



Maritime Alliance for fostering the
European Blue Economy through a
Marine Technology Skilling
Strategy



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

Highlights of MATES Pilot Experiences

Offshore Renewable Energy Crash Courses

Layman Report

January 2021



About this Report

This document was developed through the EC-funded Erasmus+ project **MATES: Maritime Alliance for fostering the European Blue Economy through a Marine Technology Skilling Strategy**.

The objective of the MATES project is to develop a skills strategy that addresses the main drivers of change in the maritime industries, in particular shipbuilding and offshore renewable energy. Both sectors are strongly linked and require new capacities to succeed in an increasingly digital, green and knowledge- driven economy.

Duration: January 2018 – April 2022 (52 months)

More information on the project is available at projectmates.eu.

Document information	
Short description	This document helps to develop effective approaches in delivering the Pilot Experience: Offshore Renewable Energy Crash Courses.
Next steps	These results present a solid foundation for the Maritime Technologies Skills Strategy and the long-term Action Plan and sustainability.
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Lead authors	Fox, J. (Aquatera Ltd), Garniati, L., (Aquatera Ltd), Vazquez, J.L. (CIFP Universidade Laboral)
Contributors	Baston, S. (Fundación CETMAR)
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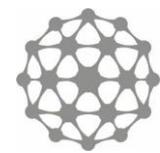
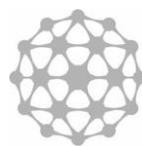
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1. Context

MATES: Maritime Alliance for fostering the European Blue Economy through a Marine Technology Skilling Strategy, is an EC-funded, ERASMUS+ project with the objective to develop a skills strategy that addresses the main drivers of change in maritime industry, in particular shipbuilding and offshore renewable energy.

The MATES Pilot Experiences (PEs) are vital components of the strategic design of the project. The Experiences consist of a series of activities that align with priority areas needed to support training and development of the shipbuilding and offshore renewable energy industries. This report summarises the outcomes and learning elements from one of those Pilot Experiences: Offshore Renewable Energy Crash Courses.

This PE was divided into two specific but related PEs

- Marine Energy Crash Course, led by Aquatera Ltd
- Offshore Wind energy Short course for VET trainers, led by CFP Universidade Laboral

The aim of these courses is to advance the exposure of the fast-developing offshore renewable energy (ORE) sector to a) those working in parallel or similar work streams in order to build the awareness and knowledge of the sector and ultimately to ensure that the skills requirements for this growing sector are met and b) VET teachers, since they are key in future generations of workers.

The goal of these short courses is to engage professionals who will be able to transfer the knowledge directly to industry and future workers of the sector. This is achieved by:

- raising awareness of ORE as part of the energy mix
- introducing a basic understanding of ORE systems development
- providing up-to-date information on the latest situation of ORE in a global context.
- training VET trainers in real skills needed for working in the wind energy sector

In line with this, the Marine Energy Crash Course is targeted at professionals who work in a parallel sector to ORE which could be oil and gas, aquaculture or related policy, funding or research related positions. The teachings in this course were designed to build upon their existing knowledge of the marine environment in the specific context of ORE, thereby providing a comprehensive introduction to the fundamental aspects of the ORE sector and enhancing their opportunities.

The EU recognises the climate emergency, committing to 55% fewer greenhouse gas emissions by 2030 compared to 1990 emissions and to achieve net zero status by 2050¹. It is foreseen that these significant changes to energy systems and infrastructure within these next years can bring significant opportunities for economic growth, markets, jobs and technological development. It is widely acknowledged that a strong mix of renewable energy solutions including wind, solar, wave, tidal, thermal and salinity energy will be vital to this transition.

The MATES project, in recognising the importance of this transition and following a practical approach, aims to produce a comprehensive and applicable skills strategy supporting further growth in the two sectors targeted and strengthening the global competitiveness of European industries. A critical review and analysis of the existing needs for education, training and skills in the sectors of shipbuilding and ORE in Europe was conducted to address current shortages and gaps in relevant skills and qualifications.

¹ <https://www.consilium.europa.eu/en/policies/climate-change/#>

2. Overview of the ORE Crash courses

2.1. Marine Energy Crash Course

The Crash Course on ORE focused on the “Fundamental principles for developing a commercial ORE project”. This course brings the latest experience and learnings from this sector to participants who may be from parallel or similar sectors but do not have direct experience or knowledge of the ORE sector. This includes regulators and policy makers in the energy sector and workers in aligned but different sectors such as the onshore and offshore wind sector, marine operations, fishing, aquaculture, oil and gas. This training was offered under the themes of technical, financial, business and environmental aspects of the ORE sector.

This course is developed by the Aquatera team, who have the unique experience of working in the ORE industry around the world and with experience in all aspects of this industry. Additionally, the Course materials have been developed in consultation with the Experts in the Offshore Energy and Activities Thematic Group. The PE is taught in an informal, user-friendly way and encourages discussion, engagement and participation of the attendees.

