mates

Sea of Experience

Virtual Dissemination & Technical Workshop

Building a Marine Technology Skilling Strategy -

The MATES project approach and achieved results

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Co-funded by the Erasmus+ Programme of the European Union

Focus on skills

In a fast-changing global economy, **skills**:

- Are increasingly determining competitiveness and the ability to drive innovation
- Serve as a pull factor for investments
- Account as the main catalyst for growth
- Are key to social cohesion

Challenge →

KEY FACTS

40%

European employers report that they cannot find people with the right skills to grow and innovate

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The New Skills Agenda for Europe

Quality and relevance of skill

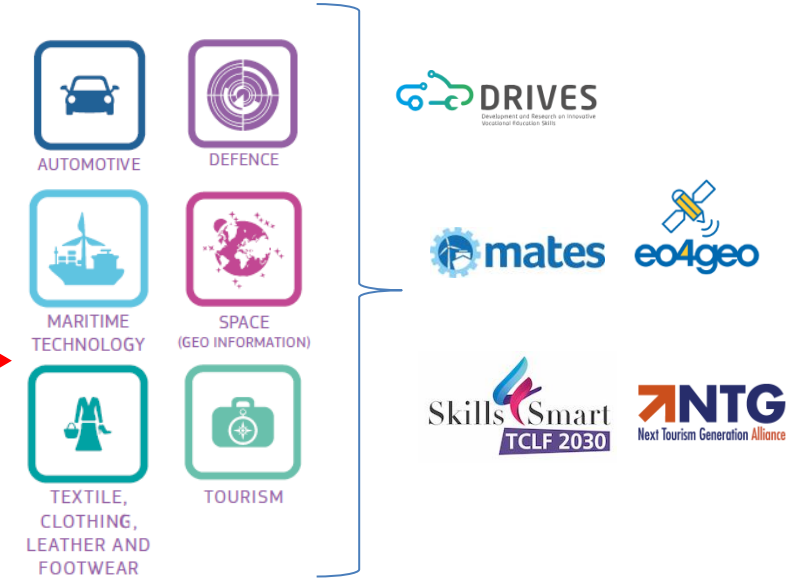
- Upskilling pathway
- Key competences framework
- VET as a first choice
- Digital skills and Jobs coalition

Visibility and comparability

- Revision of EQF
- Skills profile tool for 3rd country nationals

Skills intelligence

- Revision of EUROPASS
- Analysis of brain drain
- **BLUEPRINT FOR SECTORIAL COOPERATION ON SKILLS**
- Initiative on graduate tracking



Projects under the "The Blueprint for sectoral cooperation on skills" action, aim at **improving skills intelligence** and **addressing skills shortages** in key economic sectors

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The MATES project: Identity

CONSORTIUM

1. Centro Tecnológico del Mar (Fundación CETMAR)
2. Asociación de Industriales Metalúrgicos de Galicia (ASIME)
3. CT Ingenieros AAI SL (CT Ingenieros)
4. AQUATERA Limited (AQUATERA)
5. Indigo Med (Indigo-Med)
6. Aqualex Multimedia Consortium Ltd (AMC)
7. AQUATT UETP CLG (AquaTT)
8. Forum Oceano – Associaçao da Economía do Mar (Forum Oceano)
9. Fundo Regional para a Ciencia e Tecnologia (FRCT)
10. University of Ghent (UGhent)
11. Foundation WEGEMT (WEGEMT)
12. COSNAV Engineering SRL (COSNAV Engineering)
13. Universiteit Van Amsterdam (UvA)
14. Universidade da Coruña (UDC)
15. The Centre for Research and Technology-Hellas (CERTH)
16. Consellería de Cultura, Educación e Ordenación Universitaria da Xunta de Galicia (Xunta)
17. University of Strathclyde, Department of Naval Architecture, Ocean and Marine Engineering (NAOME)

AT A GLANCE

PROGRAMME: ERASMUS+

INSTRUMENT: Sector Skills Alliances (SSA)

TOTAL BUDGET: €4.9 million

DURATION: January 2018 - December 2021 (48 months)

COORDINATOR: Centro Tecnológico del Mar (Fundación CETMAR), Spain

CONSORTIUM: 17 partners from eight countries

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The MATES project: Main objective

Develop a **Skills Strategy** that addresses the main drivers of change to the maritime industry, and in particular *shipbuilding* and *offshore renewable energy,* which are strongly linked and require new capacities in order to succeed in an increasingly digital, green and knowledge-driven economy.

