FLORES

Offshore Renewable Energies partnership in the Pact for Skills

D4.3 ORE – Occupational Profiles update

March 2025

Co-funded by the European Union

About this Report

Forward Looking at the Offshore Renewables is promoting the core activity of the Large-scale partnership launching the Pact for Skills in the Offshore Renewable Energies (ORE) sector. FLORES support the most committed stakeholders in the ORE, underpinning the success of the offshore renewable energy strategy with the stimulation of dedicated training offers. The partnership promotes the skilling process for the new jobs expected in the sector, estimated to account for 124.000 new workers in the EU by 2030 and contribute to improve upskilling opportunities in the field of the actual ORE workforce.

Project duration: January 2023 – March 2025 (27 months)
www.oreskills.eu

Document information	
Short description	Revision of the ESCO occupational profiles involved in the ORE value chain considering the skills intelligence results from T2.1 and 2.3.
Next steps	The results will be transferred to the ESCO secretariat, to be considered in the revision for the ESCO v1.2.
Work Package	WP4: Promoting Careers in the ORE
Task	T4.2: Update to the ESCO Occupational Profiles
Deliverable	D 4.3: ORE – Occupational Profiles Update
Dissemination level	PU - Public
FLORES website link	www.oreskills.eu
Lead authors	Fraga L., (CETMAR), García-Mayoral E., (CETMAR)
Contributors	Sdoukopoulos L. (CERTH-HIT); Kellet P. (EMB), Bastón Meira S. (CETMAR)
Photo credits	Indicate credits reference
Submission date	March 2025

Please cite this publication as:

CETMAR, (2025). ORE – Occupational Profiles update. Results of the FLORES project (www.oreskills.eu).

FLORES
Offshore Renewable Energies partnership in the Pact for Skills

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

1. Executive report

The ESCO classification system plays a crucial role in aligning industry needs with the education system by providing a multilingual database of skills, competences, qualifications, and occupations across the European Union.
To ensure that ESCO occupational profiles remain relevant to the Offshore Renewable Energy (ORE) sector, this report presents an in-depth review of the database, leveraging the skills intelligence gathered by the FLORES skills observatory in 2024 and 2025. The objective is to enhance the accuracy and relevance of ORE-related occupations in ESCO, making career pathways clearer and more accessible to job seekers while strengthening the connection between skills demand and workforce development.

This review builds upon previous efforts, particularly the MATES project, and follows a methodology that combines literature review, stakeholder consultations, and analysis of job market trends. The study examined existing occupational profiles and identified gaps in ESCO, ensuring that both current and emerging roles are adequately represented.

Additionally, this report builds on the findings of the skills foresight analysis developed by the FLORES skills observatory, which examined how technological advancements, policy changes, and market dynamics will shape future workforce needs. Expanding on these results, the present study identifies the skills and competences most relevant to the evolving ORE sector and translates them into ESCO-compatible descriptors for inclusion in the database.

As a result of this work, 17 emerging occupations within the ORE value chain have been identified, nine of which are not currently listed in ESCO. Among these, two are already relevant to the industry, while seven are expected to become essential due to future sector developments. Each new occupation has been defined following ESCO taxonomy, ensuring alignment with the classification system.

Furthermore, 26 new skills and knowledge concepts have been proposed for inclusion, filling critical gaps in the current database. In total, 247 relevant skills have been mapped to 54 occupations that are expected to be significantly impacted by technological, policy, and market trends.

By transferring these insights to the ESCO secretariat, this report contributes to a more precise and up-to-date classification of ORE occupations, ultimately improving workforce planning and mobility across the EU. The updated occupational profiles will provide job seekers, employers, and training institutions with clearer information, facilitating better alignment between workforce supply and industry demand. This effort represents a key step in strengthening skills intelligence for the ORE sector, ensuring that ESCO remains a valuable tool for European labor market development.

2. Introduction

ESCO, the multilingual classification of European Skills, Competences, Qualifications and Occupations, is part of the Europe 2020 strategy. It was launched by the European Commission services in 2010 by means of an open stakeholder consultation. ESCO v1.2 is a database available in 28 languages[1]. Figure 1 shows how useful it is to have occupations, skills and qualifications listed in a common framework which can match the industry needs with the educational system.

Figure 1: Description of ESCO practical use[2].

The ESCO occupational profiles related to the Offshore Renewable Energy (ORE) value chain have been thoroughly reviewed by leveraging the skills intelligence results obtained by the FLORES skills observatory in 2024 and 2025 [3, 4].
The present update aims to ensure that the occupational profiles in the ESCO database are accurate, comprehensive, and aligned with the evolving requirements of the ORE sector. By transferring these results to the ESCO secretariat for consideration in the ESCO V1.2 revision, the project aims to enhance the visibility and clarity of ORE-related occupations across the European Union. An updated description of the ORE occupations will be accessible to any job-seeker in the EU, fostering better understanding and accessibility of relevant career pathways.

