

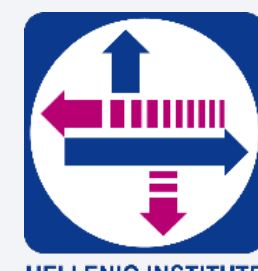
Skills intelligence analysis in the Offshore Renewable Energy (ORE) sector in Europe: A value-chain approach

Dr. Lefteris Sdoukopoulos

Head of Environmental and Energy Impacts of
Transport Systems Laboratory



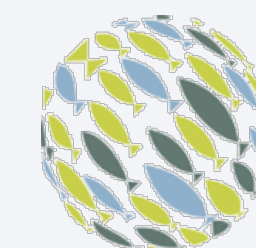
CERTH
CENTRE FOR
RESEARCH & TECHNOLOGY
HELLAS



HELLENIC INSTITUTE
OF TRANSPORT
CERTH / HIT

Ms. Lucia Fraga Lago

Coordinator of the Training Department

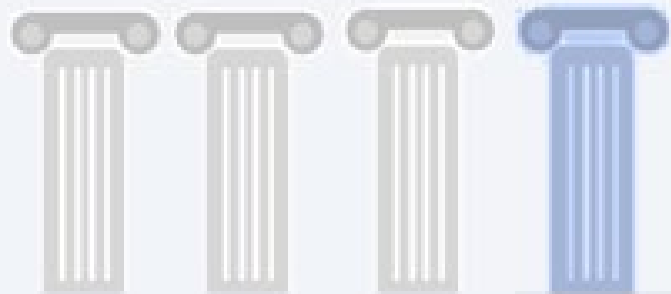


CETMAR
CENTRO TECNOLÓGICO DEL MAR

The ORE sector in Europe



Europe to become the first carbon-neutral continent by 2050



SUN



WAVES



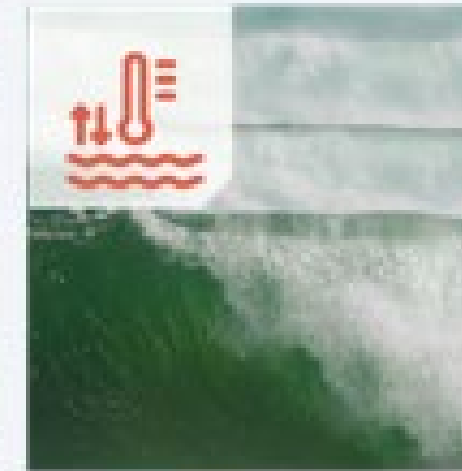
WIND



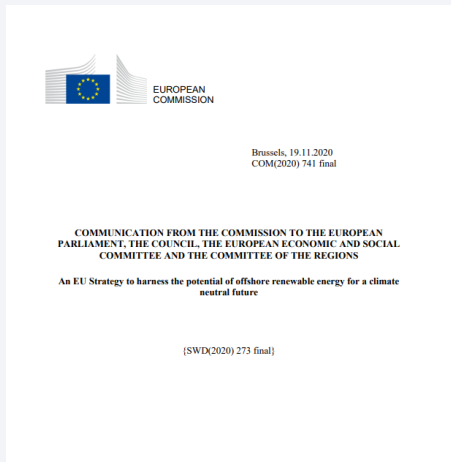
TIDES



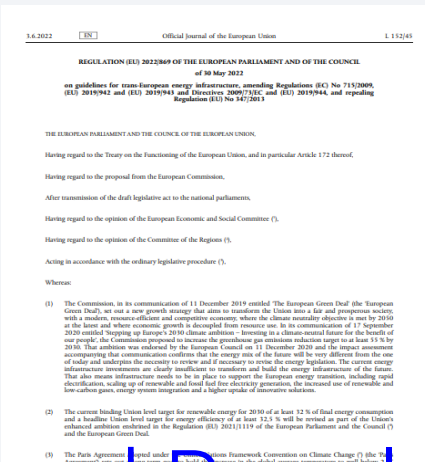
CURRENTS



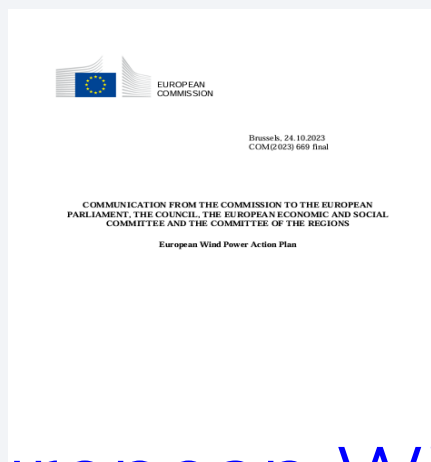
AND MORE



[EU Strategy on ORE](#)



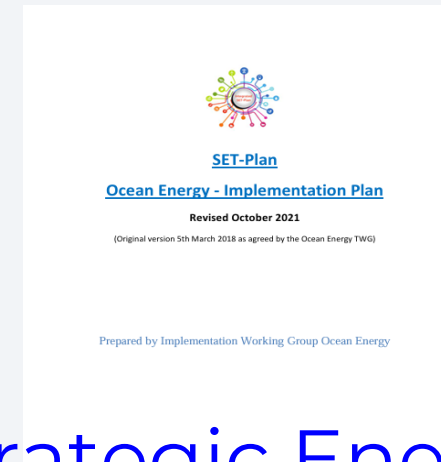
[Revised Regulation on TEN-E](#)



[European Wind Power Action Plan](#)