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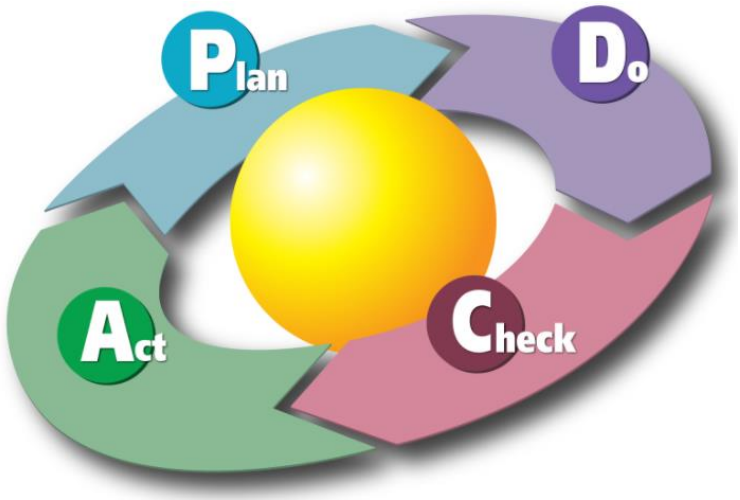
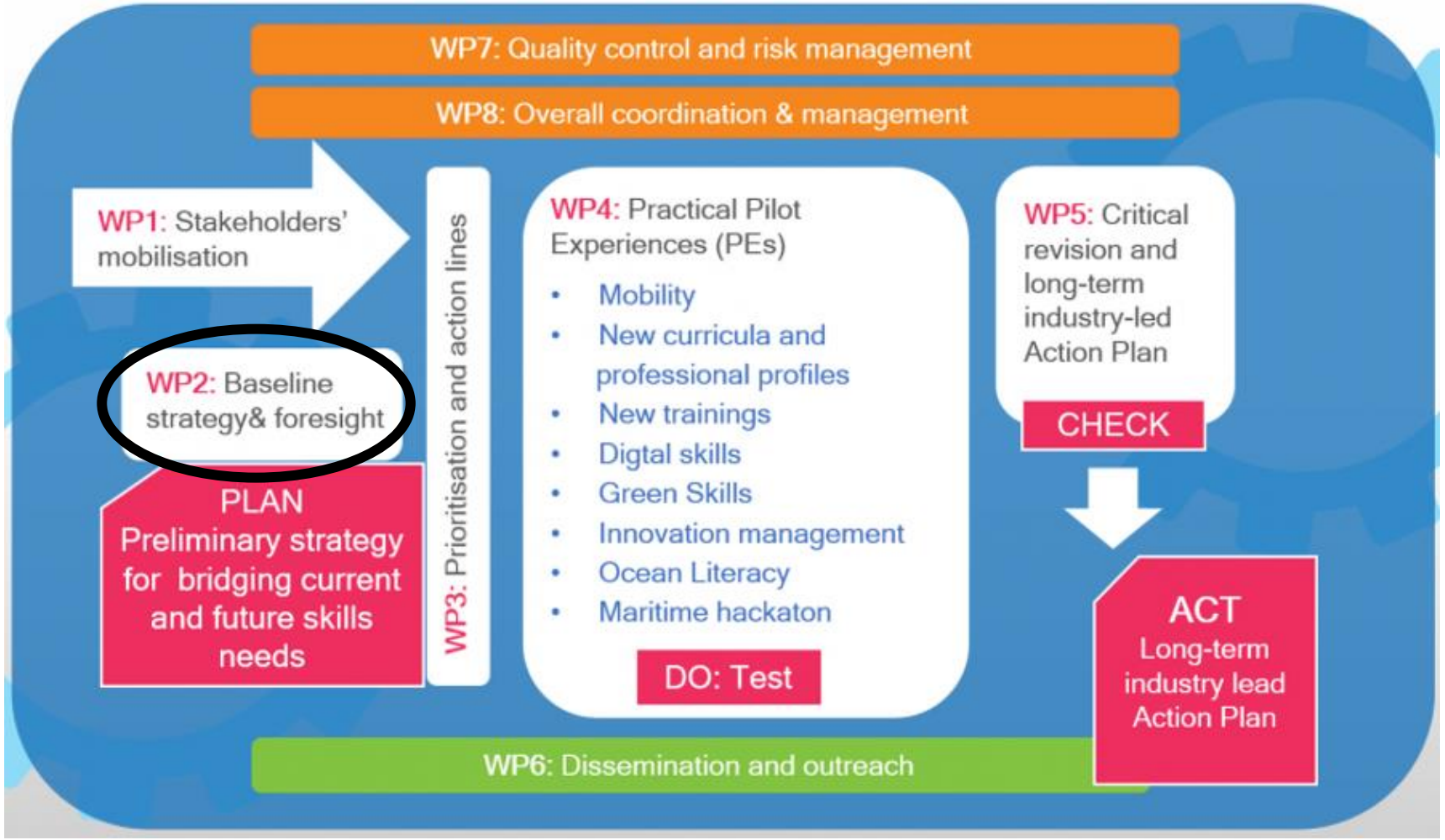
The MATES project: Methodology





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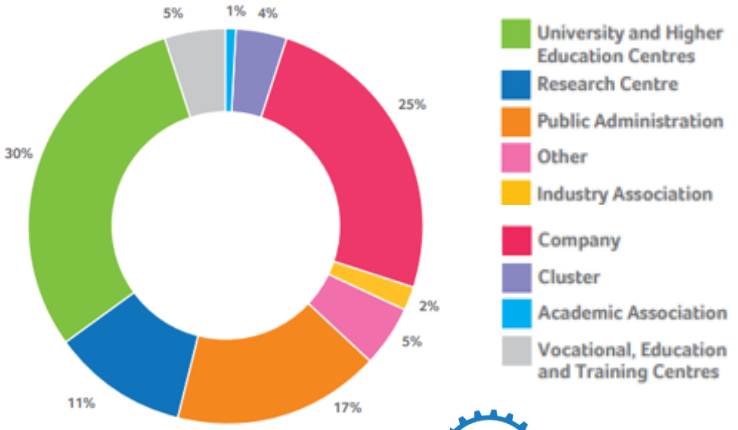
PLAN: Stakeholders' mobilization

Identification and registration of stakeholders

186 experts and stakeholders



http://whowhomates.com

Repository of relevant information

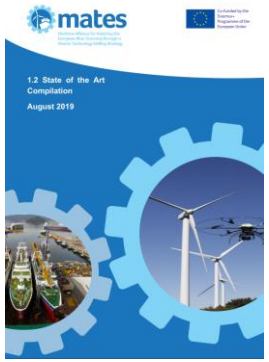
220 publications and 147 projects reviewed

↓

Digital repository

https://www.projectmates.eu/references/

↓



State-of-the-art compilation report

Status update of the two sectors mainly from an economic perspective

Mobilization workshops

5 regional workshops held in Greece, Portugal, Netherlands, UK and Spain

Discussing:

- Current and future skill gaps
- Activities required to address them

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PLAN: Baseline strategy - setting

Desk research

Reference layers

- Value chains
- Occupational profiles (ESCO classification) – primary and supporting
- EQF levels

