

# BiWPT - Bidirectional Wireless Power Transfer for Next-Generation Electric Mobility

MSCA Doctoral Network



## Doctoral Candidate 3 (DC3)

*Metamaterial design using high-power-handling materials for increasing power transfer efficiency*



Funded by  
the European Union

**HOST INSTITUTION** University of Aveiro, Portugal



**CONTRACT**  
36 months

**START DATE**  
From 1 January 2027

**APPLICATION DEADLINE**  
1 October 2026

### ABOUT BiWPT

The BiWPT Doctoral Network on **Bidirectional Wireless Power Transfer for Next-Generation Electric Mobility** has a clear mission: to train a new generation of experts who possess the skills and fundamental knowledge required to effectively address the challenges of bidirectional WPT systems for electric mobility, enabling vehicle-grid integration in support of Europe's energy transition. The network will advance fundamental understanding and practical implementation of efficient, compact, and misalignment-tolerant bidirectional WPT technologies. Expected innovations include novel electromagnetic coupling and converter designs, integrated shielding concepts and real-world demonstrators that enable seamless, efficient, and high-power electric vehicle charging and discharging. The network delivers a training programme to 15 Doctoral Candidates (DC), providing capabilities to become leaders of tomorrow's R&I in Europe.

### ABOUT THE UNIVERSITY OF AVEIRO

University of Aveiro has evolved into one of the most dynamic and innovative universities in the country, considered one of the best universities of the Times Higher Education Young University Rankings for the world's universities that are aged 50 years or under. Presently it has more than 16000 students distributed across 16 Academic Departments and 4 Polytechnic Schools that work together in an inter-disciplinary manner. Since 2019, UAveiro is part of the ECIU University, together with other 13 research intensive universities, with a collective emphasis on innovation, creativity, and societal impact driving the development of a knowledge-based economy.

### SKILLS & OBJECTIVES

**Desirable skills/interests:** Metamaterials; Simulation engineering and modelling; Energy systems; Electrical and electronic engineering; Mathematical physics; Materials engineering; Systems engineering.

**Objectives:** Design, modeling, and validation of metamaterial structures using high-power-handling dielectric and composite materials to enhance wireless power transfer efficiency. The DC will design and analyse artificial metamaterials (i.e., artificial magnetic conductors, metasurfaces, and frequency-selective surfaces) to confine electromagnetic fields and reduce leakage. The focus will be on identifying dielectric and composite materials with superior power handling, low dielectric losses, and strong thermal stability. Using full-wave electromagnetic simulations in the software program CST Studio, the most promising solutions will be integrated into practical WPT coils and systems. Experimental validation on a WPT prototype will demonstrate the efficiency and safety benefits of the metamaterial-enhanced system.

The DC will participate in two planned secondments as part of the doctoral training programme: an academic secondment at the co-supervising university abroad and an industrial secondment at the mentor's company.

The DC is expected to submit regular progress reports to the local and network supervisors. In addition, the DC will actively participate in BiWPT's training, dissemination, communication, and exploitation activities. The DC will prepare a doctoral thesis and publish scientific articles related to the research project.

## PROFILE & REQUIREMENTS

- Master's degree (or equivalent) in Electrical Engineering, Electronic Engineering, Communication Engineering, Mechatronics, Applied Physics, or equivalent. Master's students in their final year may apply. Transcripts of the master's degree should be obtained before signing the contract.
- Outstanding academic results. Moreover, applicants must have the necessary academic skills and background to make the success of a doctoral degree.
- Applicants must have the ability to understand and express themselves in both written and spoken English to a level that is sufficiently high for them to derive the full benefit from the network training.
- Motivation and commitment to interdisciplinary and intersectoral training.
- Ability to work both individually and in a team with adequate communication skills.
- Eligible to enrol in a PhD program at the host institution.

### MSCA Eligibility Criteria

**Mobility Rule:** Applicants must not have resided or carried out their main activity in the country of the recruiting host institution for more than 12 months in the 3 years prior to the recruitment date. Compulsory national service, short stays such as holidays and time spent by the researcher as part of a procedure for obtaining refugee status under the Geneva Convention are not taken into account.

**Doctoral Candidate Rule:** Applicants must not already hold a doctoral degree on the date of recruitment. Researchers who have successfully defended their doctoral thesis but have not yet formally been awarded the doctoral degree will not be considered eligible.

## BENEFITS

### Competitive MSCA Remuneration

The successful candidates will receive an attractive salary in accordance with the [MSCA WP 2023-2025](#). The **gross salary** includes a living allowance (+/- € 4000 per month, dependent on the applicable EU Country Coefficient), a mobility allowance of +/- € 700 per month and, if applicable, a family allowance of +/- € 495 per month. **These amounts are nominal (gross) amounts and certain deductions will apply for social security contributions and/or taxes according to the applicable national laws of the country where the recruiting beneficiary is located.** The exact (net) salary will be confirmed upon appointment and is dependent on local tax regulations and on the country correction factor (to allow for the difference in cost of living in different EU Member States).

### Contract Extension

PhD funding is guaranteed for 36 months. Depending on the local Supervisor and conform the regular PhD time in the country of origin, **additional funding might be available**. In countries where PhDs typically last longer than 36 months, beneficiaries may provide additional funding for the remaining period to finish the PhD if the DC fulfils all requirements at the end of month 36.

### Training & Development

Funding for technical and personal skills training and international research events.

### International Network

Secondments and training opportunities within the BiWPT consortium.

## HOW TO APPLY

Submit your application via the online application form at [www.biwpt.eu/apply](http://www.biwpt.eu/apply) **no later than 1 October 2026**. Candidates are encouraged to apply as early as possible, as online pre-interviews may be organized with candidates who meet the profile requirements and have expressed mutual interest for an exploratory conversation. **The selection interviews are planned to take place between 2 and 13 November 2026**. Before applying, candidates are required to carefully read the information on the application and selection process available at [www.biwpt.eu/recruitment](http://www.biwpt.eu/recruitment). The recruitment of Doctoral Candidates (DCs) within BiWPT is conducted in accordance with the principles of the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

## CONTACT & ADDITIONAL INFORMATION

### SUPERVISOR

N.B. Carvalho - [nbcarvalho@ua.pt](mailto:nbcarvalho@ua.pt)

### CO-SUPERVISORS / MENTORS

A.K. Baghel (UAveiro, PT), B. Minnaert (UAntwerp, BE)  
C. Alves (HFA, PT)

Questions on the application procedure can be directed to the project manager D. Ceulemans ([david.ceulemans@uantwerpen.be](mailto:david.ceulemans@uantwerpen.be)).

Disclaimer: This offer is subject to the signature of grant agreement nr° 101310414, expected by mid-July 2026.