1.1 Objectives

1. To review and update ESCO occupational profiles relevant to the ORE value chain based on skills intelligence gathered by the FLORES Skills observatory, and reported in D2.1[3] and D2.3[4].
2. To communicate the findings to the ESCO secretariat for consideration in the ESCO V1.2 revision.
3. To enhance the accuracy and relevance of occupational profiles in the ESCO database, ensuring they reflect the latest skills and competencies required by the ORE sector.

[1] ESCO is available in all EU languages, plus Islandic, Norwegian and Arabic
[2] Diagram from the ESCO presentation at the MATES project' Final Conference https://www.projectmates.eu/wp-content/uploads/2022/04/MATES-Final-Conference-Report.pdf
[3] Sdoukopoulos, Eleftherios, (2024). Report on ORE skills needs. Results of the FLORES project (http://www.oreskills.eu/)
[4] Sdoukopoulos, Eleftherios, (2025). Analysis of future trends in the ORE occupations. Results of the FLORES project (http://www.oreskills.eu/)

4. To improve the dissemination of updated ORE occupation descriptions, making them easily accessible to job-seekers throughout the EU.
5. To contribute to a more precise alignment between the ESCO classification and the skills demanded by the ORE industry.

3. Methodology

The results of this report are based in a collaborative review of occupation profiles and skills in the ESCO database, summarising the best practices and lessons learned from the ESCO review process conducted within the MATES project[5]:

1 - The offshore renewable occupations were reviewed in the FLORES report on ORE skills needs, D2.1[3], taking as a starting point the results of the MATES project[6]. The update draw insights from literature review, consultations with industry stakeholders and job vacancies-related data collected over an 8-month period. This report was the basis for the identification of new occupations already relevant to the ORE value chain, that are still not included in the ESCO database.

2 – A skills foresight was conducted in the D2.3[4], identifying future trends and paradigm shifters that will be affecting the sector in the short, medium and long-term. It considers the impact of technological advancements, policy changes, and markets dynamics evolution and informs on the impact they will be imposing on skills demand. This report provided a description of future scenarios of skills and competences, as well as gaps in the in the short, medium and long term. This report was the basis for the identification of emerging occupations in the ORE value chain, including both occupations that are already included in the ESCO database, as new occupations not yet defined. The skills identified by the experts as most relevant to address future trends were correlated to their ESCO descriptions, identifying a group that was not yet defined in the database.

This information was analysed following the MATES protocol to review occupational profiles[5] involving "ESCO facilitators" with a broad knowledge on the ESCO taxonomy and terminology and "satellite experts" with technical expertise related to the occupations that are being reviewed or defined.

[5] Fraga L., Baston, S., Soto, A. (2021) MATES Protocol to review occupation profiles and skills in ESCO database. Results of the MATES project (www.projectmates.eu). https://zenodo.org/records/6762384

[6] Sdoukopoulos, E. et al. (2020). Baseline Report on present skills needs in shipbuilding and offshore renewables value chains. Results of the MATES project (www.projectmates.eu). https://www.projectmates.eu/wp-content/uploads/2020/10/MATES_D2.1_Final_Oct-2020.pdf

4. Results

Seventeen emerging occupations in the ORE value chain have been identified, including 9 new occupations not listed in ESCO, from which 2 are already relevant for the value chain, and 7 are deemed to emerge as a result of technological, policy and market trends as identified in FLORES D2.3. All the new occupations have been defined following ESCO database taxonomy.

Moreover, the most relevant skills necessary to address the upcoming trends in the ORE sector have been matched with their ESCO descriptors, when existing, and 26 new skills and knowledge concepts have been defined for their inclusion in the ESCO database. As a result, 247 relevant skills have been correlated with the 54 occupations deemed to be most affected by the upcoming trends in the ORE.

