



# training wind energy experts on digitalisation

- Template for the description and publication of the Vacancies

## - WP 5 Network Training

### DATE

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## Document Factsheet

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## Approvals

Author(s):	UNIZAR, NTUA
Task Leader:	NTUA
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Revision	Date	Main modification	Author
1	2024/10/04	First version	UNIZAR, NTUA, OST
2	2024/10/15	Changes agreed by all partners	UNIZAR, NTUA, OST

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This document describes the common agreed template for the description and publication of the Vacancies. Please replace the blue texts in italics by adapting them to your characteristics and needs.

## 1. Job Information

**Organisation/Company:** *Norwegian University of Science and Technology NTNU*

**Research Field:** *Applied Mathematics, Engineering, Wind Energy, Physics, Data Science*

**Researcher Profile:** First Stage Researcher (R1)

**Country:** *Norway*

**Application Deadline:** *December 15<sup>th</sup>*

**Type of contract:** *Temporary (3 years)*

**Job Status:** Full Time

**Offer Starting Date (Vacancy Opening):** *November 1<sup>st</sup>*

**Is the job funded through the EU Research Framework Programme?:** YES

**Marie Curie Grant Agreement Number:** 101168673

**Is the Job related to staff position within a Research Infrastructure?:** NO

## 2. Offer description

### TWEED Project

TWEED is looking for 12 talented and motivated Doctoral Candidates (DCs) with the skills, knowledge and enthusiasm to work as part of a network to advance the field of digitalisation within the wind energy sector.

The “Training Wind Energy Experts on Digitalisation (TWEED)” Doctoral Network (DN) aims to train the next generation of excellent researchers equipped with a full set of technical and complementary skills to develop high-impact careers in wind energy digitalisation.

Co-funded by the European Commission through the Horizon Europe Marie Skłodowska Curie Doctoral Networks Programme, the TWEED network offers **12 Doctoral Candidates**



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(DCs) positions to provide high-level training in the new emerging research field of Wind Energy Data Science and Digitalisation.

An outstanding research-for-innovation programme, and a unique training programme that combines hands-on research training, interactive schools and hackathons, innovation management and placements with industry partner organisations has been designed for the DCs who will participate in the network. Alongside the exciting research topics related to wind energy data science, the research programme also includes state-of-the-art technology to develop a new Wind Energy Data Science Hub that will facilitate a virtual research environment to foster collaboration, data sharing and testing of innovative solutions to significantly increase the value of wind energy.

The network will provide an interdisciplinary and inter-sectoral context to foster creativity in tackling wind energy data science and digitalisation challenges by developing solutions for commercial exploitation.

DCs will be trained in business innovation to extend their focus beyond the academic context, to be able to identify added-value products or services with the guidance from established researchers and entrepreneurs. As a result, a research-for-innovation mindset will be developed to provide enhanced career prospects for the fellows, equipping them with a complete set of thematic, technological and innovation skills.

DCs are expected to i) conduct high quality, original academic research in the fields of Wind Energy, Digitalisation, Data Science and Computer Science, ii) participate in the network's planned training-dissemination activities and mobility plan, iii) collaborate with fellow researchers, with the goal of advancing and promoting the network's objectives.

The most talented and motivated candidates will be selected to participate in the network's interdisciplinary collaborative research training, preferably starting in February 2024. The assessment shall be carried out by the TWEED recruitment team.

## DC Project

Internal code of the position: [DC7](#)

Host Institution: [NTNU](#)

*As the amount of wind energy is increasing, the balancing of electricity production and consumption becomes more and more challenging. There are already many instances where too much wind power is available, leading to low, or even negative, power market prices. These financial incentives to reduce production are not always sufficient, thus grid operators can additionally demand such reduction (curtailment) when there is a danger*





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*of overloading the electrical network. This poses a challenge for wind farm operators, since such curtailments (e.g., by keeping offshore turbines idling) can affect the fatigue lifetime of wind turbines. The main objective of this project is therefore to develop and investigate strategies for flexible and lifetime-conscious power curtailment, optimizing the available decisions (e.g., regarding the periods and length of idling, or the degree of de-rating) under uncertainty in future market prices and wind conditions. To achieve this, the fatigue damage efficiency of different curtailment options will be established based on simulations and real-world data, and dynamic programming techniques and artificial intelligence will be used to optimise the economic value of the wind turbine asset. The main novelties are the consideration of different wind turbine components and damage criteria (e.g., including pitch actuator wear), the use of real-world data, and the consideration of uncertainties. A secondary objective is to improve the accuracy and reduce the uncertainty of remaining useful lifetime predictions, and to extend the approach to include the possibility of lifetime extension.*

