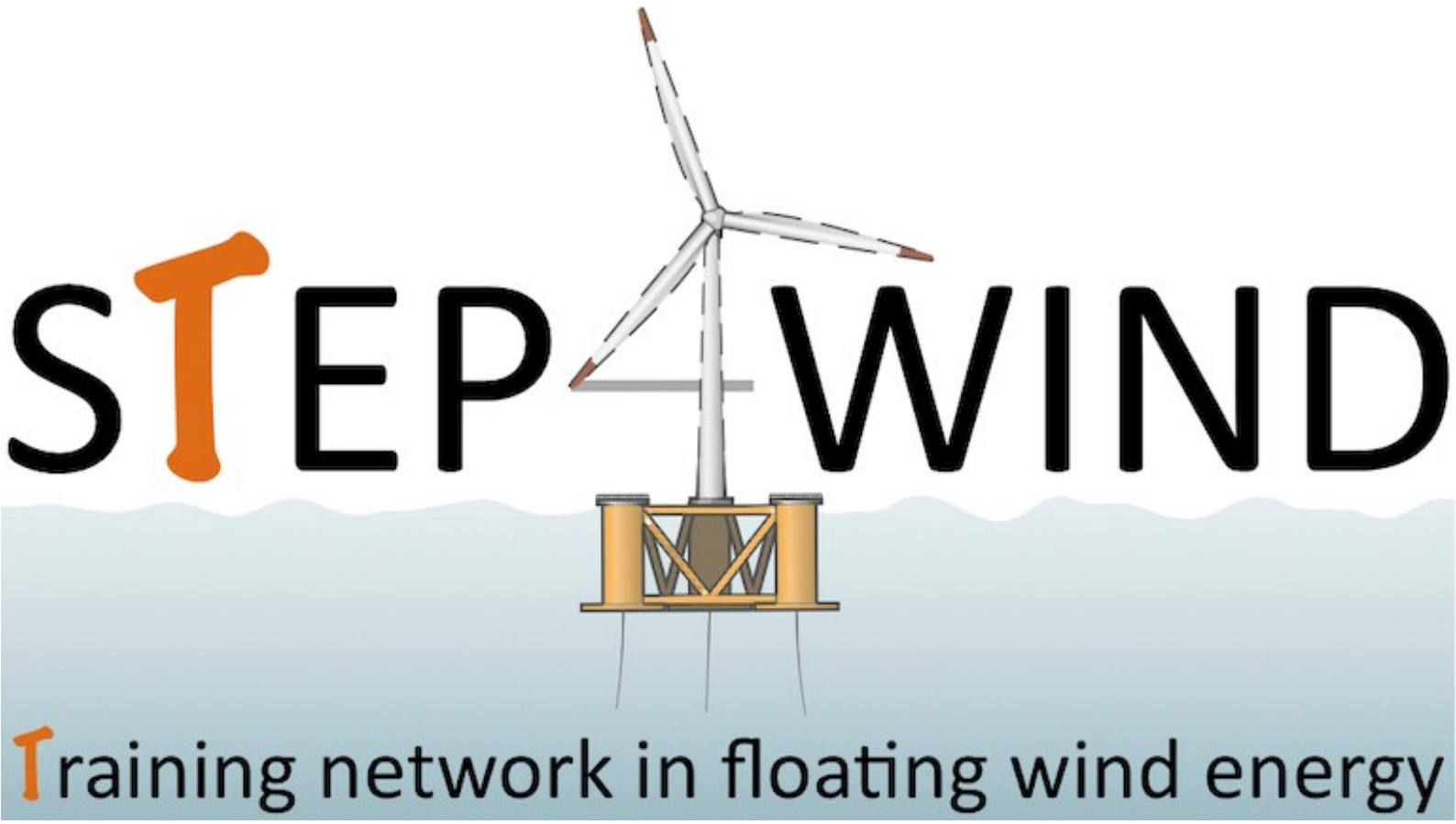
D4.1 Training guide and plan



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Document History

Revision Nr	Description	Author	Review	Date
1	First draft	Sara Muggiasca, Marco Belloli		October, 23rd 2020
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1. Introduction

This document describes the training plan for the ESRs of the Step4Wind project.