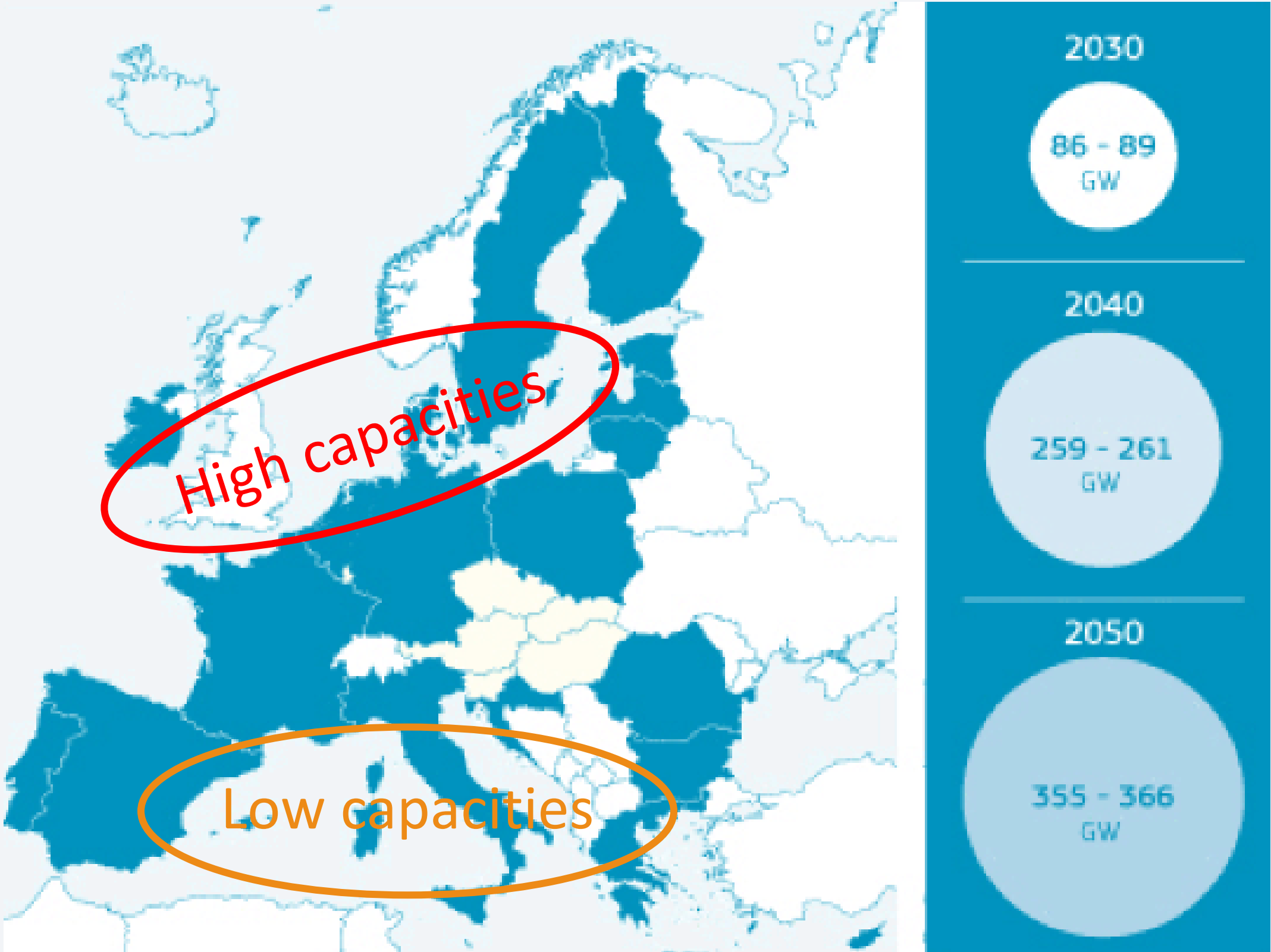
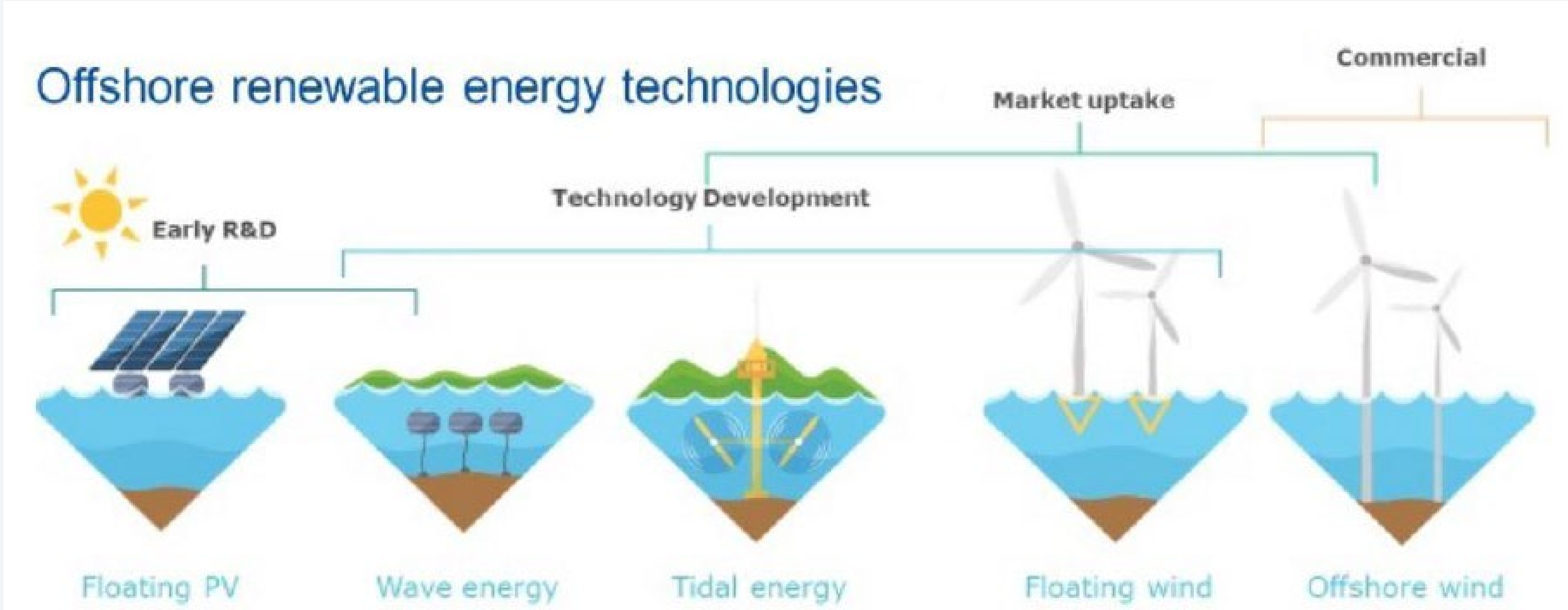


[EC's Communication on achieving EU's offshore wind ambitions](#)



[Strategic Energy Technology Plan](#)

The ORE sector in Europe



MSPs



2023



2024



2025

Skills intelligence analysis

AT A GLANCE



PROGRAMME
ERASMUS+



CALL
Forward Looking Projects



AGENCY
EACEA



TOTAL GRANT
700,000€



DURATION
January 2023 - December 2024
(24 months)



COORDINATOR
Centro Tecnológico del Mar
(Fundación CETMAR), Spain



CONSORTIUM
15 partners from eight countries

KEY ACTIONS



LARGE-SCALE PARTNERSHIP

Promote a long-lasting partnership across Europe that will promote ORE skills within the European Pact for Skills. Pilot actions at regional level will be developed to adapt the training materials and needs to the reality of Europe's different sea basins in the Atlantic, the Baltic and the Mediterranean.



STIMULATION OF DEDICATED TRAINING OFFERS

Re-skilling and upskilling processes with innovative approaches to lifelong learning. FLORES will ease access to existing ORE training offers and materials and develop new specific and multilingual tools promoting Ocean Literacy, lifelong learning and awareness raising in the sector.



SKILLS INTELLIGENCE

Identify and prioritise the most relevant actions in the capacity-building process, covering not only the rapid and complex changes occurring in this industrial ecosystem but also forecasting those changes yet to occur, especially regarding new and emerging technologies.



CAREERS

Building on industry insights, update occupational profiles in the ORE value chain, contributing to the continuous updating of the ESCO database. Materials will be developed to promote career and job opportunities in the European ORE sector, making those more attractive, especially for young people and women.