Skills supply

- Extended review and analysis of relevant E&T programs:
  - Type and EQF level
  - Name and responsible institutions
  - Duration and language
  - Curriculum and occupational profiles addressed

Regional workshops and validation workshop

5 regional workshops held in Greece, Portugal, Netherlands, UK and Spain

Discussing:

- Primary occupational profiles
- Needs in terms of both hard and soft skills
- Gaps in existing E&T programs
- New technologies and emerging trends impacting each sector

Validation workshop in Belgium

- Validation of skills supply results and of initial expert consultation

Extended industry consultation

Skills demand

Job vacancies analysis

- Occupational profiles addressed
- Knowledge and education requirements

Questionnaire survey

- Skills review process of companies
- Knowledge and education requirements they set
- Difficulty in finding well-qualified employees
- Skills gaps and shortages (hard and soft skills)
- Methods to address those gaps

Interviews with experts and Focus Group meetings

- Elaboration of questionnaire results

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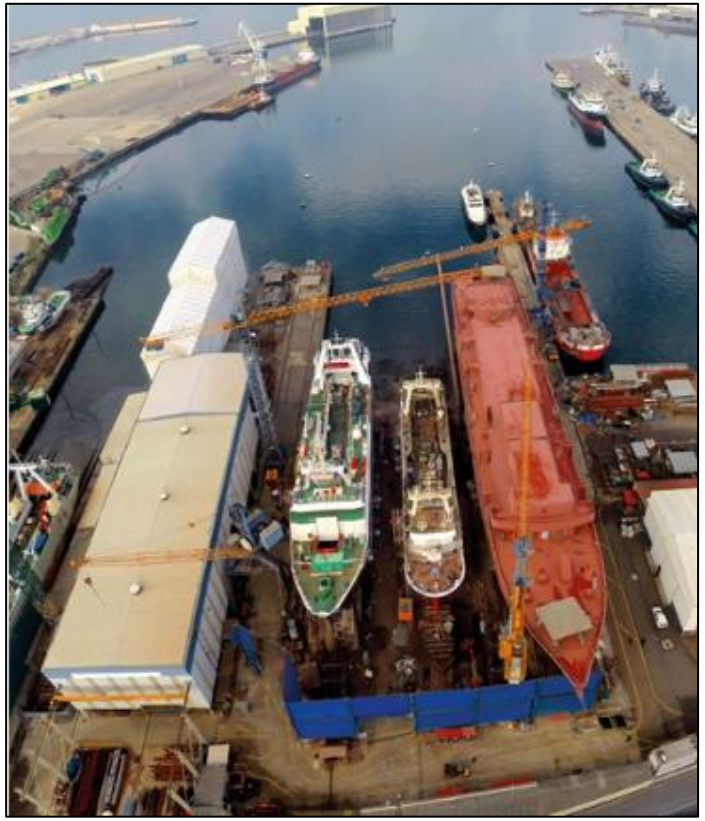
PLAN: Baseline strategy – key results



SHIPBUILDING

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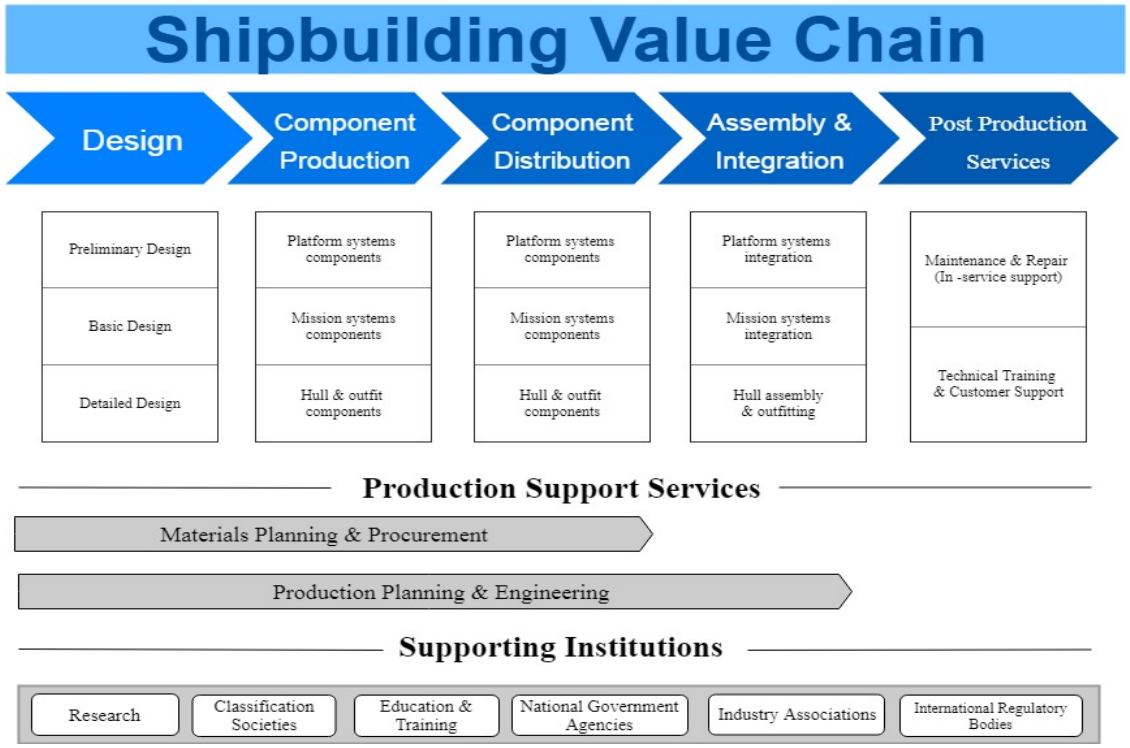
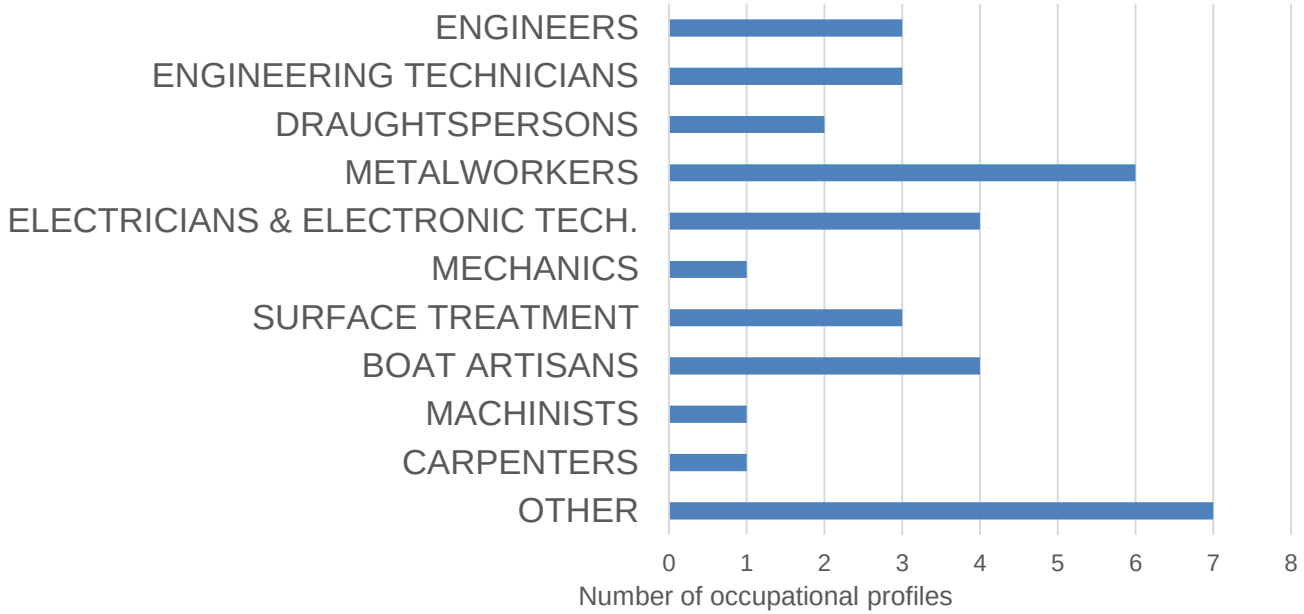
PLAN: Baseline strategy – key results