*A first goal is to establish a precise mathematical definition of the most relevant optimization problems for implementing flexible curtailment, in the most economical way. A step will be to develop an innovative solution strategy to determine the optimal curtailment strategies. Finally, a relevant industrial application shall be developed, using real-world wind turbine data, for the industrial partner.*

**Secondments:** An academic research stay at ETH Zurich in Switzerland (3 months, supervised by Prof. Eleni Chatzi, M13-15) to work on the theoretical foundations and techniques for solving the optimization problems. An industrial secondment at EnBW in Germany (3 months, supervised by Dr. Lisa Ziegler, M22-24) to work with real-world wind turbine data and develop a practical approach that can be used in industry.

**Personal Supervisory Team:** *You will be supervised by Professor Michael Muskulus, who will be your immediate leader. The co-supervisor will be Professor Hans Bihs (NTNU). Prof Eleni Chatzi (ETH Zurich) and Dr Lisa Ziegler (EnBW) will be external mentors.*

### 3. Requirements

**Research Field:** *Applied Mathematics, Engineering, Wind Energy, Physics, Data Science*

**Education Level:** Master Degree or equivalent

**Skills / Qualifications:**





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- Applicants must be proficient in the English language.
- Master degree or equivalent obtained by the time they are appointed. Students currently in the final year of a Master's degree are encouraged to apply but should note that if selected, they will be expected to start their PhD in the first quarter of 2025.

#### Specific requirements:

- You must have a professionally relevant background in at least one of the following areas: applied mathematics, data science, structural engineering, wind energy, physics, offshore engineering, control theory
- Your education must correspond to a five-year Norwegian degree program, where 120 credits are obtained at master's level.
- You must have a strong academic background from your previous studies and an average grade from the master's degree program, or equivalent education, which is equal to B or better compared with NTNU's grading scale. If you do not have letter grades from previous studies, you must have an equally good academic basis. If you have a weaker grade background, you may be assessed if you can document that you are particularly suitable for a PhD education.
- Excellent written and oral English language skills are required
- Experience with one or more programming languages is necessary (e.g. Python, C or Fortran)
- Working knowledge of statistics, probability theory, and data science is required
- At least basic knowledge of numerical optimization is expected
- Good problem-solving skills are expected
- You must meet the requirements for admission to the faculty's doctoral program (<https://www.ntnu.edu/iv/doctoral-programme>).
- You must fulfill the eligibility requirements of the European Union H2020 framework programme for Early Stage Researcher: you must not have lived for more than 12 months in Norway in the 3 years immediately prior to the starting date, must be in the first four years (full-time equivalent research experience) of your research career (i.e., after obtaining the master's degree), and must not have obtained a doctoral degree yet.

#### Preferred selection criteria

- Knowledge of wind energy, structural dynamics, fatigue, offshore engineering, and economics will be an advantage
- Experience with teaching (e.g. as student assistant) will be an advantage
- Knowledge of Linux will be an advantage



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- Experience with laboratory measurements and electronics is a plus

#### Personal characteristics

- Enthusiastic and curious
- Willingness and ability to quickly learn a lot is a must
- An interest in wind energy technology and the power market is expected
- Ability to work both independently and with other researchers in a structured manner
- Able and willing to travel internationally to events, conferences, etc.
- Candidates must be responsible and socially adept

**Languages:** English

**Level:** Excellent

## 4. Additional Information

### Benefits

You will work under a 36-month employment contract with the competitive conditions and salary adapted to the living costs in each host country, set by the MSCA Doctoral Networks (DN). The MSCA DN programme offers a highly competitive and attractive salary and working conditions. The successful candidates will receive a salary in accordance with the MSCA regulations for DCs, according to the national rules of the country with full social security benefits.

The successful candidate will receive a financial package plus an additional mobility and family allowance according to the rules for Doctoral Candidates (DCs) in an EU Marie Skłodowska-Curie Actions Doctoral Networks:

- Living Allowance of € 4610/month to be paid in the currency of the country of the Host Organisation.
- Mobility allowance of €600/month to be paid to all DCs recruited.
- Family allowance of €660/month to be paid depending on DCs family status

The gross salary will be calculated by deducting the applicable employer taxes and social security contribution for each country, from the amounts mentioned above *and will be approximately €3600 / month*. Additional deductions may apply based on your personal circumstances and local tax/social security regulations.



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In support of families with young children, flexible working hours will be offered to the DC whenever it is feasible within the requirements of the project.