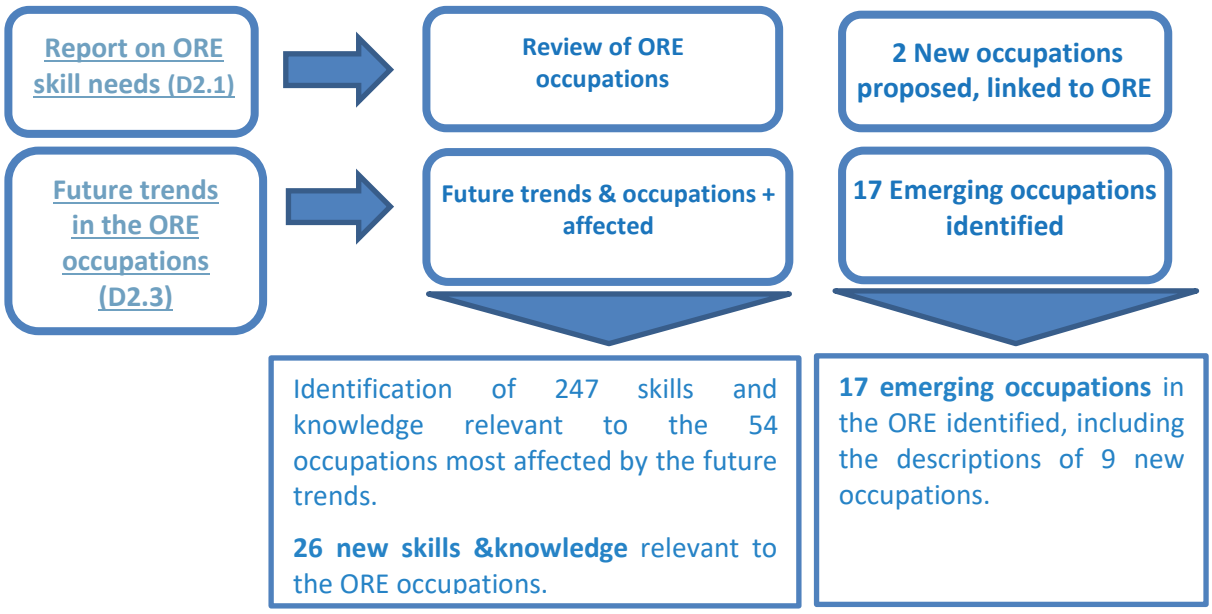


Figure 1: Schema of the overall results obtained during the update of the ORE occupations

4.1 New occupations

Proposal of definition for the two new occupations in the OFFSHORE value chain identified during the skills needs analysis (D2.1).

- Marine spatial planner (also Maritime spatial planner):
  Marine Spatial Planners coordinate the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that have been specified through a political process. They ensure integration of governance principles, stakeholder engagement, and capacity-building to enhance sustainable spatial use in marine planning.

- Metocean data analyst (also Offshore Metocean Data Analyst):
  Metocean Analysts estimate the environmental conditions of direct influence on the engineering project by considering both meteorological and oceanographical

conditions. Their tasks include researching new observation tools and validating data against other sources. As such, they combine skills and knowledge needs with the hydrographic surveying technicians and the meteorology technicians.

Proposal of definition for the seven new occupations in the OFFSHORE value chain identified during the analysis of future trends in ORE occupations (D2.3).

- Alternative materials analyst (also Sustainable Materials Analyst)
  Alternative materials analysts are responsible for identifying and checking the availability of new and alternative materials for production and other business operations, considering the requirements and supply chain processes within an organization. They conduct comprehensive research and analysis to assess the environmental and social impacts of different materials throughout their life cycles. By performing life cycle assessments (LCAs) and other environmental impact evaluations, the analyst determines the sustainability performance of current materials and explores opportunities for improvement.
  They prepare technical reports to document their analysis results, participate in design reviews and recommend process improvements.

- Circular economy engineer
  Circular economy engineers integrate sustainability principles into engineering practices to promote resource efficiency and waste reduction. They develop and implement strategies for material reuse, recycling, and remanufacturing, aiming to minimize waste and maximize resource efficiency throughout the product lifecycle.

- ORE skills certification coordinator (also ORE skills certification advisor; ORE skills certification specialist)
  ORE skills certification coordinators are responsible for managing and overseeing the certification process for skills related to ORE. They ensure that all the staff involved in an ORE project have the requested skills certification to develop their tasks. They provide advice on skills recognition processes and training programs.

- Smart grid designer and manager
  Smart grid designers and managers focus on developing and designing. electricity networks that can identify and minimize the energy cost of all the users connected to them. Their knowledge incorporates advanced metering infrastructure, smart distribution boards and circuit breakers integrated with demand response, renewable energy resources, electric surplus distribution by power lines and auto-smart switch, and digital monitoring. They work with other engineers and researchers, for the continuous improvement of the existing smart grids.

- Smart grid systems analyst
  Smart grid systems analysts evaluate the performance of smart grids. By analysing the flow of energy production and demand, they recommend cost-effective alternatives. Energy analysts suggest efficiency improvements, make business analyses and participate in the development of policies concerning the integration of renewable energy sources in the grid, transportation, and other factors relating to energy consumption.