Reference layers





35 primary

25 supporting

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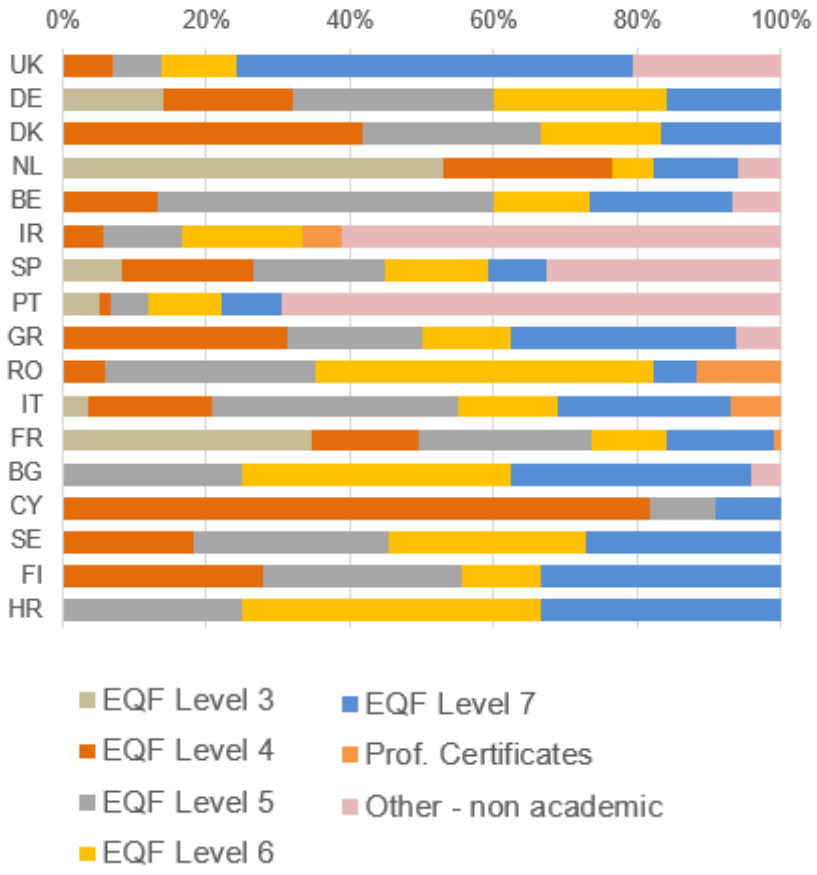
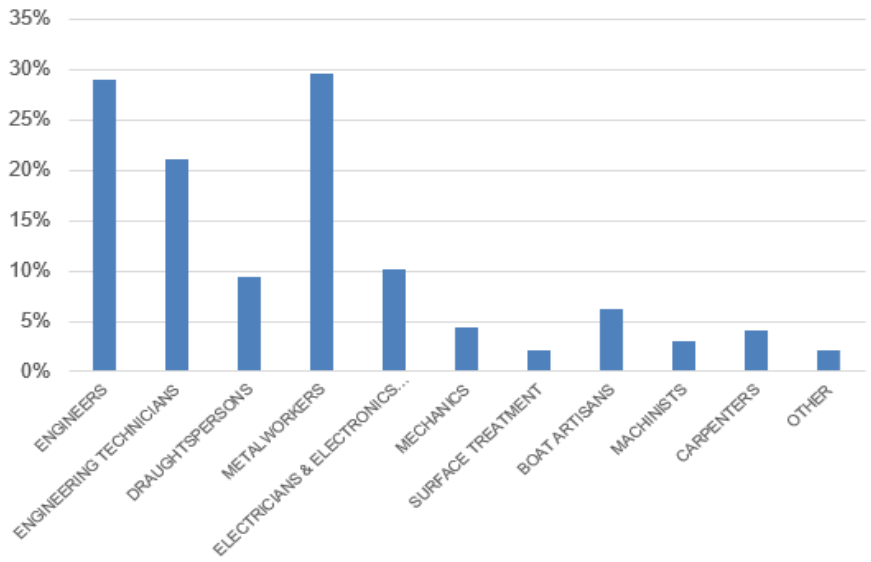
PLAN: Baseline strategy – key results