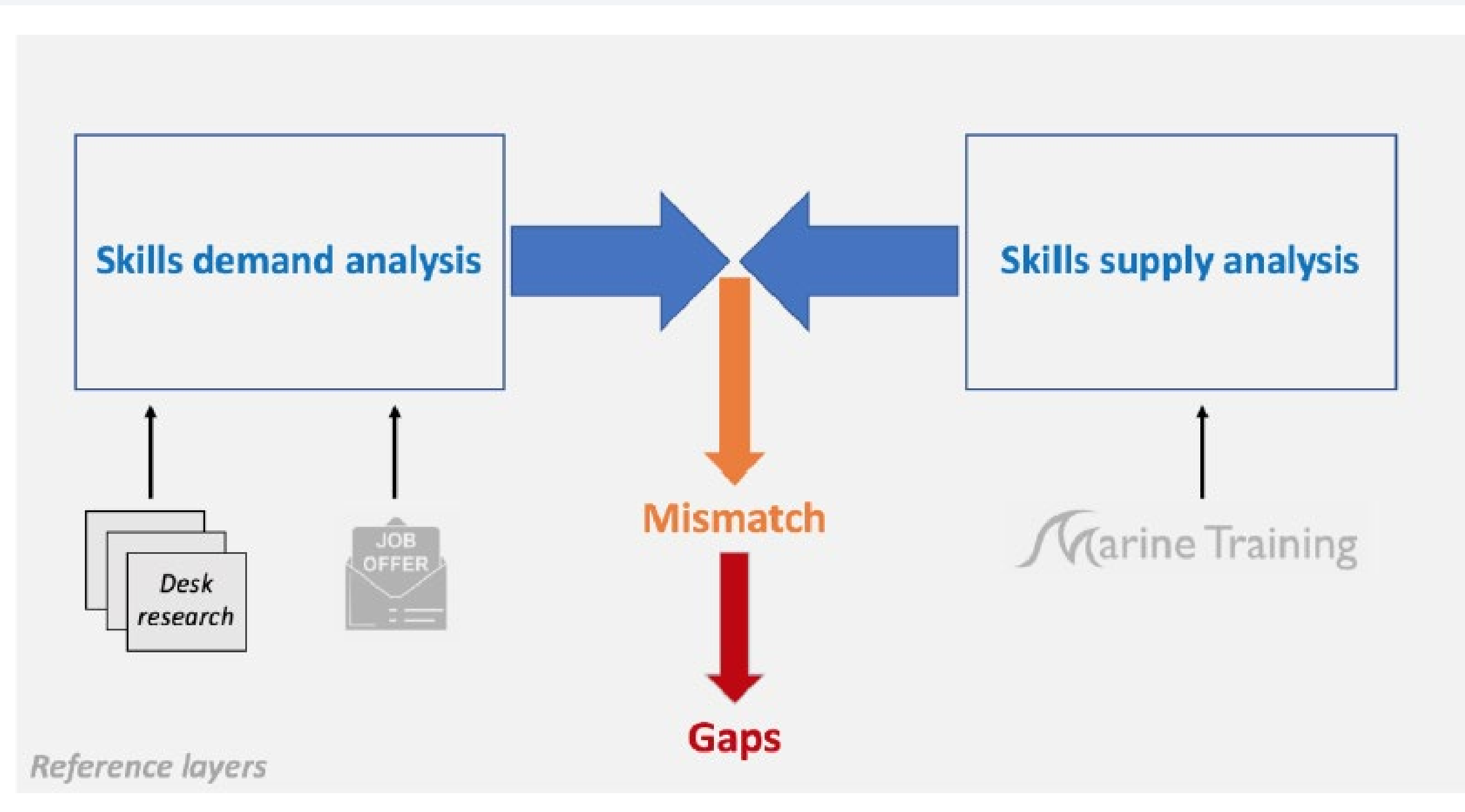
The ORE Skills Observatory



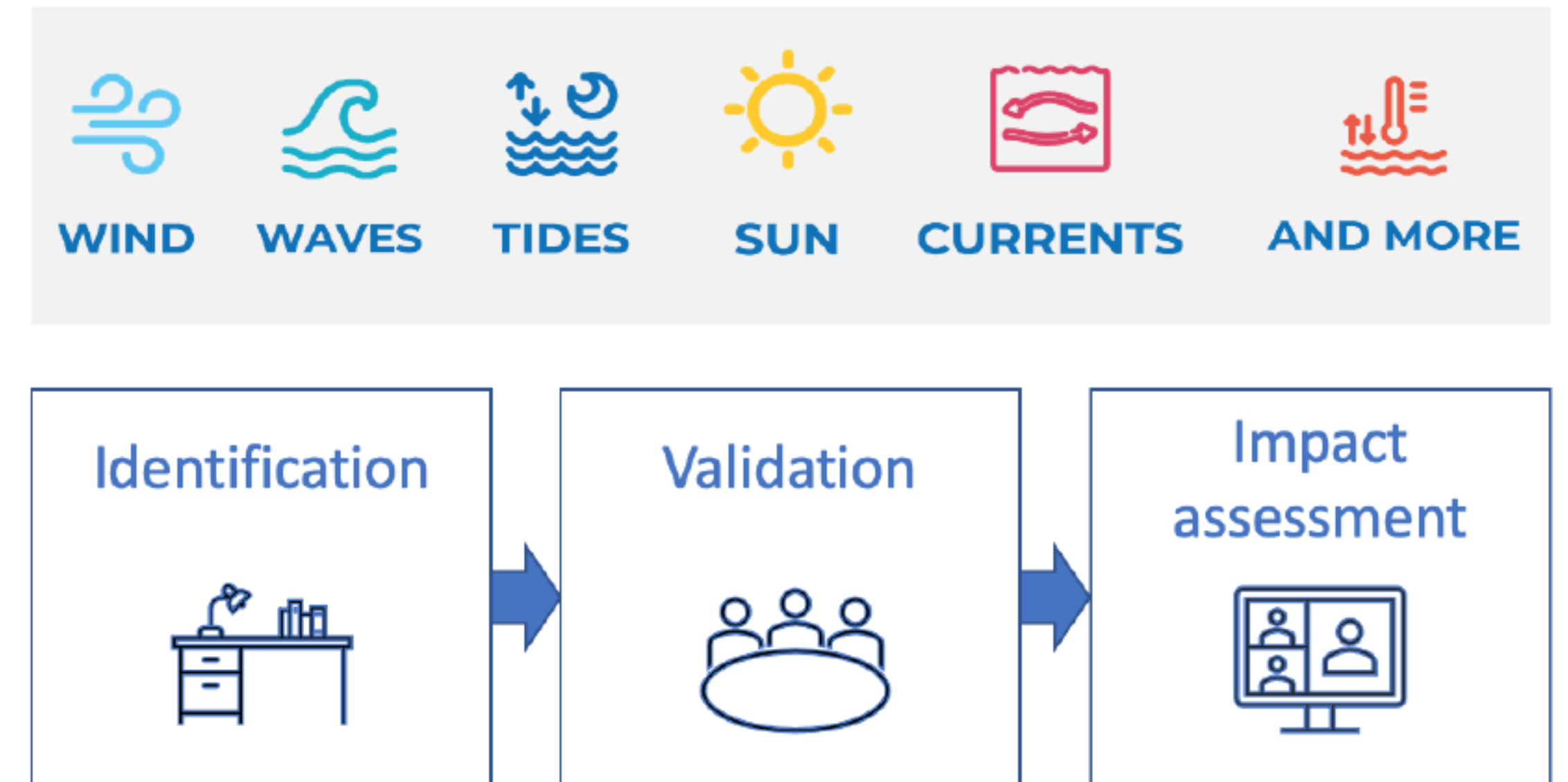
Advance skills intelligence in the ORE sector

- ▶ **Skills demand:** Establish a detailed baseline about the current situation of occupational profiles and skills needed in the ORE sector
- ▶ **Skills supply:** Map training offers, at EU level, addressing the ORE sector
- ▶ **Skills foresight:** Identify trends and paradigm shifters and analyze the expected impact on skills demand