Originally, the course was planned to be held in five locations in Europe;

- Orkney, Scotland where Aquatera is based.
- Vigo or Ferrol (Spain);
- Brussels, Belgium;
- France, and
- Denmark.

Unsurprisingly, due to the COVID-19 pandemic still being very much prevalent at the time of implementing the course, this was impossible. Instead, the Course took place in an online format. The course was implemented to three cohorts of participants between November 2020 and March 2021. The ORE Crash Course provided 54 hours of training to 39 participants in total, broken down in the following way:

Table 1: Marine Energy crash course key numbers

Course date	Number of participants	Hours of training provided
December 2020	13	18
February 2021	8	18
March 2021	18	18

There were advantages and disadvantages to this approach. Using *Microsoft Teams* allowed greater accessibility to participants and so there was a strong international presence at the Course. Additionally, it was inexpensive and therefore economically efficient for the organiser- Aquatera and also for the participants to attend.

The disadvantage of this format is that it creates a more challenging atmosphere for engagement, discussion and active collaboration. To overcome this, we utilised a suite of tools including group polling software *Poll Everywhere*, group whiteboard tool *Jamboard* and *Microsoft Teams'* breakout groups function to allow for group activities to take place and to maximise active engagement with the participants.

This PE was developed, quality assessed and thoroughly tested with a consistent feedback loop with participants and Experts. Feedback received was used in the final evaluation of the PE. Additionally, this feedback was used at interim stages in the constant improvement of the PE. The first implementation of the course was to a cohort of M.Sc .students at Heriot Watt University. This allowed for the implementation of the course to a group of students with an interest in the topics at an early stage of their studies. Important feedback was gathered from the students on the content and delivery of the course before further implementation took place. Additionally,

the information gathered at the registration stage for each cohort of participants allowed the course materials to be tailored to each group depending on their levels of expertise and their particular interests.

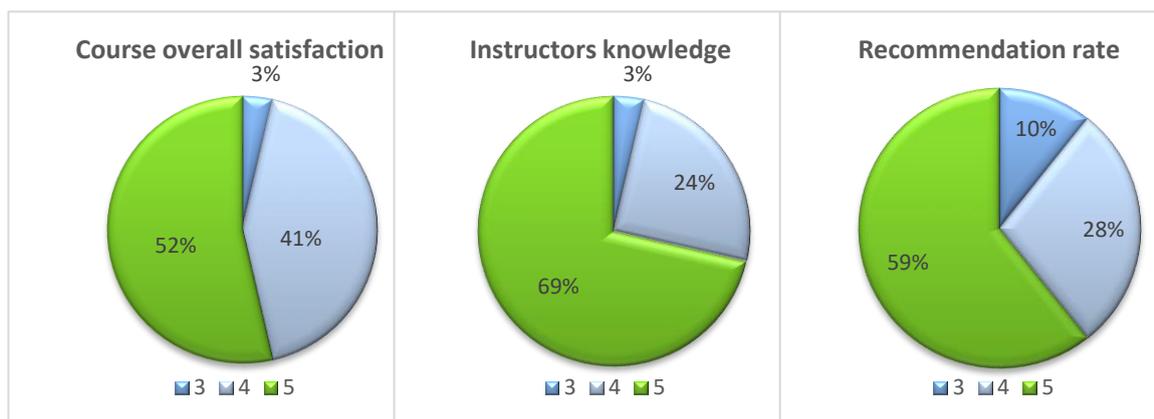


Figure 1: Left chart: Results of the survey to the question: **Rate your overall satisfaction with the course.** (1= lowest, 5= highest; only results 3-5 shown as no responses given as 1 or 2). Middle chart: Results of the survey to the question: **The instructors knew the content of the syllabus in depth** (1= lowest, 5= highest; only results 3-5 shown as no responses given as 1 or 2). Right chart: Results of the survey to the question: **I would recommend this course to a friend/ colleague** (1= lowest, 5= highest; only results 3-5 shown as no responses given as 1 or 2).

2.2. Offshore wind energy crash course for VET trainers

This course aims to provide training in the most relevant technical and safety aspects of the wind energy sector to VET trainers in order to give them support in their role of delivering up-to-date required skills for matching industry needs.

It was delivered in a face-to-face format in Galicia (Northwest of Spain) in April 2021. The workshop took place over five consecutive days. Figure 2 shows the main content of the training.