Skills supply



- 482 E&T programs (academic year: 2018-2019)
- VET programs account for the majority: metal-working is the main field of specialization
- Quite a considerable number (35%) of programs of higher education oriented towards engineering disciplines



- Only few programs are sector specific – most provide broader qualifications
- Concentration of programs in specific regions (e.g. Galicia, Friuli Venezia, etc.)
- 17% of programs are in English or are bilingual
- 40% of occ. profiles covered by less than 5 programs
- Main shortages in **specific technical skills**

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PLAN: Baseline strategy – key results

Skills demand

Skills assessment and upskilling / reskilling needs

- Most companies in the sector review the skills and training needs of their employees on an *annual basis*, while a good percent undertake such a process more than once a year
- Engineers and engineering technicians are the occupations mostly targeted by such a process
- There is a pressing need to continuously improve existing skills so that the adaptation gap to market dynamics and new technology implementation is shortened
- The sector is currently in need of skills related mainly to electrification, alternative fuels, additive manufacturing and automation & digitalization

Employment needs

- Companies find it *quite difficult* to find employees with the desired skills and qualifications
- Young engineers and blue-collar workers lack the necessary experience to be directly employed in the sector
- Engineers and managers are currently in greatest demand
  - Engineering design, collaborative working, project management, process planning & organization, simulation (CFD), compliance with regulations and H&S standards
    - Project management, planning & organization, team mng & coordination, collaborative working, financial management
- The opportunities to attract skilled personnel from other production sectors need also to be taken into careful consideration

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PLAN: Baseline strategy – key results

Skills gaps – Hard skills

Skills category	Skills gaps and shortages
Engineering	▪ Electronic & electrical engineering skills ▪ Skills in automation ▪ Engineering design skills ▪ Skills in marine engineering
Business management	▪ Knowledge of business management tools ▪ Lean management ▪ Quality management ▪ Knowledge to efficiently coordinate different projects / works and take informed decisions ▪ Team building and management techniques (especially of inter-disciplinary teams) ▪ Skills for communicating technical knowledge and work guidelines (especially to inter-disciplinary teams) ▪ Holistic perspective of shipbuilding projects, considering all different phases and the respective needs they present as well as their interrelations and cascading effects / impact of certain actions / activities
Project management	▪ Knowledge of the life cycle of shipbuilding projects ▪ Project planning and organization ▪ Resources planning and monitoring ▪ Knowledge and efficient exploitation of available financial instruments ▪ Design and optimization of production processes ▪ Logistics and supply chain organization
Design	▪ Knowledge of design software (e.g. CAD) ▪ 3D design ▪ Data-based modelling ▪ Knowledge of different production processes ▪ Knowledge of all safety and regulatory parameters; ▪ Knowledge of any changes in relevant regulations and possible implications in work flows and conditions

Skills category	Skills gaps and shortages
Technical	▪ Welding techniques (e.g. welding and casting requirements of new materials, torch cutting, etc.) ▪ Composite materials manufacturing, application and surface finishing ▪ Assembly and installation of engines of new type ▪ Knowledge of cryogenic and overpressure technology (such as hydrogen) ▪ Electrical and electronic systems assembly and installation ▪ Handling of cranes, CNC machines and robots
Digital	▪ Digitalization and optimization processes for improving operations ▪ (Big) data analytics ▪ Handling of ERP and MRP systems ▪ Programing and handling of CNC machines and robots
Foreign languages	▪ Ability to fluently communicate in the English language ▪ Reading and understanding of engineering drawings, technical specifications and user manuals which are all in the English language ▪ Knowledge of other languages (e.g. Italian, Spanish, Chinese) for supporting communication and collaboration with other companies involved in the shipbuilding value chain

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PLAN: Baseline strategy – key results

Skills gaps – Soft skills

Skills category	Skills gaps and shortages
Communication & collaboration	▪ Ability to communicate in different languages (mostly English) and in inter-disciplinary teams ▪ Ability to establish and manage horizontal and vertical relationships
Leadership and responsibility	▪ Ability to take informed and evidence-based decisions ▪ Ability to lead inter-disciplinary teams and effectively distribute roles and responsibilities
Critical thinking and problem solving	▪ Knowledge of problem solving techniques ▪ Quick and efficient solution finding ▪ Quick decision-making capability
Creative thinking and innovation	▪ Monitoring of technical and technological advancements and quick adaptation into work flows and conditions
Knowledge management and transfer	▪ Ability to efficiently manage and use new knowledge acquired through different means (E&T programs, practical experiences, etc.) ▪ Ability to transfer acquired knowledge to others (e.g. new employees)

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PLAN: Baseline strategy – key results

Recommendations for addressing identified gaps

- ***Informal*** and ***non-formal*** education and training methods are the most appropriate for addressing both hard and soft skills (i.e. knowledge and experience transfer, on-the-job training, professionally accredited courses)
- Formal education must be combined with ***on the job training*** (especially for developing the necessary hard skills) for supplying the labor market with 'ready-to-work' young professionals
- Accreditation of certain E&T programs by ***national professional or governmental bodies***. A ***centralized European system*** can minimize the differences across countries and facilitate labor mobility
- Development of ***synergies with other sectors*** for the exploitation of skills that can be efficiently transferred in the shipbuilding sector
- Shipyards must properly ***reform their human resources policies*** and the ***replacement mechanisms*** of retired employees for efficiently transfer the available knowledge and experiences to the new generations

