



**FLORES**

Offshore Renewable Energies  
partnership in the Pact for Skills



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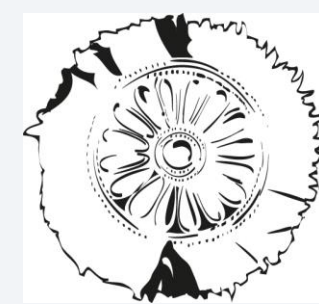


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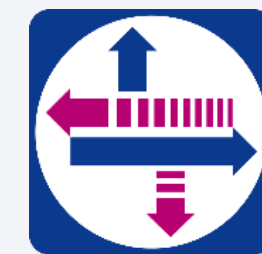
# Skills intelligence in the Offshore Renewable Energy (ORE) sector

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Head of Environmental and Energy Impacts of  
Transport Systems Department



**CERTH**  
CENTRE FOR  
RESEARCH & TECHNOLOGY  
HELLAS



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# The FLORES project

(1/3)



SUN



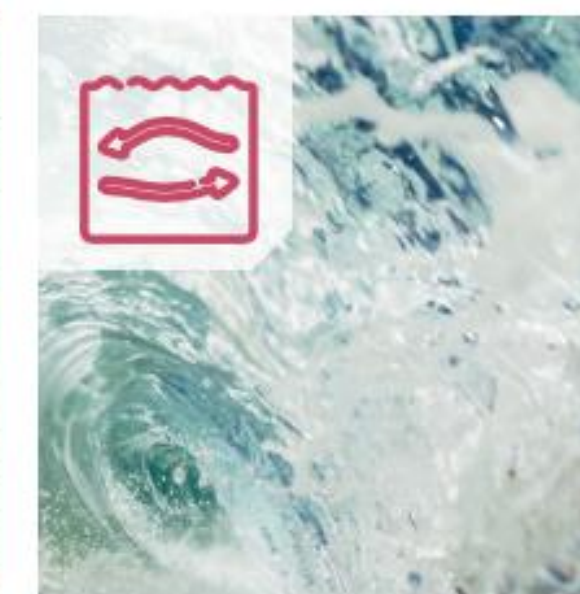
WAVES



WIND



TIDES



CURRENTS



AND MORE

## PROJECT OBJECTIVES

The FLORES project (Forward Looking at the Offshore Renewables) is devoted to the extension and spreading of ORE skills, promoting the core activities of the large-scale ORE Pact for Skills partnership set up by the Pact for Skills Initiative. The FLORES project will develop dedicated training offers, promote careers in the sector, create a Skills Observatory along with sustainable partnerships to ensure the long-term success of the initiative.

The Pact for Skills is one of the flagship actions of the [European Skills Agenda](#).

The Pact aims to support public and private organisations with **upskilling and reskilling**, so they can thrive through the green and digital transitions.

Members of the Pact have access to knowledge on **upskilling and reskilling** needs, **advice on relevant funding instruments** to boost the skills of adults in their regions and countries, and **partnership opportunities** within our growing community.

# The FLORES project

(2/3)

## 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

- |  |   |
|--|---|
| <p><b>1</b> Centro Tecnológico del Mar - Fundación CETMAR</p> <p><b>2</b> Asociación de Industrias del Metal y Tecnologías Asociadas de Galicia (ASIME)</p> <p><b>3</b> Universidade da Coruña (UDC)</p> <p><b>4</b> The Centre for Research and Technology-Hellas (CERTH)</p> <p><b>5</b> WindEurope</p> <p><b>6</b> Ghent University (UGent)</p> <p><b>7</b> Aqualex Multimedia Consortium Ltd / Aqualex Multimedia Consortium Ltd (AMC)</p> | <p><b>8</b> Deftiq</p> <p><b>9</b> Bluespring</p> <p><b>10</b> SUBMARINER Network for Blue Growth</p> <p><b>11</b> Lycée Fulgence Bienvenüe</p> <p><b>12</b> Maritime Technology Cluster FVG (mareFVG)</p> <p><b>13</b> IndustriAll Europe</p> <p><b>14</b> European Marine Board (EMB)</p> <p><b>15</b> Conférence des Régions Périphériques Maritimes D'Europe (CRPM)</p> |
|--|---|



# The FLORES project

(3/3)

## 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

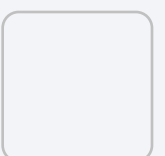
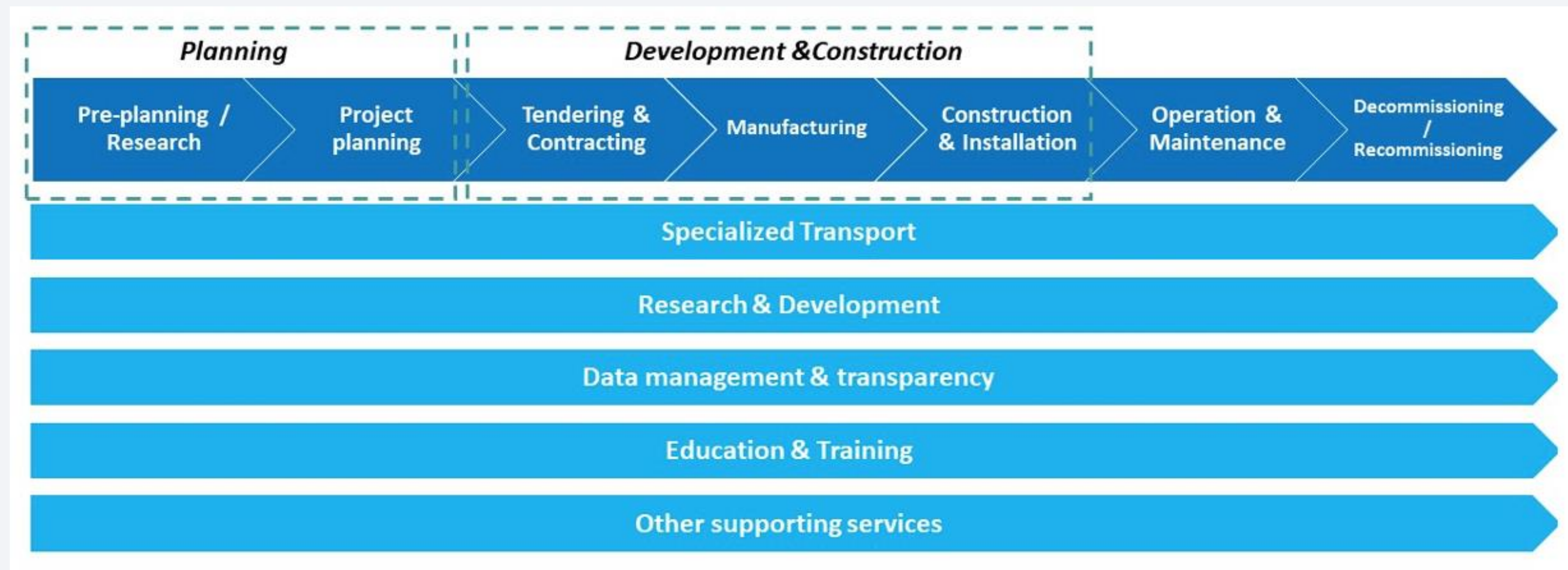


