

INTERREG ITALY-CROATIA
PROGRAMME 2021 – 2027

BEYOND - Blue Economy sYnergies fOr sustainable Development

D.3.2.4 Cross-sectorial educational programme experience

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Date: 08/2026



INTERREG ITALY-CROATIA PROGRAMME 2021 – 2027

Standard Call for Proposals

Programme priority: Sustainable growth in the blue economy

Specific objective: 1.1: Developing and enhancing research and innovation capacities and the uptake of advanced technologies

Project: BEYOND - Blue Economy sYnergies fOr sustainable Development

Work Package:	WP 3 Results capitalization and transferring
Activity:	A.3.2 Cross-Sectoral Education Program
WP coordinator:	PP6 t ² i – trasferimento tecnologico e innovazione s.c. a r.l.
Deliverable:	D.3.2.4 Cross-sectorial educational programme experience

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Project website: <https://www.italy-croatia.eu/web/beyond>


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1. Introduction

This report presents the implementation and practical experience of the cross-sectorial educational programme developed within the BEYOND – Blue Economy sYnergies fOr sustainable Development project. The programme builds on the educational framework and learning materials previously developed and described in Deliverables D.3.2.1 and D.3.2.2 and represents their practical application and testing in a real educational environment. The main purpose of this deliverable is to document the implementation of the programme, describe the educational activities carried out, and present the participation, engagement and feedback of students and experts.

The programme was implemented through two connected Summer Schools addressing complementary aspects of offshore wind farm (OWF) development. The first part, focused predominantly on technical aspects, was organised in Rijeka by the Faculty of Engineering, University of Rijeka (RITEH), while the second part, focused predominantly on ecological and environmental aspects, was organised in Trieste by OGS. Although held in two different locations, the two Summer Schools were conceived as complementary components of the same educational programme, allowing participants to explore OWF development from interconnected technical, environmental and ecological perspectives.

The division into two parts enabled the programme to make use of the specific expertise, infrastructure and educational capacities of the participating institutions. The Rijeka Summer School focused on the technical foundations of offshore wind energy, including wind potential, turbine aerodynamics, computational and experimental methods, electrical infrastructure, foundations and practical applications. The Trieste Summer School broadened this perspective by addressing marine spatial planning, interactions with fisheries and other blue economy sectors, acoustic and ecological impacts, geohazards and cumulative environmental impacts. Together, the two parts highlighted the importance of integrating technical feasibility with environmental and wider blue economy considerations.



The two Summer Schools also contributed to the cross-border and interdisciplinary character of the BEYOND project by bringing together students, lecturers, researchers and external experts from different academic and professional backgrounds. The Trieste edition was additionally implemented in synergy with the OGS Blue Skills Summer School and the Interreg Italy-Croatia MARESKILL project, which enabled broader international participation and further strengthened opportunities for knowledge exchange and networking.

The programme combined lectures with case studies, laboratory demonstrations, field visits, discussions, interactive activities and group work. This combination was intended to connect theoretical knowledge with practical examples and encourage active participation, interdisciplinary thinking and collaboration. The Rijeka edition included laboratory activities and a visit to the Vrataruša Wind Farm, while the Trieste edition included field visits and practical work related to the ecological assessment of OWFs.

This report describes the organisation and preparation of both Summer Schools, their promotion and participant selection, the activities and learning methods applied, and the evaluation and feedback collected from participants. The experience gained through the two events provides valuable insight into the practical implementation of the cross-sectorial educational programme and offers a basis for its further improvement and possible future application.

Overall, the two Summer Schools successfully provided a complementary educational experience, demonstrating the value of combining technical and ecological perspectives in addressing the development of offshore wind farms in the Adriatic and the wider blue economy context.



2. Offshore Wind Farms – Summer School – Technical Aspects (Part I)

2.1. Organisation and Preparation

The organisation and preparation of the Summer School on technical aspects began several months before the event and involved close collaboration among partners, especially RITEH and OGS. The planning process focused on developing a high-quality educational programme aligned with the objectives of the Interreg project, while ensuring that the event addressed the needs of the target audience and promoted cross-border cooperation. A comprehensive programme was designed to combine theoretical knowledge with practical learning experiences. The curriculum included lectures, laboratory demonstrations, group discussions, and field activities, providing participants with opportunities to engage with experts, exchange ideas, and apply newly acquired knowledge in real-world contexts. Particular attention was given to creating an interdisciplinary learning environment that encouraged collaboration among participants from different academic backgrounds and countries. The summer school agenda that ensures all of that is shown in Figure 2.1. The first day of summer school focused on an informative and theoretical background on the OWF; the second day on computer simulations and demonstration with experimental analysis; and the third day included a field trip to the onshore wind farm Vrataruša. The venue of the summer school was at the Faculty of Engineering, University of Rijeka (Multiplex Room (0-42) & Laboratory Hall (1-122)).



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Italy – Croatia

 BEYOND

INTERREG ITALY-CROATIA
PROGRAMME 2021 – 2027

**BEYOND - Blue Economy sYnergies
fOr sustainable Development**

**BEYOND Summer School
Offshore Wind Farms - Technical Aspects (PART I)**

University of Rijeka - Faculty of Engineering (RITEH)
1st - 3rd June 2026

Interreg  Co-funded by the European Union
Italy – Croatia

 BEYOND

1st June 2026 - Day 1

Informative and theoretical backgrounds to the OWF topic

Location: Faculty of Engineering - Multiplex Room (D-42)

Time	Name	Lecturer
8:30 - 9:00	Registration	
9:00 - 9:10	Welcome Speech	Stefan Ivčić, RITEH
9:10 - 9:40	Offshore wind farms (OWF)	Stefan Ivčić, RITEH
9:40 - 10:00	Fluid mechanics of Wind turbines	Marta Alvir, RITEH
10:00 - 10:30	Physical conditions and wind potential for OWF in the Adriatic	Martina Ivčić, RITEH
10:30 - 11:00	Coffee Break	
11:00 - 11:30	Electric grid and infrastructure for OWF	Vladimir Valentić, RITEH Luka Čalčić, RITEH
11:30 - 12:00	OWF layout optimization	Martina Ivčić, RITEH
12:00 - 13:00	Lunch	
13:00 - 13:30	Measurement and assessment of wind farm noise in Croatia	Elvis Čiligo, NZJZ Marko Kršulja, IFPU
13:30 - 14:00	Impact of OWF on wildlife and habitat - influence of noise, aggregation effects, reef effect, mechanical effects of blades, etc.	Simone Libralata, OGS
14:00 - 14:30	Coffee break	
14:30 - 15:00	Mathematical model of ocean species dynamics	Simone Libralata, OGS
15:00 - 15:30	Industry perspective on OWF	Luka Bukvić, Aventa
15:30 - 16:00	Q&A and Panel discussion	

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 BEYOND

2nd June 2026 - Day 2

OWF scaled model, computer simulations & experimental analysis demonstration

Location: Faculty of Engineering - Multiplex Room (D-42) & Laboratory Hall (I-122)*

Time	Name	Lecturer
9:00 - 9:10	Speech to start the day	Stefan Ivčić, RITEH
9:10 - 9:40	Turbines and Airfoils	Andro Rak, RITEH
9:40 - 10:10	Wind turbine airfoils - Computational fluid dynamics and simulations	Zvonimir Mile, RITEH
10:10 - 10:40	Coffee Break	
10:40 - 11:10	Airfoil in a wind tunnel: experiment design and preparation	Matej Mališa, RITEH
11:10 - 12:00	Airfoil in a wind tunnel: showcase demonstration *	Andro Rak, RITEH
12:00 - 13:00	Lunch	
13:00 - 13:30	Offshore wind turbines foundation types	Marta Alvir, RITEH
13:30 - 14:00	Making the OWF scaled model Demonstration - 3D printing showcase *	Matej Mališa, RITEH
14:00 - 14:20	Coffee break	
14:20 - 15:20	Demonstration of an offshore wind farm scaled model *	Stefan Ivčić, RITEH
15:20 - 16:00	Q&A and Panel discussion	

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 BEYOND

3rd June 2026 - Day 3

Visit to the onshore wind farm Vrataraša

Location: Faculty of Engineering - Multiplex Room (D-42) & Vrataraša wind farm

Time	Name	Lecturer
8:45 - 9:00	Speech to start the day	Stefan Ivčić, RITEH
9:00 - 9:15	Coffee Break	
9:15 - 11:00	Travel (Rijeka - Vrataraša)	
11:00 - 13:00	Wind farm Vrataraša	Robert Katalinić, HEP
13:00 - 13:30	Travel (Vrataraša - Restaurant)	
13:30 - 14:30	Lunch	
14:30 - 15:50	Travel (Restaurant - Rijeka)	
15:50 - 16:00	End of summer school program speech	Stefan Ivčić, RITEH

Figure 2.1. Summer School – Technical Aspects – Agenda.

Other preparation and organisation activities included the preparation of summer school materials, preparation of attendance lists and certificates, organisation of catering and coffee breaks, booking of Venue and transportation to Vrataruša wind farm, preparation of a welcome package, communication with participants and speakers, preparation of evaluation questionnaires, feedback collection procedures, preparation of banners, reservation of parking, preparation of accreditation passes (shown on Figure 2.2).



Figure 2.2. Summer School – Technical Aspects – Accreditation pass.

2.2. Promotion

A comprehensive promotional campaign was carried out to ensure broad visibility of the summer school and to attract participants from the project area. The promotional activities targeted students and young professionals through the communication channels of the project partners, including university websites, social media platforms, and partner networks. Informational materials presenting the objectives, programme, and application procedure were developed as a flyer and a poster (Figures 2.3 and 2.4) to maximise outreach.



MORE INFO AND REGISTRATION:



**REGISTRATION
DEADLINE**
April 15, 2026
**NOTIFICATION OF
ACCEPTANCE**
April 24, 2026

OFFSHORE WIND FARMS SUMMER SCHOOL

PART 1 - TECHNICAL ASPECTS

- Lectures and panel discussions
- Computer simulations of wind turbines
- Wind tunnel demonstrations
- 3D print and scaled offshore wind farm model
- A field visit to the Vrataruša wind farm
- Study materials and food provided



DURATION

June 1 - 3, 2026



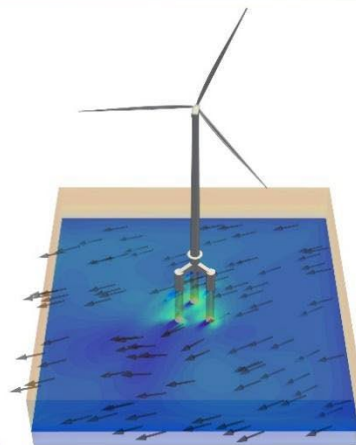
LOCATION

Faculty of Engineering,
Rijeka, Croatia



FEES

Free of charge



PROJECT PARTNERS:



Figure 2.3. Summer School – Technical Aspects – Poster.



Figure 2.4. Summer School – Technical Aspects – Flyer.

Additional promotional activities were conducted at the Faculty of Engineering, University of Rijeka, as shown in Figure 2.5, to attract students to the summer school, inform them about the BEYOND project, and raise awareness of this topic.

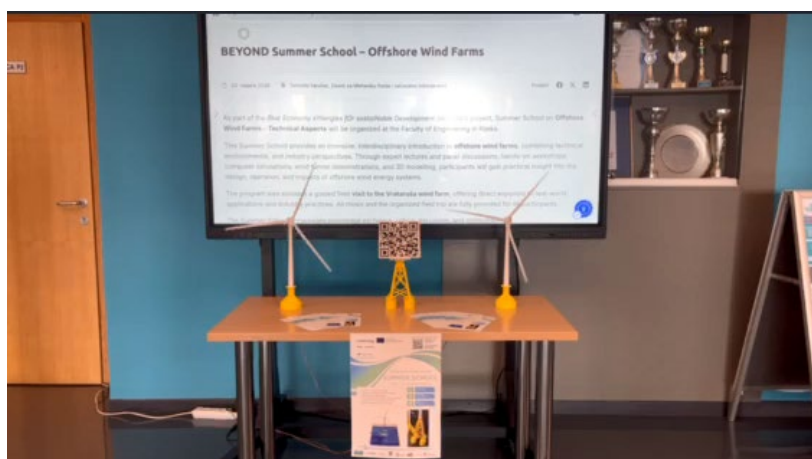


Figure 2.5. Summer School – Technical Aspects – Promotional activities.

Application for summer school was open from February 20, 2026 to April 15, 2026, via registration link and QR code using Google Form. It consisted of detail description of summer school (as presented in Figure 2.6) and several questions covering participant information:

1. First name,
2. Last name,
3. Age,
4. Education level,
5. Affiliated Institution or Company,
6. E-mail,
7. Mobile phone number,
8. Are you interested to participate in the 2nd part of the Summer school in Trieste (non-obligatory)? Transportation from Rijeka will be provided.,
9. Dietary restrictions,
10. Motivation for applying (up to 100 words).



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Italy – Croatia

 **BEYOND**

ITEH 

OWF Summer School REGISTRATION

Date: June 1–3, 2026

Location: Faculty of Engineering, University of Rijeka, Croatia

Format: In-person lectures, demonstrations, and field trip

This Summer School provides an intensive, interdisciplinary introduction to **offshore wind farms**, combining technical, environmental, and industry perspectives. Through expert lectures and panel discussions, hands-on workshops, computer simulations, wind tunnel demonstrations, and 3D modelling, participants will gain practical insight into the design, operation, and impacts of offshore wind energy systems.

The programme also includes a guided field **visit to the Vrataraša wind farm**, offering direct exposure to real-world applications and industry practices. All meals and the organized field trip are fully provided for all participants.

The Summer School encourages knowledge exchange, critical discussion, and collaboration among students, researchers, and professionals, as well as general public participants interested in sustainable energy and blue economy.

Figure 2.6. Summer School – Technical Aspects – Part of the registration form.



2.3. Participants

The participant selection process was based on participant information to ensure that applicants' academic backgrounds and interests aligned with the objectives of the summer school. Participants represented different universities, academic disciplines, and professional backgrounds, enabling the exchange of diverse perspectives and experiences throughout the programme. This diversity fostered collaboration, encouraged peer learning, and strengthened cross-border networking among the participants with special focus on participants from Italy and Croatia. There were 57 applications in total. To ensure the quality of the educational experience, 21 participants were selected.

Although all selected participants initially confirmed their attendance, five were ultimately unable to participate in the summer school due to unforeseen personal and professional circumstances. As these withdrawals occurred close to the start of the summer school, it was not feasible to identify and confirm replacement participants within the available timeframe. Consequently, the summer school was conducted with a slightly smaller cohort than originally planned, while maintaining the quality of the educational activities and ensuring active participation and engagement among all attendees.

A total of 10 participants from Croatia, 5 from Italy, and 1 from Scotland successfully finished the summer school. It included several students who are on an exchange program in those countries. Participants were between 20 and 30 years old. The participant represented different stages of higher education and professional development, including students enrolled in Bachelor's, Master's, and Doctoral (PhD) programmes, as well as participants who had already completed their PhD studies from seven different institutions. The total participant lists, including lecturers and expert associates for each day of summer school, are represented in Figures 2.7 to 2.12.