The original training programme has been redesigned due to the COVID19 Pandemic, thus some events have been moved from physical meetings to on-line courses and the whole timing has been adapted to the new travel restrictions, because of the not known and unpredictable evolution of the pandemic. Additionally, the workshop about the WindFloat Atlantic wind farm is removed due to a change in beneficiary. The content of this training will be included in one of the existing summer schools, where a new associated partner will be able to cover the challenges and development of another floating offshore wind farm.

2. Network wide training events

Table 1 describes the whole training programme, with the lead institution and the timing indicated by the progressive month form the kick-off.

In addition, Table 1 shows the possibility of carrying out the training activity on-line instead of in person, in order to facilitate the construction of a network among the ESRs participating in the project, and limit the travel uncertainties related to the global pandemic.

Currently, there is an active collaboration with other MSCA projects on wind energy, such as LIKE, and on floating wind energy, namely FLOAWER and Train2Wind. It is agreed that these ITNs and STEP4WIND will open their training activities to the ERSs from the four networks. This will allow all the involved ESRs to gain further experience and competences, and to create a wider network of future researchers in wind energy science and technology.

Name	Short description	Lead Institution	Month from kick-off	On-line
Soft 1	Project and big data management	ORE	15	Y
Academic 1	Increase impact through open science and online teaching	TUD	16	Y
School 1	1st summer school	POLIMI	18	N
Industrial 1	1st workshop: wave tank experiments	MARIN	23	N
Academic 2	Course: Build your start-up	TUD	23	tbc
Industrial 2	Design, manufacture and testing of wind turbine blades	Eire	28	N
Soft 2	Course on scientific writing and presentation skills	UCC	28	N
School 2	2nd summer school	UCC	28	N
Industrial 3	Risk considerations for the commercialization of FOWTs	ORE	30	Y
Soft 3	Transitioning from a PhD degree to a career in industry	SIEMENS	34	N
Soft 4	4th workshop: IPR and diversity in engineering	TUD	42	N

Table 1 Overview of the whole training events

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3. Synopsis of the Training Activities

Soft 1. Project and big data management (3 days, led by ORE Catapult, month 15). This course will cover all aspects related to data collection, management, analysis, visualisation, and sharing. Topics are: management and interpretation of large quantities of SCADA data; open and confidential data management; practical examples of data management at ORE Catapult such as POD (Platform for Operational Data) for data collection and SPARTA (System Performance, Availability and Reliability Trend Analysis) to improve offshore wind assets. The data manager at TUD will provide additional input on project and open data management.

Academic 1. Increase impact through open science and online teaching (**Online course, 1 ECTS over 4 weeks, led by TUD**, **Month 16**). This course will empower the ESRs to become more visible and impactful researchers by learning the benefits from Open Science principles. Topics include: basic concepts of Open Science, with advantages for the researchers and science in general; how to effectively store, manage and share research data; the different forms of open access publishing; the use of social media to increase visibility and impact; and how to design online teaching materials. All the ESRs will directly apply this knowledge in their research through open-access publications, open data, open-source codes, and the STEP4WIND online game.

School 1. Polimi Summer School (5 days, led by Polimi, Month 18). This summer school will be held at https://lakecomoschool.org and it is programmed for Month 18, October 2021. The villa on the Lake Como is owned by the Volta Foundation and it is available for the Step4Wind because of the winning of a grant. This grant includes also a small fund for organizing the School; the location and the fund make to have enlarge the school to all the ESRs form the cited ITNs on wind energy and also to have, as teachers, some of the most prominent researchers on wind energy. The programme will include seminars on: atmosphere physics and natural wind boundary layer, ,mechanical and control models of wind turbines, aerodynamic modelling of wind turbine, wind farms control problems, floating wind research topics and future and floating wind industrial applications. The ESRs will also have OpenFoam hands on session and they will do a visit to Politecnico di Milano wind tunnel.

