

**Public Competition  
for the admission to the PhD programmes  
41<sup>st</sup> cycle  
Academic year 2025/2026  
Faculty of Engineering  
PhD Programme in  
SUSTAINABLE ENERGY AND TECHNOLOGIES**

**Website:** [PhD in Sustainable Energy and Technologies / Free University of Bozen-Bolzano \(unibz.it\)](https://unibz.it/PhD-in-Sustainable-Energy-and-Technologies/)

**Duration:** 3 years

**Academic year:** 2025/2026

**Start date:** November 1st, 2025

**Official language:** English

**Art. 1 - POSITIONS**

1. A **total of 5 positions** are available for the PhD programme in "Sustainable Energy and Technologies";

2. All information about the PhD programme in general, the schedule and its structure as well as the possible research projects listed below can be found at the following link: [PhD in Sustainable Energy and Technologies / Free University of Bozen-Bolzano](https://unibz.it/PhD-in-Sustainable-Energy-and-Technologies/).

3. **Positions with unibz scholarship: 4**

**Positions without scholarship: 1**

4. The following list of research projects and related supervisors and linked to positions financed with a unibz scholarship or without a scholarship is listed for illustrative purposes only, as other topics inherent to the activities of the various research groups at the university may be the subject of study.

Within the first two months, applicants are assigned a thesis topic and a supervisor based on the skills they have taken from their CV and motivation letter, as well as based on interviews with the faculty.

In particular, the topic of the doctoral thesis must fit into one of the research activities listed below.

**a) Energy efficiency and sustainability (EES) in end-use, particularly in buildings and production processes, from the user to the regional scale**

- Characterization and improvement of opaque and transparent elements of the building envelope, of HVAC systems for heat production, storage, distribution and supply as well as ventilation systems.
- Characterization and optimization of the energy performance of the building-plant system during design/diagnosis/renovation and in management and control.
- Study of energy efficiency solutions in industrial production processes and waste heat recovery.
- Characterization and optimization of the indoor environmental quality, assessed in terms of thermos-hygrometric, visual, acoustic comfort and air quality, and analysis of the interaction of the occupant with the building system and his/her performance.
- Managing of energy consumption at district and urban level, diagnosis of the energy performance of the existing building stock and development of energy policies and energy retrofit at local and national scale.

#### **b) Renewable energy and technology (RET)**

- Optimization of energy production and management from renewable or low environmental impact sources, with a particular focus on:
  - Optimization and development of technologies for the thermochemical conversion of biomass (e.g. fixed beds, fluidized beds, granular fluidized beds and others), with focus on flexibility in feeding, load modulation and by-product valorization;
  - Analysis of integrated poly-generation supply chains for the production of solid biofuels (e.g. hydro-char from hydrothermal carbonization), liquid biofuels (e.g. gasoline from the Fisher-Tropsch process) or gaseous biofuels (e.g. synthesis gas from gasification processes and/or power-to-gas processes);
  - Development and optimization of fluid power plants and machines for energy conversion, such as combustion engines and gas turbines powered by alternative fuels or innovative management solutions;
  - Analysis and development of innovative powertrains, electric and hybrid, in the automotive and industrial machinery sectors; study of energy flow management in the vehicle;
  - Energy analysis of agricultural machines also using liquid biofuel mixes also with nanoparticles, fuel cells with biohydrogen, analysis and optimization of food processing plants (in particular for wine production) from a dual machine-process viewpoint, study of bio lubricants (possibly also with nanoparticles) in agricultural machines;
  - Study of decentralized hydrogen production from biomass or other sources as an energy carrier for stationary generation and/or mobility; energy simulation of the entire hydrogen value chain, i.e. from hydrogen generation to storage and then utilization. Development and optimization of traditional and innovative hydrogen turbines (e.g. pump as turbine, hydrokinetic turbines) with emphasis on energy recovery;
  - Development and optimization of generation technologies from hydroelectric and wind power plants and their integration into the territory;
  - Development and optimisation of networks for the transport of fluids under pressure (such as district heating plants, water distribution networks, natural gas distribution networks) and energy recovery measures;
- Prevention of hydrogeological risks related to energy production and water use.