- Standards developers (also Standards developer expert, Standards development expert, Regulatory Affairs Specialist Regulatory Affairs Manager)
  Standards developers are responsible for developing and implementing technical standards in an organization. They work to ensure that products and services are consistent with industry standards and regulations. They may also play a role to cooperate on an international level in the agreement of new standards as IMO and ISO, as well as in the design and development of new products and services, and may work closely with other engineers, scientists, and technicians to ensure that products and services meet the needs of customers and stakeholders.

- Transboundary marine spatial planner (TMSP)
  Transboundary marine spatial planners coordinate and support processes of transboundary cooperation involving transboundary coastal nations and regions. They promote collaborative planning and governance in marine areas and cross-cutting issues. Their approach can potentially contribute towards overcoming TMSP challenges and to increasing cohesion and alignment of national marine spatial plans.

List of the eight emerging occupations in the ORE value chain, following the analysis of future trends in ORE occupations (D2.3).

EMERGING OCCUPATIONS
3D printing technician (ESCO-3118.1)
Aquaculture environmental analyst (ESCO-2133.2)
Artificial intelligence engineer (ESCO-2511.11)
Corporate training manager (ESCO-1212.4)
Integration engineer (ESCO-2511.17)
Model maker (ESCO-2163.1.6)
Robotics engineering technician (ESCO-3119.2.1)
Sensor engineer (ESCO-2152.1.15)

4.2 New knowledge concepts and definitions

Proposal of definition for the nine new knowledge concepts identified as relevant for the OFFSHORE value chain during the analysis of future trends in ORE occupations (D2.3).

- Advanced communication networks (also advanced communication networks and systems)
  Advanced communication systems are networks designed to transmit information quickly and efficiently over long distances. Some of the key features of advanced communication systems include high bandwidth, low latency, security, reliability, scalability, and interoperability.

They are used in various applications such as telecommunications, broadcasting, military operations, scientific research, and remote sensing, and at present evolving with the integration of AI, IoT, quantum computing and other cross-cutting technologies.

- Circular economy
  The circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible.

- Hybrid energy offshore projects
  Hybrid energy offshore projects integrate multiple offshore energy sources, such as wind, wave, and solar, to optimize efficiency, reliability, and resource use in a single system.

- Hybrid energy storage systems
  A Hybrid Energy Storage System (HESS) consists of two or more types of energy storage technologies. The complementary features make it outperform any single component energy storage devices, such as batteries, flywheels, supercapacitors, and fuel cells.

- Hydrogen storage systems
  A hydrogen storage system is a specialized system designed to safely store and manage hydrogen in various forms—gas, liquid, or solid—before its use in energy production, industrial applications, or transportation. These systems typically include storage tanks or containers, pressure regulation mechanisms, safety controls, and sometimes thermal management features to maintain stability and efficiency.

- Multiphysics modelling (also multiphysics; multiphysics simulation)
  Multiphysics modeling refers to the simultaneous simulation of multiple physical processes and their interactions within a computational framework. This approach integrates individual physics solvers—such as thermal, structural, fluid, and electromagnetic models—into a unified workflow, allowing engineers and scientists to accurately predict system behavior as it occurs in the real world. Multiphysics modeling is closely related to multiscale simulation, which addresses a single process across multiple time or spatial scales.

- Offshore foundations and floating platforms
  Offshore foundations and floating platforms are structural systems that support offshore energy installations in various water depths. Offshore foundations are fixed to the seabed and include monopiles, jackets, and gravity-based structures, mainly used in shallow waters. Floating platforms, such as spar, semi-submersible, and tension-leg platforms (TLPs), are moored to the seabed and suitable for deeper waters.

- Recognition of qualifications
  Refers to the processes and frameworks that enable individuals to have their formal education, professional experience, and skills acknowledged across different countries. It involves the understanding of qualification frameworks, mechanisms such as academic recognition and professional recognition, and validation of non-formal and informal training.

- Spatial computing
  Spatial computing refers to the integration of digital and physical environments through technologies that enable computers to interact with the real world in a spatially aware manner. It encompasses augmented reality (AR), virtual reality (VR), mixed reality (MR), and artificial intelligence (AI), along with sensors, 3D mapping, and real-time data processing.

4.3 New skills concepts and definitions

Proposal of definition for the seventeen new skill concepts identified as relevant for the OFFSHORE value chain during the analysis of future trends in ORE occupations (D2.3).

- Adapt designs
  Adapt a design for its use in a different context, such as the adaptation of a component design for its production by additive manufacturing (3D printing).