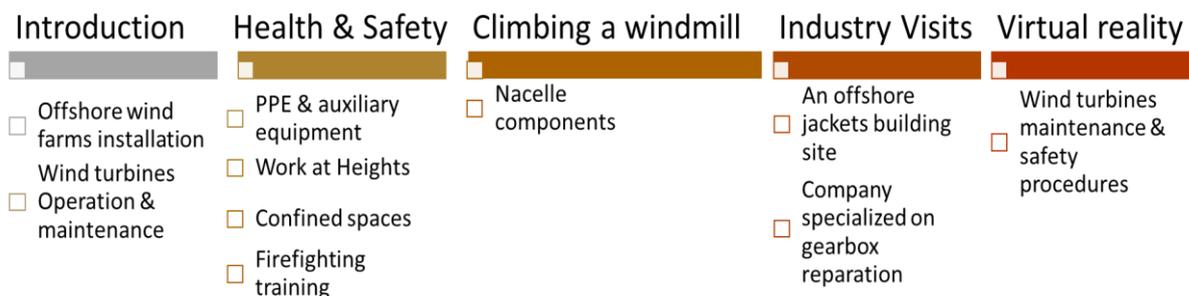


Figure 2: Programme of the Wind energy course for VET trainers held in Galicia (Northwest of Spain)

Faculty members from HE-VET (Higher Education Vocational Education and Training) participated in the development of the course. The course provided the participants with the opportunity to experience first-hand part of the training that is required for workers in the wind sector in both technical and safety skills, as the latter is one of the most important training loads in this sector. Theoretical and, above all, practical training was combined, including training in virtual reality models applied to the sector.

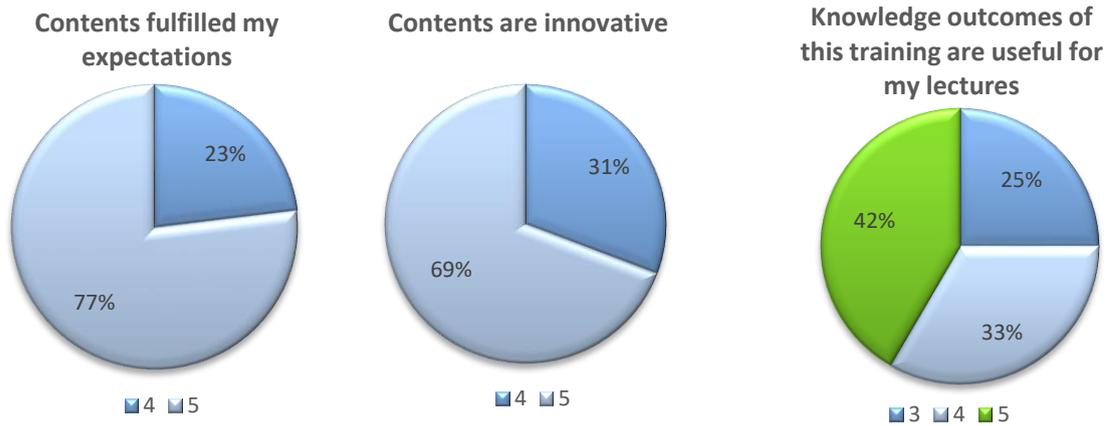


Figure 3: Results of the satisfaction survey of the Wind Energy course for VET trainers. Left chart: Results to the statement: **Contents fulfil my expectations**. (1= lowest, 5= highest; only results 4-5 shown, as no responses given as 1, 2 or 3). Middle chart: Results to the statement: **Contents are innovative** (1= lowest, 5= highest; only results 4-5 shown, as no responses given as 1, 2 or 3). Right chart: Results to the statement: **Knowledge outcomes of this training are useful for my lectures** (1= lowest, 5= highest; only results 3-5 shown, as no responses given as 1 or 2).

OUTCOMES

- This Pilot Experience has been developed directly by people who have significant levels of direct experience in all aspects of marine energy projects, from the supply chain to business management, project development and environmental consenting. In this way, this Pilot Experience brings innovation to the addressing of skills gaps in the European ORE sector in Europe
- The Marine Energy Crash course focuses on the skills required for commercial success in the ORE industry, as identified by experts in the industry working in the UK and throughout the world (e.g., Europe, North America, South America, Africa, Australia and Southeast Asia).
- Thirteen participants answered the satisfaction survey of the Offshore Wind energy crash course and the feedback was positive. All of them agree that this kind of training is key for VET teachers' upskilling. The overall rate was the top one (5/5). The participants highlighted the content of the training since H&S training is not available for teachers, and wind farms' companies are very strict allowing access to wind turbines.

Summary of Participants Engaged in the ORE Crash courses

	Location	Galicia (Spain)	Orkney (UK)
	Hours of Training	30	54
	Number of people	14 (6 women + 8 men)	39
	Number of countries reached	1	15

3. Achievements

The ORE Crash Course Pilot Experience provides a framework for replicating similar activities across different geographic locations and among many different groups. Here we outline the materials available and the main impacts.