#### **c) Sustainable production and supply chain management**

- Circular economy in production and in the supply chain

- Decarbonization and life cycle engineering
- Eco-smart production processes and factories
- Smart, resilient and human-centric production
- Sustainable organization and supply chain management

5. The application for admission must state the preference for eventual positions with a subject-related scholarship. The preference expressed will be indicative of the interests of the applicant and not binding for the selection committee.

6. Separate rankings will be compiled for positions tied to subject-related scholarship. The positions tied to subject-related scholarships oblige the winners to carry out research activities relevant to the indicated subject. These will be assigned preferentially to applicants who make a specific request in their application.

7. Pursuant to the general part of the present call for applications, the number of positions may be increased as a result of funding provided by other universities, public research bodies or qualified private companies. Notice of such an increase will be given exclusively on the unibz web page dedicated to PhD programmes. Applicants wishing to obtain eligibility for any additional subject-related scholarships may make an explicit request to the selection committee during the interview, in order to allow it to assess the specific eligibility.

## **Art. 2 – ADMISSION REQUIREMENTS**

1. Application to the present public competition for the admission at the PhD programme in “Sustainable Energy and Technologies” may be presented pursuant to art. 4 of the general part of the present call for application, without limitations regarding gender, age or citizenship, by:

- a) Applicants holding a postgraduate degree as per Ministerial Decree no. 509/1999, a postgraduate degree as per Ministerial Decree no. 270/2004, a degree of the former Italian university system of the following degree classes: all. For admission to the doctoral programme, an appropriate educational, cultural or work background in the field of the research doctorate is an advantage. Degrees in the fields of engineering and architecture are desirable.
- b) Applicants holding an equivalent degree obtained abroad;
- c) Applicants achieving one of the above-mentioned titles within the enrolment deadline. In the latter case, applicants will be conditionally admitted to the public competition and are required to present the qualification by the enrolment deadline, under penalty of forfeiting admission to the programme.

- Master’s degree certificate/list of exams passed with indication of final grade /exam transcript. **For admission, the (exams) average grade of master’s degree (or equivalent) must be greater than or equal to 24/30.** For foreign degrees, the mark will be converted to an equivalent one in thirtieths. The candidate should provide certified information on the assessment methods used at the place where the qualification was awarded. In case of Italian university degree, the certification must be substituted by a self-declaration or the diploma supplement.

2. Language requirements:

As the programme is offered in English, applicants must have an adequate knowledge of English (corresponding to at least upper intermediate level, B2), which will be assessed during the interview.

2.1 If language skills are proven by a high school diploma/graduate or master's degree, the latter must be uploaded a second time in the section above.

2.2 If the certificates or diplomas were issued by Italian public bodies, the relevant substitutive declarations must be completed in the portal.

2.3 If the certificates or diplomas were issued by foreign bodies, the certificates or diplomas must be uploaded to the portal.

2.4 Language skills can be proven by:

a) if the main language of instruction in the last year of high school is English, it counts as C1;

b) a bachelor's or master's degree in English certifies the C1 level. unibz graduates must upload the language certificates obtained or declare that they have passed the language examinations at the unibz Language Centre (B2, B2+ or C1).

c) A recognized language certificate (see the list of certificates recognized by the Language Centre: <https://www.unibz.it/it/services/language-centre/study-in-three-languages/>). Please note: the certificate must not have been obtained more than 5 years before the application for recognition

### **Art. 3 – APPLICATION FOR ADMISSION**

1. In addition to the documentation listed in the general part of the present call for applications, the following documents must be uploaded to the application portal:

a) Motivation letter in English language (maximum 1 page), which must show the match between the applicant's profile/interest and the research areas of the doctoral programme as well as the preference for possible subject-related scholarship positions.

b) Updated curriculum vitae in English pursuant to the European format, downloadable at the following link: <https://europass.cedefop.europa.eu/en/documents/curriculum-vitae>

c) up to a maximum of 3 letters of reference, written in Italian, German or English by a university lecturer or researcher from a research institute, in which the work carried out or the quality of the same is described;

d) a list of publications together with a digital copy of them.