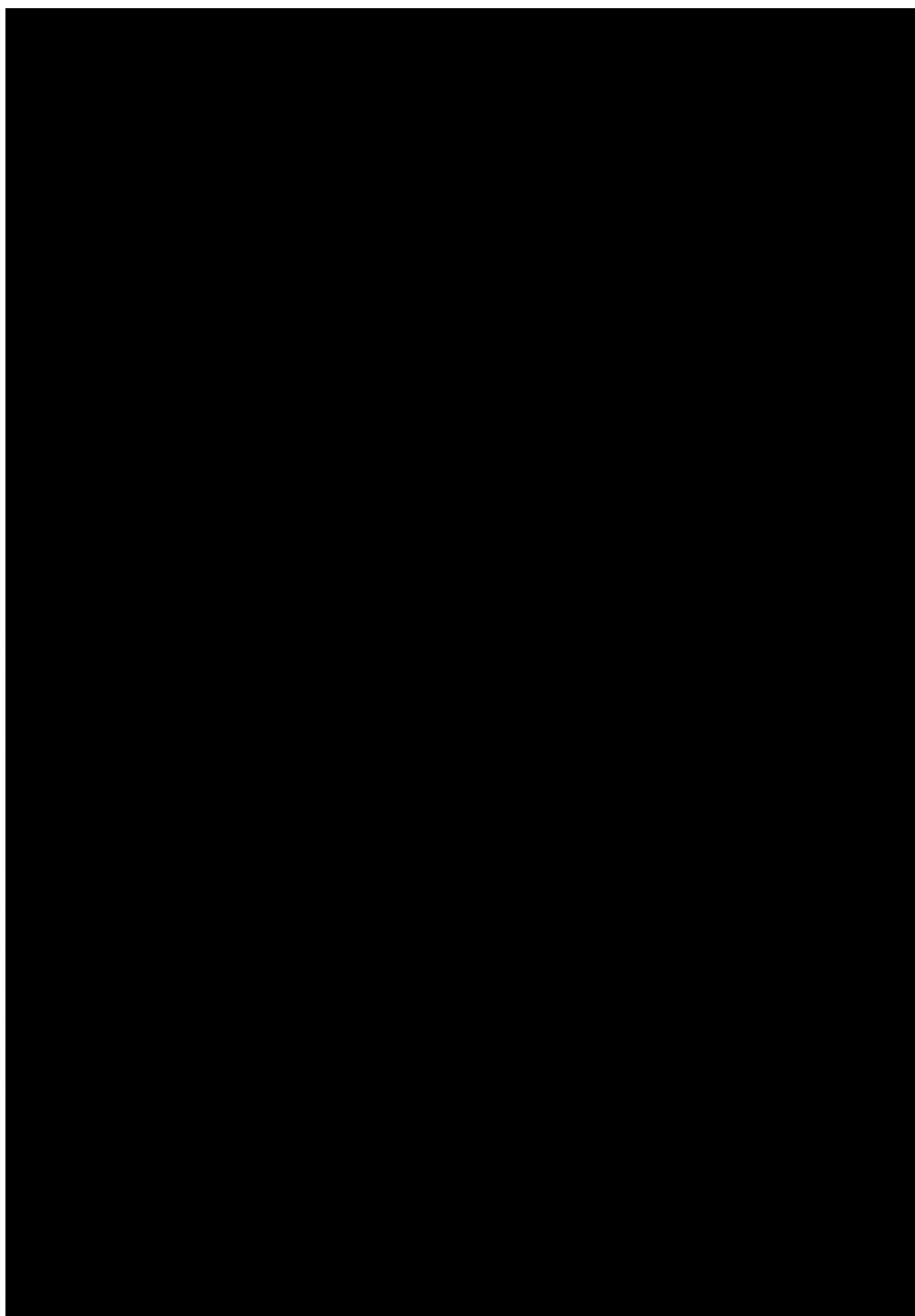


Figure 2.7. Summer School – Technical Aspects – Participation list - Day 1 (1. part).

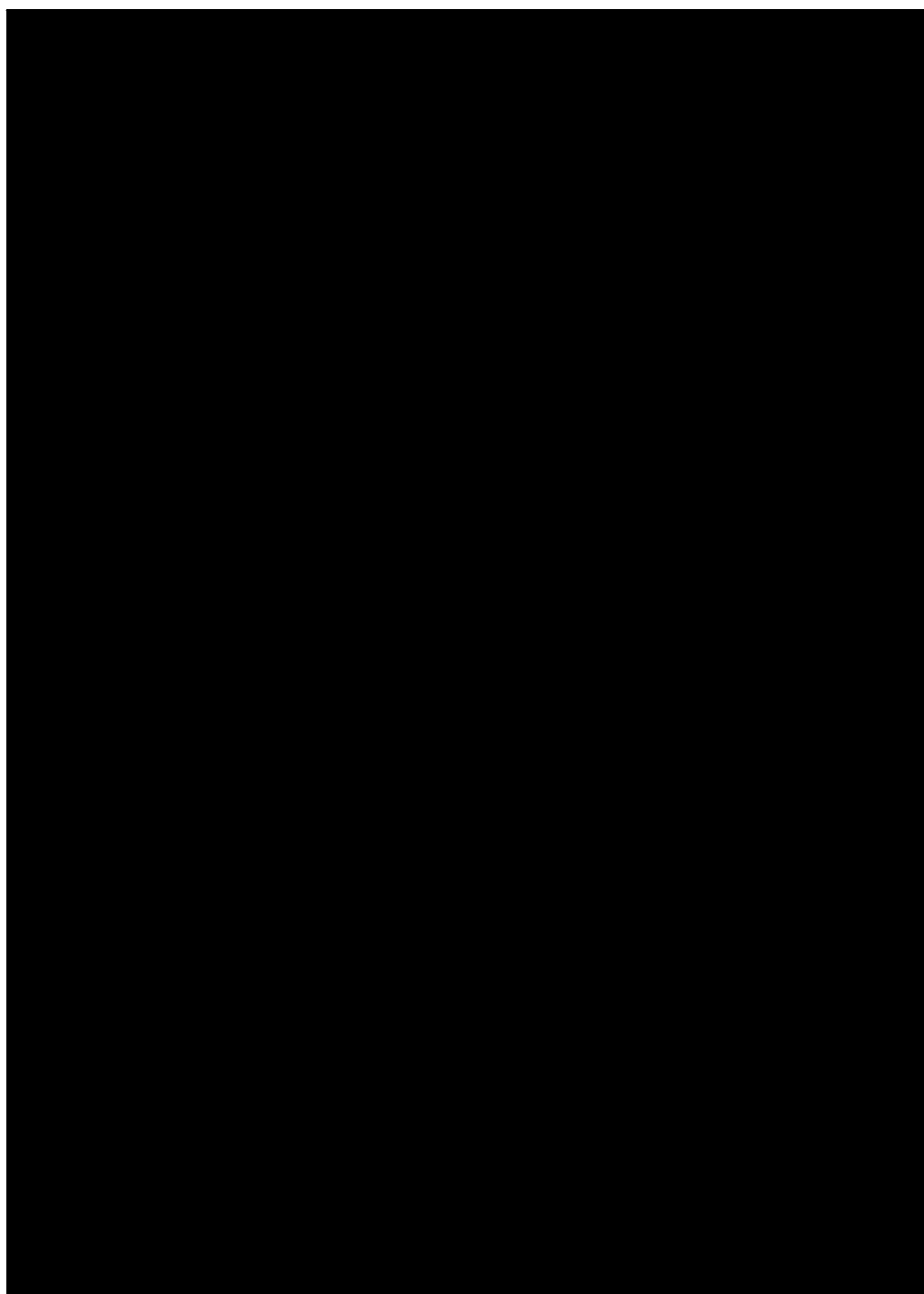


Figure 2.8. Summer School – Technical Aspects – Participation list - Day 1 (2. part).

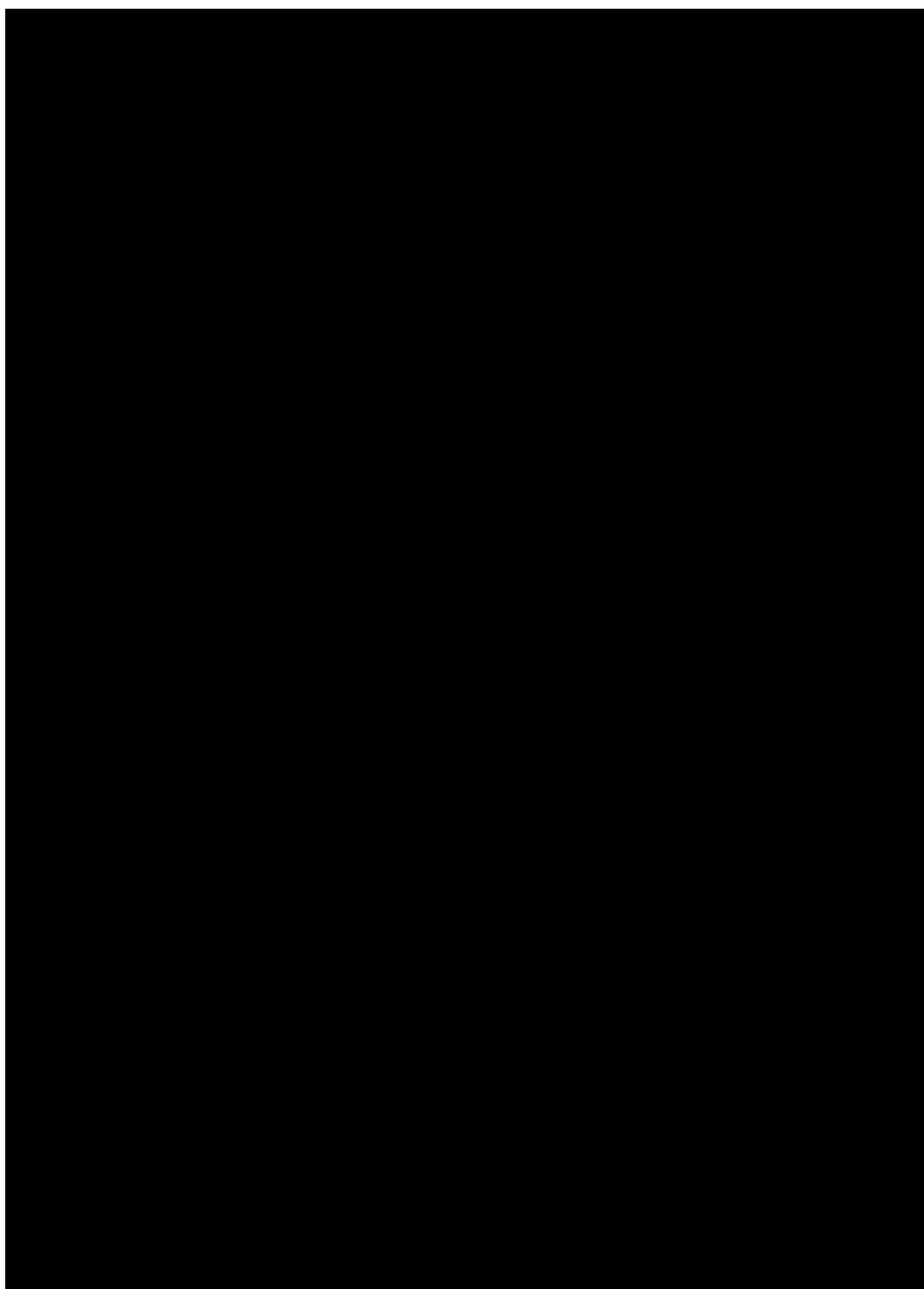


Figure 2.9. Summer School – Technical Aspects – Participation list - Day 2 (1. part).



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Figure 2.11. Summer School – Technical Aspects – Participation list - Day 3 (1. part).



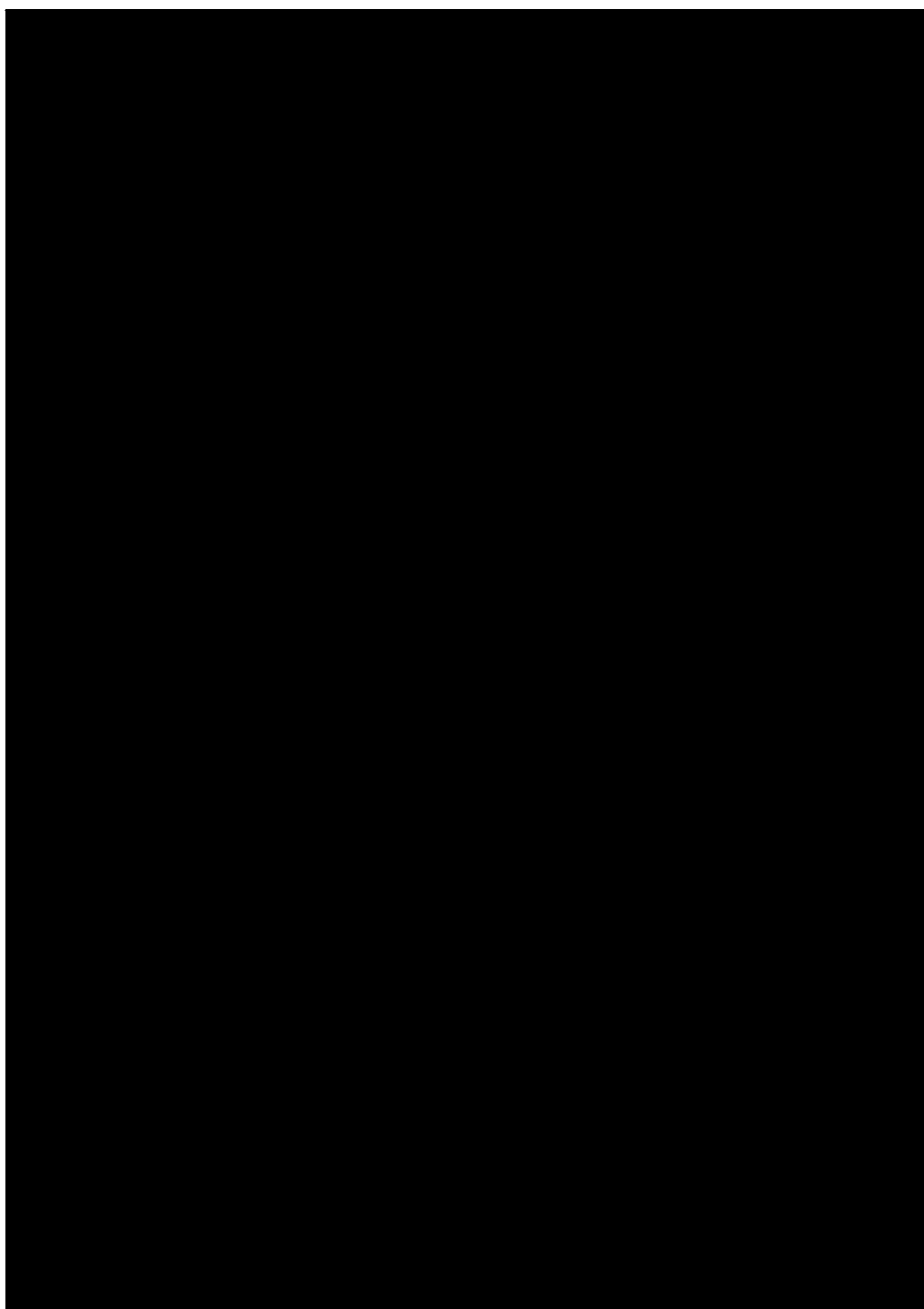


Figure 2.12. Summer School – Technical Aspects – Participation list - Day 3 (2. part).

2.4. Activities and Learning Methods

The highly specialised and focused nature of the technical content of Part I guaranteed the involvement of internal and external lecturers who are experts in their field and were as follows in Fig. 2.13:

Speaker	General Background
Marta Alvir	Postdoctoral Researcher at the Faculty of Engineering, University of Rijeka. She holds a PhD in the scientific area of Technical Sciences with doctoral research focused on numerical modelling of marine outfalls and coastal flow using computational fluid mechanics and machine learning. Her research interests include remote sensing technologies, machine learning, numerical modelling, ocean engineering, renewable energy sources, and offshore wind farms.
Martina Ivić	Assistant at the Faculty of Engineering, University of Rijeka. Her research focuses on renewable energy sources, with particular interest in hydrogen as an energy source and the optimization of pipeline systems.
Vladimir Valentić	Assistant Professor at the Faculty of Engineering, University of Rijeka, Department of Electric Power Systems. His research focuses on smart energy systems, virtual power plants, energy storage, distributed energy production, active distribution networks, and the integration of renewable energy sources into power systems. His recent work also explores digital twins, e-mobility, sustainable electric ferries, and the role of energy storage in ensuring the adequacy, stability, and security of electricity transmission systems.
Luka Calcich	Assistant at the Faculty of Engineering, University of Rijeka, Department of Electric Power Systems. His research focuses on smart energy systems, virtual power plants, renewable energy integration, and the application of artificial intelligence to hydrogen-based energy systems. His work also explores digital twins, e-mobility, and sustainable electric ferry systems as part of integrated energy ecosystems.