Methodological framework

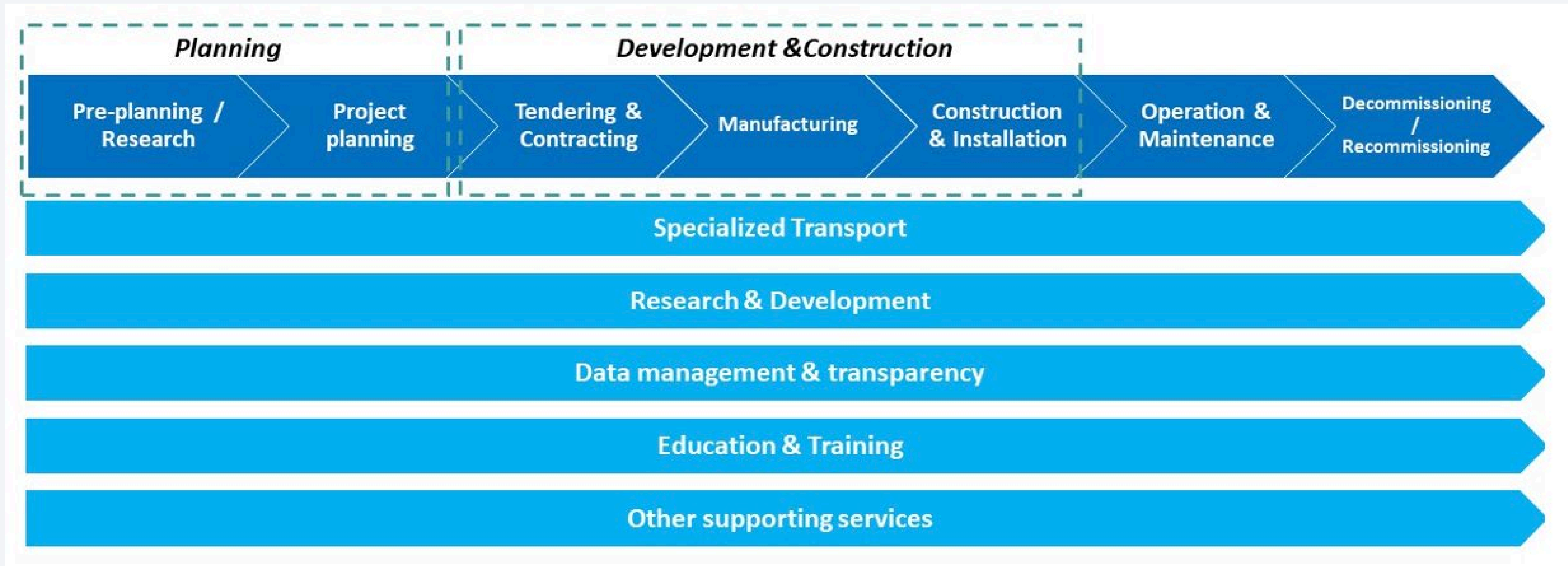


Trends and paradigm shifters in the ORE sector



Reference layers

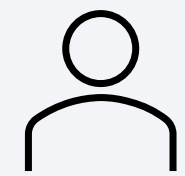
➤ ORE value chain



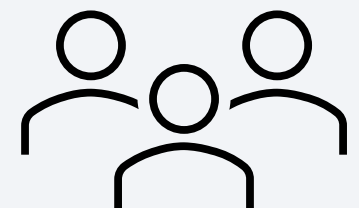
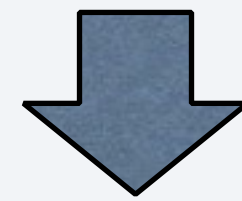
Reference layers

➤ Corresponding occupational profiles

ESCO European Classification of Skills/Competences, Qualifications and Occupations



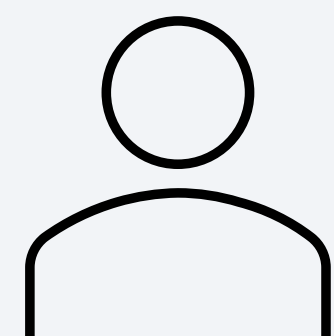
174 occupational profiles (ESCO-level 4 and >4)



42 groups of occupational profiles (ESCO-level 3)



Group of occupational profiles		Occupational profiles	
ESCO-214	Engineering professionals	ESCO-2149.9.5	Offshore renewable energy engineer



Offshore renewable energy engineer

Alternative Labels

hydrodynamics engineer

marine renewable energy engineer

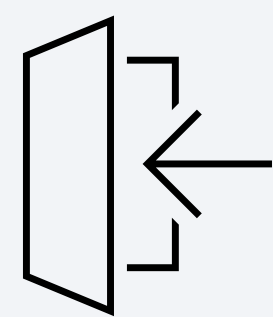
ocean renewable energy engineer

offshore energy farms engineer

ORE engineer

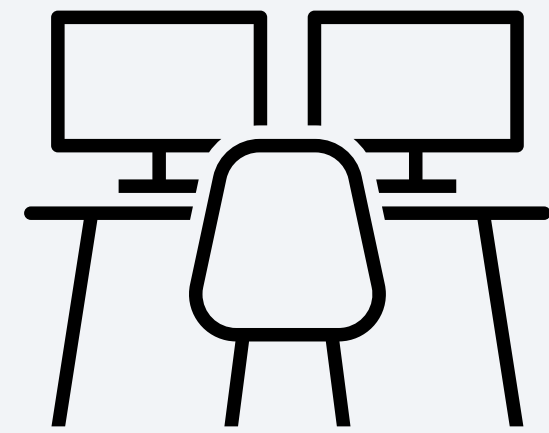
Reference layers

➤ Corresponding occupational profiles

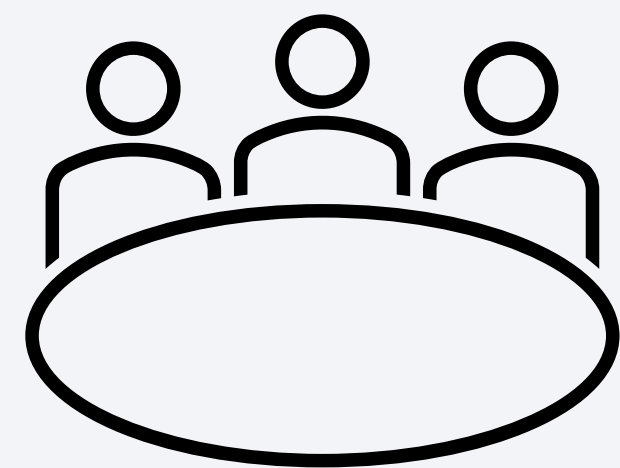


Group of occupational profiles		Occupational profiles	
ESCO-213	Life science professionals	ESCO-213X.X	Metocean analyst
ESCO-216	Architects, planners, surveyors and designers	ESCO-216X.X	Marine spatial planner

Knowledge basis



Desk
research



Stakeholder
consultation

Web-portals



Articles



Studies & reports



Initiatives



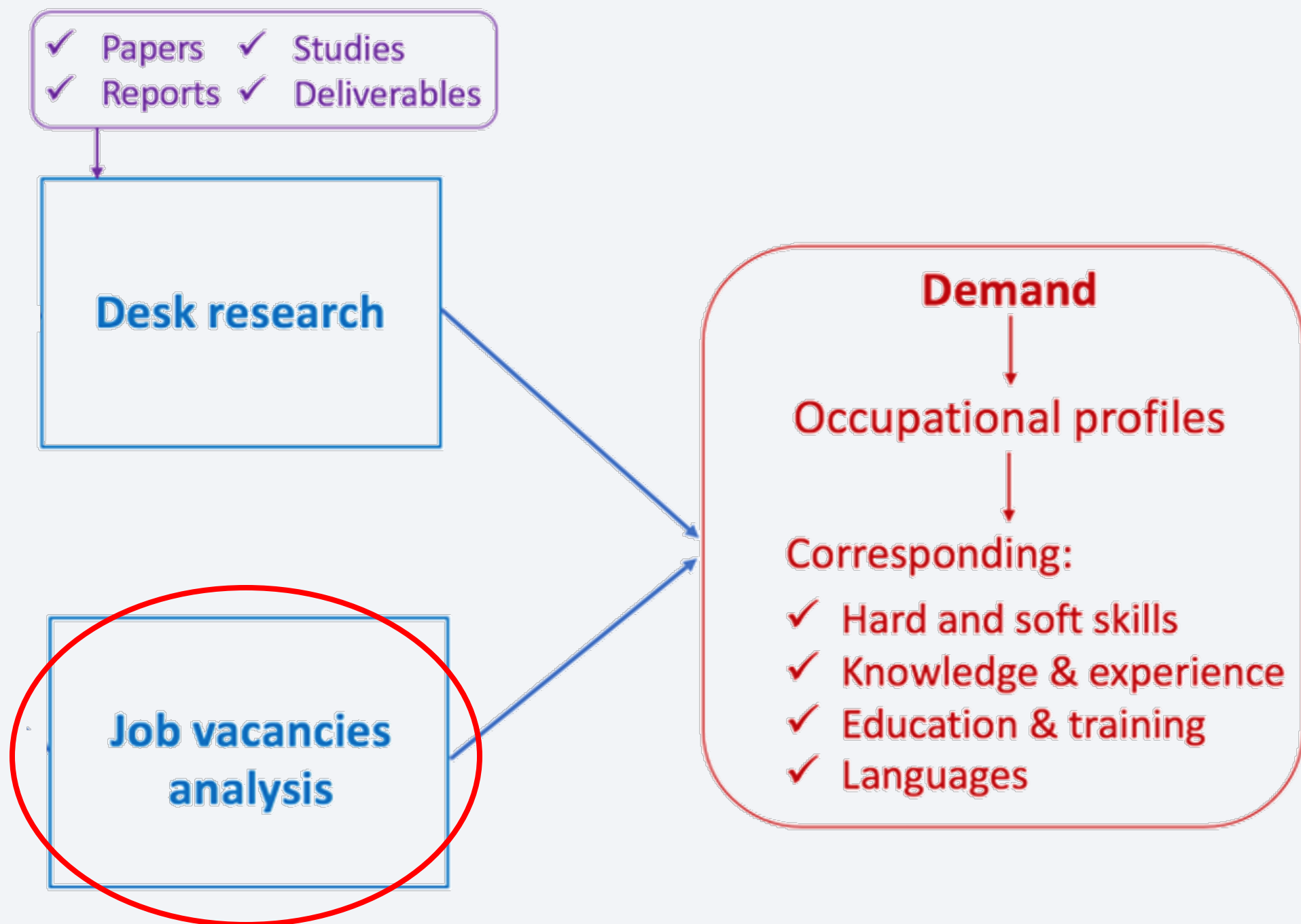
Input:

- Data analytics & insights on job vacancies and skills demand
- Holistic view of available E&T offers and qualifications provided
- Skills challenges, gaps & shortages
- Outlook of sectoral developments and implications on skills demand
- Recommendations for skills development
- Pathways to improve skills supply & demand mismatch
- Elaboration of specific activities in the ORE value chain, and flagging of critical ones (i.e., tendering & contracting)
- Recommendations to expand the list of identified occupational profiles
- Insights on occupational profiles and/or groups that are currently in high demand
- Insights on skills & knowledge increasingly needed now by the industry

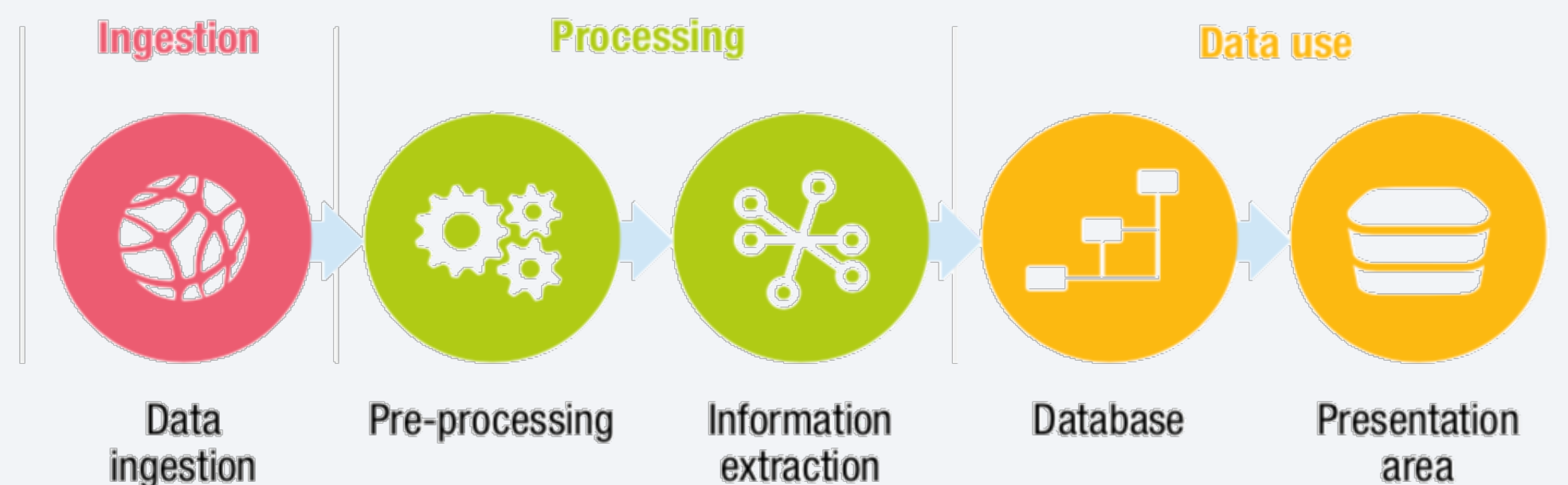
Wind
EUROPE

ANNUAL EVENT
2023
COPENHAGEN
25-27 APRIL

Skills demand analysis - methodology



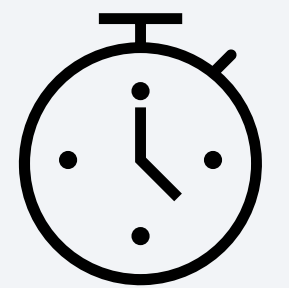
- Job title
- Job level (e.g. senior, mid-senior, etc.)
- Company / organization / institution posting the vacancy
- Work model (e.g. on-site, hybrid)
- Working hours (e.g. full-time, part-time)
- Job location (e.g. country, region)
- ORE sub-sector addressed
- Time stamp (i.e. date that the job advertisement was posted)
- Contract duration (e.g. in years, permanent, etc.)
- Link to the online job advertisement
- Technical skills and competences required for the position
- Soft skills required for the position
- Education and/or training required or desired for the position
- Experience required or desired for the position
- Knowledge of other languages required or desired for the position.



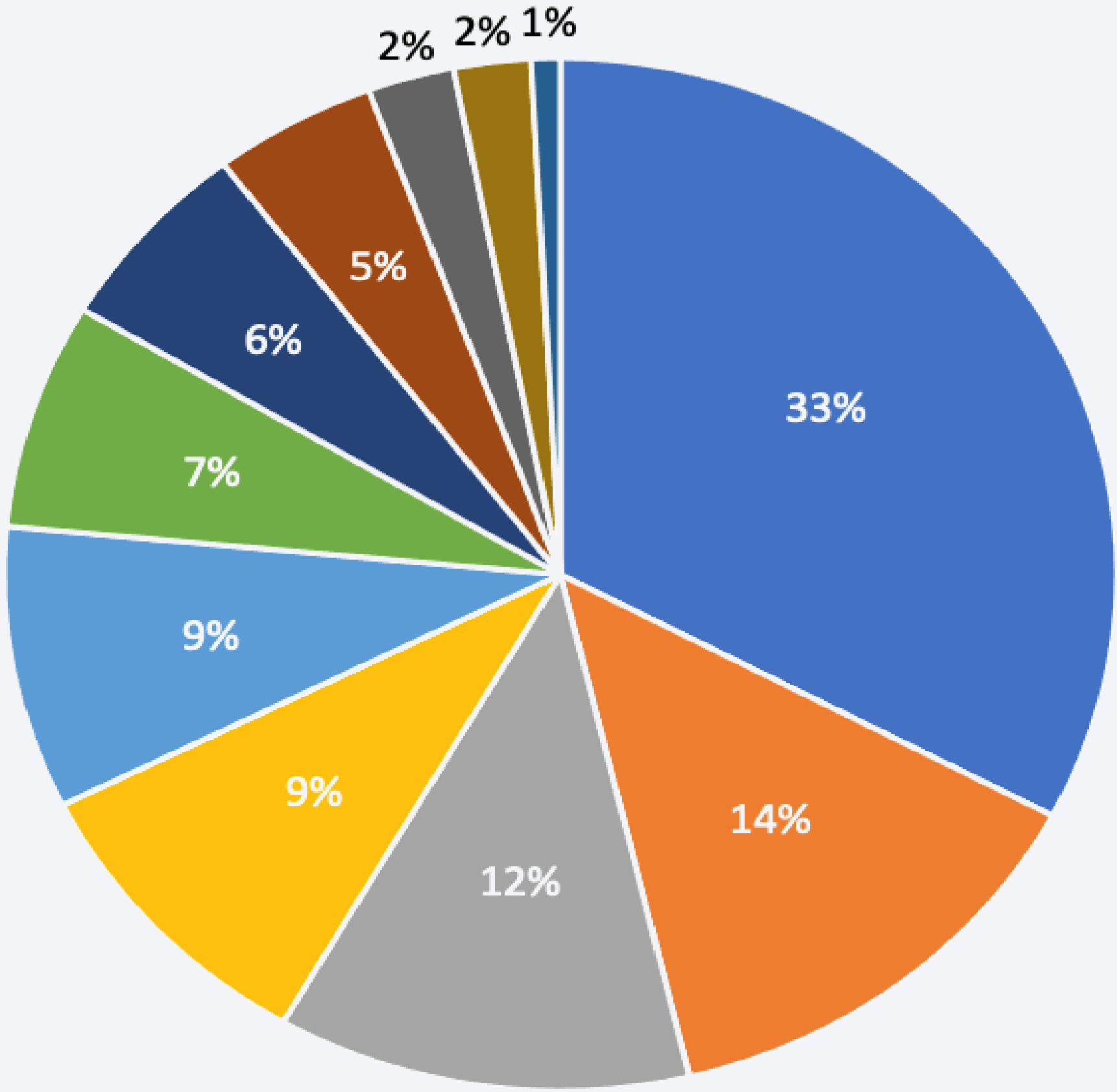
Skills demand analysis - data



981 online job vacancies



April – October 2023



- Portugal
- Spain
- Netherlands
- Denmark
- France
- Germany
- Italy
- Belgium
- Sweden
- Ireland
- Finland