3.1. Results: Education and Training Materials

Through the development of this PE, materials have been developed in support of the course that are available at no charge. These materials cover the contents of the course and allow participants who have undertaken the course to spread and share the learnings. Additionally, those who are aware of the course but have not been available to attend are able to use the materials to increase their knowledge of the ORE industry. The materials are available through the MATES Project². Please contact Jennifer Fox at Jennifer.fox@aquatera.co.uk if you need additional support.

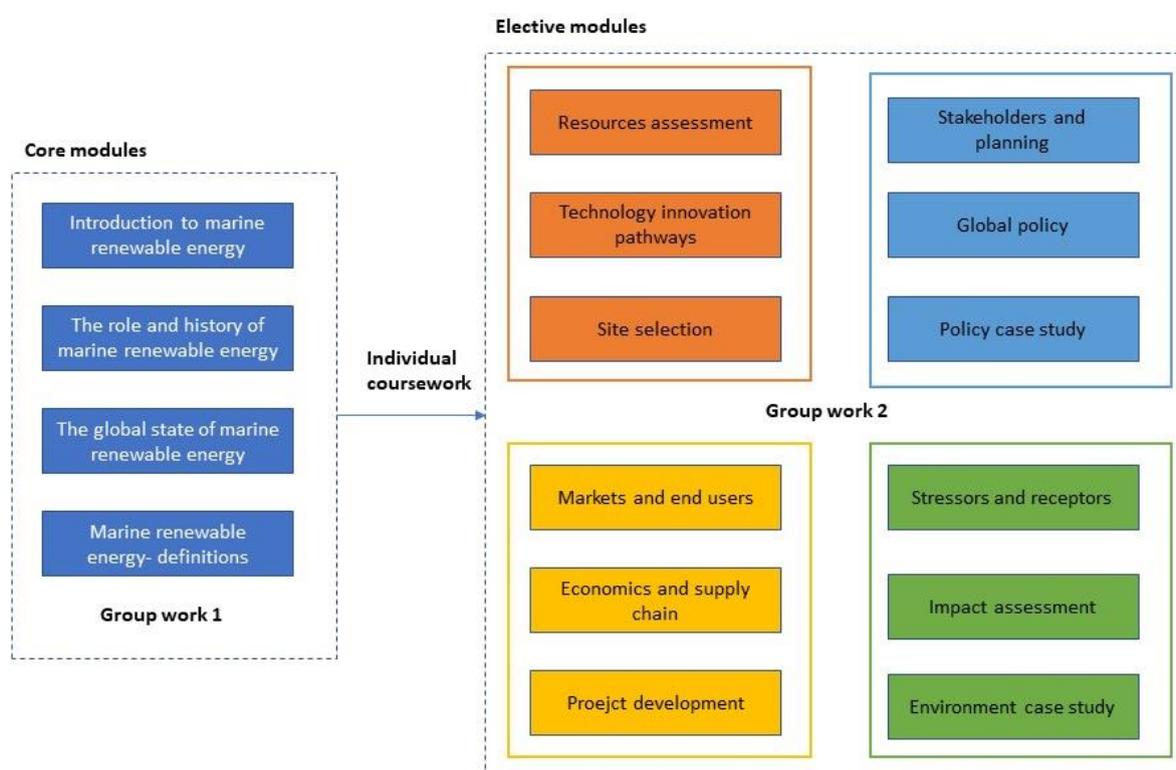


Figure 4: Summary of course content and materials including coursework to be completed throughout the Crash Course

Learning outcomes are designed with a focus on what knowledge, skills, and competences the learner has acquired by the end of the learning process. Learning outcomes achieved within the Crash Course are:

1. **Explain and provide** several examples of MRE’s role in the global energy mix, and the different stages of the sector development in different parts of the world
2. **Apply analytical skills** for evaluating the potential of MRE to be implemented in certain settings from different sectoral point of views (policy, technology, environment, and business development)
3. **Explain** the foundations for concepts and calculations on MRE resources
4. **Explain** the key technical aspects of MRE devices
5. **Explain** the enabling policy and strategy around MRE development

² <http://intranet.projectmates.eu/index.php/s/xE5zibmyowp5GbH>

6. **Explain** the costs and benefits of MRE systems
7. **Explain** the potential environmental and social risks around MRE development
8. **Communicate** the different stages of MRE systems development and implementation aspects using numerical, verbal and visual means

You can find detailed information about the course [here](#)³.

The materials of the Course have been identified as a transferable Knowledge Output. There are two potential applications for this- with policy makers such as Marine Scotland and Welsh Government and with ORE experts. With policy makers, it is foreseen that the materials of the course would be used to highlight the opportunities within the ORE sector to skilled workers in other marine and maritime sectors. Those policy makers will use this as an example of the importance of future planning for this sector and disseminating the details of the opportunity within the political framework in which they work, impacting policy and funding opportunities for the sector to grow in strength and meet the skills gaps challenges that come with that growth.