- Adjust 3D printed components
  Adjust 3D printed components for their integration into a wider device or system.

  Scope: Operation developed for maintenance purposes in isolated locations, such as vessels, offshore facilities and remote areas

- Design hybrid energy offshore projects
  Design hybrid offshore energy projects in collaboration with other professionals, applying design and engineering principles. Ensure that the specific requirements of the different energy-generation technologies are met, considering their potential interactions and the overall performance of the system in the intended installation site.

- Design offshore energy storage systems
  Design and develop different types of energy storage systems for their installation in coastal and offshore facilities. Characterise their properties and performance, as well as to devise the integration of various components, in order to meet specific requirements for different applications.

- Design offshore foundations and floating platforms
  Design offshore foundations and floating platforms in cooperation with other professionals, by applying design and engineering principles. Ensure that they meet the specific performance requirements for their intended installation site.

- Handle high voltage
  Perform work in high-voltage environments, ensuring safety and risk prevention.

- Integrate energy storage systems
  Integrate energy storage systems into an electric grid as well as in off-grid systems

- Manage advanced communication systems

Manage advanced communication networks, considering applicable standards (e.g. IEC 61850, Modbonus, etc.)

- Manage hybrid energy offshore projects
  Manage the overall planning, coordination, and control of a hybrid energy offshore project from inception to completion; this includes maintaining contact with different types of equipment, materials and subcontractors, throughout the project.

- Manage smart grid systems (also manage smart grid)
  Administer a smart grid by planning, monitoring and reporting on the production, distribution and use of electricity. Optimise the use of information collected by the grid promoting efficiency in the electricity management.

- Process sensor data (also Sensor data processing and filtering)
  Systematic method by which raw data collected from various sensors is cleaned, transformed, and analyzed to extract valuable insights.

  Scope: It is a crucial component in managing the complex data ecosystems as smart electrical grids or smart cities, facilitating decision-making.

- Provide emergent technologies training
  Plan and conduct training of staff on emergent technologies. Utilise training material, evaluate and report on the learning progress of trainees.

  Scope: Emergent technologies include at present quantum computing, artificial intelligence, internet of things and their combinations, among others. Due to their emergent naturity, the definition does not mention any specific technology.

- Provide VR/AR training
  Plan and conduct training of staff on virtual reality (VR) and augmented reality (AR). Utilise training material, evaluate and report on the learning progress of trainees.

- Use analytics for decision purposes
  Understand, extract and make use of patterns found in data. Use analytics to describe happenings in order to apply them for decision purposes. Understand, extract and make use of patterns found in data. Use analytics to describe happenings in order to apply them for decision purposes.

- Use digital twin models
  Use digital twin models to simulate, analyse and predict the behaviour of the original elements, for optimising processes and improving operational efficiency.

- Use quantum computing applications integrated with IoT
  Use quantum computing applications integrated to the Internet of Things (IoT), to improve its accuracy, speed, and security.

- Utilise multiphysics modelling
  Utilise multiphysics modelling to accurately predict a system behavior.

4.4 Correlation of future trends, occupations and skills

The comprehensive correlation of future trends, occupations most affected and the skills and knowledge concepts necessary for their adaptation are listed below. Emerging occupations already existing in ESCO are marked in green, and new occupations and skills and knowledge concepts are marked in blue.

Future trend	Most affected occupations	Optional skills	Optional knowledge
Smart grid and smart sensors	Energy systems engineer	adapt to change	sensors
	Automation engineer	address problems critically	advanced communication networks
	Operations manager	apply strategic thinking	automation technology
	Sensor engineer	cooperate with colleagues	control systems
	Smart grid designer and manager	coordinate communication within a team	principles of artificial intelligence
	Smart grid systems analyst	design smart grids	smart grids systems
		draw up risk assessment	
		follow reporting procedures	
		maintain sensor equipment	
		manage advanced communication systems	
		manage smart grid systems	
		operate automated process control	
		operate control systems	
		perform data analysis	
		perform smart grid feasibility study	
		project management	
		process sensor data	
		think creatively	
		troubleshoot	
		use remote control equipment	
		use specific data analysis software	

Emerging occupations already existing in ESCO are marked in green, and new occupations and skills and knowledge concepts are marked in blue.