Elvis Ciliga	Employed at the Teaching Institute of Public Health of Istria County. He holds a Master's degree in Mechanical Engineering and is Head of the Laboratory for Acoustic Measurements.
Marko Kršulja	Associate Professor and Dean of the Faculty of Engineering in Pula. He holds a Ph.D. in Mechanical Engineering. His research interests include the implementation of digitalization and simulation in engineering processes, as well as the analysis and optimization of industrial processes, with a focus on noise measurement and occupational safety.
Andro Rak	Postdoctoral Researcher at the Department for Fluid Mechanics and Computational Engineering. He is an Aerodynamicist and CFD Researcher with a Ph.D. in Technical Sciences. His expertise includes computational fluid dynamics, aerodynamic analysis, and data analysis using Python, with experience in advanced CFD methods such as RANS, LES, and LBM. He is also active in F1 technical analysis, combining motorsport data and engineering expertise.
Zvonimir Mrle	Assistant at the Faculty of Engineering, University of Rijeka. His research interests include parametric 3D modeling, 3D printing of advanced engineering materials, generative design, and the study of foundations for offshore wind turbines.
Robert Katalinić	Vrataruša Wind Farm employee.

Figure 2.13. Table of Speakers – Part I – Rijeka

The first day of the summer school provided participants with a comprehensive theoretical introduction to offshore wind energy, establishing the knowledge base for the practical activities planned later in the programme. Following registration and a welcome address, participants were introduced to the importance of offshore wind energy in supporting the transition towards sustainable and renewable energy systems. The morning sessions focused on the fundamental principles of offshore wind farms. Lectures covered the basic concepts of offshore wind energy, fluid mechanics of wind turbines, and the physical conditions influencing wind potential in the Adriatic Sea (Figure 2.14). Additional presentations



addressed the electrical grid infrastructure required for integrating offshore wind farms into the energy system and introduced optimisation approaches for designing efficient wind farm layouts.



Figure 2.14. Summer School – Technical Aspects – Presentation “Physical conditions and wind potential for OWF in the Adriatic”.

In the afternoon, the programme of the summer school expanded the discussion to include noise measurement and assessment. The environmental impact of offshore wind farms was also examined, with particular attention given to wildlife and marine habitats, including the effects of underwater noise, habitat alteration, reef effects, and interactions with marine species. The programme further introduced mathematical modelling approaches for analysing ocean species dynamics, highlighting the importance of integrating ecological considerations into offshore wind farm planning and operation (Figure 2.15). The final technical session provided an industry perspective on offshore wind development, allowing participants to gain insights into current practices, technological challenges, and future opportunities from professionals working in the sector.





Figure 2.15. Summer School – Technical Aspects – Presentation “Mathematical model of ocean species dynamics”.

The day concluded with a Q&A and panel discussion, encouraging participants to engage with the lecturers, discuss key topics, and reflect on the multidisciplinary aspects of offshore wind energy (Figure 2.16).



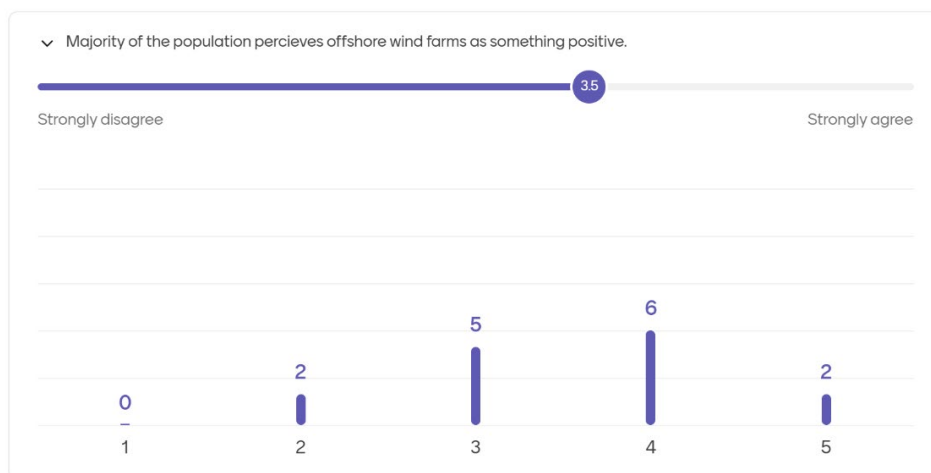
Figure 2.16. Summer School – Technical Aspects – Q&A and Panel discussion.

The questions were posed using the Mentimeter app, with each summer school participant answering anonymously via their mobile phone, and the results appearing on the screen. This allowed for feedback on the opinions of the summer school participants and discussion around key issues related to offshore wind turbines. Questions and results are shown in Figures 2.17 to 2.19.

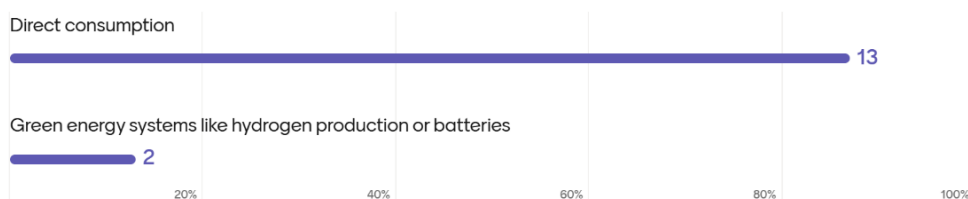


Figure 2.17. Summer School – Technical Aspects – Q&A and Panel discussion – Day 1 (1. part).

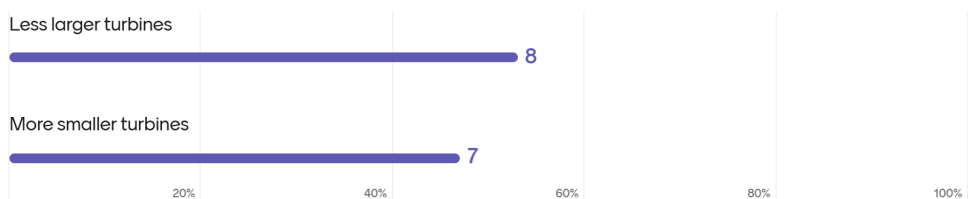




Electricity generated from offshore wind should primarily be used for: 15 / 15

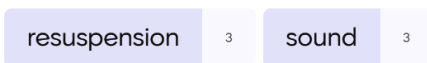


Is it better to build fewer larger wind turbines or more smaller turbines? 15 / 15

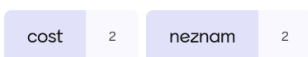


Name the environmental problems when building offshore wind farms? 15 / 15 19

Most popular



Also prominent



Other responses

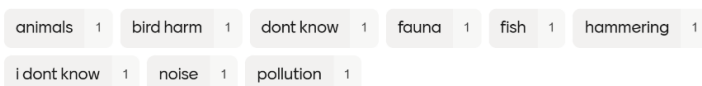


Figure 2.18. Summer School – Technical Aspects – Q&A and Panel discussion– Day 1 (2. part).





Figure 2.19. Summer School – Technical Aspects – Q&A and Panel discussion – Day 1 (3. part).

The second day of the Summer School was dedicated to the practical and technical aspects of offshore wind energy, with a particular focus on computational simulations and experiments. The programme combined theoretical lectures with laboratory demonstrations, providing participants with an opportunity to observe how engineering principles are applied in the design, analysis, and validation of offshore wind energy systems. The day began with an introductory session, followed by lectures on wind turbine aerodynamics and the role of airfoils in energy conversion. Participants were introduced to the fundamentals of computational fluid dynamics and learned how numerical simulations are used to



analyse airflow around wind turbine blades, optimise aerodynamic performance, and support the design process. The morning continued with practical demonstrations in the laboratory, where participants observed the preparation and execution of wind tunnel experiments (Figure 2.20). The sessions illustrated the design of experimental setups, measurement procedures, and the importance of validating computational models through physical testing. These activities enabled participants to gain first-hand insight into experimental methodologies commonly used in wind energy research.



Figure 2.20. Summer School – Technical Aspects – “Airfoil in a wind tunnel: showcase demonstration”.

During the afternoon, the programme focused on offshore wind turbine foundations and the development of scaled physical models. Participants were introduced to the different foundation concepts used in offshore wind farms and attended a demonstration of the manufacturing process of a scaled model using 3D printing technologies (Figure 2.21). Demonstration of an offshore wind farm scaled model in a sand-filled basin illustrated the interaction among individual system components.

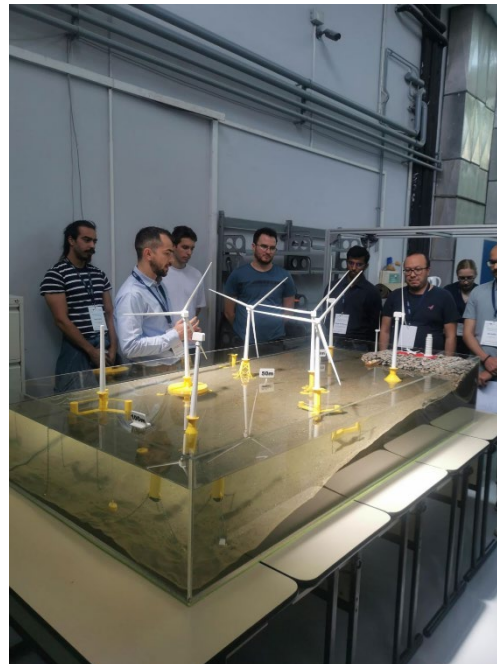


Figure 2.21. Summer School – Technical Aspects – Presentation “Making the OWF scaled model Demonstration - 3D printing showcase” and “Demonstration of an offshore wind farm scaled model”.

The day concluded with a Q&A and Panel discussion, during which participants had the opportunity to engage with lecturers and exchange ideas on current challenges and future developments in offshore wind energy. This section was conducted in the same way as on the first day, but with different questions, and the results are presented in Figure 2.22. to 2.25.

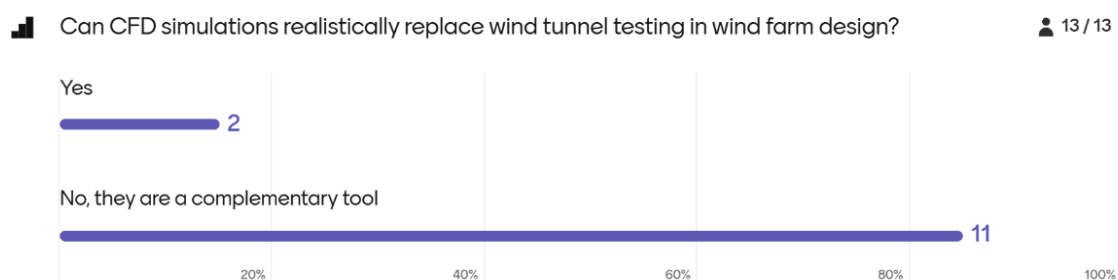
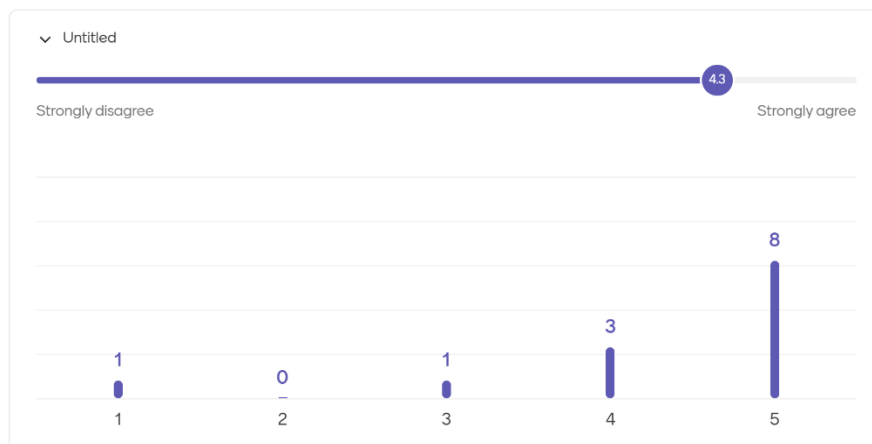


Figure 2.22. Summer School – Technical Aspects – Q&A and Panel discussion – Day 2 (1. part).



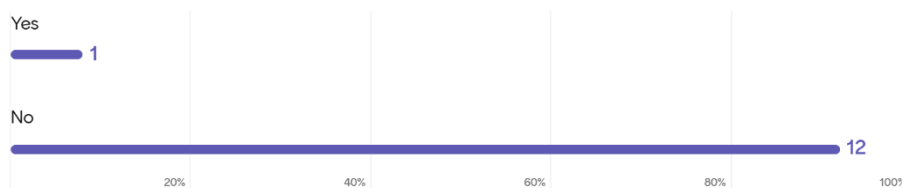
▼ Aerodynamic design choices for turbines and airfoils play a significant role in improving wind farm efficiency and mitigating noise impacts.

13 / 13



▀ Should only one type of foundation be prioritized and maximally advanced?

13 / 13



▼ 3D-printed scaled models have only limited engineering value in offshore wind farm design..

13 / 13

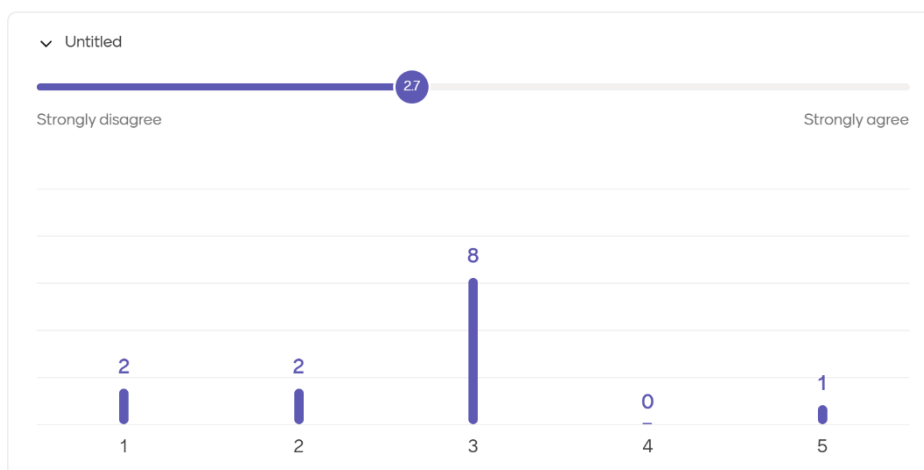


Figure 2.23. Summer School – Technical Aspects – Q&A and Panel discussion – Day 2 (2. part).



Rank the industries that contribute most to the development of OWF.