# Reference layers

(1/3)



✓ ORE value chain



# Reference layers

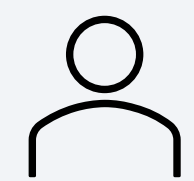
(2/3)



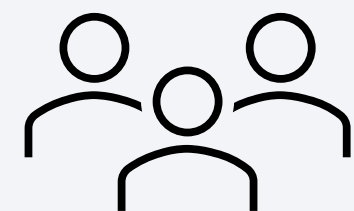
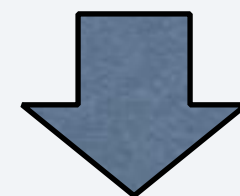
✓ Corresponding occupational profiles



[https://esco.ec.europa.eu/en/classification/occupation\\_main](https://esco.ec.europa.eu/en/classification/occupation_main)



**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

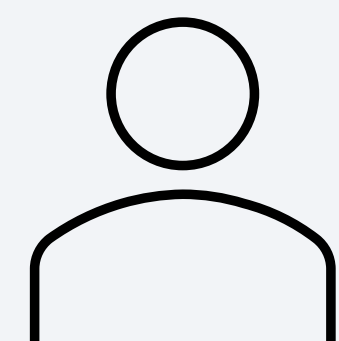
# Reference layers

(3/3)



## ✓ 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



Offshore renewable energy engineer

### Alternative Labels

hydrodynamics engineer

marine renewable energy engineer

ocean renewable energy engineer

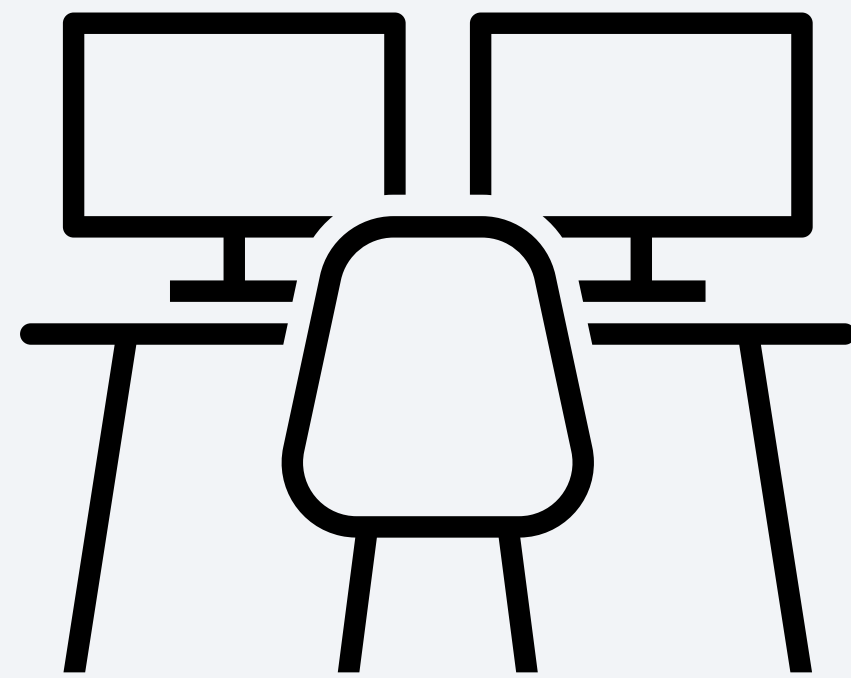
offshore energy farms engineer

ORE engineer

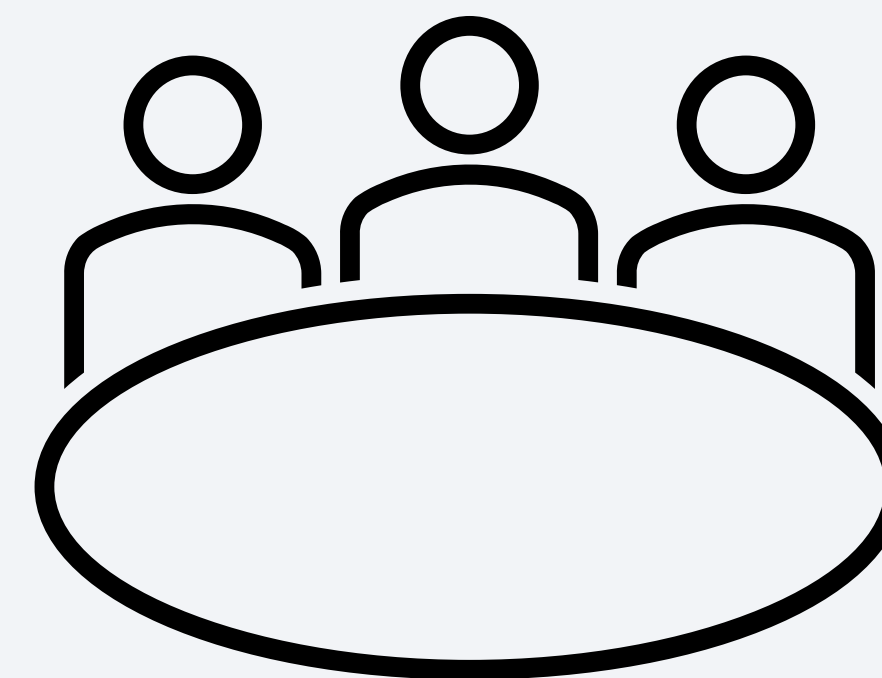


# Knowledge basis

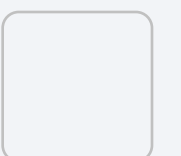
(1/2)



Desk research



Stakeholder consultation



# Knowledge basis

(1/2)