Future trend	Most affected occupations	Optional skills	Optional knowledge
Automation and robotics	Automation engineer	assemble mechatronic units	automation technology
	Robotics engineer	assemble sensors	control engineering
	ICT intelligent systems designer	cooperate with colleagues	mechatronics
	Industrial robot controller	coordinate communication within a team	robotics
	Robotics engineering technician	coordinate remote communications	robotic components
		design automation components	sensors
		develop computer vision system	human-robot collaboration
		install automation components	computer vision
		install mechatronic equipment	set up automotive robot
		maintain robotic equipment	principles of artificial intelligence
		make use of personal robots for practical support	
		process sensor data	
		simulate mechatronic design concepts	
		test mechatronic units	
		test sensors	
		troubleshoot	
		use remote control equipment	
		utilise machine learning	

Emerging occupations already existing in ESCO are marked in green, and new occupations and skills and knowledge concepts are marked in blue.

Future trend	Most affected occupations	Optional skills	Optional knowledge
Energy storage	Energy systems engineer	apply strategic thinking	energy storage systems
	Pricing specialist	cooperate with colleagues	health and safety regulations
	Energy engineer	coordinate communication within a team	hybrid energy storage systems
		design offshore energy storage systems	hydrogen storage systems
		draw up risk assessment	smart grids systems
		integrate energy storage systems	
		monitor developments in field of expertise	
		operate hydrogen extraction equipment	
		promote health and safety	

Future trend	Most affected occupations	Optional skills	Optional knowledge
Digital twin	Energy systems engineer	cooperate with colleagues	3D modelling
	Pricing specialist	coordinate communication within a team	cyber security
	Energy engineer	develop predictive models	digital twin technology
		engage with stakeholders	predictive maintenance
		handle cybersecurity incidents	teamwork principles
		manage teamwork	
		operate 3D computer graphics software	
		real-time computing	
		use CAD software	
		use digital twin models	

Emerging occupations already existing in ESCO are marked in green, and new occupations and skills and knowledge concepts are marked in blue.

Future trend	Most affected occupations	Optional skills	Optional knowledge
Big data	Data analyst	analyse big data	business intelligence
	Business analyst	analyse test data	cloud technologies
	Data scientist	cooperate with colleagues	data ethics
		coordinate communication within a team	data mining
		manage cloud data and storage	data science
		manage data	data storage
		perform data mining	distributed computing
		think critically	information extraction
		use analytics for decision purposes	information structure
		use specific data analysis software	statistical analysis system software
		utilise machine learning	unstructured data
			visual presentation techniques

Future trend	Most affected occupations	Optional skills	Optional knowledge
Inmersive Technologies	Design engineer	3D body scanning technologies	3D modelling
	Software developer	3D lighting	augmented reality
	ICT intelligent systems designer	3D texturing	spatial computing
	Corporate training manager	animate 3D organic forms	virtual reality
	Model maker	cooperate with education professionals	web based collaborative platforms
		create 3D characters	
		create 3D environments	
		create 3D texture map	
		ICT system integration	
		operate 3D computer graphics software	
		provide VR/AR training	
		use scripting programming	

Future trend	Most affected occupations	Optional skills	Optional knowledge
AI, IoT and Quantum computing	ICT intelligent systems designer	use quantum computing applications integrated with IoT	computational physics
	Data scientist	cooperate with colleagues	deep learning
	Software developer	cooperate with education professionals	emergent technologies
		coordinate communication within a team	Internet of Things
		create solutions to problems	machine learning
		provide emergent technologies training	multiphysics modelling
		think creatively	quantum computing
		utilise machine learning	scientific computing
		utilise multiphysics modelling	

Future trend	Most affected occupations	Optional skills	Optional knowledge
Smart &sustainable materials	Materials engineer	adapt to change	advanced materials
	Health, safety and environmental manager	attend to detail	circular economy
	Component engineer	check compatibility of materials	global standards for sustainability reporting
	Aquaculture environmental analyst	check durability of materials	materials engineering
	Environmental scientist	check stability of materials	nanotechnology
		check strength of materials	sustainable building materials
		cooperate with colleagues	sustainable installation materials
		coordinate communication within a team	
		create solutions to problems	
		develop advanced materials	
		develop material testing procedures	
		monitor developments in field of expertise	
		research equipment needs	
		select material to process	
		select sustainable technologies in design	
		think creatively	
		use sustainable materials and components	

Emerging occupations already existing in ESCO are marked in green, and new occupations and skills and knowledge concepts are marked in blue.