13 / 13

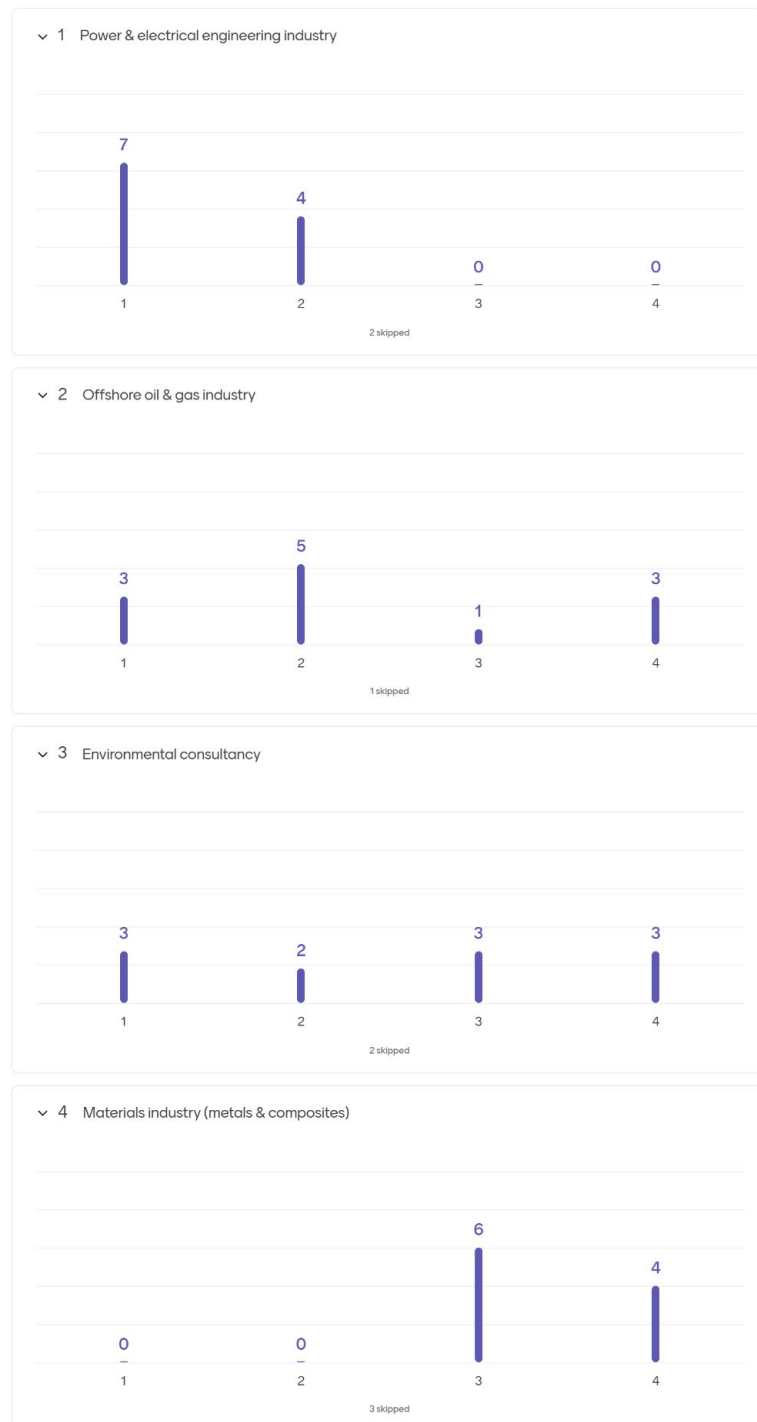


Figure 2.24. Summer School – Technical Aspects – Q&A and Panel discussion – Day 2 (3. part).





Figure 2.25. Summer School – Technical Aspects – Q&A and Panel discussion – Day 2 (4. part).

The third and final day of the summer school was dedicated to a technical field visit to the Vrataruša Wind Farm, providing participants with the opportunity to observe the practical implementation and operation of a commercial wind energy facility. The visit complemented the theoretical lectures and laboratory demonstrations from the previous days by allowing participants to experience real-world applications of the concepts discussed throughout the programme.



Following a brief introduction, participants travelled from Rijeka to the Vrataruša Wind Farm. During the site visit (Figure 2.26), they were introduced to the wind farm's technical characteristics, operational principles, and maintenance practices by an industry expert. The presentation covered the planning and development of the wind farm, turbine technology, electricity generation, grid integration, and the operational challenges associated with managing renewable energy facilities. Participants also gained valuable insights into the role of onshore wind farms in the broader energy transition and the practical considerations for ensuring reliable and efficient operation.



Figure 2.26. Summer School – Technical Aspects – Participants at the Vrataruša wind farm.

Following the site visit, participants travelled to a nearby restaurant for a networking lunch, which encouraged informal discussions among participants, lecturers, and industry representatives. After that, participants evaluated the summer school. The summer school at RITEH concluded with closing remarks and diploma awards. Two types of certificates of participation were issued at the end of the summer school. The first certificate, stating that the recipient "has contributed and presented a lecture," was awarded to lecturers and invited experts in recognition of their contribution. The second certificate (Figure 2.27), stating that the recipient "has participated in and successfully completed", was awarded to participants who fulfilled all program requirements. To obtain this certificate, participants were required to actively attend the summer school and complete the final knowledge assessment, which was conducted during the program with questions shown in Figure 2.28.



Figure 2.27. Summer School – Technical Aspects – Certificate of participation.



BEYOND Summer School Offshore Wind Farms - Technical Aspects (PART I)

Final Work

University of Rijeka - Faculty of Engineering (RITEH)
1st - 3rd June 2026

Please provide your information.

First Name:

Last Name:

Organisation:

E-mail:

Signature:



1

- b) The optimisation of wind farm location in the sea.
- c) The optimisation of turbine blade design for maximum efficiency.
- d) The optimisation of subsea cables between the wind turbines.

8. To reduce the influence of the wake effect, wind turbines in a wind farm should be:
- a) Installed as close together as possible.
 - b) Operated at different rotational speeds.
 - c) Spaced optimally far apart from each other.
 - d) The wake effect can not be reduced.

9. Where is the highest noise exposure from wind turbines typically observed?
- a) Downwind of the turbines in the prevailing wind direction.
 - b) Upwind of the turbines, where the wind first hits the rotor.
 - c) Directly above the turbine hub height.
 - d) Inside the turbine tower base.

10. What factor does NOT cause a load on wind turbine foundations?
- a) Waves
 - b) Wind
 - c) Marine Growth
 - d) Air temperature

11. Which angle of attack will generate lift (positive vertical force) for the symmetrical wing?
- a) 0°
 - b) 5°
 - c) -5°
 - d) 15°

12. For the same angle of attack and same chord length, which wing will have a bigger lift coefficient?
- a) Symmetrical wing
 - b) Cambered wing
 - c) They have the same lift coefficient
 - d) The wing is made of a lighter material

13. What is the correct order of the main steps in CFD analysis?
- a) Geometry preparation, simulation setup, numerical grid construction
 - b) Numerical grid construction, geometry preparation, simulation setup



3

1. What is the nominal power of the currently biggest produced turbine?
 - a) 5 MW
 - b) 12 MW
 - c) 18 MW
 - d) 22 MW
2. What is the theoretical limit for wind turbine efficiency (Betz limit)?
 - a) 50 %
 - b) 60 %
 - c) 70 %
 - d) 80 %
3. Which air properties have the most influence on the power production of the wind farm?
 - a) Humidity
 - b) Temperature
 - c) Pressure
 - d) Wind speed
4. What is the value of the Reynolds number after which the flow becomes turbulent?
 - a) 400
 - b) 1000
 - c) 4000
 - d) 10 000
5. What are the two main natural conditions to be considered in OWF planning?
 - a) Air and sea temperature
 - b) Distance from the protected and residential areas
 - c) Wave conditions and sea currents
 - d) Wind speed and water depth
6. What is the average cut-in speed of most wind turbines?
 - a) 0 m/s
 - b) 3 m/s
 - c) 9 m/s
 - d) 15 m/s
7. Offshore wind farm layout optimisation refers to:
 - a) The optimisation of wind turbine positions in a wind farm.



2

- c) Geometry preparation, numerical grid construction, simulation setup
- d) Simulation setup, geometry preparation, numerical grid construction

14. What is the role of a numerical grid?
- a) It divides the computational domain into finite elements to reduce the overall simulation time
 - b) It divides the geometry into smaller parts to obtain numerical results at many different points in space
 - c) It interpolates the boundary conditions between the inlet and outlet of the geometry
 - d) It connects the solver to the geometry to define the fluid material properties

15. Which wing scale did we use in wind tunnel testing?
- a) 1:1
 - b) 1:2
 - c) 1:5
 - d) 1:20

16. What is the most often used type of offshore wind farm foundation?
- a) Monopiles
 - b) Spar
 - c) Barges
 - d) Tripod

17. Which type of foundation is placed on a prepared seabed without piling?
- a) Jacket
 - b) Semisubmersible
 - c) Tension-leg
 - d) Gravity



4

Figure 2.28. Summer School – Technical Aspects – Final work.



2.5. Evaluation and Feedback

At the end of the Summer School, participants were invited to complete an anonymous evaluation questionnaire developed using Mentimeter. The questionnaire was designed to assess participants' satisfaction with the programme, the quality of lectures and practical activities, organisational aspects, and the overall learning experience. It also included open-ended questions that allowed participants to provide comments and suggestions for future editions of the summer school. Results of the evaluation are presented in Figures 2.29 and 2.30. The evaluation results indicated a high level of participant satisfaction. Respondents particularly appreciated hands-on demonstrations and the technical visit to the Vrataruša Wind Farm, highlighting the practical orientation of the programme. Overall, the evaluation confirmed that the summer school successfully achieved its educational objectives by enhancing participants' knowledge of offshore wind energy, strengthening interdisciplinary collaboration, and promoting cross-border knowledge exchange. The collected feedback will be used to further improve the design and delivery of future training activities.

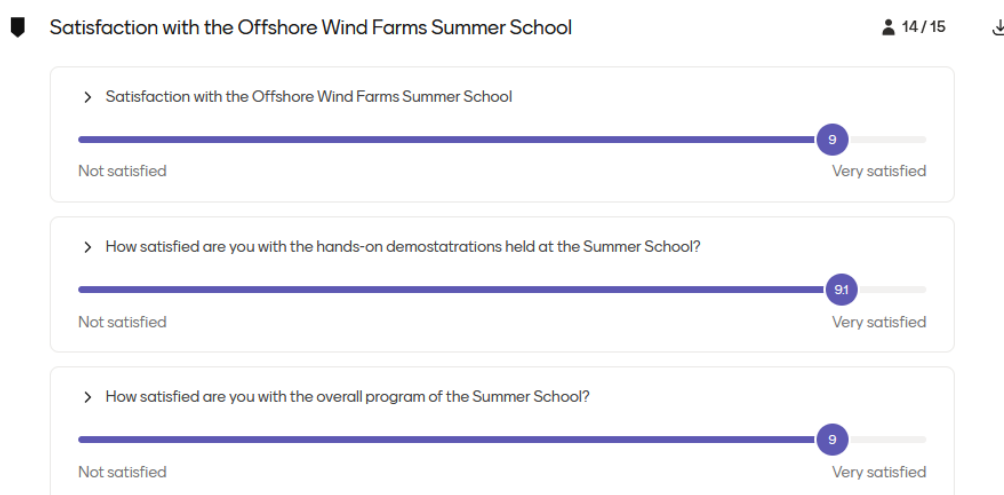
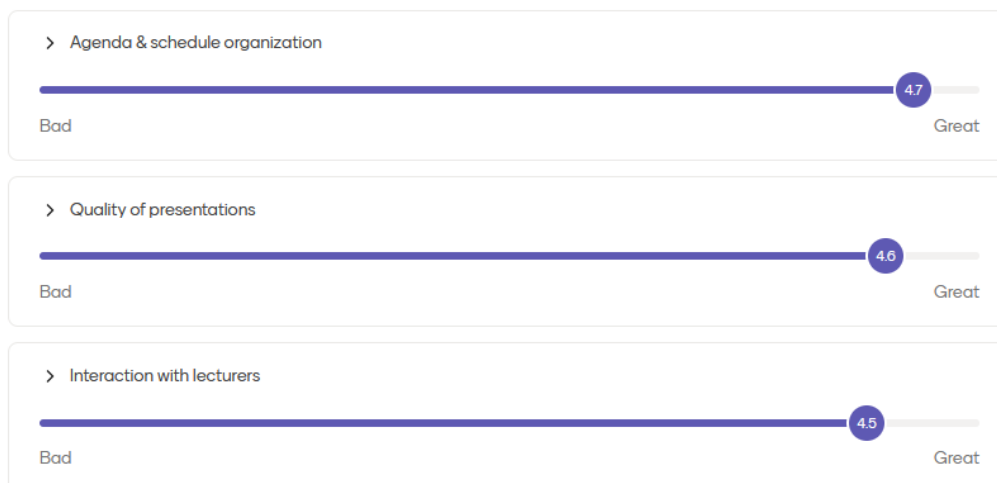


Figure 2.29. Summer School – Technical Aspects – Evaluation (1. part).



▼ Evaluate the organization's quality.

14 / 15



● Your comments & recommendations

10 / 15

10



I like it	I loved every bit especially the 3D printed bit,
Future editions might integrate more economic evaluations	Very positive experience
More practical, less theoretical.	Thanks for the free calories
I had a really great time, and I enjoyed the field trip to the onshore wind farm the most. I would love to see more events like this at RITEH.	Great experience.
It was an excellent summer school with a perfect approach to offshore energy wind field, both in technical aspects both in general aspects with the unique opportunity of visit an onshore energy plant	Maybe spend more time at the wind farm, talking about installation and operation and maintenance as well

Figure 2.30. Summer School – Technical Aspects – Evaluation (2. part).



3. BEYOND Summer School – Offshore Wind Farms – Ecological Aspects (Part II)

3.1. Organisation and Preparation

The decision to incorporate the Trieste edition of the BEYOND Summer School – Ecological Aspects into the annual OGS Blue Skills Summer School was taken almost one year in advance, to ensure planning and implementation would unfold smoothly while creating an important synergy between the project BEYOND and the institutional OGS Blue Skills Summer School (<https://blueskills.ogs.it/summer-school>). To foster collaboration with other projects on similar topics, moreover, it was decided to develop the Summer School event by combining BEYOND and another Interreg Italy-Croatia project, MARESKILL (<https://www.italy-croatia.eu/web/mareskill>), given the relevance and partial overlap of topics under the auspices of the blue economy. Notably, the integration of BEYOND Summer School Part II into OGS Blue Skills Summer School and in cooperation with MARESKILL project, was done to assure widest participation, strongest impact and synergic development, without compromising objectives and aims of the BEYOND Summer School – Ecological Aspects (Part II) as planned in D3.2.1 and D3.2.2.

Given the BEYOND Summer School – Ecological Aspects edition was incorporated into the OGS Blue Skills Summer School creating a synergy, applications from outside the Project area were invited. As with RITEH for Part I, OGS carefully planned the educational program Part II to align with the objectives of BEYOND, and to promote Adriatic cross-border cooperation, and more widely across the Mediterranean, thanks to the Blue Skills context. The curriculum also reflected the methodology of that planned by RITEH for its technical edition, and included lectures, case studies, working groups, and hands-on use of a simplified ecosystem model. The Summer School – the result of a synergy between three projects, including that of BEYOND – fostered an interdisciplinary learning journey that included 34 students from Algeria, Egypt, France, Libya, Malta, Morocco, Pakistan, Portugal, Spain and Tunisia, in addition to the core target participants from Croatia and Italy.



The BEYOND Summer School agenda in Figure 3.1 reflects the comprehensive content of the Trieste program, moving from a general introduction and overviews to specific case studies and finally, hands-on use of a simplified ecosystem model. The students were also able to take part in two field trips related to the topic. The venue of the Summer School was at the Giambiagi Lecture Hall at the Adriatico Guest House in Trieste (Italy), thanks to the collaboration between OGS and The Abdus Salam International Centre for Theoretical Physics (ICTP).