## Web-portals



## Articles



## Studies & reports

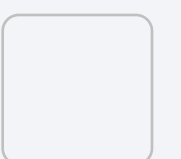


## Initiatives

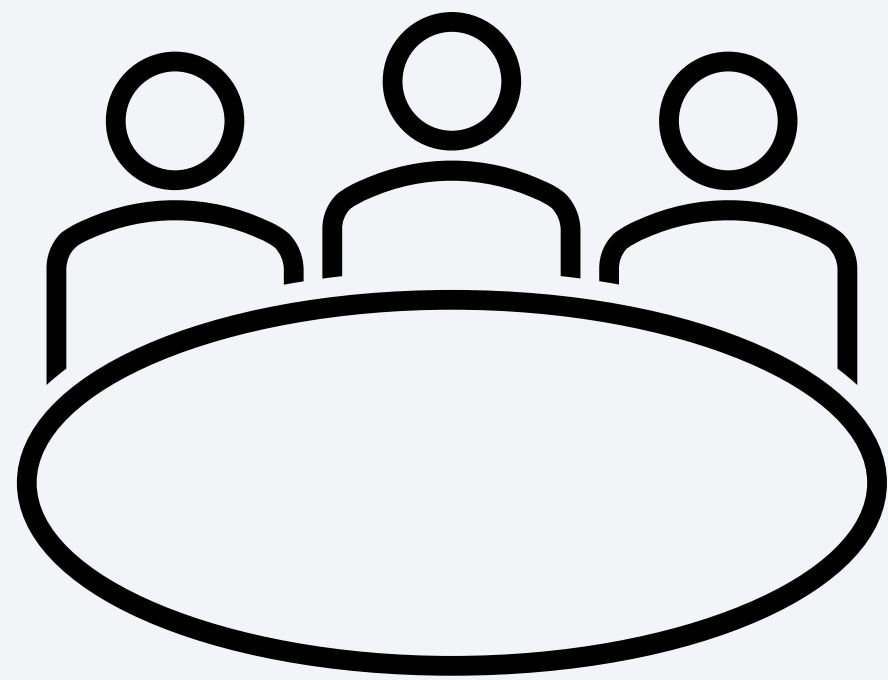


## Input:

- 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 (upskilling & reskilling)
- Pathways to improve skills supply & demand mismatch



Targeted  
workshop

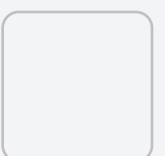


**Wind**  
EUROPE

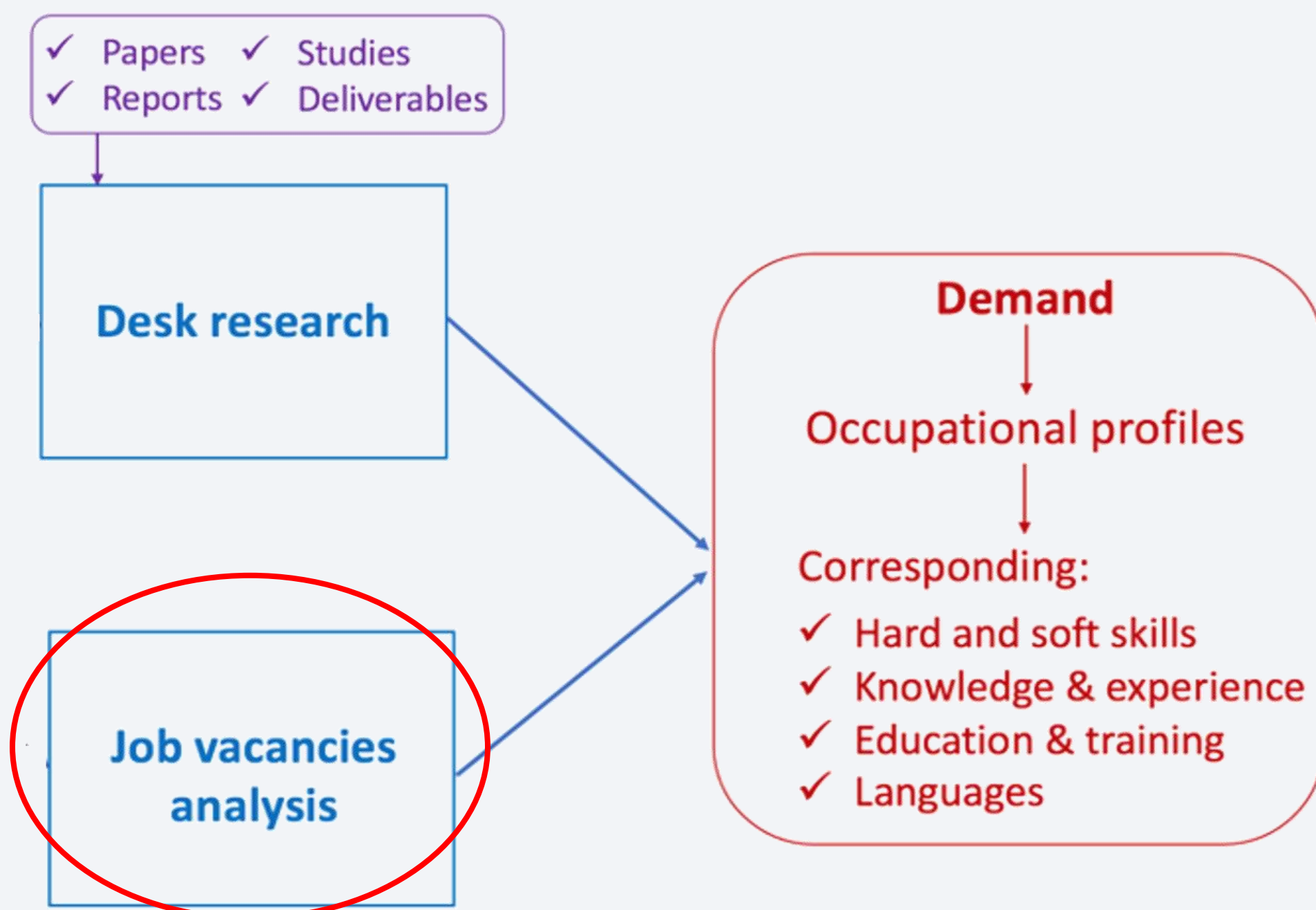
ANNUAL EVENT  
**2023**  
**COPENHAGEN**  
25-27 APRIL