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PLAN: Baseline strategy – key results

OFFSHORE RENEWABLE ENERGY

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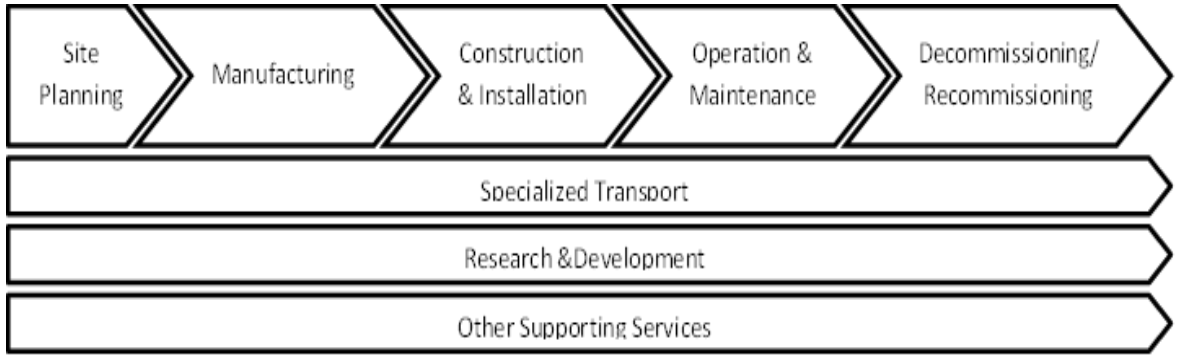
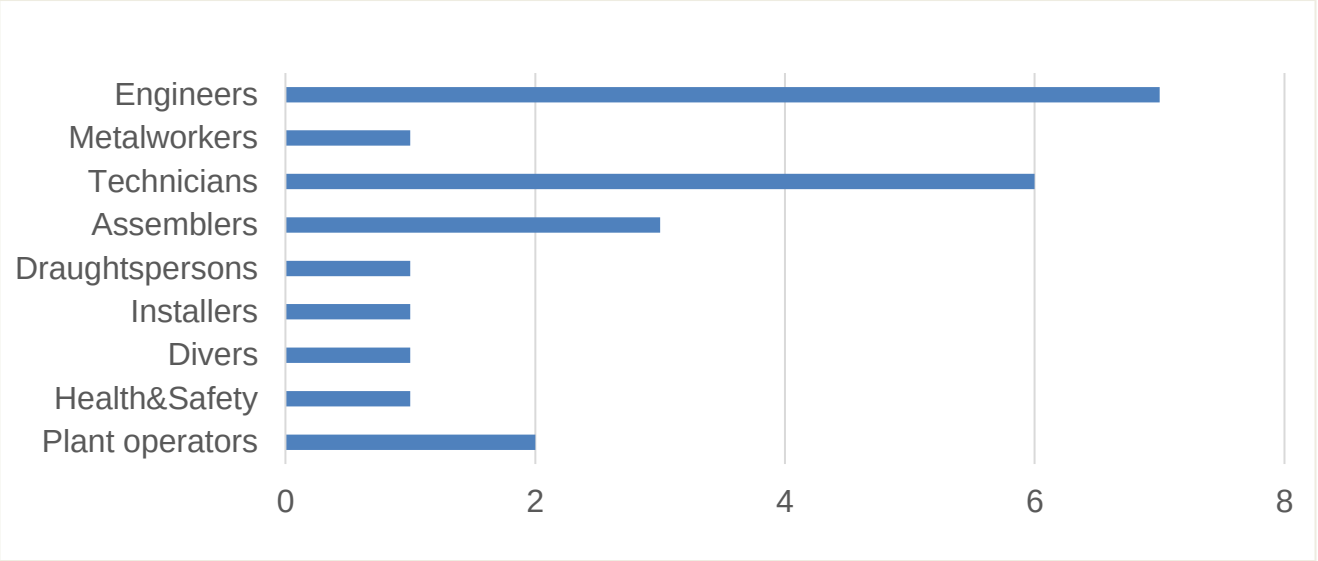
PLAN: Baseline strategy – key results

