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Editorial

Network for the Large-Scale Integration of Renewable Energies in Electrical Systems (RIBIERSE-CYTED, 723RT0150): Results for 2023

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The RIBIERSE-CYTED network, *i.e.*, the network for the large-scale integration of renewable energies in electrical systems (723RT0150) (2023-2026) is a hub for researchers and technologists belonging to Ibero-American universities, companies, and local administrations. This network promotes cross- training, mobility between centers, and the dissemination and implementation of technical and training activities aimed at analyzing and developing opportunities for the maximal integration of renewable resources, seeking a more sustainable energy model while allowing for the increased use of renewable resources and electric mobility (e-mobility).

This framework of cooperation and joint scientific research allows establishing synergies and exchanging experiences in order to construct a shared vision of Ibero-American society, from suppliers to end users, thanks to the fostering and transfer of knowledge to the business sector and the training of users. To this effect, the proposed lines of action, which are derived from the specific objectives of this network, are grouped into three areas. The first line includes the assessment of energy planning models and tools, as well as the prediction, evaluation, control, and management of

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renewable sources currently in use in Ibero-American countries, with the aim of extending, developing, and systematizing their application. The second line deals with analyzing the effective application of methodologies in real cases. Finally, the third line is dedicated to the technical training of researchers and suppliers of sustainable systems, as well as to the electrical eco-literacy of end users.

The kick-off meeting of the RIBIERSE-CYTED network was held in the second half of 2023, and it was a great challenge to arrange its schedule, as the network is made up of 22 Latin American countries and 214 researchers. As a consequence, all actions, distributed among 13 specific objectives, have led to the following achievements:

- 23 research projects on the development of technical and economic tools for optimal electricity management, which are aimed at hybridizing different renewable energy, storage, and e-mobility technologies as well as improving the transfer of results from research groups to the industrial sector and society in general.
- Three infrastructure works, *i.e.*, the construction of a solar thermal collector testing laboratory (Panama), the expansion of the ETL laboratory at Universidad de Talca (Chile), and the construction of the Pelton hydraulic microturbine's remote laboratory (Bolivia).
- Four technological contracts: one involving energy efficiency consulting for Isla de la Juventud (Cuba) and three related to electric vehicle safety (Cuba).
- 21 final degree projects from network member universities, namely in Spain, Argentina, Cuba, Ecuador, Colombia, Panama, Portugal, and Venezuela.
- Three doctoral theses from partner universities in Spain and Argentina.
- Two utility patents (currently in the process of application or undergoing processing): a power quality analyzer and a system and method for smoothing photovoltaic generation intermittency (Brazil).
- Three internships linked to the selection of electric motors for artisanal fishing boats equipped with photovoltaic panels (Colombia), the Engineering Coop Program at LUMA (Puerto Rico) and, finally, the Faculty Mini Sabbatical Program of Summer 2023 hosted by Lawrence Livermore National Security LLC (LLNS) (Puerto Rico).
- Five short mobilities: from Spain to Brazil, from Spain to Argentina, within Colombia, from Portugal to Spain, and from Portugal to Spain, with funding external to CYTED.
- One cycle of postgraduate conferences with speakers from members from Spain and Colombia, which was published on the CYTED website.
- Five technical courses in Cuba, Ecuador, El Salvador, Panama, and Peru.
- Two postgraduate courses in Argentina and Colombia, two Diploma courses in Panama and, finally, two research conferences in Cuba and Ecuador.
- Two semiannual/annual meetings of the RIBIERSE-CYTED network: the first one (the kick-off meeting) was held online at the University of Jaén (Spain) during June 2023, and the second one, the first annual meeting, was held in the city of Manabí (Ecuador), within in the framework of the VII Scientific Convention of Universidad Técnica de Manabí (UTM), with broad participation by the partners and co-financing members of the University of Jaén and UTM, respectively.