## Input:

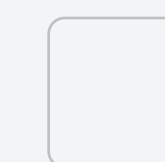
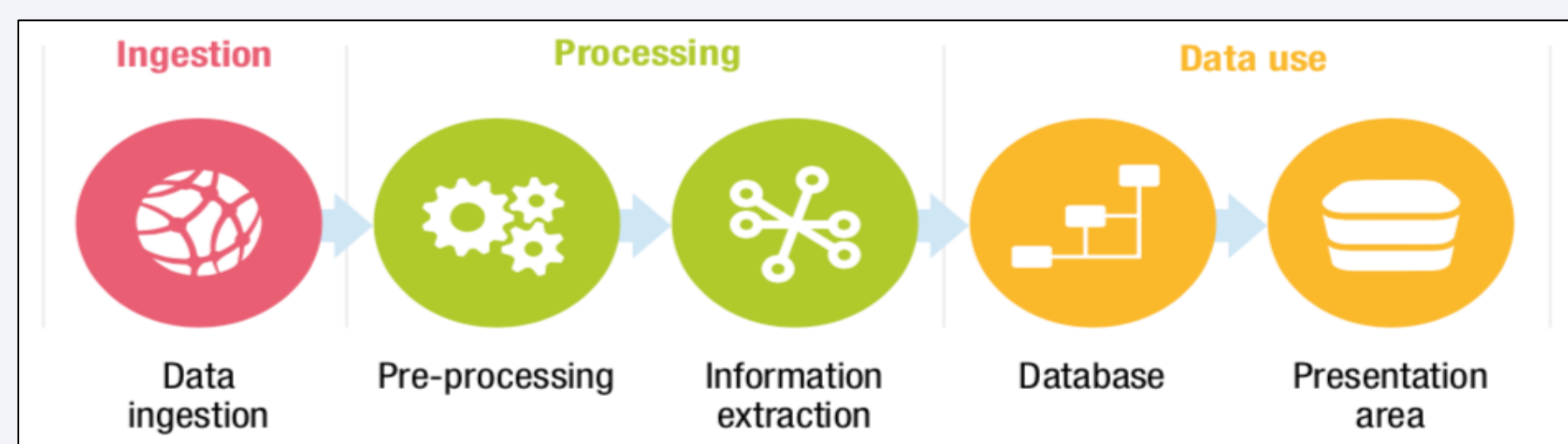
- Elaboration of specific activities in the ORE value chain, and flagging of critical ones (i.e., tendering & contracting)
- Recommendations to expand the list of identified occupational profiles with 15 additional ones -> 13 were however, alternative labels of profiles already included, while the remaining two were the ones not currently included in the ESCO database
- Insights on occupational profiles and/or groups that are currently in high demand according to the experts' views: *Divers, Technical workers, Engineers, Service technicians and Welders*
- Insights on skills & knowledge heavily needed now by the industry: relevant policy frameworks and legal procedures, commercial aspects and marketing



# 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.



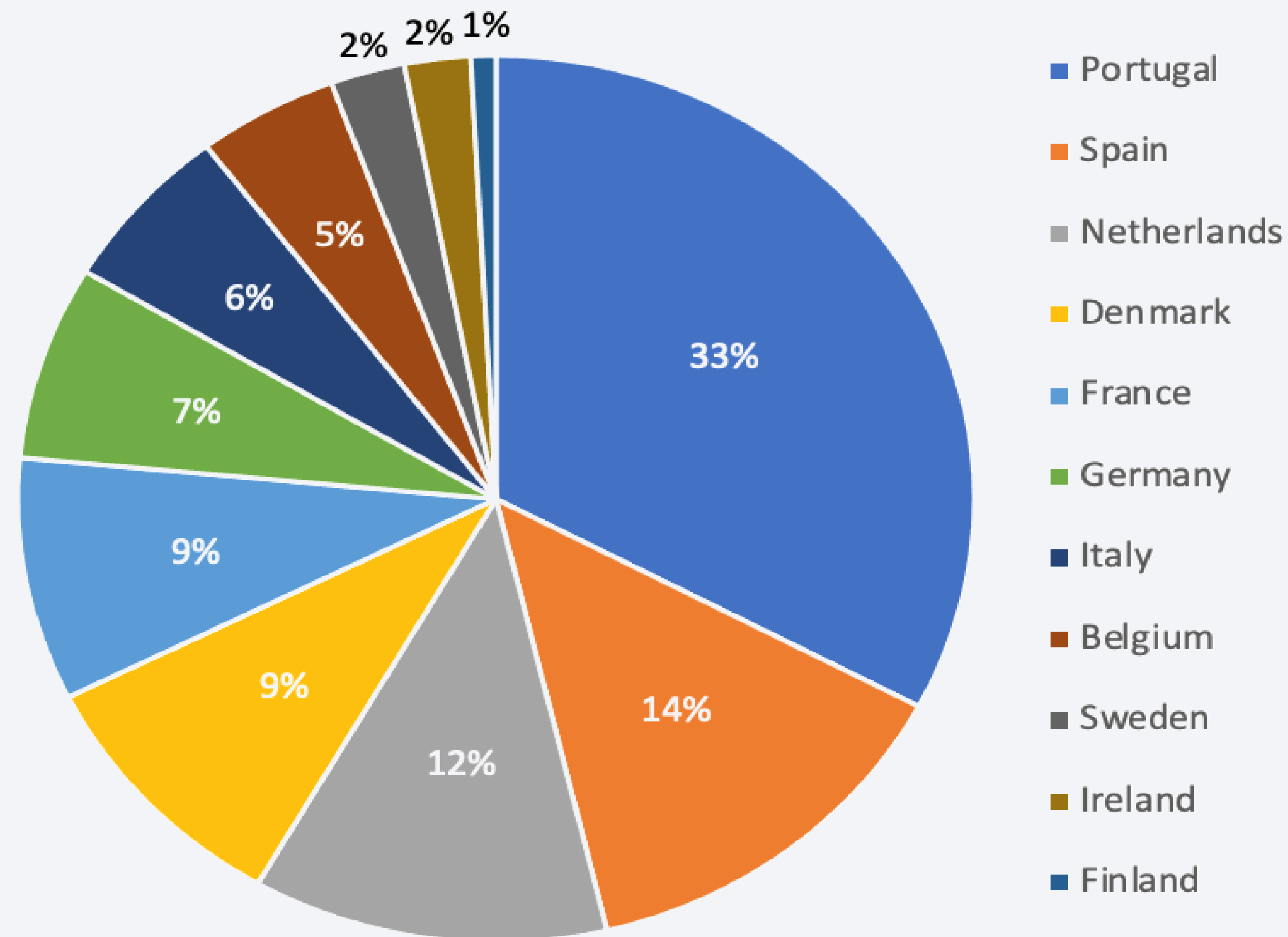
# Skills demand analysis - data



**981** online job vacancies

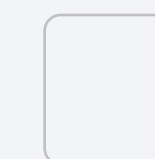


April – October 2023



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# Skills demand analysis – results