Reference layers





23 primary

43 supporting

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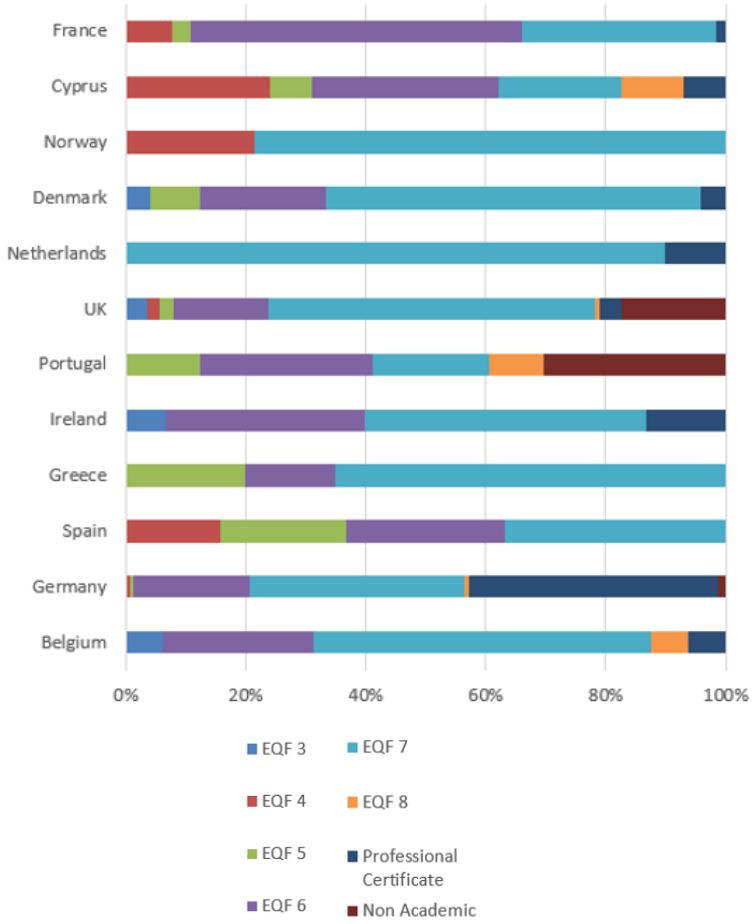
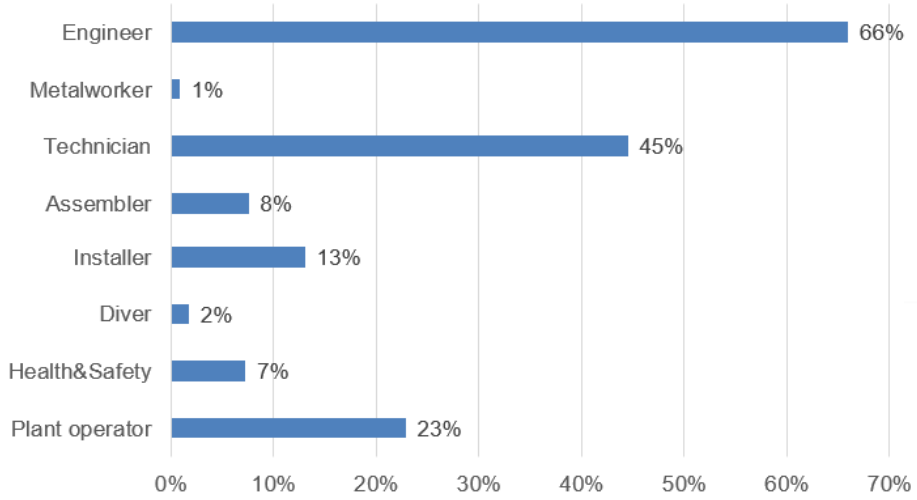
PLAN: Baseline strategy – key results

Skills supply



- 551 E&T programs (academic year: 2018-2019)
- The majority constitutes of B.Sc. & M.Sc. Programs ⟶ ORE specialization provided mostly at academic level – very few VET programs
- Most programs address ORE within the broader context of renewables. Only 5% of identified programs are specializing only in ORE



- Despite their low number, they are covering several critical aspects of the ORE value chain
- Shortages and gaps concern mostly technical occupations related to electro-mechanics, assembly processes, H&S procedures, underwater construction and welding
- Almost half of programs identified are offered in English or are bilingual

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PLAN: Baseline strategy – key results

Skills demand

Skills assessment and upskilling / reskilling needs

- The majority of companies review the skills and training needs of their employees on an *annual basis* (40%) or even *more than once a year* (40%)
- Engineers and technicians are the occupations mostly targeted by such a process
- Qualified employees tend to transfer to more well-established sectors (e.g. offshore oil & gas). This loss of skills should be carefully addressed
- Upskilling and reskilling needs mainly relate to *health & safety procedures*, *offshore-specific skills* and *digitalization.* Also required for coping with increasing size of ORE projects

Employment needs

- Open job positions are currently limited, but will considerably increase in the near future covering the needs of construction & installation and maintenance & repair
- Managers (*specializing on the overall planning and development of ORE projects*) and engineers (*specializing on electrical engineering, structural and geotechnical engineering and design processes*) are currently in greatest demand
- Companies find it *sometimes difficult* to find employees with the desired skills and qualifications (e.g. technical staff able to work at sea)

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PLAN: Baseline strategy – key results

Skills gaps – Hard skills

Skills category	Skills gaps and shortages
Project management	• Contract management • Preparation of deliverables • Working towards milestones • Meet deadlines • Finances • Risk management • Logistics
Engineering (e.g. electrical, structural, offshore, etc.)	• Electrical engineering • Marine engineering • Naval engineering • Offshore engineering • Submarine cable engineering • Structural engineering • Mechanical engineering • Instrumentation & Control systems engineering • Wind turbines • 3D design • Foundations • Principles of ORE technologies
Digital (e.g. ICT skills, remote-controlling, data analytics, smart device handling, etc.)	• Database management and design • Front-end development • Control software development • Software programming • Automation in offshore foundations • Automation in submarine cables activities • Automated/Autonomous marine surveys • Automated (life) condition monitoring • Remote control • Robotics • Drones • Non-invasive monitoring methods for ORE turbines • Data science • Data analysis • Numerical modelling • Statistics • Algorithm modelling • Ability to use new technologies

Skills category	Skills gaps and shortages
Offshore-specific (e.g. working at heights, etc.)	• Offshore renewable energies technologies (including marine and floating wind) • Standardization of installation and maintenance procedures • Offshore O&M • Offshore access systems • Metocean • Working in harsh offshore environment • Working underwater and in depth near the sea bottom • Knowledge of sea bottom • Basic knowledge of ships • Floating component exchange • Drones for offshore applications • Impact of offshore projects on the marine environment • Principles of ORE technologies
Health and safety	• Offshore health and safety • Offshore H&S protocols • Standardization of installation and maintenance procedures • Appropriate metocean conditions for working offshore • Knowledge of marine risks • Handling of heavy weights, cranes, etc.
Project design and planning	• Consenting paperwork • Offshore policies expertise • Logistics • Naval architecture • Numerical modelling • 3D Design and visualization • Appropriate metocean conditions for working offshore

