

# Rules of IEEE Global Student Wireless Power Competition



## Purpose

- To encourage young generations to join the research and development of WPT (Wireless Power Transfer) technologies.
- To demonstrate the WPT capabilities for promoting public acceptance and practical applications of WPT systems.

## Participants

Teams can include undergraduate and/or postgraduate students that are still registered by December 2022. High school students may also join in special cases. Staff members can only serve as advisors.

## Procedure

The competition includes two rounds. The first round is to select qualifying teams based on initial design project reports. The second round is onsite with practical demonstrations at the 2023 IEEE Wireless Power Transfer Conference and Expo (WPTCE), which is the largest event in the world for wireless power research. The competition is to be held on June 6th 2023 at WPTCE'23 in San Diego, CA USA (<https://ieee-wptce.org/competition/>).

## Requirements

The joining teams should present a project by taking the following aspects into consideration:

- The project may be near field or far field wireless power solution for transferring power. For the demonstration in the conference, no more than 100 watts of power should be transferred over a distance of a few centimetres to meters even if the project is capable of transferring more. Note there is no limitation on what technology is to be used. All types of wireless transfer systems are encouraged, as long as they can demonstrate real time wireless power transfer and show the advantages in improving the system power transfer efficiency, density, distance, etc.
- The project may be supplied by 110V/60Hz AC sources which will be available at the site to be connected to the Power Transmitter (Tx). Battery powered systems may be used for easy setup, and regulated DC supplies will be provided if requested a month in advance of the demonstration. If batteries/supercapacitors are used at the Power Receiver (Rx), they should be completely discharged before the demonstration or the team will need to justify the use of the batteries/supercapacitors to the judges and how the power is being transferred.
- At least part of the system needs to be portable for carrying to the competition site for practical demo/competition at WPTCE'23. The part that will be demonstrated in the conference should have a size over 1m<sup>3</sup>.
- EMC (Electromagnetic Compatibility), standards and safety requirements need to be satisfied outside the 1m<sup>3</sup> demonstration area, and along a power flow path via air or other media if applicable.

### **Initial Project Reports Submission**

For the initial project reports submission, the joining teams are required to submit **a project report within 10 pages** (in a single column standard technical report format, excluding appendices). The project report will be checked for plagiarism and documents with similarity report equal or above 30% will be immediately disqualified. Any idea from any literature should be properly cited using IEEE standard.

The project report should at least contain an introduction, objectives of the project, design concept, results, conclusion and a list of the references cited. A project report missing any of those items will lose 15% per item missing. For double blind review, any personal information such as name of students, university and project should be submitted in separate. Only the title of the project can be added to the report. **Any report with disclosed names of universities and/or students will be disqualified for competition.**

Appendices are only to indicate extra information not completely related to the development of the project, such as standards, tables of material specifications, letter of support, etc. The budget can also be in the appendices. All the design concept schedule and results should be within the report and counted for the limit of number of pages.

Project reports exceeding the number of pages will lose 10% of the points per extra page.

### **Practical Demonstrations in the Conference**

For the practical demonstration of the second round, the joining teams are required to create a short video explaining how the project works and demonstrating the power transfer. The **video should be no longer than 10 minutes**. It should show all parts of the project and demonstrate a load not being powered before switching on the developed device and being powered as soon as the developed device turns on to proof the transfer. Demonstrations of the power/voltage and current in the RX and TX at the two different moments (before and after coupling RX and TX) should be clear.

Only the teams selected from the submission of the initial project report will be allowed to demonstrate the project in the conference.

The practical demonstrations will take place at the 2023 IEEE Wireless Power Transfer Conference and Expo (WPTCE), where **selected participants should have the videos available for demonstration. The full project or part of the project should also be available** at the conference for viewing. The project part available at the conference should also be shown in the video demonstration.

No more than 50 W should be transferred in the demonstration at the conference. Projects with higher power may participate, but will not be allowed to transfer more than 50 W in the conference.

Poster with information and figures about the project is recommended but not required. In this case, the poster should follow the requirements of the conference. More information about poster size and standard will be provided for the selected teams.

### **Assessment**

The assessment and selection of projects related to near field or far field wireless power solution will be done separately, i.e., project with near field will not compete with far field wireless power solution.

A judging team including not less than 3 wireless power transfer experts in both academia and industry will assess the project reports by looking at the following aspects:

- **Novelty of the project (20%)**: The global and/or societal contextualization of a problem that is solved by the project, and the need for the project.
- **Correctness of the concepts and theoretical analysis (20%)**: Description of the overall process of development of the project in general terms, explaining how the project solve the problem described. Describe clearly the methodology the team approaches to develop the project.
- **Results and/or final performance (20%)**: Resources used by the project, deliverables of the project, final results, faced problems and achieved milestones.
- **Potential of an impressive live demonstration (40%)**: The project report shows that the project is complete and can show an impressive live demonstration.

### **Awards**

The teams qualified at the initial design report for joining the demonstrations round in the live competitions will be announced and receive a certificate from IEEE. A cash grant of will be given to the best qualified projects that attend the WPTC'23 conference.

Detailed requirements and supports to the second round will be advised later. The teams may request travel subsidies for joining the competition. The final winning team may publish their demonstration system in an IEEE magazine by recommendation.

### **Timeline**

- Submission of the initial design report      ~~17 Feb 2023~~ Extended to 08 March 2023
- Announcement of qualified teams            28 Mar 2023
- Final registration                                    05 May 2023

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