(1/2)



## 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%

## Occupational profiles in highest demand (Top10):

- |  |   |
|--|---|
| 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    |

# Skills demand analysis – results

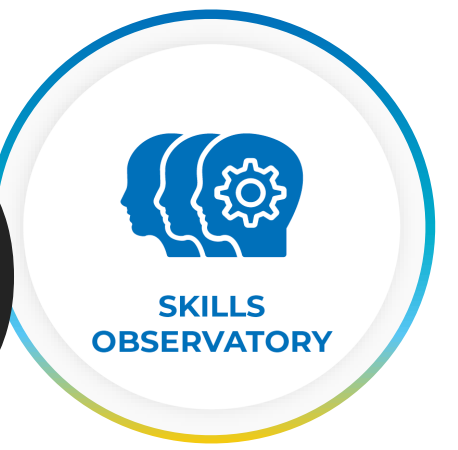
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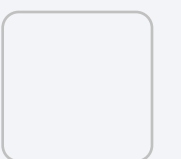
Identified job vacancies mainly addressed 39 of the 174 occupational profiles (82,6%). For each one of them, the following information was analyzed:

- ✓ Technical skills and competences
- ✓ Soft skills
- ✓ Knowledge
- ✓ Experience
- ✓ Education and training (qualifications)
- ✓ Languages

# Skills demand analysis - key findings (1/3)

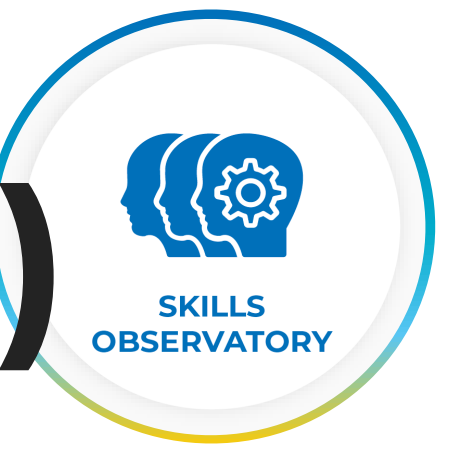


- Occupational profiles that are currently in high demand are those that are key to the value chain
  - ↳ Project managers and engineers especially, rank at the top
- IT skills (at least basic) are needed for the large majority of occupational profiles (e.g., for managing documentation, monitoring performance, reporting results, etc.)
- QA/QC and QHSE-related skills are much in need across many different occupational profiles
- Stakeholder management is also key in several positions, for ensuring the building of strong and long-lasting working relationships

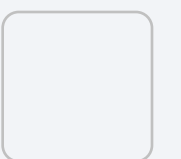




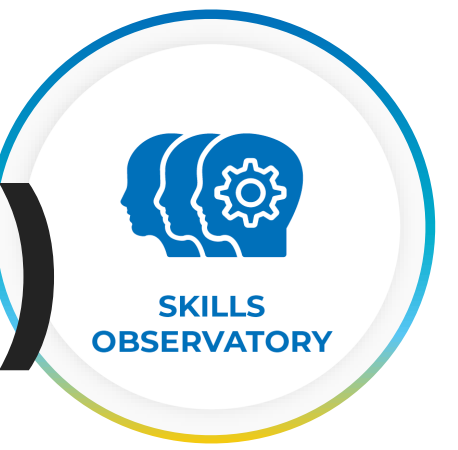
# Skills demand analysis - key findings (2/3)



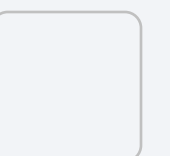
- Soft skills are of equal importance to hard skills.
  - ↳ Communication and collaboration (internal & external) skills were required in all job vacancies, while great was also the demand for adaptivity, problem-solving, and candidates being open-minded, detail- and results-oriented as well as self-motivated
- Knowledge requirements were diverse often relating to specific software and technologies, data analysis and visualization as well as regulations and standards
- Experience requirements were also diverse, often indicating 2-3 years as the minimum threshold



# Skills demand analysis - key findings (3/3)



- Higher academic education qualifications were mostly required (EQF 6-7). VET is in lower demand. Training from specific bodies (e.g., Global Wind Organization) is often mentioned



# Skills supply analysis – methodology



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



**RELATED COURSES**

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READ MORE →

**WIND AND WATER ENGINEERING**

📍 Écully, FR

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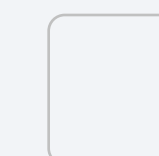
**NEW CONCEPTS IN HETEROGENEOUS CATALYSIS, SURFACE SCIENCE, AND ENERGY STORAGE**

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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