Skills category	Skills gaps and shortages
Using and understanding numerical or statistical information	• Data science • Data analysis • Statistics • Numerical modelling • Algorithm modelling
Foreign languages - reading and writing (especially English)	• English • International technical language • Other languages are also desirable
Business management	• Personnel management • Finances • Consenting paperwork
Supply chain and logistics	• Logistics
Environmental and other interdisciplinary skills	• Offshore – Marine environment • Environmental sciences • Marine sciences • Offshore aquaculture • Metocean • Physics • Impacts of offshore projects on the marine environment

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PLAN: Baseline strategy – key results

Skills gaps – Soft skills

Skills category	Skills gaps and shortages
Creative thinking and innovation	Necessary skill for Engineers
Critical thinking and problem solving	Necessary for Engineers
Communication and collaboration	Supports teamwork
Initiative and self-direction	Can be gained mainly through work experience
Knowledge management and transfer	Can be gained through trainings
Leadership and responsibility	Can be gained mainly through work experience
Flexibility and adaptability	
ICT literacy	
Productivity and accountability	Can be improved through specific trainings
Ocean literacy	Relevant information can be easily accessed online

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PLAN: Baseline strategy – key results

Recommendations for addressing identified gaps

- ***Informal*** and ***non-formal*** education and training methods are the most appropriate for addressing both hard and soft skills (i.e. learning by doing, on-the-job training, in-house training, professionally accredited courses)
- Exploitation of ***test sites*** for training (once confidentiality issues are addressed and financial support can be ensured)
- Development of an ***ORE competency framework***, complemented by skills assessment from the industry and collaboration with professional bodies, societies and associations
- Need for ***formal recognition of professional accreditation and certification***
- Development of ***synergies with relevant sectors*** (i.e. offshore oil & gas, onshore wind energy)
- Reporting of incidents, near-misses and accidents for addressing skills gaps especially related to health and safety

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PLAN: Other activities and outputs

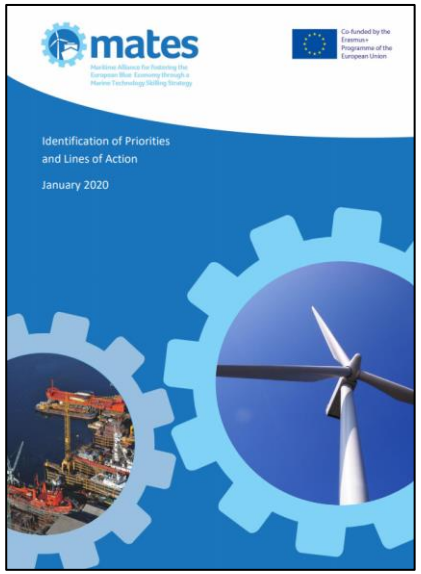
Foresight scenarios for identifying future skills needs and trends

Delphi consultation:

- Identification of paradigm shifters
- Occupations affected
- Required skills and competences

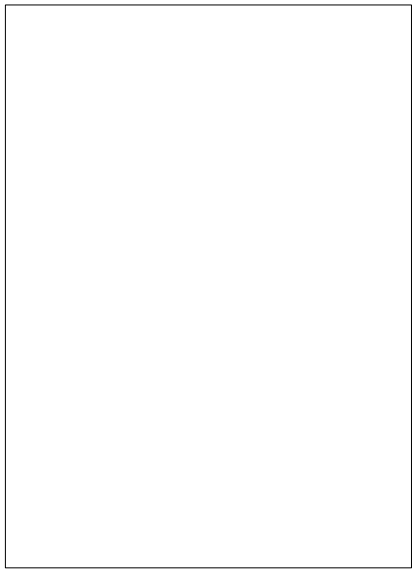
Time horizons: <2025, 2025-2030, >2030

Identification of priorities and lines of action



- Identification of lines of action to address identified skills gaps
- Establishment of prioritization system
- Identification of actions addressing top priorities

Baseline strategy



- Guidance on how the project's Pilot Experiences will be contributing to the Skilling Strategy

https://www.projectmates.eu/deliverables-2/

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DO: Pilot Experiences

DOP: Definition of New Occupational Profiles

The main goal of this Pilot Experience is to define the new occupations emerging from the evolving technologies in the Offshore Renewable Ene...

Read more...

ED2MIT: Education and Training for Data Driven Maritime Industry

ED2MIT, is developing training courses for main topics related to data literacy, data management and modern platforms for digitalisation in t...

Read more...

MOOC Training Course

This Pilot Experience aims to address the common problem of the mismatch of skills acquired through education and the needs of companies. It ...

Read more...

Freeboard

The aim of Freeboard is to build a boat model using a block assembly process, in order to reproduce conditions that students will face in rea...

Read more...

The Magnus effect

Coming soon!

Read more...

Green Maritime Hackathon

The Green Maritime Hackathon (GMH) aims to support open innovation and facilitate the development of innovative and breakthrough ideas for me...

Read more...

MOL2: Maritime on the Loop of Ocean Literacy

MOL2 aims to engage educational and training centres with cross-curricular skills related to Shipbuilding and Marine Technologies. Read more...

Offshore Renewable Energy Courses

The offshore renewable energy courses will provide information on the marine energ...

Read more...

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DO: Pilot Experiences

Summer School

The Summer School will consist of a short-term course on knowledge exchange between workers from traditional sectors (including shipbuilding/...

Read more...

Green Move

Green Move aims to promote professional mobility (including exchanges and technical visits) of students and workers to encourage the use of g...

Read more...

Innovation manager course

The aim of the Innovation Manager Course is to attract talent from training centres to the shipbuilding sector and improve the skills of part...

Read more...

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CHECK & ACT: Long-term action plan and sustainability

CHECK

Critical review of the project strategy and lessons learnt from the Pilot Experiences

Sustainability roadmap and policy recommendations

ACT

Long term commitment and action plan by the project partners (MATES Alliance members)

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Thank You !

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