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BEYOND

OGS Summer School: Building Capacities for an Innovative and Resilient Sustainable Blue Economy
The Beyond Offshore Windfarms Programme – Ecological Aspects (Part 2)
15 – 19 June 2026, Giambiagi Lecture Hall, Adriatico, Grignano

Programme Schedule:

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Date	Time	Lesson	Teacher
Monday 15 June	09.30 AM – 10.30 AM	Blue Skills introduction	Mounir Ghribi (OGS, Italy)
	10.30 AM – 10.45 AM	Coffee Break	
	10.45 AM – 12.00 PM	Introduction of the Beyond project	Simone Libralato (OGS, Italy)
	12.00 PM – 13.45 PM	Free time in Koper and Lunch	
	13.45 PM – 17.00 PM	Field trip in Slovenia (Fonda Fish Farm and Ščednja Salt pans)	Simone Libralato (OGS, Italy)
Tuesday 16 June	13.15 PM – 14.45 PM	Introduction to the need for green energy production and marine renewable energy	Nikola Petrić (BEYOND Project Coordinator, Istrian Regional Energy Agency - IRENA, Croatia)

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	13.45 PM – 14.30 PM	Physical conditions and wind potential for OWF in the Adriatic	Stefan Ivč/other (Faculty of Engineering, University of Rijeka - RITEH, Croatia)
	14.30 PM – 15.15 PM	Planning an offshore windfarm: Rimini project	Daniela Mijović (Energia Wind 2020, Italy)
	15.15 PM – 15.30 PM	Coffee Break	
	15.30 PM – 16.00 PM	OWF and interactions with fisheries sector: challenges, opportunities and solutions	Carlo Franzosini (SHORELINE, Italy)
	16.00 PM – 16.30 PM	Estimating interactions between OWF and other blue sectors: the case of fisheries	Diego Panzeri (OGS, Italy)
Wednesday 17 June	13.45 PM – 14.30 PM	The role of MSP for the sustainable development of offshore wind farms.	Emiliano Šegović (Italian National Research Council's Institute of Marine Sciences – CNR, Italy)

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BEYOND

	14.30 PM – 15.15 PM	Compensation activities and valorisation: solutions for interaction with other blue sectors including nature inclusive design (NID)	Daniela Mijović (Energia Wind 2020, Italy)
	15.15 PM – 15.30 PM	Coffee break	
	15.30 PM – 16.00 PM	OWF layout optimization	Stefan Ivč/other (Faculty of Engineering, University of Rijeka - RITEH, Croatia)
	16.00 PM – 16.45 PM	Scenarios co-development in MSP: practical examples of OWF zoning in three Italian case studies	Emiliano Šegović (Italian National Research Council's Institute of Marine Sciences – CNR, Italy)

	20.00 PM	Social Dinner – Hotel Savio	
Thursday 18 June	09.00 AM – 09.45 AM	BEYOND: Ecological impacts of infrastructures at sea	Simona Iannucci (OGS, Italy)
	09.45 AM – 10.30 AM	Acoustic impacts of OWF	Alice Affatati (OGS, Italy)
Friday 19 June	09.00 AM – 10.30 AM	Geohazards and offshore wind farms	Silvia Gargano (OGS, Italy)
	10.30 AM – 10.45 AM	Coffee break	
	10.45 AM – 12.15 PM	BEYOND: Ecosystem approach for analysis of cumulative impacts of offshore wind farms	Simone Libralato (OGS, Italy)
	12.15 PM – 13.30 PM	Lunch	



5

	13.30 PM – 15.00 PM	Working groups: practical use of an ecosystem model representing effects of OWF (simplified use)	Igor Celic (OGS, Italy)
	BREAK		
	15.15 PM – 16.15 PM	Group presentations	
	16.15 PM – 16.45 PM	Closure and Summer School Certificates	



6

Figure 3.1. BEYOND Summer School on Ecological aspects Agenda

The logistical requirements of the Summer School also included the organisation of catering and coffee breaks, the booking of the venue and the field trip host locations. Travel and accommodation arrangements were also made by OGS, that also organized the transportation for students to and from the venue and the city centre as well as for the field trips. In terms of administration, students received an info pack in advance, while registers and certificates were also prepared, as well as evaluation questionnaires. Access badges for students and external lecturers alike were ordered in advance.

3.2. Promotion

In conjunction with RITEH, OGS also produced the same flyer (Fig. 3.2) and poster (Fig. 3.3) to advertise the Summer School Part II (with links at Part I and vice versa). Furthermore, the call to apply was publicised extensively on OGS institutional social media and through the English social media channels of the OGS Blue Skills team. A Blue Skills newsletter was also sent to the 1,600 contacts on its database.



Interreg

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BEYOND

OFFSHORE WIND FARMS SUMMER SCHOOL

PART 2 - ECOLOGICAL ASPECTS*

[Apply here](#)

- Lectures and interactive group work
- Interdisciplinary learning programme
- Exploration of ecological effects of wind farms and sustainable solutions
- Field trips
- Study materials and food provided

	DURATION June 12 - 19, 2026
	LOCATION National Institute of Oceanography & Applied Geophysics - OGS Trieste, Italy
	FEES Free of charge

Day 1 - 15 June

- Introduction to BEYOND Project
- Field Trip to offshore infrastructure (farm)
- Social dinner

Day 2 - 16 June

- Introduction to the need for green energy
- OWF potential in the Adriatic (RITEH)
- Planning an OWF case study
- OWF and fisheries
- OWF and other blue sectors

*Sister Programme Part 1 Technical Aspects: Faculty of Engineering, Rijeka, Croatia from 1 - 3 June, 2026. For the programme and to apply, [click here](#)

REGISTRATION DEADLINE: 10 March, 2026 NOTIFICATION OF ACCEPTANCE: mid-March, 2026

ORGANISERS:

OGS RITEH

DAY 3 - 17 June

- The role of Marine Spatial Planning (MSP) for the sustainable development of offshore wind farms
- OWF layout optimization (RITEH)
- Interactions with other blue sectors and nature inclusive design
- Scenarios co-development in MSP: three Italian case studies

DAY 4 - 18 June

- Ecological impacts of infrastructures at sea
- Acoustic impacts of OWF
- An organised visit to the Marine Protected Area of Miramare in Trieste, including organised transportation and a guided tour.

DAY 5 - 19 June

- Ecosystem approach for analysis of cumulative impacts of offshore wind farms
- Working groups: practical use of an ecosystem model representing effects of OWF

PROJECT PARTNERS:

IRIENA OGS RITEH REGIONE PUGLIA SINLOC Ministry of Maritime Development and EU Funds

Figure 3.2. Summer School – Ecological Aspects – Flyer

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BEYOND

OFFSHORE WIND FARMS SUMMER SCHOOL

PART 2 - ECOLOGICAL ASPECTS

- Lectures and interactive group work
- Interdisciplinary learning programme
- Exploration of ecological effects of wind farms and sustainable solutions
- Field trips
- Study materials and food provided

DURATION June 15 - 19, 2026

LOCATION National Institute of Oceanography and Applied Geophysics - OGS Trieste, Italy

FEES Free of charge

REGISTRATION DEADLINE: 10 March, 2026 NOTIFICATION OF ACCEPTANCE: mid-March, 2026

PROJECT PARTNERS:

Figure 3.3 Summer School – Ecological Aspects – Poster

The call to apply was launched on 17 February 2026 on the [Blue Skills Summer School web page](#), where applicants were able to discover more about course content and logistics, before applying via a registration link using a Google Form. It consisted of detail description of Summer School and several questions covering participant information:

1. Family name,
2. First name,
3. Email,
4. Phone number,
5. Gender (for statistical purposes),
6. Date of birth,
7. Age,
8. Citizenship,
9. Country of birth,
10. Country in which you are living in,
11. If VISA required, *
12. Which airport or train station would be preferable to use,
13. Level of English,
14. Educational experience,
15. Work history,
16. Affiliation,
17. Description of interest or experience in topics related to sustainable blue economy,
sustainable energy security and marine resources (max 800 characters),
18. Upload of CV, motivation letter and qualifications required,
19. Signature of privacy notice required.

The application window closed on 10 March 2026.

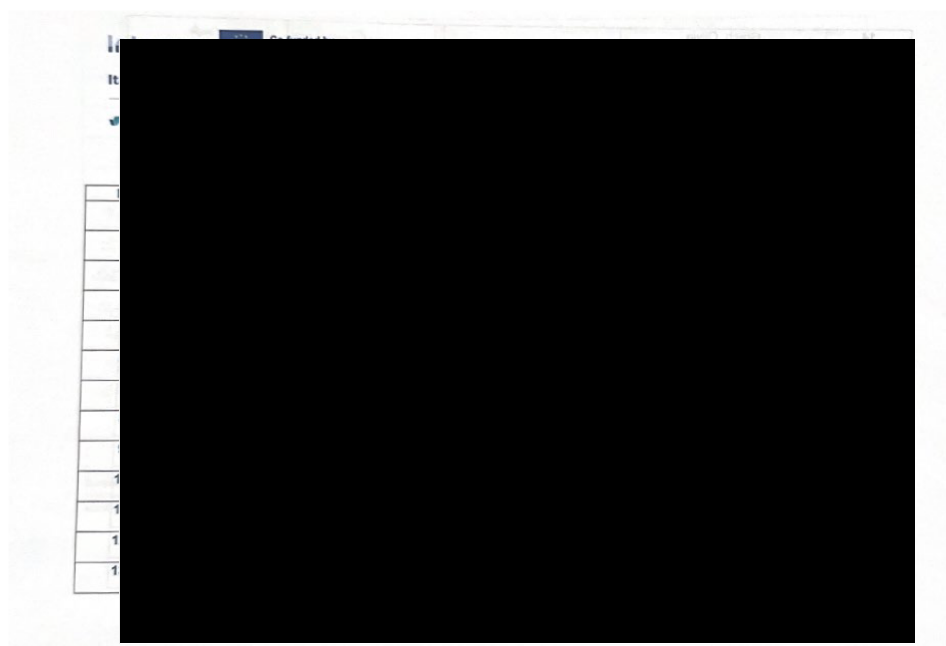
3.3. Participants

Following the closure of the application window, a Summer School commission was formed to select the most appropriate applicants based on participant information and Summer School requirements. The Commission included one representative for the Blue Skills (Angelo Camerlenghi, OGS) , one



representative for the Interreg Italy-Croatia Project Mareskill (Alessandra Lanzoni, OGS) and one representative for BEYOND (Simone Libralato, OGS). The Commission met on the morning of Monday 16 March and following a three-hour session, produced the first-choice selection of names. There were approximately 650 applications in total, with a reserved quota of places set aside for Croatian and Italian applicants. To enhance the benefits of cross-cultural collaboration and with the aim of achieving optimal impact of the Summer School program, the Commission selected 35 participants. All those selected initially confirmed their place, before one student from the Italian quota pulled out, allowing the Commission enough time to call the next applicant on the reserve list, who accepted. A few weeks before Summer School started, another student from the Croatian quota withdrew for personal reasons, which did not allow the OGS team enough time to contact another applicant and arrange accommodation nor travel. There was a total of 7 participants from Croatia (including one Erasmus student) and 11 from Italy. The age range of the Croatian - Italian cohort ranged from 20 – 44 years-old. As with RITEH's Summer School participants, the students were at different stages of their higher education and professional development: the cohort included undergraduate students, Master graduates, PhD candidates, as well as those already employed. [REDACTED]

[REDACTED]



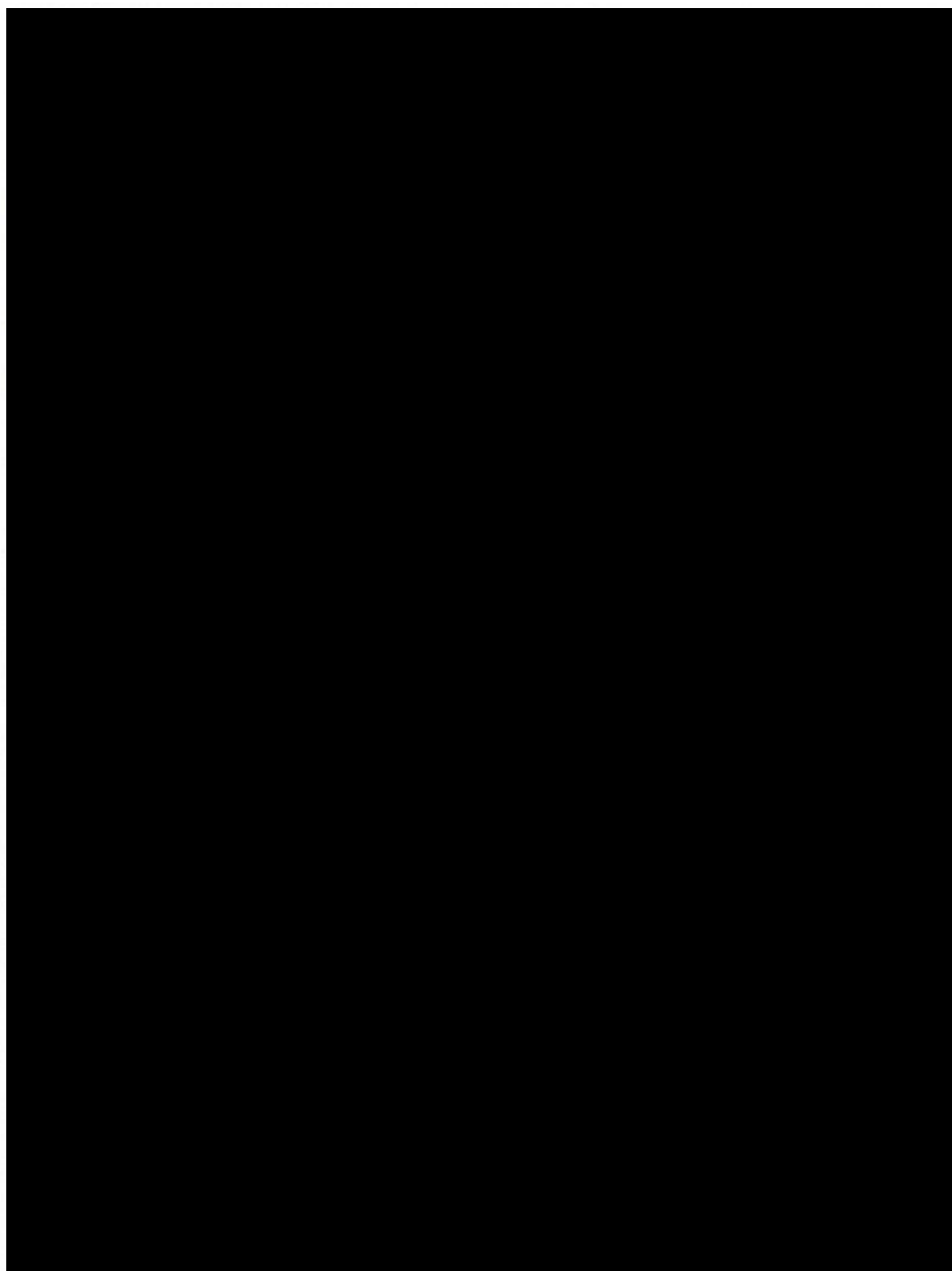
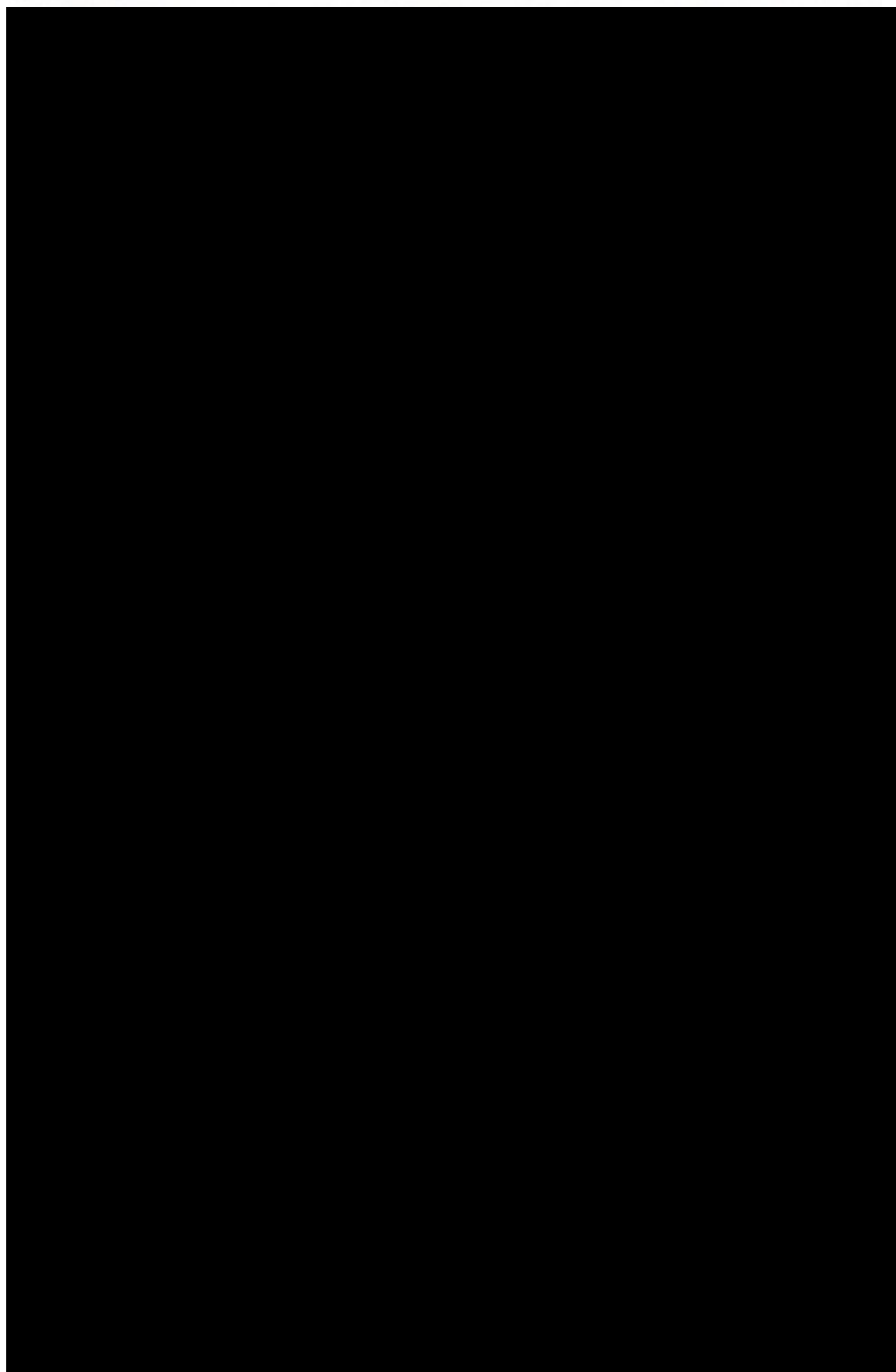