Industrial 1. Workshop on wave tank experiments (2 days, led by MARIN, month 23). The workshop will teach offshore hydrodynamics applied to offshore wind turbine foundations (fixed and floating). On Day 1, lectures will cover: design considerations; model testing techniques; first- and second-order wave loads; numerical modelling of FOWTs; a case study of a semi-submersible foundation; and a practical assignment in the wave tank. Day 2 will exclusively focus on a practical work in a wave basin. The ESRs will work in team of 3 to build a floating foundation from PVC tubes and foam plates. The concepts will be ranked based on their weight and the results of these tests.

Academic 2. Build your start-up (3 days, led by TUD, month 23). This course will be delivered in collaboration with Yes!Delft, the business incubator of TUD. It will give the ESRs a hands-on experience with building their own start-up. The ESRs will work in teams of 3-4 with their own start-up idea or a problem that could be solved by building a start-up. Topics include: methods and tools associated with the lean start up and design-thinking philosophy, identify key actors, market size and trends analysis, revenue model, business model, IP management, convince investors.

Industrial 2. Design, manufacture and testing of wind turbine blades (3 days, led by Eire, month 28). The goal is to provide a strong practical understanding of the context that underpins wind blade innovation. The ESRs will be divided into teams of 3-4 and asked to design a wind turbine blade taking into account how the blade will be manufactured and tested. They will use CFD/FEA software to design their blades and the results will be baselined against actual blades from industry. The event will include a short overview of the processes associated with aerospace manufacturing and testing, and opportunities for cross-learning between sectors will be discussed. Finally, there will be demonstrations of the equipment used to manufacture and test blades.

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Soft 2. Course on scientific writing and presentation skills (2 days, led by UCC – MaREI, month 28). The event will include a practical seminar on technical reporting, scientific writing, and how to use theatrical techniques when designing and delivering oral presentations. The ESRs will apply the techniques to a talk on their research topic. A guest presentation will also be given by Dr. Ray Alcon, CEO of Exceedence Ltd., on the commercialisation of research.

School 2. UCC Summer School (2 days, led by UCC – MaREI, month 28). This summer school will focus on social, economic and environmental impact of offshore wind. Emphasis will be on the regional economic impact of offshore wind development activities and on the environmental impact of various end of life options for wind turbines and their support structures

Industrial 3. Risk considerations for the commercialisation of FOWTs (1 day, led by ORE Catapult, Month 30). Risk analysis in the development of FOWTs is one of the strongest areas of ORE Catapult. The company will present its methodology for risk management of FOWTs (including risks into some costs parameters), the associated risk registers, and a methodology for technology assessment process. The ESRs will apply these methods to different FOWT designs.

Soft 3. Transitioning from a PhD degree to a career in industry (1 day, led by Siemens Gamesa, month 34). Topics are: tools for a successful transition from academia to industry (networking, industry involvement, soft-skills); HR/Management perspective on PhD applications; experience sharing from Siemens Gamesa staff holding a PhD degree.

Soft 4. Workshop: IPR & diversity in engineering (2 days, led by TUD, month 42). The workshop will be divided into two parts and will be organised with the technology transfer officer at TUD and the Delft Women In Science organisation. Topics are: good practises in research, patentability, workplace rights and responsibilities, talks by female role models from academia and industry.

4. Additional peer-to-peer training activities between the ESRs

Once per year, the ESRs will gather for the annual research review. At that time, MDAO hackathons will also be organised. These hackathons will be instrumental to integrate the knowledge of the different ESR projects and also train their fellow PhD students to their specific field and associated requirements.