For ORE experts, the materials of the course could be used to expand the opportunities for the material to be used in the training of potential ORE workers beyond the capacity that Aquatera has for this training. This will increase the capacity of Aquatera's efforts to educate skilled workers about the opportunities within the ORE sector.

This [YouTube video](#)⁴ summarizes the Offshore Wind energy Short Course for VET trainers.

Learning outcomes of the Offshore Wind energy Crash Course for VET trainers are:

- **Identify** the different technologies of wind turbines and their components
- **Understand** the differences of logistics for onshore and offshore wind farms.
- **Be able to safely climb** high platforms using the necessary technical means
- **Be able to work** in confined spaces
- **Climb** a wind turbine safely
- **Recognize** the different techniques for repairing and manufacturing wind turbines components
- **Follow** essential wind turbine maintenance task through Virtual Reality



Figure 5: VET teachers during one of the visits within the offshore wind energy Crash Course

³ <http://intranet.projectmates.eu/index.php/s/x3XLQT6WRt3XKA6>

⁴ <https://www.youtube.com/watch?v=X7oHKFq82kY>

3.2. Main Impact

The main impacts of the Pilot Experience are:

- Extended network of informed, educated individuals and professionals who will have the basic knowledge to develop the marine energy sector within their own business, and become an advocate for the sector (See Table 1 for numbers).

The implementation of the PE has resulted in an extended network of professional individuals who have received a Short Course in the fundamental principles of ORE. These individuals are now encouraged to engage further with ORE and to share their learnings with colleagues and peers

- Full evaluation of the learning objectives of the PE

The implementation of the PE has allowed validation of the objectives of the MATES project. In other words, it has been possible to evaluate this method of addressing skills gaps in the ORE sector

- Improved VET, LLL, HE⁵ training curricula

A workforce which receives a well-designed and delivered VET, LLL, and HE training is more able to perform their job well. The training has given the workforce a greater understanding of their responsibilities within their role and build their confidence. This confidence will enhance their overall performance and the sector's competitiveness. The investment in training that is made shows any workforce that they are valued. The training creates a supportive workplace. Participants may gain access to training they wouldn't have otherwise known about or sought out themselves. A workforce which feels appreciated and challenged through training opportunities may feel more satisfaction toward their jobs.

- Disseminated opportunities in ORE industry and supply chain

These Courses allow participants throughout the ORE industry and supply chain to strengthen the skills that each sub-sector component needs to improve skill weaknesses. This helps reduce any weak links within the sector. Providing the necessary training creates an overall knowledgeable workforce which is mobile and can take over from one another as needed, work on teams or work independently without constant help and supervision from others. A robust training and development programme, such as these courses, ensures that the workforce has a consistent experience and background knowledge. The consistency is particularly relevant for an organisation's basic policies and procedures.

Productivity usually increases when an organisation is engaged and implements training courses, such as these courses. Increased efficiency in processes will ensure project success which in turn will improve the company turnover and potential market share. Ongoing training and upskilling of the workforce can encourage creativity. New ideas can be formed as a direct result of training and development. With this in place, professionals are more likely to feel valued if they are invested in and therefore, less likely to change employers. Training and development are an additional organisational benefit. Recruitment costs therefore go down due to staff retention.

Since the wind energy course was aimed at VET trainers, the multiplier effect of the Pilot Experience had a big impact. The possibility of including it as a European mobility activity for VET trainers⁶ can be further explored.

⁵ VET- Vocational Education and Training; LLL- Lifelong Learning; HE Higher Education

⁶ <https://erasmus-plus.ec.europa.eu/programme-guide/part-b/key-action-1/mobility-vet>