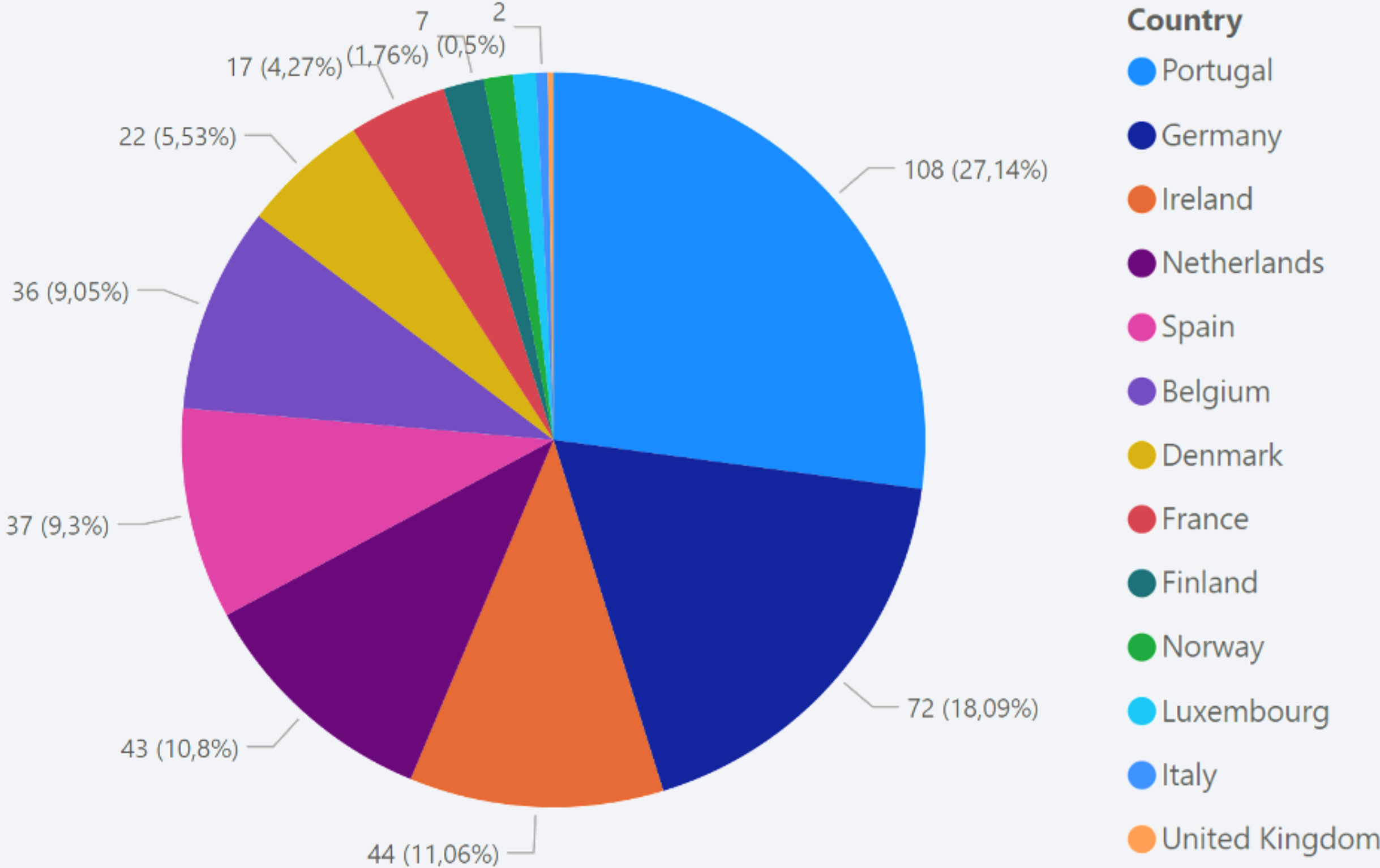
# Skills supply analysis – data



**398** educational and training programs and courses



March – September 2023



# Skills supply analysis – results

(1/4)



Type

- 56% educational programs
- 44% training courses

Level

- 82% were higher education programs & courses
  - 46% M.Sc.
  - 23% B.Sc.
  - 13% PhD
- 17% were short-cycle tertiary programs & courses
- 1% were post-secondary non-tertiary programs & courses

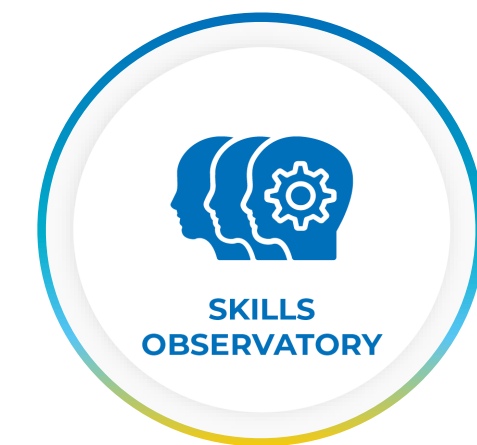
Language

- 59% in English
- 41% in national language



# Skills supply analysis – results

(2/4)



*Format*

- 49% were on-site
- 29% were online
- 22% were blended

*Sub-sector*

- 86% applied to all ORE sub-sectors
- 14% emphasized on offshore wind

*Duration*

- Typical for higher education programs
- Varied for training courses per format, thematic focus, expected learning outcomes, etc.

# Skills supply analysis – results

(3/4)