Skills demand analysis – results

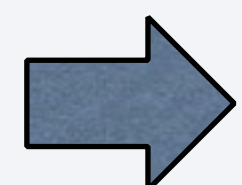
Occupational groups in highest demand:

1. ESCO-21: Science and engineering professionals
2. ESCO-12: Administrative and commercial managers
3. ESCO-31: Science and engineering associate professionals
4. ESCO-25: Information and communication technology professionals
5. ESCO-33: Business and administration associate professionals

85,6%



- | | |
|--|---|
| 1. ESCO-1219.6: Project manager | 6. ESCO-3323.2: Purchaser |
| 2. ESCO-3119.11: ORE technician | 7. ESCO-2149.2.5: Installation engineer |
| 3. ESCO-2149.9.5: ORE engineer | 8. ESCO-3131.1: ORE plant operator |
| 4. ESCO-2512.4: Software developer | 9. ESCO-2141.8: Maintenance & repair engineer |
| 5. ESCO-2149.7.6: Wind energy engineer | 10. ESCO-2149.9.2: Energy systems engineer |



82,6% of the identified job vacancies addressed 39/174 occupational profiles. For those profiles, the following information was analyzed: (i) technical skills and competences; (ii) transversal skills; (iii) knowledge; (iv) experience; (v) educational and training requirements; and (vi) language requirements

Skills demand analysis - key findings

- Occupational profiles currently in high demand are those that are key to the ORE value chain (especially *project managers* and *engineers*)
- (At least basic) IT skills are essential in almost all profiles (e.g. for documentation mng, performance monitoring, results reporting, etc.)
- QA/QC and QHSE-related skills are much in need across many different profiles
- Stakeholder management is also key in several positions, for ensuring the building of strong and long-lasting working relationships
- Soft skills are of equal importance to hard skills
- Knowledge requirements were diverse, often relating to specific software and technologies, data analysis and visualization, regulations and standards. Same for experience requirements, with 2-3 years set as the minimum threshold
- Higher academic education qualifications were mostly required (EQF 6-7). VET is in lower demand. Training from specific bodies (e.g., GWO) is often mentioned

Skills supply analysis – methodology

Identification of relevant educational & training programs and courses using the MarineTraining data entry form



RELATED COURSES

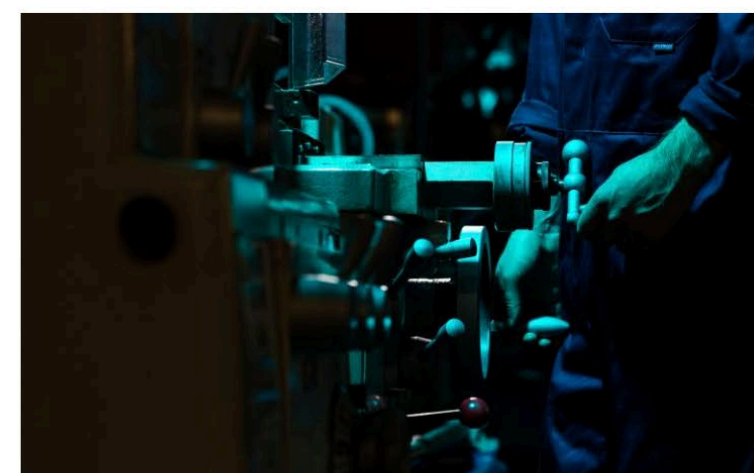
FLORES



NEW CONCEPTS IN HETEROGENEOUS CATALYSIS, SURFACE SCIENCE, AND ENERGY STORAGE

📍 Erlangen, DE

[READ MORE →](#)



WIND AND WATER ENGINEERING

📍 Écully, FR

[READ MORE →](#)



NEW CONCEPTS IN HETEROGENEOUS CATALYSIS, SURFACE SCIENCE, AND ENERGY STORAGE

📍 Erlangen, DE

[READ MORE →](#)

Program / course info collected:

✓ Title	Title of the programme / course in English or in the national language of the country where the programme / course is offered
✓ Type	Short-cycle tertiary education, B.Sc., M.Sc., Ph.D., etc. The ISCED 2011 Level is also indicated
✓ Format	Onsite, online or blended
✓ Description	Short description of what the programme / course entails and what exact knowledge students / attendees will acquire
✓ Start date	Date that the programme / course starts
✓ Duration	In hours, days, months or semesters
✓ Cost	In Euros (€) or national currency either for the whole programme / course or per year. Cost is often differentiated for EU and international students
✓ Entry level	Level of education required for entering the programme / course (e.g. B.Sc., M.Sc., etc.)
✓ Application procedure	Link to online application platform / system
✓ Grant opportunities	Available opportunities that can be exploited for covering part of the cost of the programme / course
✓ Learning outcomes	List of competences and qualifications that students will gain upon completion of the programme / course
✓ Prerequisites	Degrees (or grades) that applicants should have for getting selected to attend the programme / course, or entrance exams
✓ Language	Language of the programme / course
✓ Provider	Institution / body offering the programme / course
✓ Contact	Contact e-mail to reach out for more information
✓ Relevant ISCED categories	Thematic ISCED category(ies) that the programme / course is relevant to