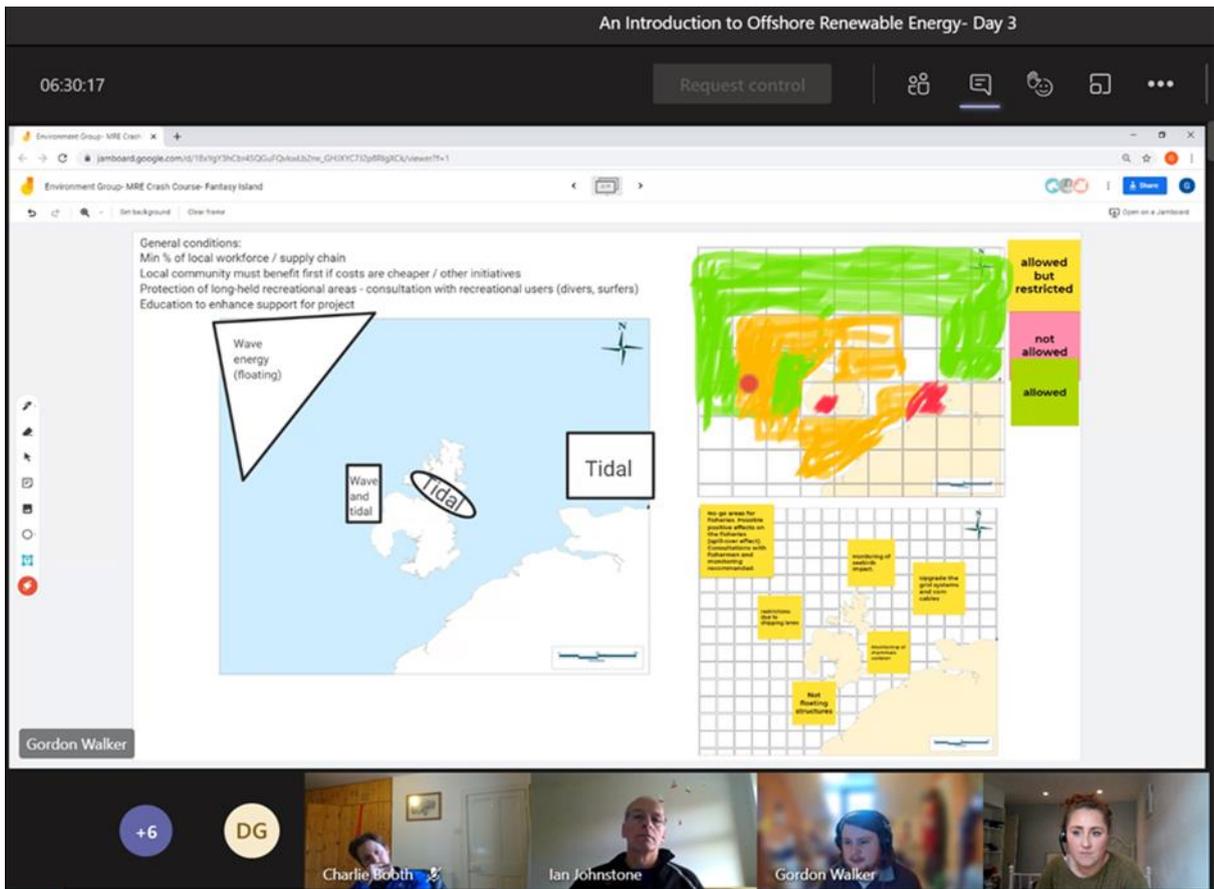


Figure 6: Screenshots from the ORE Crash Course

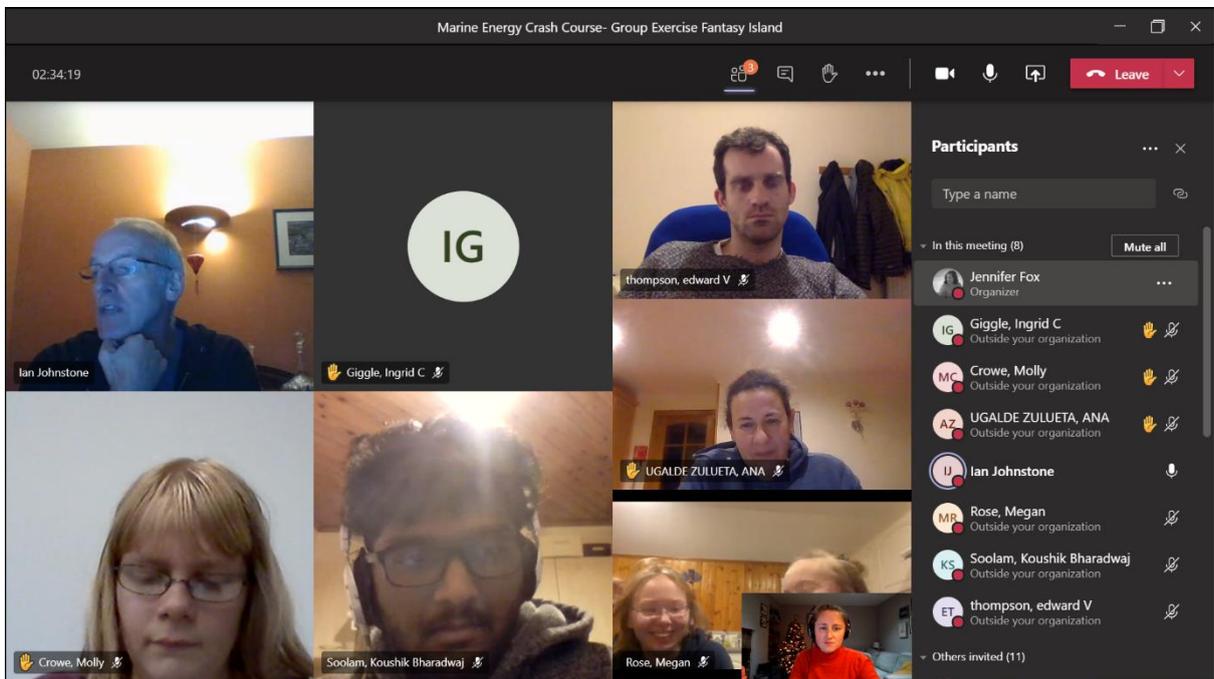


Figure 7 Screenshots from the ORE Crash course

4. The European Added Value

This PE has targeted EU Policy objectives as shown in Table 2.