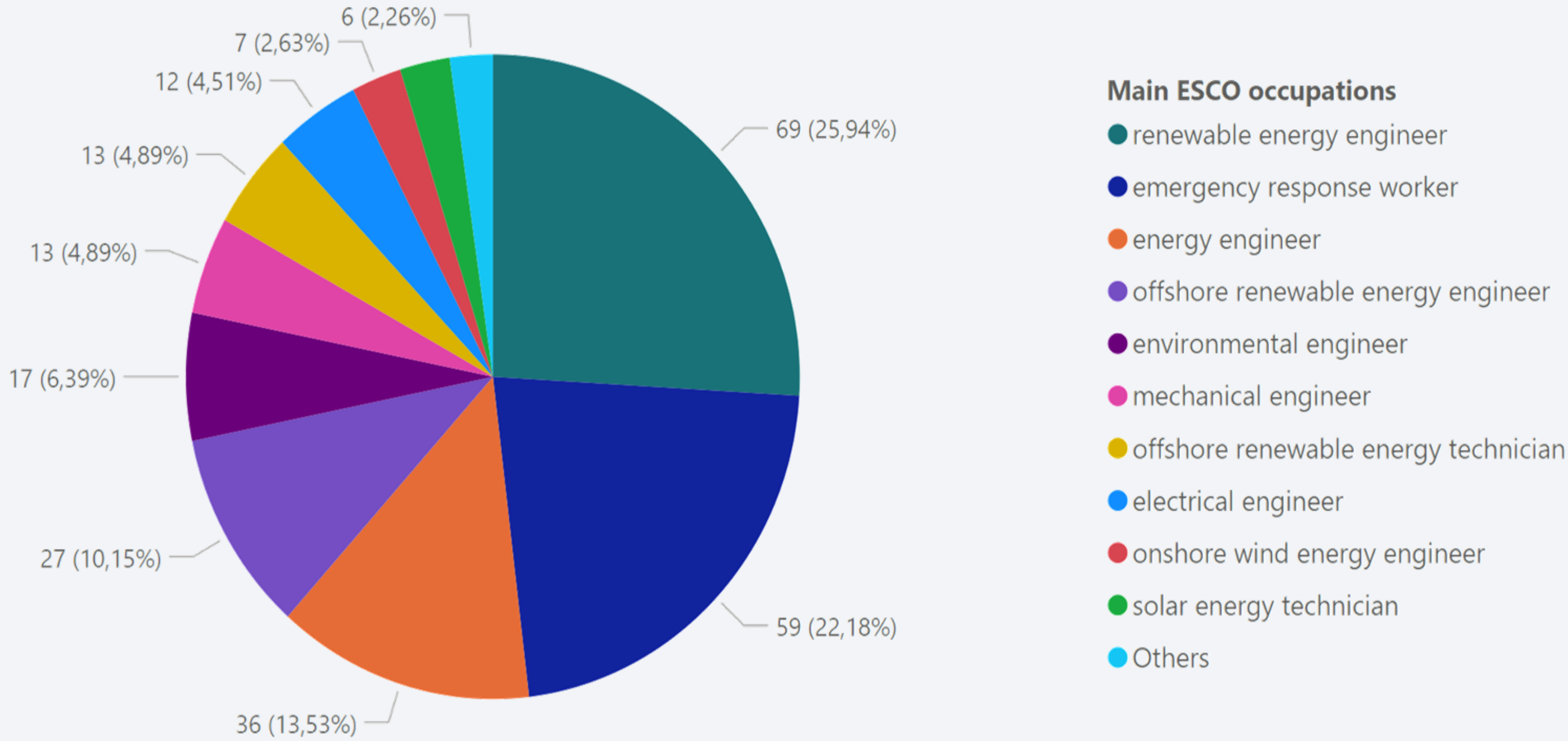


*Cost* ● → Varied from free to thousand euros –  
differentiated for EU and non-EU attendees

*Hosting institution* ● → Universities, academies, VET providers, research institutions,  
consulting companies, service providers, key industrial actors  
and their associations

# Skills supply analysis – results

(4/4)





# Findings and key mismatches with demand (1/3)



- Despite being top priorities for the industry, educational and training programs and courses targeting project managers and ORE technicians were low in number
- There is significant lack of VET programs and courses
- Most programs and courses were at M.Sc. level, indicating that ORE-related qualifications and competences are provided as a specialization
- Compared to the past when ORE-related qualifications and competences were integrated in the broader spectrum of programs and courses addressing renewables in general (see MATES), there is now a greater number of programs and courses dedicated to ORE

# Findings and key mismatches with demand (2/3)



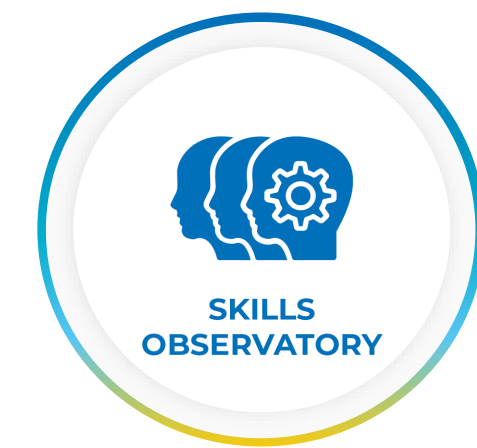
- Alignment of skills demand and supply is more balanced for engineers, with some tasks however being carried out by different types of engineers. Undergraduate backgrounds shape, to some extent, employment decisions given the interrelated functions to be completed
- Many of the identified programs and courses address occupational profiles with a more supporting role in the ORE value (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 (3/3)

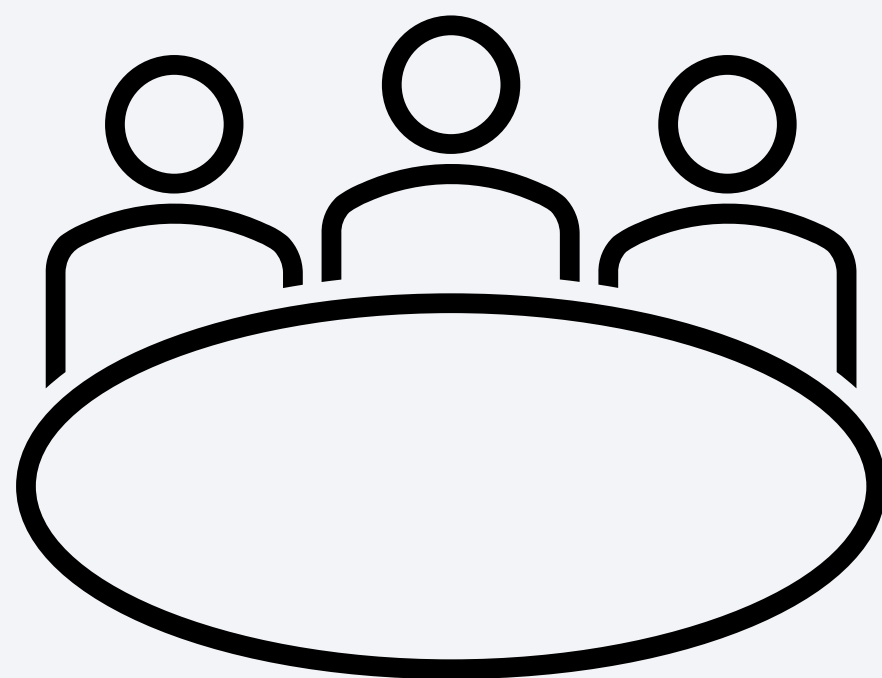


- Proficiency in using specialized software requested by the industry can be better facilitated by educational and training providers through, for example, the acquisition of educational licenses
- It would be of real added value if additional industrial associations invest in providing targeted training,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

