	200. Checklist part III for digitalization and digital transformation
200.10	Digitalization and digital transformation are not a final goal in itself. On what topics would digitalization and digital transformation have an impact? Consider e.g. smart traffic management, multi and synchro modality, safety, security, sustainability, mobility
200.20	What ICT technologies will mature by 2030 and are most relevant for ports? Consider big data, cloud computing, artificial intelligence, virtual and augmented reality, automated vehicles, business intelligence, internet of things, mobile internet, block chain, advanced robotics, 3D printing, s
200.30	What are the risk of digitalization and digital transformation? Consider cyber security, privacy, disruptive nature and job loss, inclusion, knowledge gaps, etc.
200.40	What is your opinion about the EU digital agenda (digital single market, interoperability and standards, trust and cybersecurity, ultra-fast internet, research and innovation, digital literacy, benefits for the society
200.50	What are the key elements of a "smart port" and/or of a network of smart ports
	300: Checklist part III for sustainability
300.10	Concerning the 17 UN SDG's, do you consider these all applicable to ports, in other words are they indivisible or can ports only focus on some of them? If they are all applicable, are some more important than other? Do you dispose of a "translation" between these very generic goals for "the whole world" to SMART goals for the ports of the future?
300.20	The horizon of DocksTheFuture is 2030 but the horizon for sustainability planning is much further away. Do you consider this as a risk? Consider e.g. the promotion of technology that is at mid-term the only feasible solution but not a solution at all for the longer term.
300.30	How do macro trends influence port operations and strategic decisions relative to energy use/optimization and environmental footprint?





300.40	Making the business case of sustainable investments. Is it correct that in many cases a sustainable solution would be more costly than a traditional investment and if this is the case how can sustainable projects get financed?		
300.50	What environmental and/or energy investment have the biggest positive impact on both corporate results and environmental footprint		
	400: Checklist part III for port-city		
400.10	Spatial organisation.		
400.20	Environmental challenges.		
400.30	Socio-economic development strategies.		
400.40	Governance and port-city co-construction.		
	500: Checklist part III for infrastructure, means of transport and accessibility		
500.10	Is the current planned capacity for container terminals in the EU in line with the forecasted needs?		
500.20	What are key measures to shift cargo off the road (modal split)?		
500.30	How would the trend for urbanization affect accessibility of ports and cities?		
500.40	How can information technology be used to reduce congestion?		
500.50	The use of autonomous vessels, automated mooring, platooning, vehicle to vehicle communication, etc.?		
500.60	Introduction of River Information Services		
60	0: Checklist part III for competition, cooperation and bridging R&D and implementation		
600.10	Impact of TEN-T corridors		
600.20	How can we evolve from a "silo mentality" to working together (change management)		
For each o	f the following questions consider this list of topics		
T10: Infrastructure;			
T30: Acces	T30: Accessibility;		

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T40: Stand	rds;				
T50: Integ	50: Integration in the supply chain;				
T60: Sustainability;					
T70: Safet					
T80: Secu	y;				
T90: Digiti	tion, digitalization and digital transformation				
600.30	Is the previous list correct and complete when it comes to cooperation? If not what topics should be added to this?				
600.40	Have small ports, islands and deserted areas sufficient financial and human resources to implement the solutions deployed in the bigger ports?				
	Should these solutions been tailored to their specific situation and if so, how should this been done?				
600.50	How should the EU or its members states cooperate with other countries?				
	What about knowledge transfer to and from neighbouring countries?				
	What countries should the EU cooperate with?				
600.60	Should ports cooperate or compete with other ports on these topics? Differentiate between ports that compete over a common hinterland or not;				
	From the list above what are the topics that ports rather compete or rather cooperate;				
	What is the impact of clustering of ports for each of these topics;				
	Is stimulation of cooperation on these topics a matter for the ports or should this be dealt with at another level (member states, EU)				
600.70	Should the different actors in the supply cooperate or compete on these topics?				
600.80	What H2020 research projects do you know off, the outputs of which could be transferred to a CEF project?				
600.90	What national, European and international organisations, interest groups, standardization bodies, etc. do you know of that stimulate cooperation concerning the topics mentioned above?				
600.100	What financial instruments do you know of to stimulate cooperation concerning the topics mentioned above?				

Table 4: Review checklist