Figure 3.4. Summer School – Ecological Aspects – Participation list - Day 1





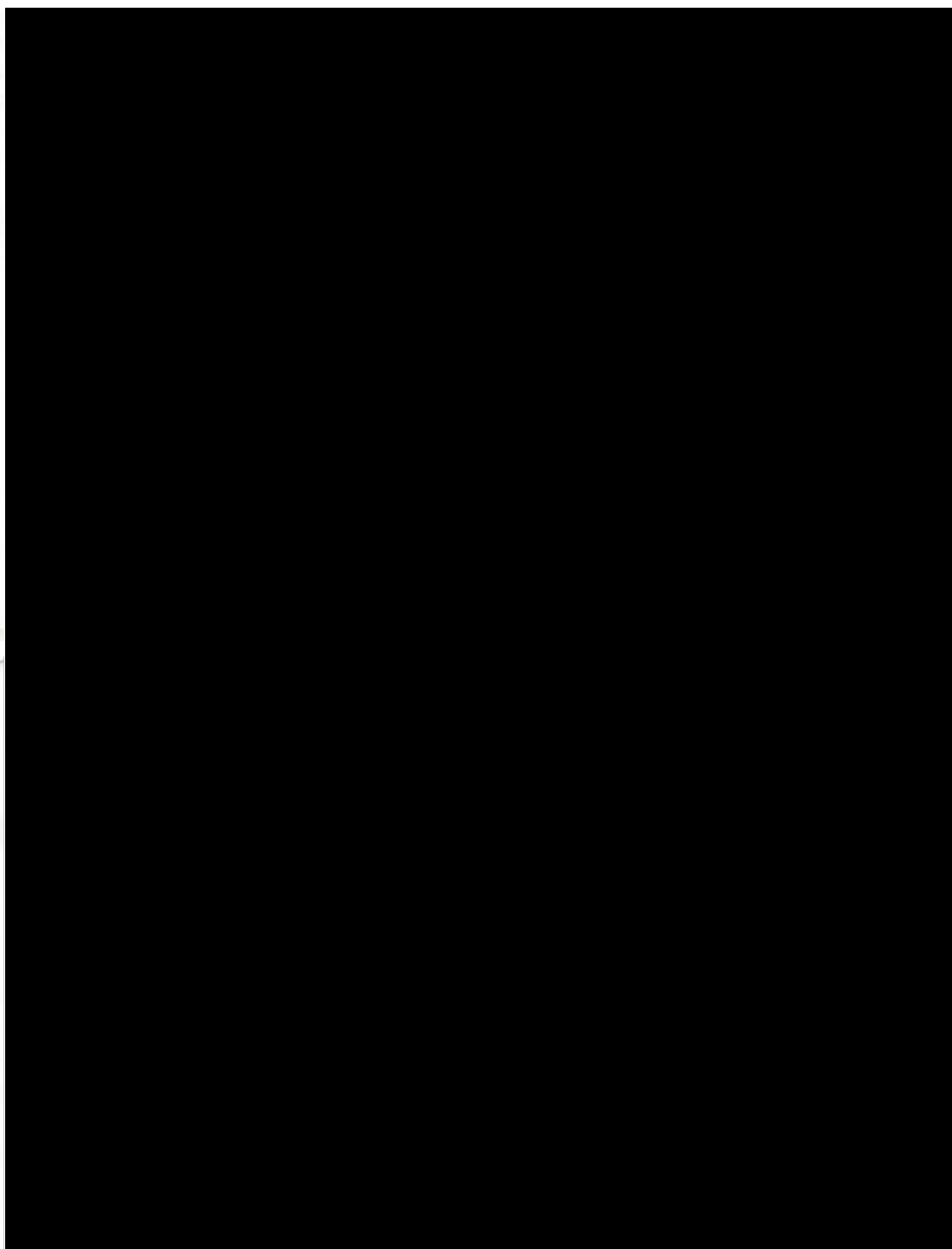
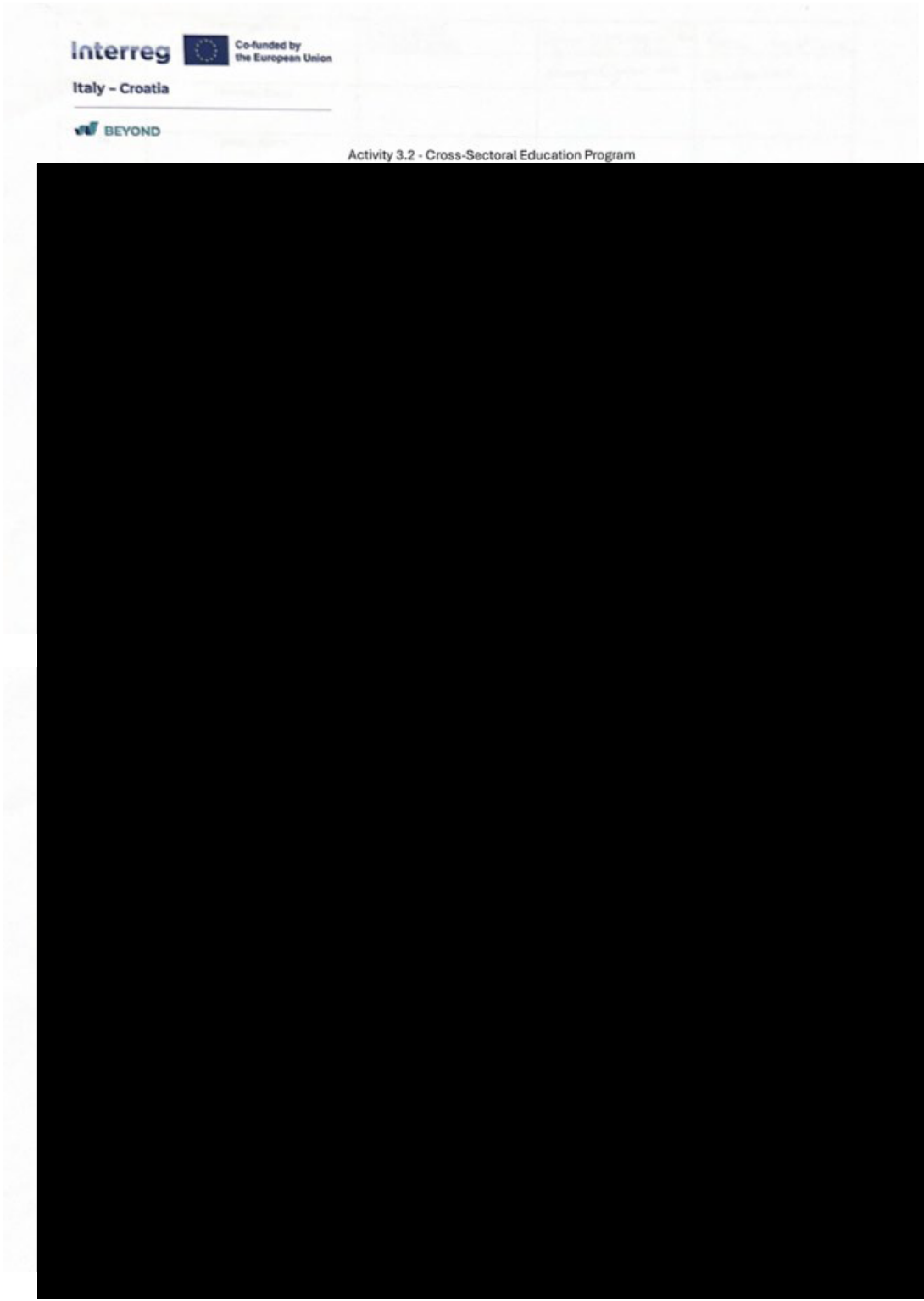
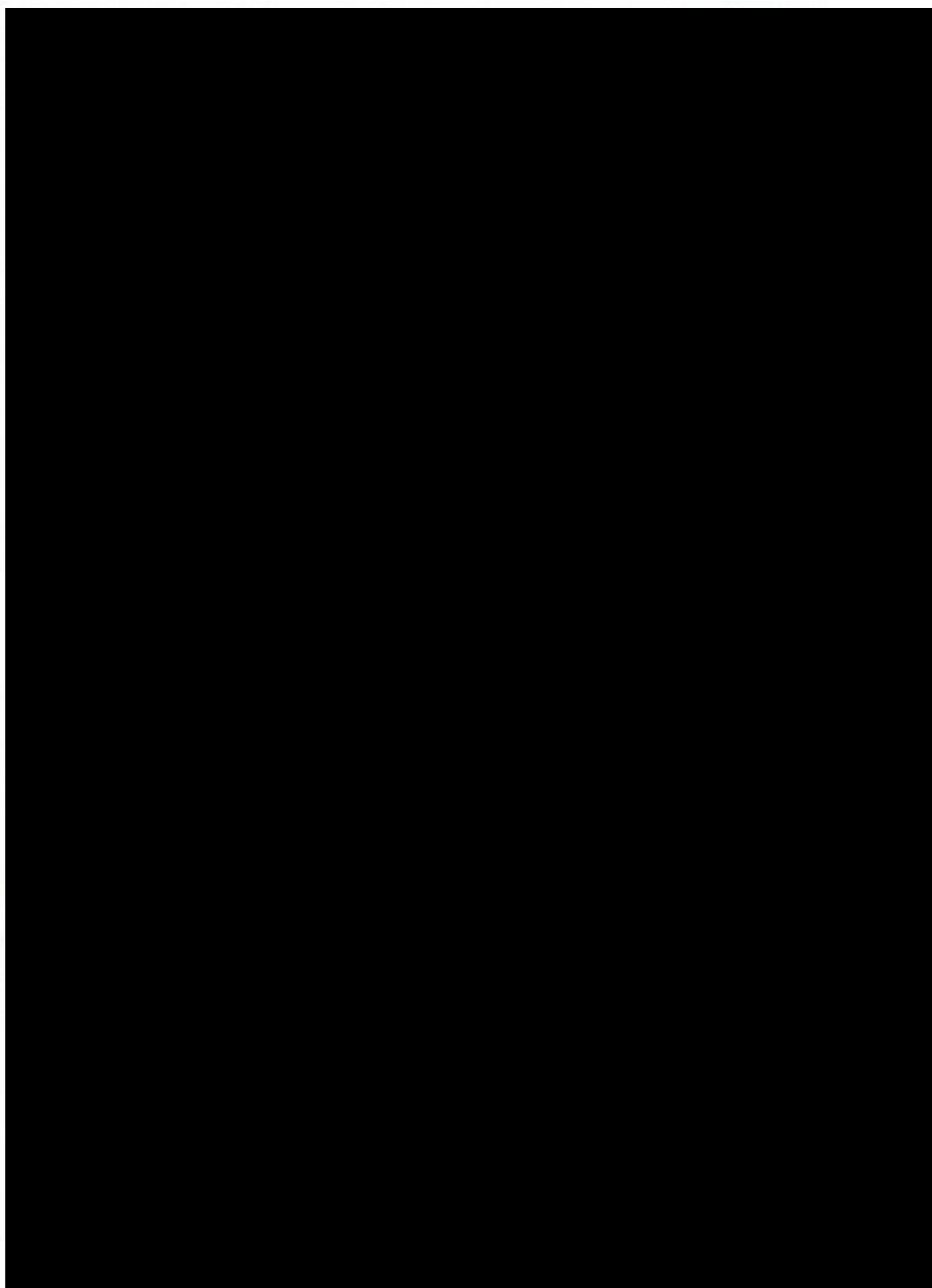


Figure 3.6. Summer School – Ecological Aspects – Participation list - Day 3





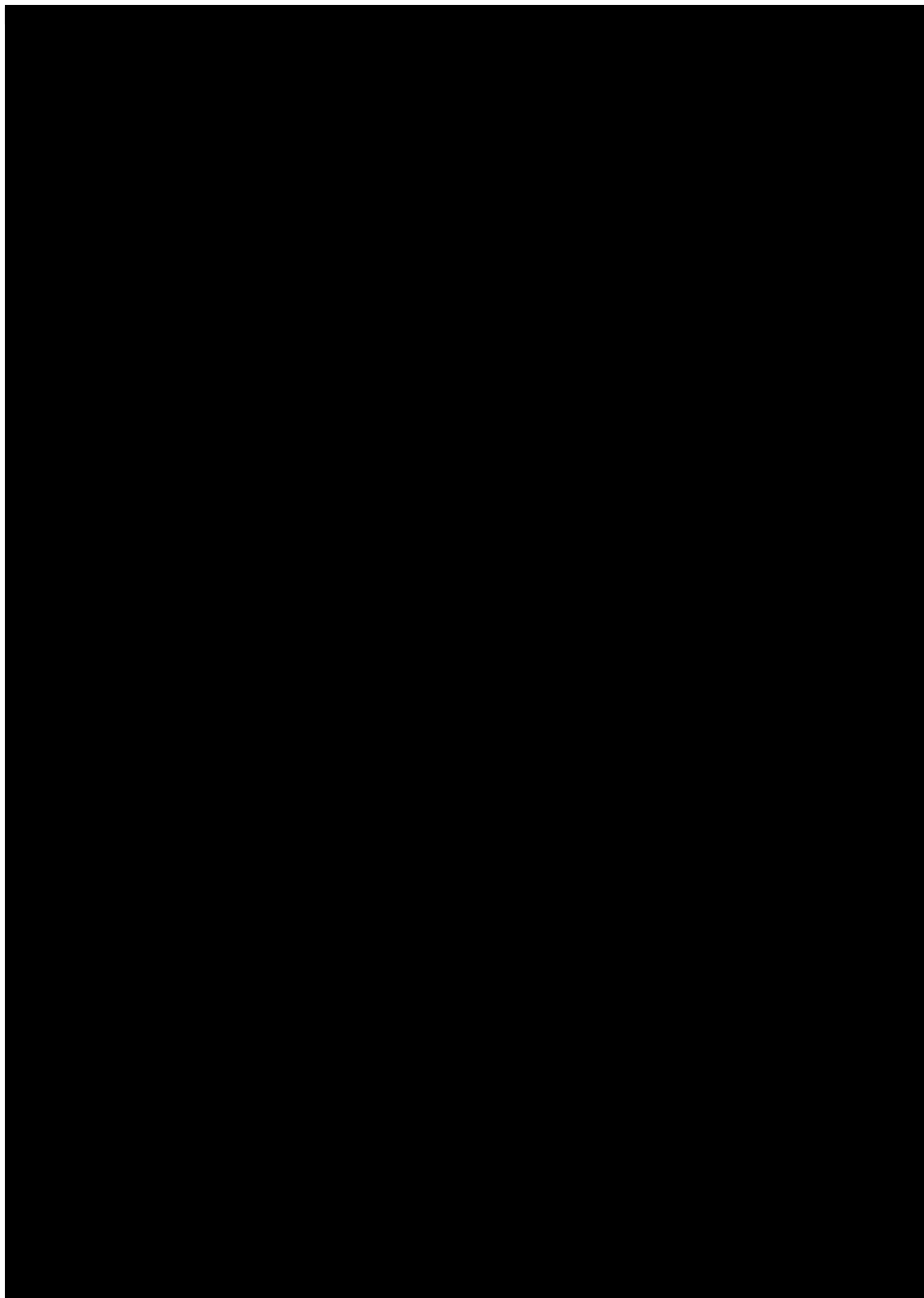


Figure 3.8. Summer School – Ecological Aspects – Participation list - Day 5

3.4. Activities and Learning Methods

OGS tried to ensure the list of external and internal lecturers was varied and reflected the comprehensive content of the program. The table of speakers is listed below in Fig 3.9.