# Skills foresight - methodology



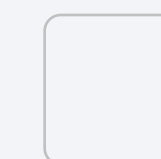
Targeted  
workshop



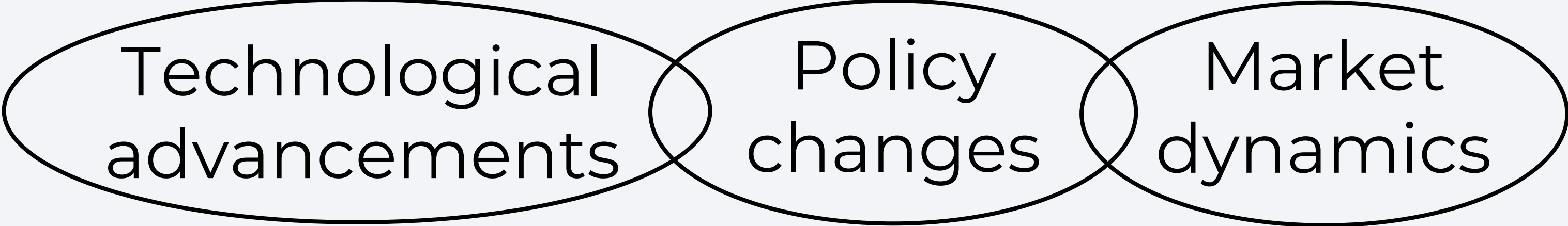
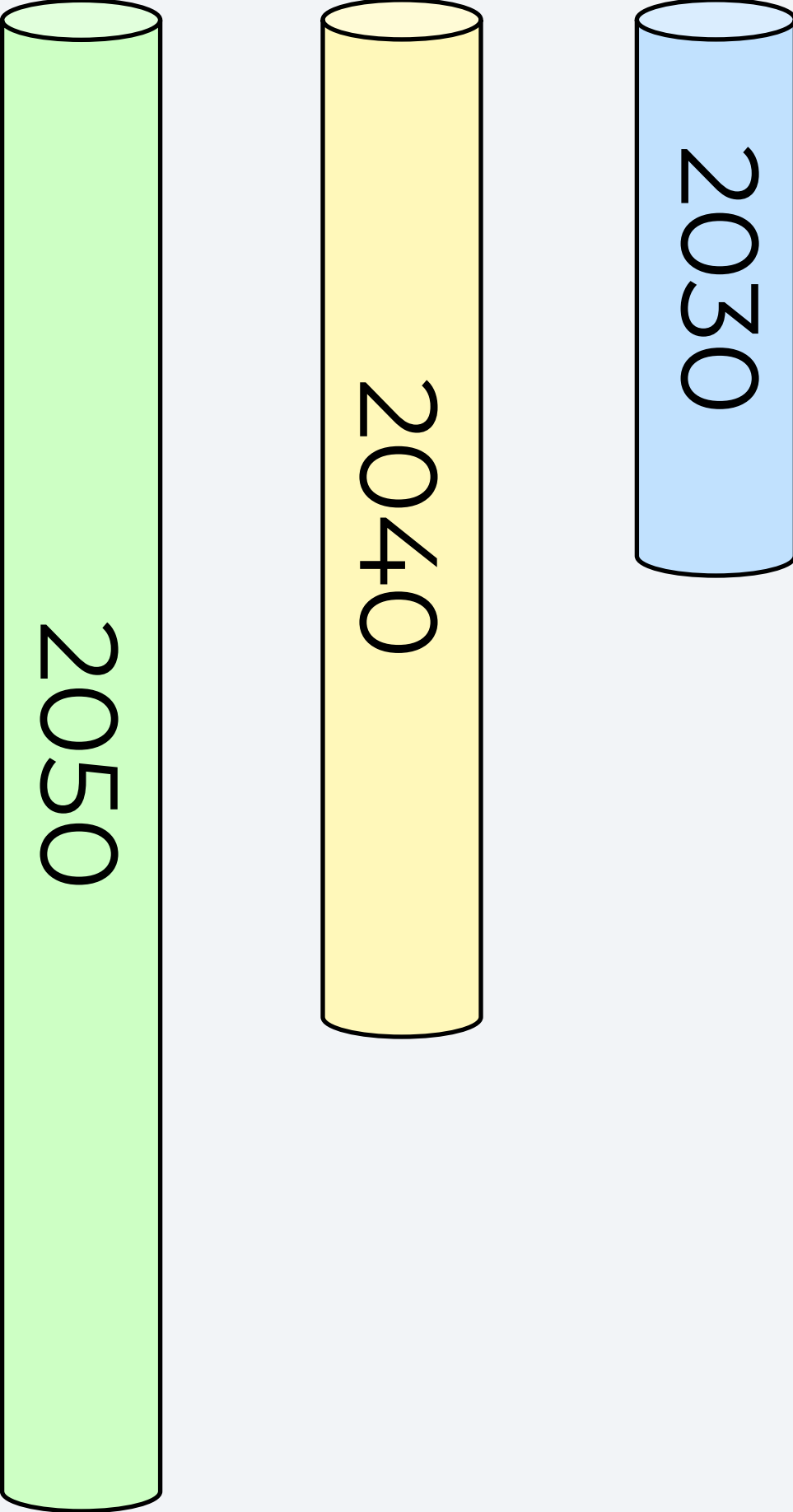
Delphi survey



Online questionnaire – 2 rounds



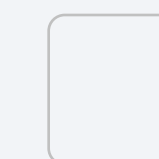
# Skills foresight - trends



# Technological advancements



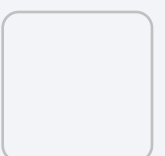
- A1. Integration of smart grid technologies & sensors
- A2. Energy storage systems
- A3. Higher automation levels & advanced robotics
- A4. Digital twin
- A5. Artificial Intelligence (AI), Internet of Things (IoT) and Quantum Computing
- A6. Big data
- A7. Immersive technologies: Virtual and Augmented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



# Policy changes



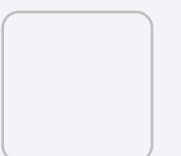
- B1. Reform of relevant regulatory frameworks (e.g. setting of new targets, requirements, processes, etc.)
- B2. Adoption of Maritime Spatial Plans (MSPs)
- B3. Introduction of new / update of existing applicable standards
- B4. EU-wide accreditation of training / skills



# Market dynamics



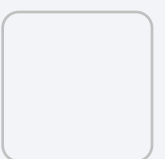
- C1. New structures
- C2. Scale and efficiency increases & security of energy supply
- C3. Hybrid projects
- C4. New financing mechanisms
- C5. Energy price





# Insights to be gained

- Additional trends (if any)
- Impact to be imposed on the sector (order of scale) and expected time-horizon (short-, medium- or long-term)
- Impact on current skills and on employment
- Occupational profiles to be mostly affected
- New hard and soft skills to be required
- New occupational profiles that may emerge
- Effective methods to be adopted for providing the new skill sets

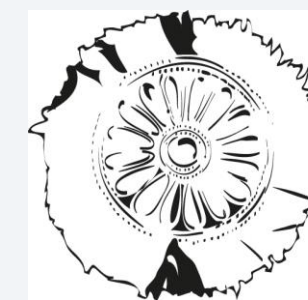


# Get in **touch.**

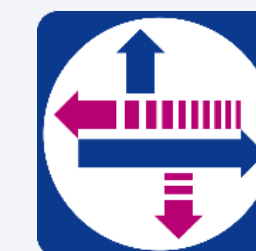
Contact us for any clarification you may need

Dr. Lefteris Sdoukopoulos [sdouk@certh.gr](mailto:sdouk@certh.gr)

Skills Observatory mail: [observatory@oreskills.eu](mailto:observatory@oreskills.eu)



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