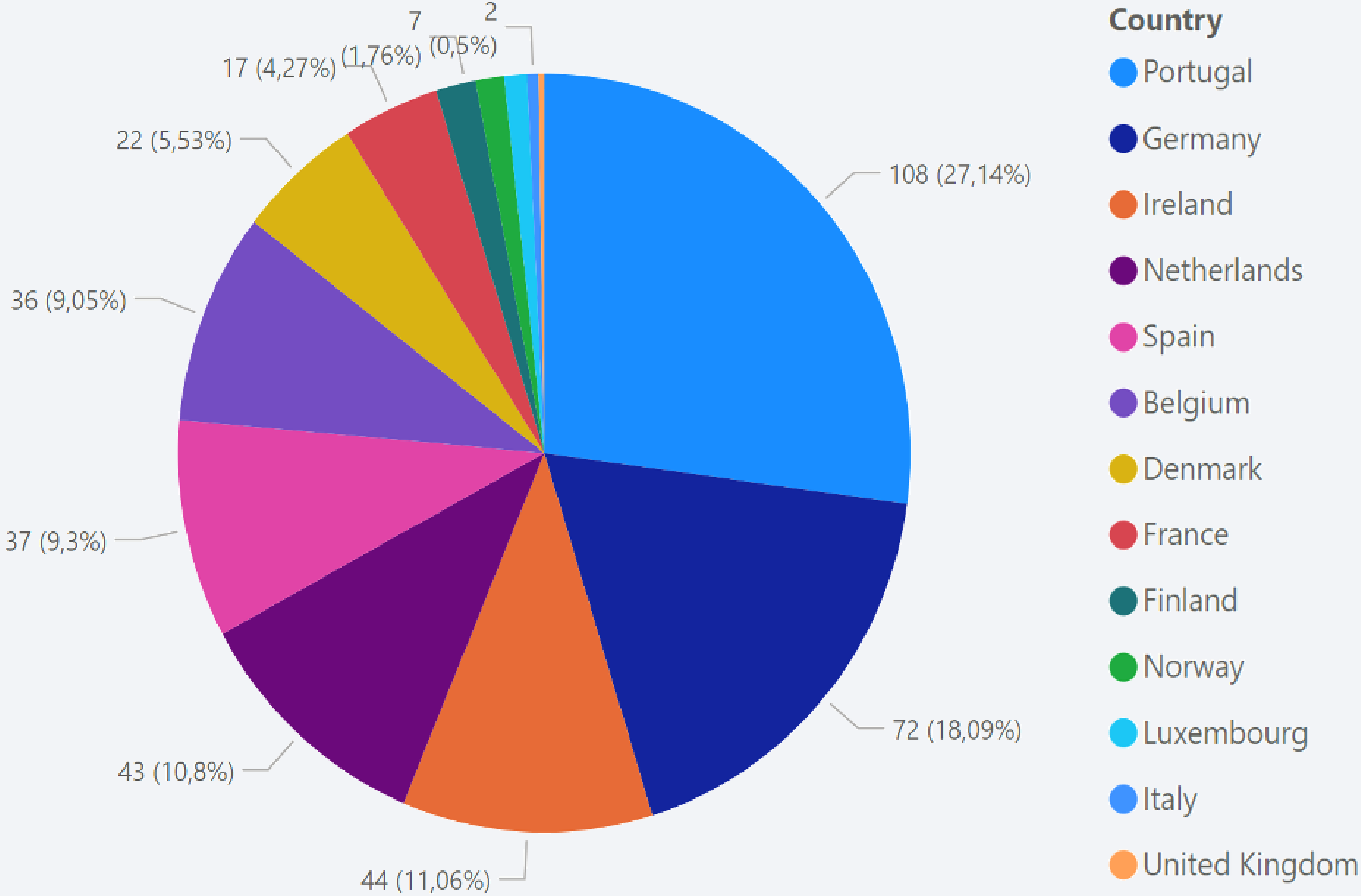
Skills supply analysis – data



398 educational and training programs and courses



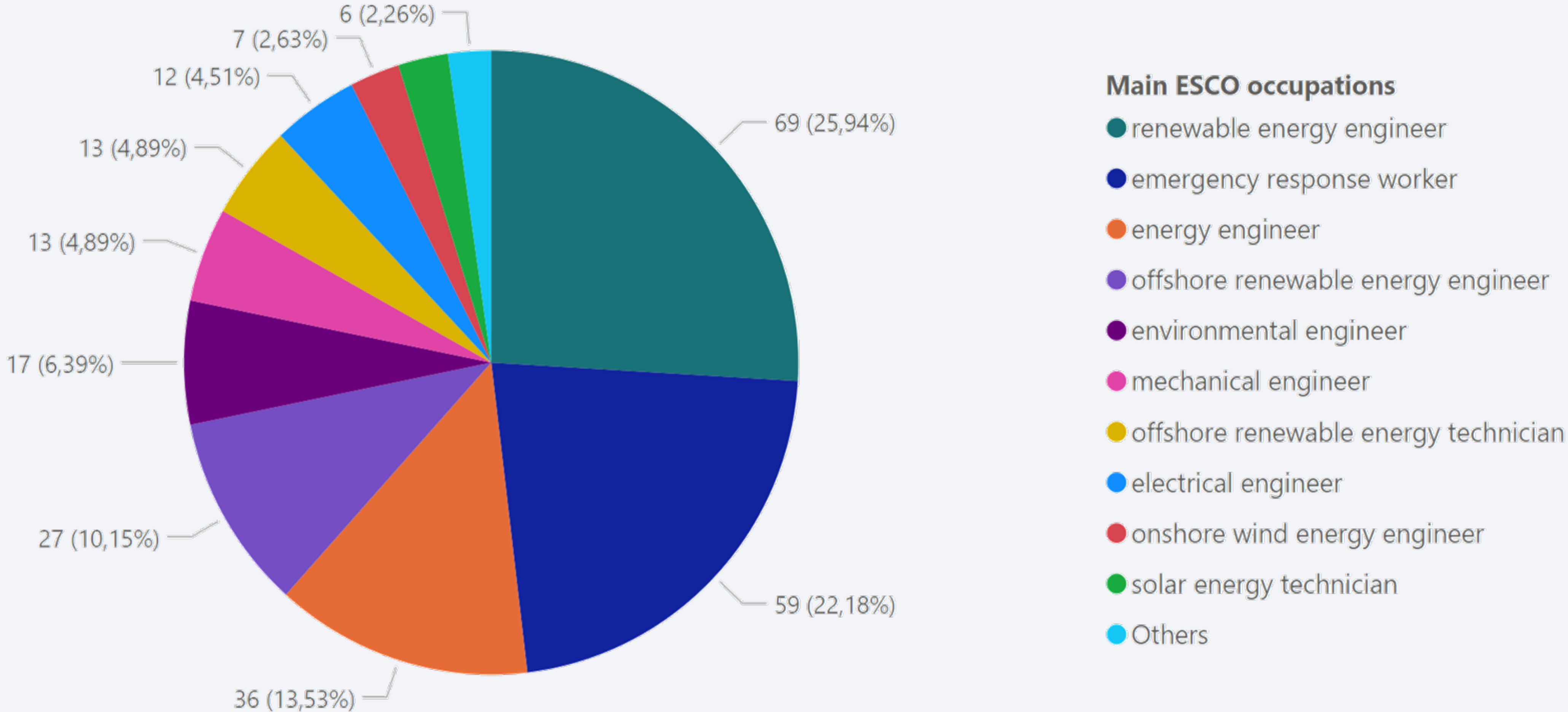
March – September 2023



Skills supply analysis – results

Type	56% educational programs - 44% training courses
Level	<ul style="list-style-type: none">▪ 82% were higher education programs & courses (46% MSc, 23% BSc, 13% PhD)▪ 17% were short-cycle tertiary programs & courses▪ 1% were post-secondary non-tertiary programs & courses
Language	59% in English - 41% in national language
Format	49% on-site, 29% online, 22% blended
Sub-sector	86% applied to all sub-sectors – 14% dedicated to offshore wind
Duration	Typical for higher education – varied for training courses per format, thematic focus, expected learning outcomes, etc.
Cost	From 0 to thousand € - different for EU and non-EU attendees
Hosting institution	Universities, academies, VET providers, research institutions, consulting companies, service providers, key industrial actors and their associations

Skills supply analysis – results



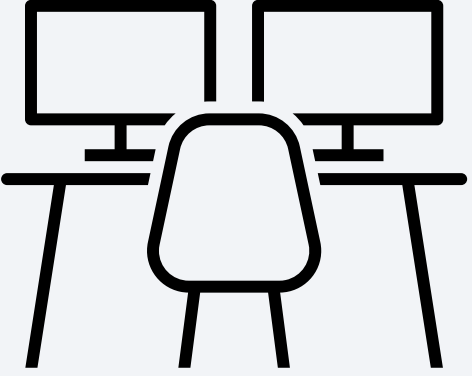
Findings and key mismatches with demand

- Despite being a top priority for the industry, there are only few programs and courses targeting *project managers* and *ORE technicians*
- Most programs and courses are offered at M.Sc. level, indicating that ORE-related qualifications and competences are provided as specialization. There is significant lack of VET programs and courses
- Compared to the past, there is now a greater number of programs and courses specifically dedicated to ORE
- Many of the identified programs and courses address occupational profiles with a more supporting role in the ORE value chain (compared to the demand where key occupational profiles for the ORE value chain are needed)
- Educational and training providers should place greater emphasis on equipping graduates with QA/QC and QHSE-related skills, as well as soft skills

Findings and key mismatches with demand

- Proficiency in using specialized software requested by the industry can be better facilitated by educational and training providers through, for example, the acquisition of educational licenses
- It would be of real added value if additional industrial associations invest in providing targeted training, either via their own resources or in partnership with key institutions. Those programs / courses are often well-respected and widely-recognized