Speaker	General Background
Nikola Petrić	Senior Associate at IRENA Istrian Regional Energy Agency and Financial Manager of BEYOND Project.
Stefan Ivić	Currently working as Professor at the Faculty of Engineering, University of Rijeka. He does research in Mechanical Engineering, Environmental Engineering and Artificial Intelligence.
Daniela Moderini	Architect and landscape designer with private practice in Venice since 1990. She deals with landscape and architectural design in many forms and experimentations, particularly regarding the realization of renewable energy production plants in relation to the landscape, combining professional activity with academic research and university teaching.
Carlo Franzosini	Marine biologist and Chairman of Shoreline, with extensive experience in managing the Miramare Marine Protected Area. Specialized in biological and biophysical monitoring, fisheries resources, education, communication, and vocational training. Co-founder of the AdriaPAN network and a member of IUCN World Commission on Protected Areas – Marine: Mediterranean and the Black Seas. Additionally, he is an expert appointed by the EU Commission for realizing missions in third countries for environmental issues.
Diego Panzeri	Research Fellow at the Oceanography Section of OGS. Specialized in species distribution models using various modeling approaches applied to fisheries data. Focused on Adriatic, Ionian and Central/Western Mediterranean Seas.



Emiliano Ramieri	Technologist at the Institute of Marine Sciences in Venice of CNR since 2021. Currently, he is involved in studies and research supporting maritime spatial planning (MSP), integrated coastal zone management (ICZM), sustainable blue economy, and climate change adaptation.
Simona Iannucci	PostDoc Researcher in Marine Ecology at OGS. Experience in benthic ecology and biology, macrofaunal benthic assemblages associated to pinnid Bivalves (<i>Pinna nobilis</i> and <i>Atrina fragilis</i>), functional assessments of benthic communities.
Alice Affatati	Affiliated Researcher for OGS at the Geophysics Section. Expertise in marine bioacoustics, underwater noise and effects on fauna, ocean acoustics and marine megafauna.
Silvia Ceramicola	Senior Researcher for OGS at the Geophysics Section since 2000. Specialized in investigating sedimentary and tectonic processes occurring along active and passive continental margins. Primary expertise in assessing seabed dynamics and defining marine geohazards. Extensive experience across several Mediterranean areas, with a specific focus on the Ionian Sea, the Gulf of Taranto, the Nile deep-sea fan, and the Alboran Sea.
Simone Libralato	Lead Researcher at the Oceanography Section of OGS. Expert in ecological modeling and quantitative analysis, with a primary focus on the bioenergetics of finfish and shellfish, ecosystem dynamics, and ecological indicators. His research centers on applying marine food web and end-to-end models to evaluate the cumulative impacts of anthropogenic and environmental pressures - such as fishing, aquaculture, climate changes, and nutrient enrichment – on marine ecosystems. Additionally, he is a member of the Scientific Council of OGS.
Igor Celic	Technologist and Marine Biologist at OGS (Oceanography Section). Holding a Ph.D. in Marine Biology from the University of Trieste. His research focuses on ecosystem modeling, quantitative fisheries science and Ecosystem-Based Fisheries Management.

Figure 3.9. Table of Speakers – Part II - Trieste



The first day of Summer School was largely introductory during which all students gained an understanding of the concepts behind the BEYOND Project (Fig. 3.10), the Summer School program, the learning objectives and the methodology. The afternoon included a field trip to Fonda Fish Farm and Sea Oasis Piran, a non-profit organisation in Slovenia dedicated to marine biodiversity conservation, close to the Italian border. The visit proved successful, as the group was taken on a boat to visit the aquaculture farm while Sea Oasis Piran explained its projects and activities, making the experience a great bonding exercise for the students (Fig. 3.11).



Figure 3.10. Introduction with Simone Libralato



Figure 3.11. Field trip – Fonda Fish Farm and Sea Oasis Piran

Classroom activities began intensively on the second day with an introduction to the need for green energy production and marine renewable energy by the BEYOND Lead Partner, IRENA, and RITEH on the wind potential of the Adriatic. This was then consolidated by the presentation of a real-life case study related to the planning of an OWF in Rimini by external lecturer, Daniela Moderini (Enterprise: Energia Wind 2020, Italy). After a brief break, students then continued focusing on the interactions between OWFs and fisheries with lectures by Carlo Franzosini (WWF Italy and Shoreline Scarl) and by Diego Panzeri and Libralato Simone (OGS), and hence by the end of the second day, participants had received a broad overview of the various aspects related to OWF potential in the Adriatic.



The third day introduced students to the role of marine spatial planning (MSP) in the development of OWFs with external lecturer Emiliano Ramieri (CNR-ISMAR, Italy) before Moderini capitalised on the previous day's lecture by demonstrating to students how nature inclusive design (NID) can be harnessed as a solution for interaction with other blue economy sectors. Stefan Ivic (RITEH) once again lectured to provide more detail on the optimal layout of OWFs before Ramieri returned with the topic of MSP and three Italian case studies of OWF zoning. Summer School students were invited to and attended the OGS diploma ceremony social dinner of the Advanced Master in Sustainable Blue Economy, which is held jointly with the University of Trieste.

The fourth day was ecologically intensive in terms of course content with lectures centring on acoustic (Alice Affatati, OGS) and ecological impacts of infrastructures at sea (Simona Iannucci and Nessim; OGS) before students had their second field trip of the week to the marine protected area of AMP Miramare in Trieste (Fig. 3.12), which fostered a better understanding of the impacts on the marine ecosystem in reality.



Figure 3.12. Field trip – AMP Miramare

The final day fostered a lecture by Silvia Ceramicola on geohazards and OWFs (Fig. 3.13) and a more hands-on approach for students with an interactive and engaging lectures on cumulative ecological impacts of OWF given by Simone Libralato (OGS). This was followed by the practical demonstration by Igor Celic (OGS) of a simplified ecosystem model representing the effects of OWF, which students would then go onto to apply in working groups and present as part of their evaluation final work (Fig. 3.14). The day closed with the presentation of certificates to each student, for which 100% attendance was required, and bears the Project logo (Fig. 3.15).



Figure 3.13. Lecture on geohazards and OWFs



Figure 3.14. Student presentations using ecosystem model

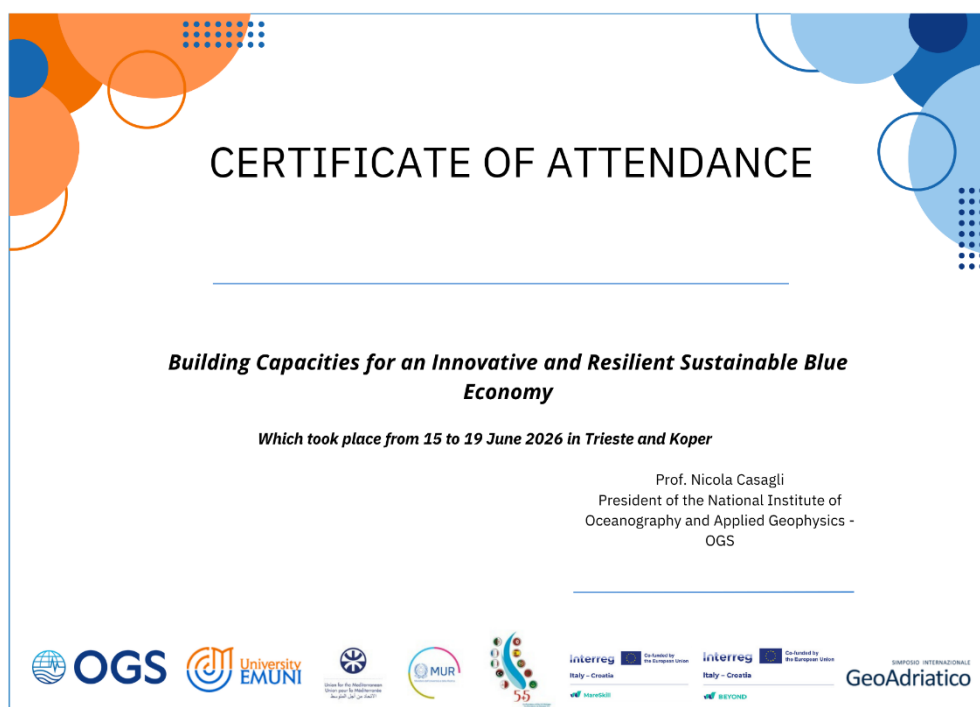


Figure 3.15. OGS Summer School Certificate

3.5. Evaluation and Feedback

At the end of final student presentations, participants were invited to complete an anonymous evaluation questionnaire developed using Mentimeter, replicating the version used by RITEH in Rijeka. The questionnaire was designed to assess participants' satisfaction with the Summer School, the hands-on demonstrations and the overall program. The results were extracted and are represented below in Fig. 3.16, showing a high level of satisfaction for the BEYOND programme. The lowest score recorded concerned the hands-on demonstration, which was the interactive practical simplified ecological model in the penultimate session of the last day, indicating a need to dedicate more time to this activity.



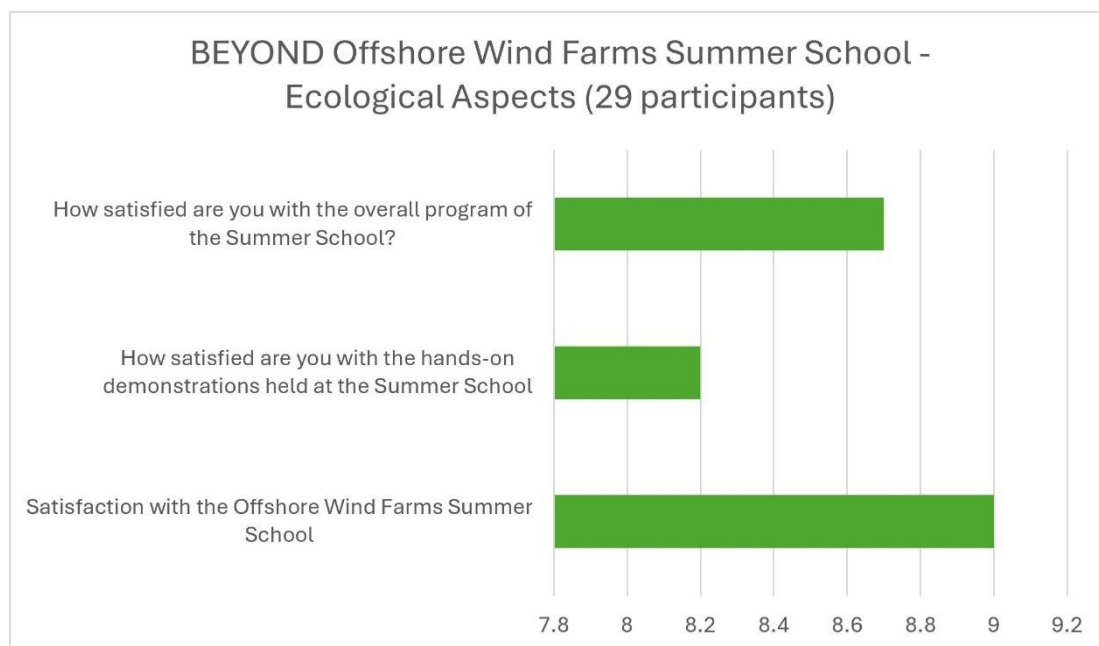


Figure 3.16. OGS Summer School Mentimeter results

In addition, the Blue Skills team sent an OGS Summer School evaluation to all participants following the closure of the edition on 8 July with a deadline for completion of 24 July. There were several questions related to the organisation, promotion and content of the overall Summer School, to which 23 participants responded in anonymity. The overall scientific program scored extremely well, with just under half rating it very good (maximum) and the remainder good (Fig. 3.17).

Overall scientific programme
23 risposte

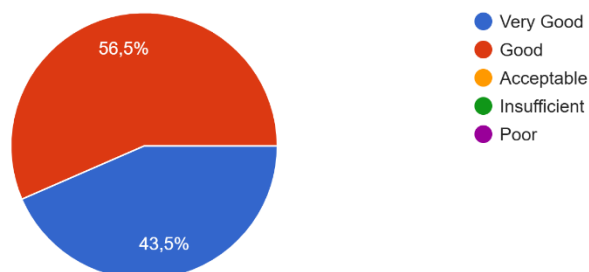


Figure 3.17.



Students were also asked to rate each lecture from 1 (not good) to 5 (excellent). Most BEYOND lectures collected the highest number of votes in the category of 4 or 5, with only one participant consistently marking 2 and on average two participants marking 3, most likely due to a mismatch of their existing knowledge and ability to understand the content of the lectures. Some of the highest ranked lectures were allocated to Carlo Franzosini (almost 61% awarded the lecture a 5), Alice Affatati and Silvia Ceramicola (56.5% awarded the lecture a 5). The scores for each lecture can be viewed below in Figs 3.18 – 3.30.