Following the [EU's commitment to DEI](#), the TWEED network and {Host institution} encourages and promotes the participation of under-represented groups such as women in technical careers, people from diverse economic and ethnic backgrounds, people with disabilities, those who identify as neurodivergent and LGBTQA+. The {Host institution} community aims to exercise a policy of equal opportunities at all times.

Additional information can be found in Information Note for [Marie Skłodowska-Curie fellows in Doctoral Networks](#).

### Eligibility criteria

All applicants must, at the date of the recruitment, comply with the following ELIGIBILITY CRITERIA:

- Candidate status: At the time of recruitment, applicants must not hold a doctoral degree or equivalent.
- Mobility Rule: Applicants can be of any nationality. However, applicants must not have resided or carried out their main activity (work, studies, etc.) in the country of the recruiting organisation for more than 12 months in the 3 years immediately before the appointment. This excludes short stays such as holidays or compulsory national service

Candidates are required to document in their applications their compliance with the eligibility criteria. To prove their eligibility, candidates can use supporting documents such as studies, residence or work certificates.

## 5. Selection Process

Selection process complies with the guidelines set forth in the European Charter for Researchers, including the Code of Conduct for Recruitment of Researchers.

Candidates will be requested to provide their consent for their application documents to be shared among the members of the recruitment team for review (including other institutions than the institution to which they originally addressed their application). Additionally, they will be requested to consent (or decline) to having their application forwarded to another host institution within the network, should their profile be better suited for a different position. Personal documents and information of the candidate will be treated confidentially.





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### Eligibility check

- The Recruitment Team of TWEED will gather the information from all candidates and will check that they comply with the eligibility criteria and that the applications are complete, in English, and submitted before the deadline.
- The initial check of the eligibility criteria will have to be formally approved by the host institution at the time of recruitment of the appointed candidates.
- Ineligible candidates will be notified via email.

### Assessment:

A Selection Committee will be set up at the host institution, led by the Main Supervisor. The Selection Committee will assess all candidates according to their academic profile, personal motivation, relevant background, professional experience, scientific knowledge, transversal skills, soft skills and English proficiency. The Selection Committee will short-list at least the best 3 candidates.

### Interview

The Selection Committee will interview the short-listed candidates and will produce a ranked list of candidates that qualify for the position.

### Decision

According to the procedure established in TWEED, the Selection Committee will submit its list of preferences to the Supervisory Board (the project's governing body). The SB will prepare the final ranking of candidates for each position.

### Communications

Candidates will be informed of the status of their application during the selection process.

## 6. How to apply

The application must include:

- Detailed CV:
  - Candidate personal information
  - Information about graduate and postgraduate degree and qualifications
  - Work experience
  - English proficiency
- Eligibility information, countries of residence for the last 3 years
- Motivation letter





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- A copy of the master's thesis. If you recently have submitted your master's thesis, you can attach a draft of the thesis. Documentation of a completed master's degree must be presented before taking up the position.
- The names and contact information of **three** referees.
- Written agreement of the permission to share information with the TWEED project Recruitment Team.
- Identification of other possible positions at TWEED in which you may be interested or which have also been applied for.

The application must be submitted electronically via [jobbnorge.no](https://www.jobbnorge.no) with your CV, diplomas and certificates attached. Applications submitted elsewhere will not be considered. Upon request, you must be able to obtain certified copies of your documentation. More information and a link to the application website can be found here: <https://www.jobbnorge.no/en/available-jobs/job/270587/phd-candidate-in-analysis-and-optimization-of-wind-turbine-operations>

## Work location

**Number of offers available:** 1

**Company/Institute:** *Department of Civil and Environmental Engineering, Norwegian University of Science and Technology NTNU*

**Country:** *Norway*

**City:** *Trondheim*

**Postal Code:** *7491*

**Street:** *Høgskoleringen 7A*

**About** *NTNU is a broad-based university with a technical-scientific profile and a focus in professional education. The university is located in three cities with headquarters in Trondheim.*

*At NTNU, 9,000 employees and 43,000 students work to create knowledge for a better world.*

*NTNU believes that inclusion and diversity is our strength. We want to recruit people with different competencies, educational backgrounds, life experiences and perspectives to contribute to solving our social responsibilities within education and research. We will facilitate for our employees' needs.*



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*NTNU is working actively to increase the number of women employed in scientific positions and has a number of resources to promote equality.*

## 7. Contact

*If you have any questions about the position, please contact Prof. Dr. Michael Muskulus (michael.muskulus@ntnu.no).*

Main contact of the project: [tweedproject@unizar.es](mailto:tweedproject@unizar.es)