Table 2: Details of how these PE targets are relevant EU Policy Objectives

EU Policy Objective	How Pilot Experience targets the Relevant EU Policy Objective
Skills agenda ⁷	<ul style="list-style-type: none"> - Providing direct engagement and knowledge exchange with SMEs who have applied high-tech-skills in their businesses by facilitating <u>industry visits</u> and dialogue. This is done through these courses by providing direct access to industry experts
European Pillar of Social Rights	<ul style="list-style-type: none"> - Ensuring inclusivity is adhered to when selecting participants - Providing avenues for upskilling and growing confidence by incorporation of new knowledge into training curricula - Promoting self-worth and personal skills values by integrating acknowledgement and certification of attainments
Open science ⁸	<ul style="list-style-type: none"> - Ensuring public accessibility to training material and appropriate case studies by encouraging all participating partners to practise publishing open research, utilising open access, and communicating scientific knowledge generated from the PE to the wider ORE professional and extended end users. In this case, all materials of the courses are openly available.
Blue Growth and Economy ⁹	<ul style="list-style-type: none"> - Targeting the energy sector relevant to blue economy by focusing on ORE in the curricula - Promoting sustainable marine resources management through clean energy technology <p>Explaining the direct correlation between low carbon technology and the aims of blue growth and economy</p>
DigiComp (Digital Competence Framework for Citizens) ¹⁰	<ul style="list-style-type: none"> - Utilising ICT platforms in delivering course material - Introducing relevant ICT programmes
EntreComp (Entrepreneurship Competence Framework)	<ul style="list-style-type: none"> - Providing examples of and industry lessons learnt in accessing routes/channels for business start-ups in ORE

Depending on the results of the MATES Project, it is foreseen that this PE will be scaled up to be offered to larger numbers of participants on a wider geographic scale. There are additional opportunities on local, national, European and global scales to offer this course to consistently improve the ocean literacy and general knowledge and education of professionals, policy makers and researchers on the topic of ORE. Aquatera will carry forward the learnings from the MATES Project to implement this course around the world.

⁷ 'New Skills Agenda for Europe - Employment, Social Affairs & Inclusion - European Commission'. [Online]. Available: <https://ec.europa.eu/social/main.jsp?catId=1223>.

⁸ A. M. Kaplan and M. Haenlein, 'Higher education and the digital revolution: About MOOCs, SPOCs, social media, and the Cookie Monster', *Bus. Horiz.*, vol. 59, no. 4, pp. 441–450, Jul. 2016.

⁹ 'COM (2012) 494 final. Blue Growth opportunities for marine and maritime sustainable growth', Policy Document.

