CALL FOR GRANT APPLICATIONS

(AE2025-0292)

INESC TEC is now accepting grant applications to award 1 Post Doctoral Research Grant (BIPD) on the scope HYNET with reference 101172757 funded by the European Commission under the Horizon Europe program for the period 2021-2027.

1. GRANT DESCRIPTION

Type of grant: Post Doctoral Research Grant (BIPD)

General scientific area: ENGINEERING

Scientific subarea: Electrical engineering

Area of Work: Power Systems - Hybrid AC/DC Distribution grids

Grant duration: 12 months, starting on 2025-09-01, with the possibility of being renewed until the end of the project.

Scientific advisor: Carlos Moreira

Workplace: INESC TEC, Porto, Portugal

Maintenance stipend: € 1851.00, according to the table of monthly maintenance stipend for FCT grants , paid via bank transfer. Grant holders may be awarded potential supplements, according to a quarterly evaluation process (Articles 19, 21 and 22 of the Regulations for Grants of INESC TEC and Annex II), up to a maximum limit of 50% of the monthly maintenance stipend.

INESC TEC supports costs with registration, enrolment or tuition fees, during the grant duration, under the terms established in the internal document: "Payment of Tuition fees to grant holders".

The grant holder will benefit from health insurance, supported by INESC TEC.

2. OBJECTIVES:

The interest in direct current (DC) power distribution systems has been growing significantly, driven by the increasing use of power electronics-based loads and the rise of distributed energy resources (DERs), which inherently operate in DC. In the context of this technological evolution, the HYNET project has emerged to address this challenge, focusing on the development of innovative technologies for AC/DC hybrid power systems—alternating current networks that integrate DC networks—and the definition of functional requirements to ensure their performance and reliability.
As part of this mission, INESC TEC offers the opportunity to expand knowledge and explore advanced solutions for AC/DC hybrid distribution networks, tackling critical topics such as the operational behavior of these grids, including protection strategies, islanded operation, and service restoration after total or partial grid collapse caused by adverse events.
Within this scope, this research grant aims to achieve the following objectives:
• Expand technical and scientific knowledge on the analysis of AC/DC hybrid distribution and microgrids, fostering a deeper understanding of the behavior of these infrastructures under different operational conditions.
• Advance the study of protection strategies, islanded operation, and service restoration, developing safer and more resilient approaches for AC/DC hybrid distribution and microgrids.
• Develop advanced computational simulation models, ranging from the simulation of complex and representative use cases to the detailed modeling of components such as power cables, power converters, and protection devices, exceeding the current state of the art.
• Design and validate innovative control and operation methodologies for AC/DC hybrid distribution networks, focusing on challenges such as dynamic stability, steady-state operation, protection, islanded mode management, and service restoration after faults.

This research grant offers a unique opportunity to join a leading research team and contribute to the advancement of more efficient, secure, and sustainable energy solutions. If you are passionate about being part of this transformation and making an impact on the future of power grids, join us!

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

- Survey of the state of the art regarding dynamic and steady-state analysis of AC/DC hybrid distribution networks and microgrids;
- Survey of the state of the art regarding protection, islanding operation, and service restoration in AC/DC hybrid distribution networks and microgrids;
- Identification of use cases for hybrid AC/DC distribution networks and assessment of the technical challenges in the addressed aspects that are still unresolved according to the current state of the art;
- Development of innovative technical and scientific solutions to address the challenges identified for the use cases from the previous point, using computational simulation;
- Contribute to the development of toolboxes for computational simulation, specifically designed for DC networks, considering widely used software in academia and system operators, such as Matlab, PSCAD, PSSE, and DIgSILENT PowerFactory;
- Contribute to the writing of project deliverables, where the developed work should be reported.
- Dissemination of the work in international journals and/or conferences

4. REQUIRED PROFILE:

Admission requirements:

The PhD degree must have been obtained within the three years prior to the date of submission of the application and the research work leading to the award must have been carried out at a host entity other than INESC TEC.

Preference factors:

- Proficiency in English (written and spoken).
- Relevant academic or practical knowledge in control theory and power electronics.
- Knowledge of computational simulation tools (for example, Matlab, PSCAD, PSSE or DIgSILENT PowerFactory).

Minimum requirements:

Solid academic knowledge in electrical power systems

5. EVALUATION OF APPLICATIONS AND SELECTION PROCESS:

Selection criteria and corresponding valuation: the first phase comprises the Academic Evaluation (AC), based on the criteria referred to in Article 12 of the Regulations for Grants of INESC TEC, while the second phase comprehends the Individual Interview (EI). All factors are evaluated on a scale of 0 to 100, taking into account the applicants' merit, suitability and conformity with the preference factors.
The weight of the AC factors are as follows: Academic Qualifications (FA, 50%), Scientific Publications (PC, 20%), Experience (EX, 20%) and Motivation Letter (CM, 10%).
Candidates who score less than 50 points in the AC average will be considered excluded on absolute merit. The top five candidates approved on absolute merit will be qualified for the individual interview. The Final Grade (CF) is obtained by the weighted average of AC (80%) and EI (20%).

DISABILITY INCENTIVE

Candidates who present a degree of disability equal to or greater than 90% will benefit from an incentive (20) in the score of the CV Assessment.
Candidates who present a degree of disability equal to or greater than 60% and less than 90% will also benefit from an incentive (10) in the score of the CV Assessment.
Said score may, in these cases, exceed 100 points.
Candidates must demonstrate the degree of disability during the application, namely through the submission of the

Multi-Purpose Medical Certificate of Disability, issued in accordance with Decree-Law no. 202/96, of October 23 - currently in effect.
Candidates must declare, in the application form, the type of disability used throughout the selection process, in order to proceed with the required adaptations.

The Selection Jury is composed of the following members:

President of the Jury: Justino Miguel Rodrigues
Full member: Carlos Moreira
Full member: Ignacio Gil
Substitute member: Clara Sofia Gouveia

Release of results and prior hearing: the results of the selection process, as well as the terms and procedures for prior hearing, will be released to the applicants by email, under the terms referred to in Article 13 of the Regulations for Studentships and Fellowships of INESC TEC.

6. FORMALISATION OF APPLICATIONS:

Application Documents:

1. Motivation letter;
2. Curriculum Vitae (must include the list of previous fellowships, their type, beginning and end dates, funding entities and host institutions);
3. Certificate or diploma degree;
4. Documental evidence to support the country of residence, residence permit or other legally equivalent document, in cases where the applicant is a foreigner or non-resident in Portugal - valid until the beginning of the grant.
5. Other supporting documents relevant to the final assessment.

Failure to deliver the required documents within the 90-day period after the date of the notice of the conditional awarding of the grant implies its cancellation.

Application period: From 2025-07-24 to 2025-08-06

Submission of applications: the application will be formalised by submitting the form available in the *Work With Us* section of INESC TEC website.

7. BINDING LEGISLATION AND REGULATION

The hiring process shall comply with the current legislation regarding the Research Grant Holder Statute, approved by Law no. 40/2004 of August 18, in its current wording, as well as by the Regulations for Grants of INESC TEC and for FCT Grants Regulation in force.

For more information, please check the Regulations for Grants of INESC TEC and relevant annexes at www.inesctec.pt/bolsas

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