Future trend	Most affected occupations	Optional skills	Optional knowledge
3D Printing	Component engineer	adjust 3D printed components	3D modelling
	Materials engineer	adapt designs	3D printing process
	Design engineer	design prototypes	advanced materials
	3D printing technician	operate 3D computer graphics software	CAD software
		research equipment needs	global standards for sustainability reporting
		use CAD software	maintenance of printing machines
		use sustainable materials and components	sustainable installation materials

Future trend	Most affected occupations	Optional skills	Optional knowledge
Reform of Regulatory Frameworks	Policy manager	advise on maritime regulations	community-led local development
	Regulatory affairs manager	analyse legislation	environmental policy
	Legal consultant	apply strategic thinking	EU law
		communicate with stakeholders	leadership principles
		comply with legal regulations	maritime law
		comply with regulations	pollution legislation
		cooperate with colleagues	security regulations
		coordinate communication within a team	
		engage with stakeholders	
		inspect project regulations	
		keep up-to-date with regulations	
		lead others	
		manage relationships with stakeholders	
		negotiate compromises	
		negotiate with stakeholders	
		work within communities	

Future trend	Most affected occupations	Optional skills	Optional knowledge
Adoption of Maritime Spatial Plans (MSPs)	Marine biologist	advise on conflict management	
	Policy manager	apply strategic thinking	cartography
	Oceanographer	assess environmental impact	conflict management
	Marine spatial planner	collect mapping data	spatial planning
	Transboundary marine spatial planner	combine multiple fields of knowledge	
		communicate with stakeholders	
		cooperate with colleagues	
		coordinate communication within a team	
		engage with stakeholders	
		evaluate project plans	
		handle geospatial technologies	
		manage environmental impact	
		manage relationships with stakeholders	
		plan allocation of space	
		project management	
		resolve conflicts	
		work within communities	

Future trend	Most affected occupations	Optional skills	Optional knowledge
Standardization	Construction manager	adhere to Standard Operating Procedures	
	Project manager	develop working procedures	data science
	Policy manager	adapt to change	data storage
	Standards developer	attend to detail	framework for a safety management system
		cooperate with colleagues	global standards for sustainability reporting
		coordinate communication within a team	smart grids systems
		follow reporting procedures	
		manage cloud data and storage	
		manage data	
		promote health and safety	

Future trend	Most affected occupations	Optional skills	Optional knowledge
EU wide accreditation of training/skills	Human resources officer	advise on curriculum development	
	Health, safety and environmental manager	adhere to Standard Operating Procedures	curriculum standards
	Policy manager	shape organisational teams based on competencies	recognition of qualifications
	Corporate training manager	analyse curriculum	
	ORE skills certification coordinator	develop learning curriculum	
		ensure curriculum adherence	
		manage personal professional development	

Future trend	Most affected occupations	Optional skills	Optional knowledge
Energy price	Pricing specialist	analyse energy market trends	business management principles
	Energy trader	analyse relation between supply chain improvement and profit	green logistics
	Energy analyst	analyse supply chain strategies	logistics
		analyse supply chain trends	supply chain principles
		cooperate with colleagues	
		coordinate communication within a team	
		forecast energy prices	
		liaise with logistics management teams	
		make decisions	
		manage logistics pricing systems	
		managing a business with great care	
		think critically	

Future trend	Most affected occupations	Optional skills	Optional knowledge
Scale and efficiency increases	Electrical engineer	analyse energy market trends	data science
	Electric power generation engineer	approach challenges positively	data storage
	Energy analyst	cooperate with colleagues	marine energy
	Energy trader	coordinate communication within a team	offshore constructions and facilities
		design offshore energy systems	offshore renewable energy technologies
		design wind turbines	transmission towers
		detect bottlenecks	types of wind turbines
		develop project schedule	wind energy
		handle high voltage	
		implement strategic planning	
		manage data	
		manage electricity transmission system	
		perform data analysis	
		plan engineering activities	
		use analytics for decision purposes	
		use specific data analysis software	

Future trend	Most affected occupations	Optional skills	Optional knowledge
New financing mechanisms	Financial manager	analyse financial risk	financial analysis
	Financial analyst	assess financial viability	financial engineering
	Investment analyst	control financial resources	financial management
	Energy trader	cooperate with colleagues	financial markets
		coordinate communication within a team	financial products
		create a financial plan	sustainable finance
		financial forecasting	
		liaise with financiers	
		manage financial risk	
		negotiate compromises	
		negotiate with stakeholders	
		obtain financial information	
		operate financial instruments	
		optimise financial performance	
		prepare financial projections	

Future trend	Most affected occupations	Optional skills	Optional knowledge
New structures	Operations manager	analyse supply chain strategies	financial analysis
	Manufacturing manager	design offshore energy systems	financial engineering
	Construction manager	design offshore foundations and floating platforms	financial management
	Offshore renewable energy engineer	detect bottlenecks	financial markets
	Offshore renewable energy technician	install offshore renewable energy systems	financial products
		supply chain management	offshore constructions and facilities
			offshore foundations and floating platforms
			offshore renewable energy technologies
			supply chain principles
			sustainable finance