DAY 2 | Nikola Petrić & Dino Glavičić - "Introduction to the need for green energy production and marine renewable energy" (BEYOND Project Coordination...strian Regional Energy Agency - IRENA, Croatia)
23 risposte

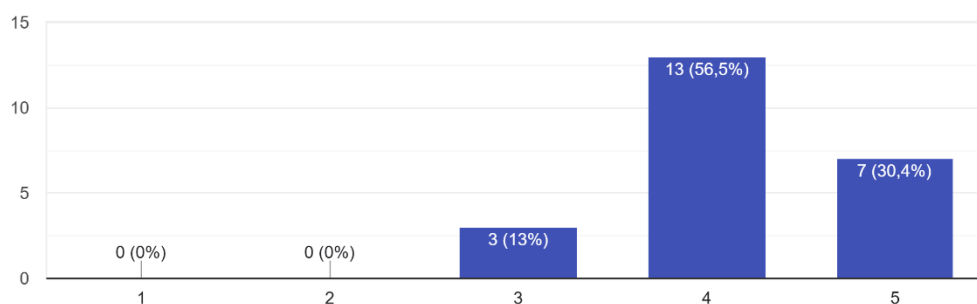


Figure 3.18

DAY 2 | Stefan Ivić/other - "Physical conditions and wind potential for OWF in the Adriatic" (Faculty of Engineering, University of Rijeka - RITEH, Croatia)
23 risposte

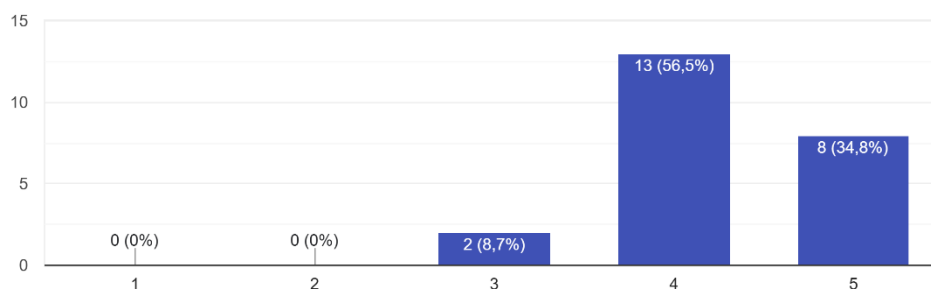


Figure 3.19



DAY 2 | Daniela Moderini - "Planning an offshore windfarm: Rimini project" (Energia Wind 2020, Italy)

23 risposte

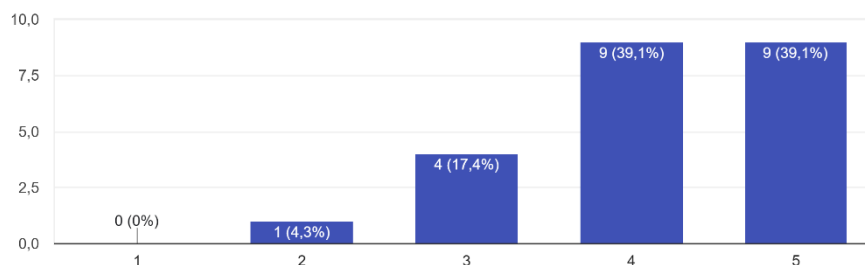


Figure 3.20

DAY 2 | Carlo Franzosini - "OWF and interactions with fisheries sector: challenges, opportunities and solutions" (SHORELINE, Italy)

23 risposte

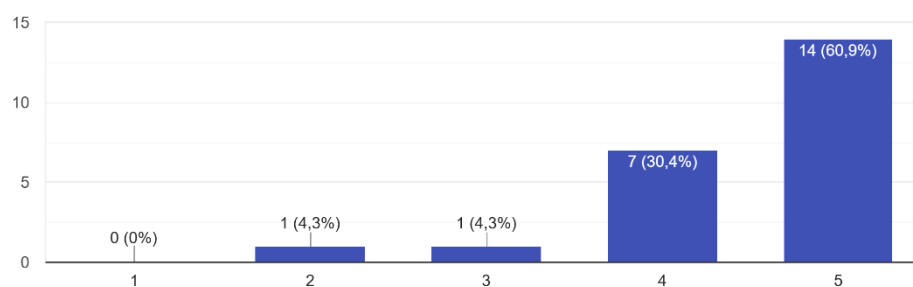


Figure 3.21

DAY 2 | Diego Panzeri - "Estimating interactions between OWF and other blue sectors: the case of fisheries" (OGS, Italy)

23 risposte

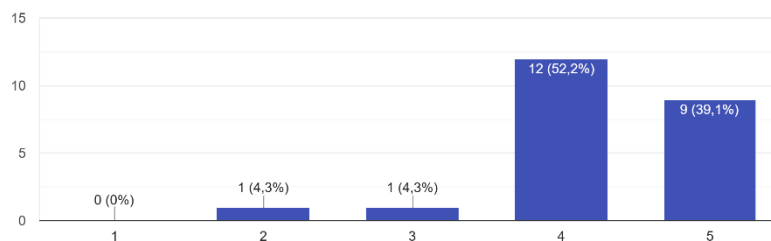


Figure 3.22



DAY 3 | Emiliano Ramieri - "The role of MSP for the sustainable development of offshore wind farms"(Italian National Research Council's Institute of Marine Sciences – CNR, Italy)

23 risposte

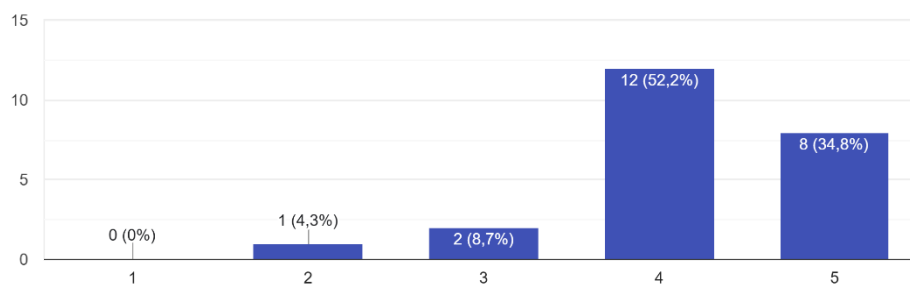


Figure 3.23

DAY 3 | Daniela Moderini - "Compensation activities and valorisation: solutions for interaction with other blue sectors including nature inclusive design (NID)" (Energia Wind 2020, Italy)

23 risposte

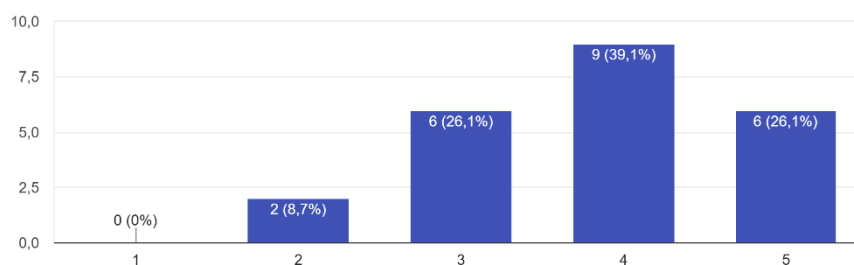


Figure 3.24

DAY 3 | Stefan Ivić/other "OWF layout optimization" (Faculty of Engineering, University of Rijeka - RITEH, Croatia)

23 risposte

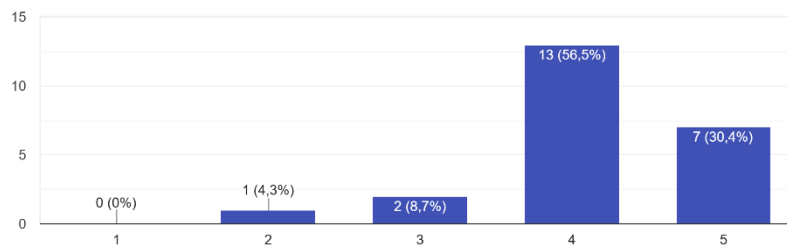


Figure 3.25



DAY 3 | Emiliano Ramieri "Scenarios co-development in MSP: practical examples of OWF zoning in three Italian case studies" (Italian National Research Council's Institute of Marine Sciences – CNR, Italy)

23 risposte

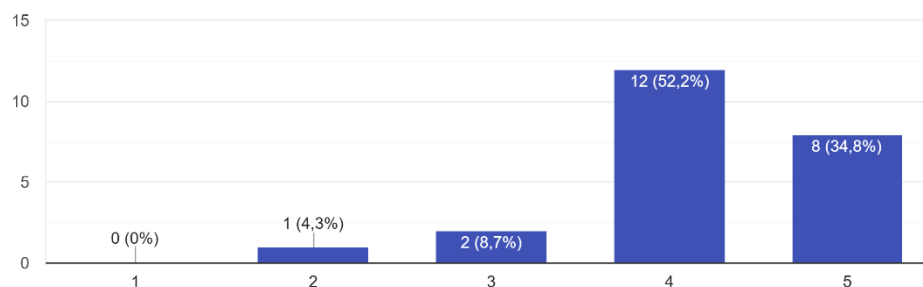


Figure 3.26

DAY 4 | Simona Iannucci - "BEYOND: Ecological impacts of infrastructures at sea" (OGS, Italy)

23 risposte

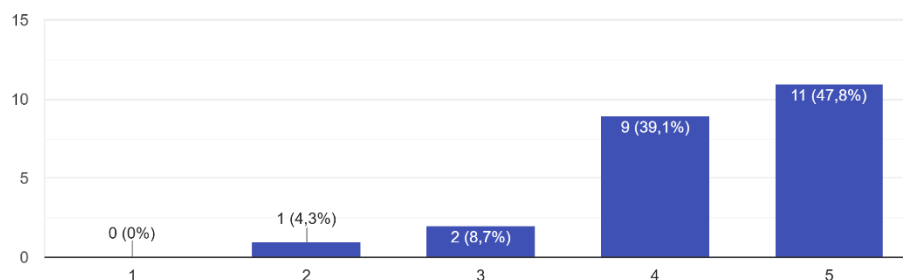


Figure 3.27

DAY 4 | Alice Affatati - "Acoustic impacts of OWF" (OGS, Italy)

23 risposte

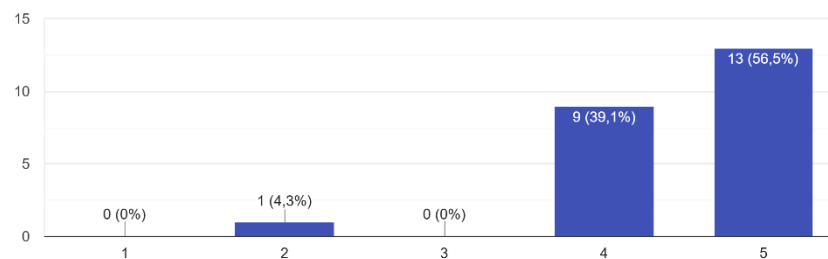


Figure 3.28



DAY 5 | - Silvia Ceramicola - "Geohazards and offshore wind farms" (OGS, Italy)

23 risposte

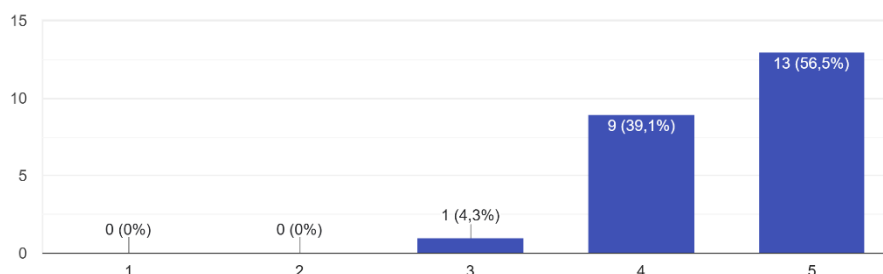


Figure 3.29

DAY 5 | Simone Libralato - "BEYOND: Ecosystem approach for analysis of cumulative impacts of offshore windfarms" (OGS, Italy)

23 risposte

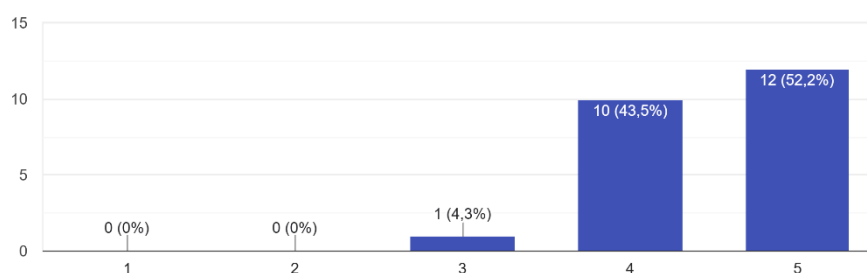


Figure 3.30

The lecture that received the lowest average scores was that which demonstrated the ecosystem model, which the BEYOND team predicted may be the case, as this was the most demanding in terms of student input, with over a third ranking the lecture with a 3, although more than a third also scored it a 5 (Fig. 3.31). This is also reflected in the evaluation of the group presentations that followed, where almost half of the participants who responded ranked the last session with a 3 (Fig. 3.32).



DAY 5 | Igor Celic - "BEYOND: Working groups: Practical use of an ecosystem model representing effects of OWF (simplified use)" (OGS, Italy)

23 risposte

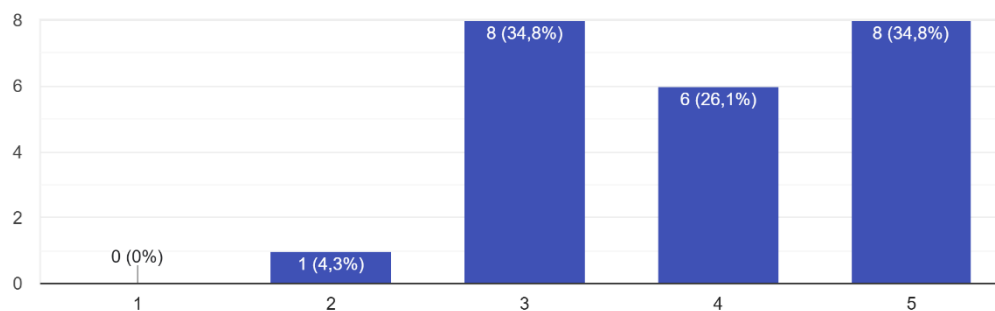


Figure 3.31

DAY 5 | Group presentations

23 risposte

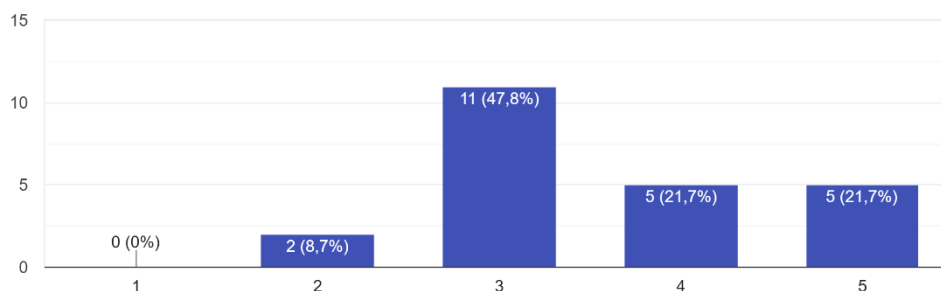


Figure 3.32

Having asked participants to provide individual comments, the feedback also echoed the results of the last two sessions of the BEYOND program, with the following remarks supplying valuable insight into how the methodology could be improved in future editions (Fig. 3.33).



To make the summer school more engaging, I recommend replacing long lectures with a flipped classroom model that prioritizes short content chunks, live polling, and hands-on, collaborative projects.

I recommend expanding on technical, hands-on topics like marine renewable energy systems and Python-based oceanographic data analysis, while condensing the broader, introductory overviews.

I would suggest including more hands-on activities and practical exercises while slightly reducing the overall amount of theoretical content. This would provide participants with more practical skills that they can apply in their work.

Figure 3.33

Overall, the BEYOND team was satisfied with the successful implementation of the Trieste edition of the BEYOND program, based on the real-time experience in the sessions and the participants' feedback. The pilot edition provided invaluable information, which can be used in future to refine the program's content and methodology to further enhance the learning experience and learning impacts for lecturers and students alike.



4. Conclusions

The cross-sectorial educational programme developed within the BEYOND project was successfully implemented through two complementary Summer Schools, one held in Rijeka and organised by RITEH and the other held in Trieste and organised by OGS. The two events provided participants with an integrated learning experience covering both the technical and ecological aspects of offshore wind farm development.

The organisation of the programme in two parts and two locations proved beneficial, as it allowed each institution to build the programme around its specific expertise and facilities while maintaining a common educational objective. The Rijeka Summer School provided a strong technical foundation through lectures, laboratory demonstrations and a wind farm site visit, while the Trieste Summer School expanded the perspective towards environmental, ecological and cross-sectoral aspects through lectures, case studies, field visits and practical activities. In this way, the two parts complemented each other and demonstrated the importance of considering technical, environmental and blue economy aspects together when addressing offshore wind farm development.

The participation of students and external experts from different countries, institutions and educational backgrounds further strengthened the interdisciplinary and cross-border character of the programme. The collaboration between project partners and, in the case of the Trieste edition, the synergy with other educational and Interreg initiatives, contributed to a broader exchange of knowledge and experience and increased the reach of the activities.

The combination of theoretical presentations and practical activities was an important element of the programme. Field visits, laboratory demonstrations, discussions and practical group work provided participants with opportunities to connect the presented concepts with real-world applications. The feedback collected during both Summer Schools indicated a high level of satisfaction and confirmed the relevance of the selected topics and learning approach. At the same time, the evaluation highlighted



opportunities for further improvement, particularly in relation to allowing more time for demanding practical activities and interactive exercises.

Overall, the pilot implementation confirmed the feasibility and value of the cross-sectorial educational programme developed within BEYOND. The experience gained provides a useful basis for refining the programme, particularly with regard to the balance between theoretical and practical content, the duration of individual activities and the integration of different disciplinary perspectives. The strong interest in the Summer Schools and the positive feedback from participants also indicate the potential for similar educational activities to be continued and further developed in the future, supporting knowledge transfer and capacity building in the field of offshore wind energy and the sustainable blue economy.