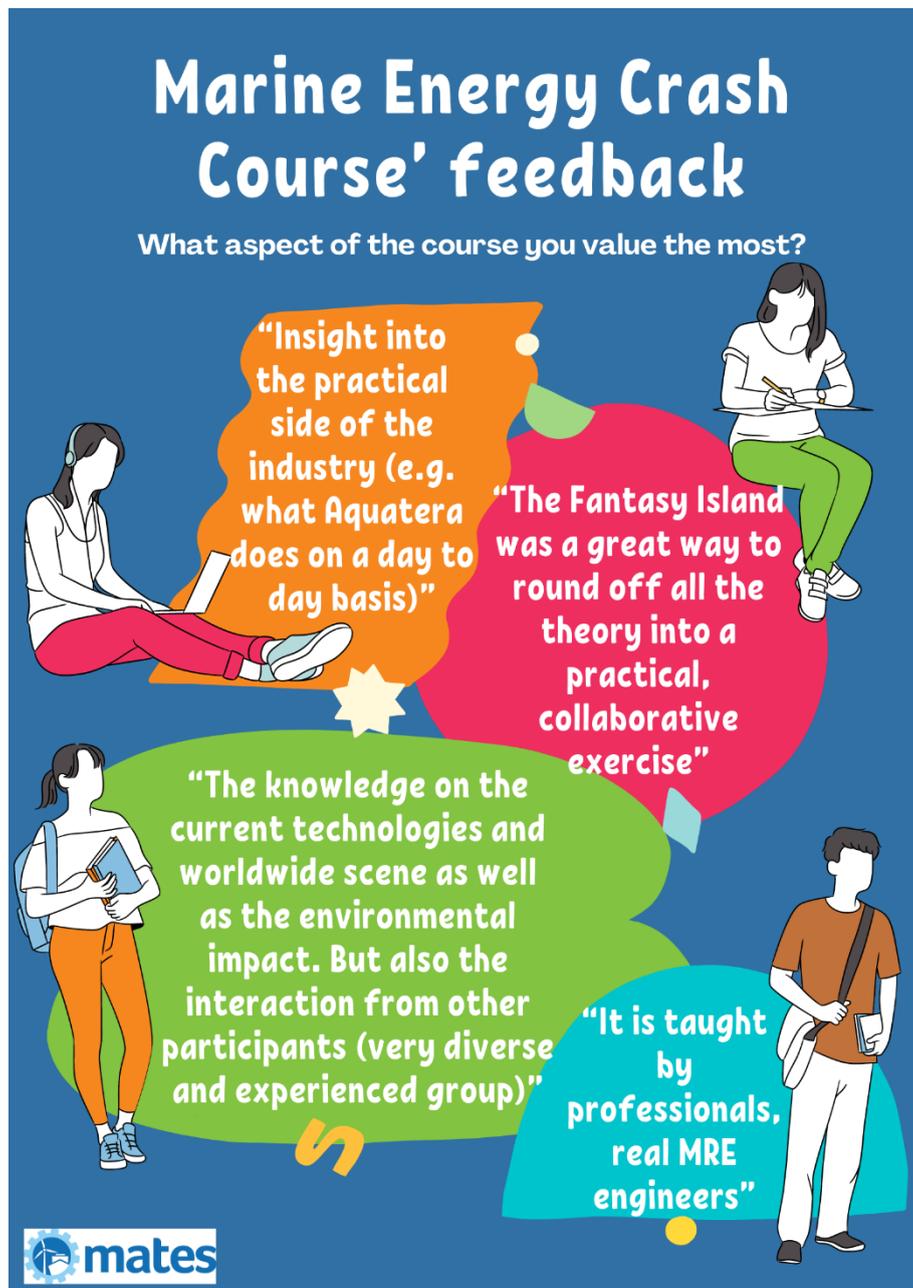
¹⁰ 'COM (2012) 494 final. Blue Growth opportunities for marine and maritime sustainable growth', Policy Document.

Indonesia has particularly strong prospects for developing offshore / near-shore renewable energy resources including floating solar, tidal, offshore wind, wave and thermal energy.

To extend its impact and as part of EU MATES' legacy, the 'Pilot Experience – Introduction to Marine Energy' will be delivered remotely to a wide range of audiences during Indonesia's National Renewable Energy Conference, EBTKE ConEx in November 2021. The event is an official annual event of the Indonesian Renewable Energy Society with full support from the Ministry of Energy and Mineral Resources, Republic of Indonesia.

To ensure that the programme is fit for purpose, the EU MATES Pilot Experience training material has been tailored to Indonesia's needs and situations, with support from the UK-Indonesia Bilateral MENTARI Programme.

In the future, the introductory-level training programme could be further replicated in collaboration with the MENTARI Programme, and advanced level material could be created and delivered, contributing to Indonesia's skills development agenda in the area of low-carbon, just energy transition.



Offshore wind energy crash course for VET trainers' feedback

What aspect of this course can be improved?



All Layman Reports and education and training materials from all the MATES Pilot Experiences are available on the MATES website and include:

ED2MIT: Education and Training for Data Driven Maritime Industry projectmates.eu/pilotexperience/ed2mit
MOOCs on Industry 4.0 and the naval sector projectmates.eu/pilotexperience/mooc-training-course
Freeboard projectmates.eu/pilotexperience/freeboard
The Magnus Effect projectmates.eu/pilotexperience/the-magnus-effect
Innovation Manager in Shipbuilding Course projectmates.eu/pilotexperience/innovation-manager-course
Additive Manufacturing and Risk Management in the Shipbuilding and Ship Repairs Sectors projectmates.eu/pilotexperience/training-seminar
MOL² Maritime on the Loop of Ocean Literacy projectmates.eu/pilotexperience/mol2
Offshore Renewable Energy Courses projectmates.eu/pilotexperience/renewable-energies-crash-courses
Ocean Pro.Tec Lab projectmates.eu/pilotexperience/ocean-pro-tec-lab
Green Move projectmates.eu/pilotexperience/green-move
Definition of New Occupational Profiles projectmates.eu/pilotexperience/dop-definition-of-new-occupational-profiles





Contact

Lead Author: Jennifer Fox,
jennifer.fox@aquatera.co.uk

Project Coordinator: Lucía Fraga, lfraga@cetmar.org

projectmates.eu