### **Art. 4 – SELECTION PROCEDURE**

1. The selection procedure consists of three phases:

a) applications will be examined ex officio for completeness and fulfilment of the formal requirements; applicants excluded due to incomplete applications or lack of requirements will be notified on the dedicated unibz web page. The publication will have the nature of a notification to all effects. No individual communications will be made.

b) The selection committee will assess the complete applications in accordance with Article 5, considering the qualifications and attached documentation referred to in Article 3. Applicants who reach the minimum score referred to in Article 5 will be admitted to the interview. Admission to the interview, as well as the relevant dates and times, will be communicated on the unibz dedicated web page. Individual communications will be sent in due time to the e-mail address indicated in the application form to applicants admitted to the interview.

c) The interviews will be held by videoconference and will be evaluated in accordance with the criteria set out in article 5. Applicants must ensure the use of a webcam to enable them to identify themselves to the selection committee by showing a valid identity document or passport, under penalty of exclusion from the public competition.

2. Absence from the tests and/or interviews, non-connection, unavailability of the applicant on the appointed day and/or time or non-exhibition of a valid identity document or passport are a cause for exclusion from the public competition.

3. If technical problems occur during the interviews by videoconference, if the problem concerns one or more members of the selection committee, the interview is deferred to another date ex officio; if the problem concerns the applicant, the committee may, subject to the principles of non-discrimination and equal treatment of applicants, postpone the test to another date for justified reasons.

4. Once the examinations have been completed, the relevant selection committees draw up rankings on the basis of the scores obtained by the applicants in the individual tests.

### **Art. 5 – EVALUATION CRITERIA**

1. The selection committee carries out a comparative assessment of the applicants. For applicants who have expressed a preference for eventual positions tied to subject-related scholarships, the committee also ascertains their suitability for the specific subject.

2. The following scores will be awarded during the evaluation of the documents submitted with the application under Article 3:

- up to a maximum of 15 points: for the CV, the letter of motivation, and additional qualifications,
- up to a maximum of 15 points for the interview.

The final score is the sum of the previous points, with a maximum of 30, and will be used to define the priority list and the access to the scholarship. The lowest score to be admitted in the ranking is 18/30.

The selection criteria for the evaluation of the CVs, the letter of motivation and the qualifications of the applicants are as follows:

1. up to 2 points for the average grade of the master's degree programme (final grade) or, for students who have not yet completed the master's degree programme but will complete it before enrolment, for the average grade of the examinations taken up to that point
2. up to 2 points for the quality of the CV
3. up to 4 points for the coherence between the CV and the research topics of the doctoral programme
4. up to 1 point for the motivation letter
5. up to 2 points for professional experience
6. up to 2 points for publications
7. up to 2 points for research experience.

Criteria 5, 6 and 7 are weighted according to the applicant's seniority, which is calculated using the function  $EXP[-(2025 - \text{year of graduation})/9]$  depending on the year of graduation.

3. Applicants who reach a threshold of at least 7 points will be admitted to the interview. Admission to the interview and the relevant dates and times will be communicated on the unibz dedicated web page. Individual communications will be sent in due time to the e-mail address indicated in the application form to applicants admitted to the interview.

4. The following elements will be assessed during the interview: aptitude for research; possession of a language level appropriate to the language of the programme; argumentative capacity in relation to the theoretical and methodological hypotheses of the research project presented. A maximum of 15 points will be awarded.

5. The final score is made up of the sum of the scores obtained in the assessment of the documentation and interview. Please note that if the candidate does not reach the minimum threshold of 7 points in the first assessment, he/she will not be admitted to the oral interview (second assessment) and will therefore not be considered eligible for inclusion in the ranking list. In the event of a tied score, the applicant with the youngest age will have priority.

#### **Art. 6 – RANKING**

1. Applicants and candidates will be admitted to the programmes in the order of their ranking until the number of positions available is reached. In the event of equal merit, the applicant who is younger in age shall prevail. In the event of successful placement in more than one ranking list, the winner must exercise the option for only one position. Separate rankings will be drawn up for each position tied to a subject-related scholarship.

2. The final rankings will be published on the unibz website on the page dedicated to PhDs. **Such publication has the value of an official communication. No individual communications will be made.**