CALL FOR GRANT APPLICATIONS
(AE2024-0427)

INESC TEC is now accepting grant applications to award 1 Research Grant (BI) within the scope of the INESC TEC LA funded by National Funds through FCT - Portuguese Foundation for Science and Technology, I.P., project reference LA/P/0063/2020.

1. GRANT DESCRIPTION

Type of grant: Research Grant (BI)

General scientific area: ENGINEERING

Scientific subarea: Electrical engineering

Area of Work: Power Systems - Converter dominated power grids

Grant duration: 12 months, starting on 2024-11-27, with the possibility of being renewed until the end of the project.

Scientific advisor: Carlos Moreira

Workplace: INESC TEC, Porto, Portugal

Maintenance stipend: € 1259,64, 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:

Grid-forming inverters are critical for the future of power systems, especially as renewable energy sources such as solar and wind become more dominant. Traditionally, power grids have relied on synchronous generators to assure grid stability by providing system inertia and regulating voltage and frequency. However, as the share of renewable energy increases, synchronous generation progressively decreases, leading to emergency challenges with respect to grid stability.
Grid-forming inverters will play a key role in enabling 100% renewable grids by providing the necessary grid stability of inverter dominated power grids. The primary difference between grid forming and grid following inverters lies exclusively in their control systems, being possible to operate any inverter in the aforementioned modes provided proper adaptations are made.
In this context, the objectives of this grant are:

- Expand the knowledge of the state of the art regarding the operation of converter dominated power grids;
- Develop innovative methodologies for the coordinated control of grid forming type converters for the provision of fast regulation services aiming to improve grid stability
- Develop innovative methodologies for coordinating the control of reactive current provision from power converters to improve transient stability of synchronous units.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

- Survey of the state of the art regarding the use of grid forming inverters in power grids, either exploiting energy storage systems as well as endowing renewables power conversion stages with this type of functionalities;
- Develop a PHIL-based simulation set suited for off-line and on-line studies exploiting equipment existing in the smart grids laboratory
- Identification of innovative methodologies for coordination strategies of grid forming inverters using advanced systems and tools exploiting PMU-based information;
- Exploit the experimental set-up for proof-of-concept of the proposed methodologies
- Writing Q1 journal papers.

4. REQUIRED PROFILE:

Admission requirements:

The awarding of the fellowship is dependent on the applicants' enrolment in study cycle or non-award courses of Higher Education Institutions.

Preference factors:

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

Minimum requirements:

Solid academic knowledge in electrical power systems. </minimum

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: Carlos Moreira
Full member: Justino Miguel Rodrigues
Full member: Filipe Joel Soares
Substitute member: João Peças Lopes

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. Proof of enrollment in a degree awarding study cycle or in a non degree awarding Higher Education program.
   - The proof of enrollment may be presented just during the grant hiring stage.
5. Signed declaration stating the infringement of the grant holder's duties (article 14, no. 4)
6. 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.
7. 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 2024-10-10 to 2024-11-10

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