Skills foresight - methodology

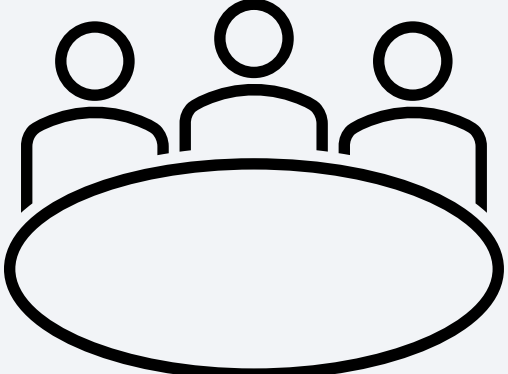


Desk research



Identify future trends and paradigm shifters

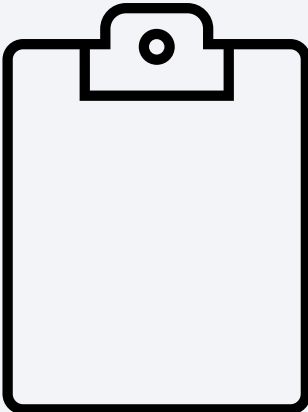
18 trends identified falling into 3 key categories



Targeted workshop



Update, validate and discuss characteristics of identified trends and paradigm shifters



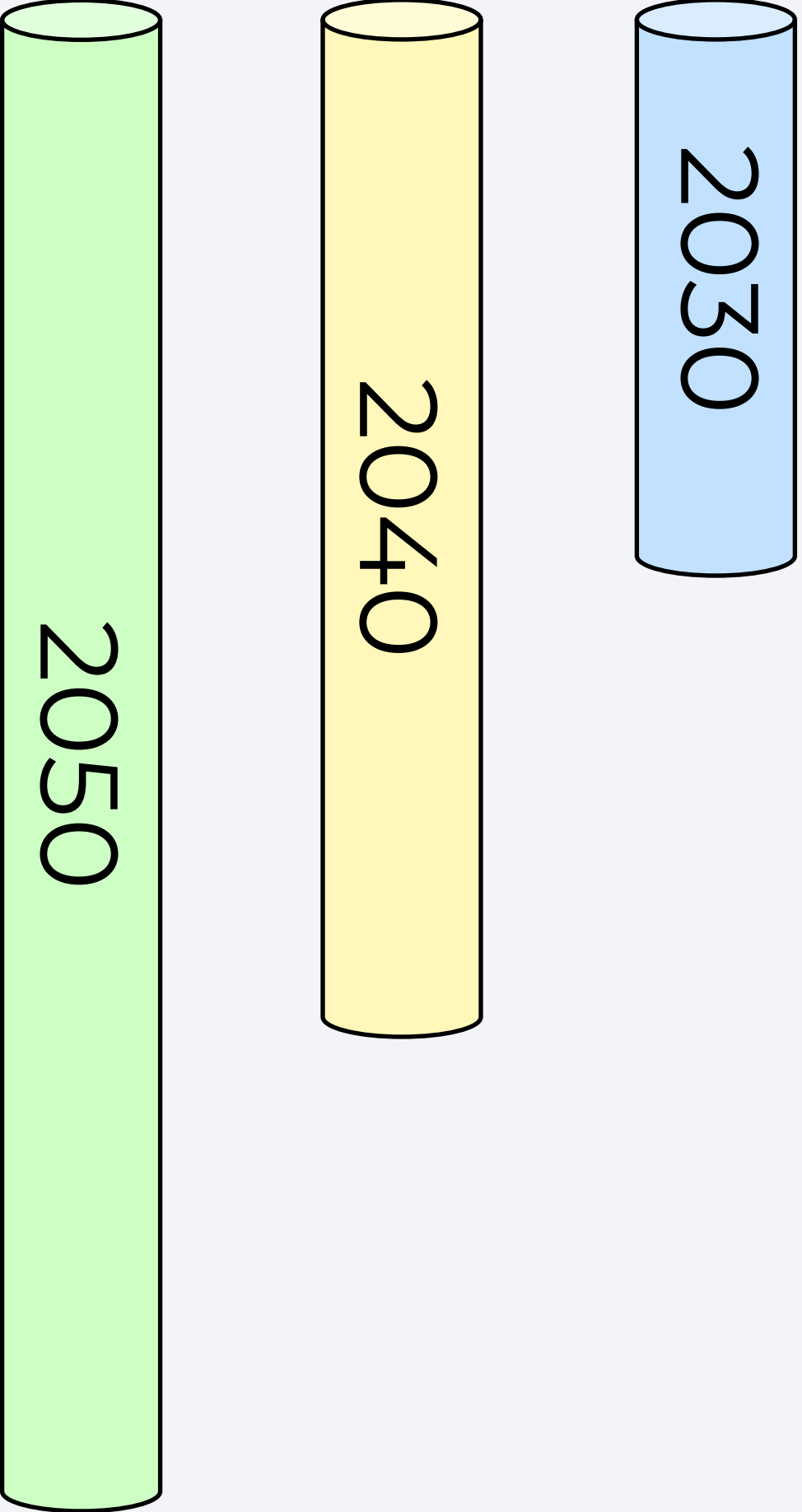
Online Delphi survey (2 rounds)



Assess the impact of validated trends and paradigm shifters on skills



Skills foresight – categories of trends



Technological
advancements



Policy
changes



Market dynamics
/ evolution



Skills foresight – validated trends

Technological advancements



- A1. Integration of smart grid technologies & sensors
- A2. Energy storage systems
- A3. Higher automation levels & advanced robotics
- A4. Digital twin
- A5. Artificial Intelligence (AI), Internet of Things (IoT) and Quantum Computing
- A6. Big data
- A7. Immersive technologies: Virtual and Augmented Reality (VR & AR)
- A8. 3D printing
- A9. Sustainable and smart materials

Policy changes



- B1. Reform of relevant regulatory frameworks (e.g. setting of new targets, requirements, processes, etc.)
- B2. Adoption of Maritime Spatial Plans (MSPs)
- B3. Introduction of new / update of existing applicable standards
- B4. EU-wide accreditation of training / skills

Market dynamics / evolution



- C1. New structures
- C2. Scale and efficiency increases & security of energy supply
- C3. Hybrid projects
- C4. New financing mechanisms
- C5. Energy price

Skills foresight – aspects assessed

- Impact to be imposed on the sector in the short and medium-sized term (none evaluated with a long-term impact)
- Impact on skills requirements
- Effects on employment
- Three (3) occupational profiles to be affected the most
- New skills requirements in terms of hard and transversal skills, and most effective methods for addressing them
- New occupational profiles likely to emerge

Skills foresight – findings

- Technological advances are the most impactful, with the majority of them to be affecting the sector in the short-term
- Trends in all three categories are expected to have a positive, albeit low, impact on employment. Technological advances are expected to create employment opportunities mostly in mid-level positions, while for the other two categories jobs in management and upper-management levels are expected to be triggered
- Technological advances will increase demand for occupational profiles to be affected the most, while trends in the other two categories will create the need to upskill
- There is good balance between requirements for hard and transversal skills. For the latter, particular emphasis is placed on the inter- and cross-disciplinary communication & collaboration
- New occupational profiles likely to emerge are not included in ESCO

Skills foresight – findings

- For hard skills, blended apprenticeships in pioneering companies was acknowledged as the most effective method in the short-term. In the medium-term, educational programmes with industry boards are believed to impose the greater impact

A decorative graphic on the left side of the slide. It features a large yellow circle in the upper left quadrant, set against a light blue background. Below the circle, there are several overlapping, curved shapes in various shades of blue, ranging from a deep navy blue to a light sky blue, creating a sense of depth and movement.

Thank you!

Contact us for any clarification you may need

Dr. Lefteris Sdoukopoulos sdouk@certh.gr

Ms. Lucia Fraga Lago lfraga@cetmar.org

Skills Observatory mail: observatory@oreskills.eu