Future trend	Most affected occupations	Optional skills	Optional knowledge
Hybrid projects	Financial manager	assess hydrogen production technologies	hybrid energy offshore projects
	Construction manager	combine multiple fields of knowledge	energy efficiency
	Business manager	conduct research across disciplines	energy storage systems
	Energy systems engineer	cooperate with colleagues	energy transformation
	Integration engineer	coordinate communication within a team	marine energy
		design hybrid energy offshore projects	multidisciplinary research
		ensure cross-department cooperation	renewable energy
		execute feasibility study on hydrogen	security requirements of goods transported via pipelines
		manage hybrid energy offshore projects	wind energy
		promote innovative infrastructure design	
		solve problems	
		think creatively	
		think innovatively	

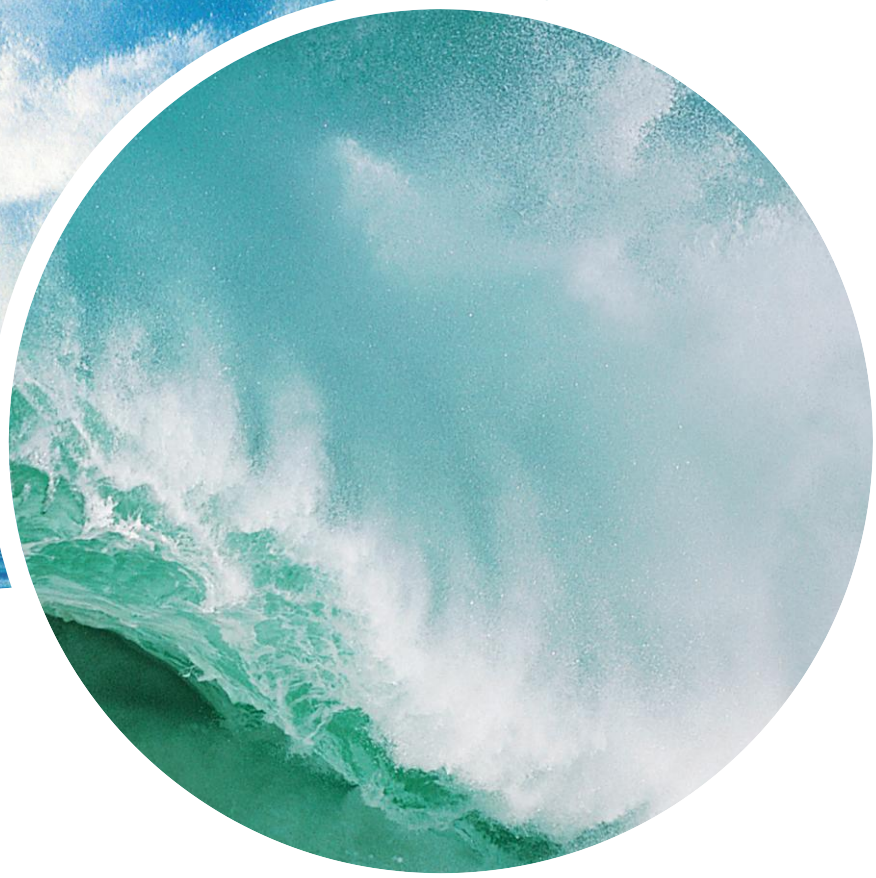
5. Conclusions

This report has provided a structured approach to align ESCO classifications with industry demands, leveraging skills intelligence gathered through the FLORES Skills Observatory,

The analysis has identified 17 emerging occupations within the ORE sector, including nine not currently listed in the ESCO database. Of these, two are already relevant to the industry, while seven are expected to emerge due to technological advancements, policy changes, and market evolution. All newly identified occupations have been defined in accordance with ESCO taxonomy, contributing to a clearer representation of career pathways in the sector.

In addition to occupations, the study has highlighted the need to refine skill descriptions within ESCO. A total of 247 relevant skills have been mapped to 54 key occupations, with 26 new skills and knowledge concepts proposed for inclusion. These updates will help ensure that ESCO accurately captures the competencies required to address future trends in the ORE sector.

By transferring these findings to the ESCO secretariat, this initiative supports a more precise alignment between industry needs and workforce qualifications, ultimately fostering better career guidance, training programs, and job matching across the European Union. Enhanced visibility of ORE-related occupations will benefit both job seekers and employers, strengthening the sector's capacity to attract and develop a skilled workforce.



FLORES
Offshore Renewable Energies partnership in the Pact for Skills

Co-funded by the European Union