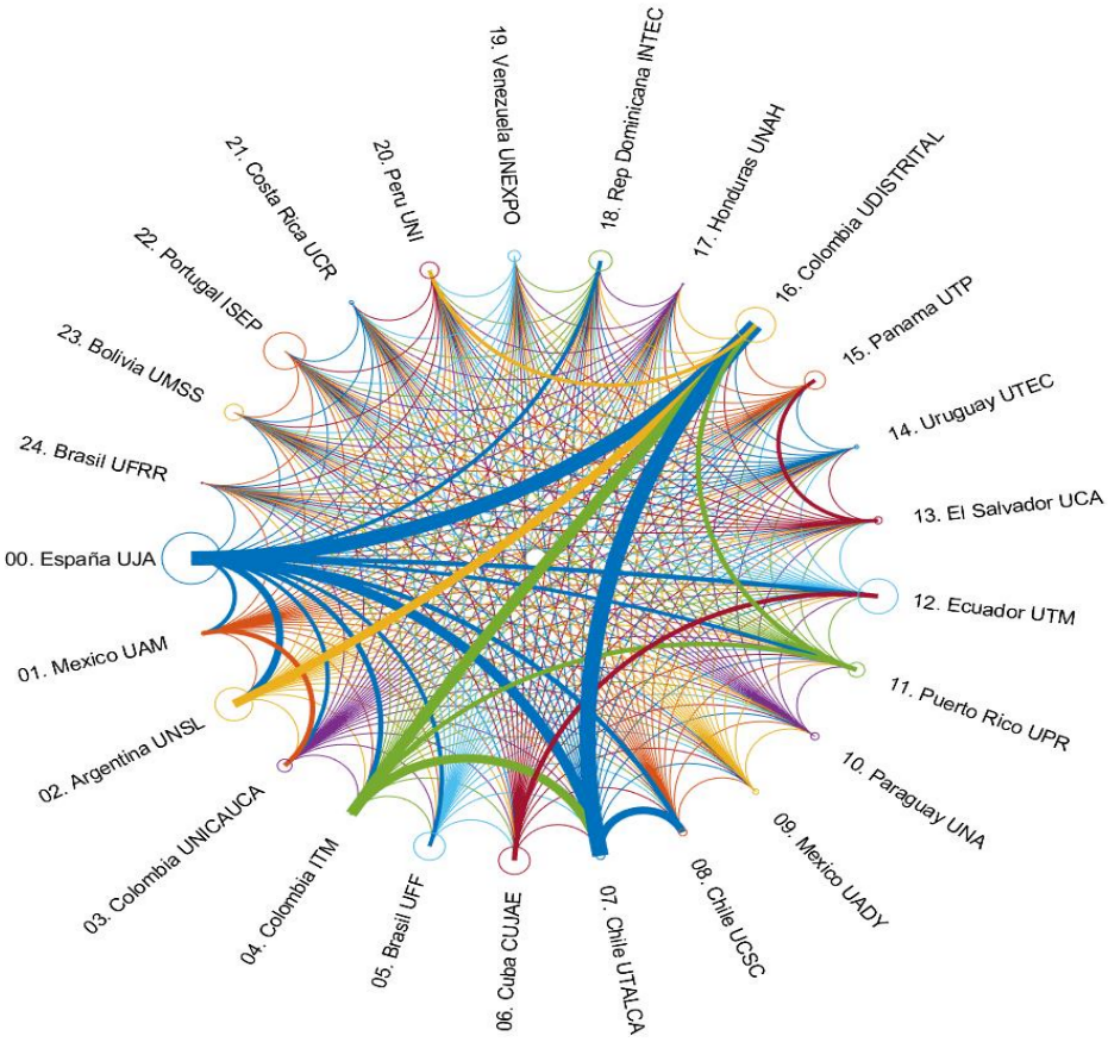

Figure 1. Interrelation between partners in collaborative activities

- Participation in Universidad Nacional de San Luis's Engineering Week (Argentina), two seminars in Argentina and Colombia (one was collaborative, with the participation of more than one member of the network), the II Symposium on Electrical Engineering in Colombia, the Workshop on the Rural Energization Plan for the Cauca Region (Colombia), the 52nd Technical Exhibition at the Ricaldone Institute: Electric Vehicles (El Salvador), and, finally, the V INERGE Workshop (Brazil).
- 113 articles published in scientific journals, 31 of which were collaborative works.
- 34 articles related to participation in scientific events (conferences).
- One event memoir.
- 10 deliverables with the participation of all RIBIERSE members.
- 34 news pieces, eight of which are available on the CYTED website and are related to the achievements made by the network in Spain, Ecuador, El Salvador, Panama, Chile, and Argentina.

In addition, 28 CYTED pieces have been disseminated through other channels and are related to congresses, courses, conferences, engineering weeks, workshop seminars, doctoral theses, short mobilities, and attendance to scientific events.

Figure 1 describes the interrelation between the participants involved in collaborative activities. This figure faithfully reflects what happened in the first year of the network's journey, as collaboration between member partners is still difficult, sometimes due to lack of knowledge regarding the lines of work of each research group or regarding personal relationships that can benefit professionals in the medium and long term.

Finally, it is worth noting that all the achievements during the network's first year of collaborative work demonstrate the great commitment of its members, who are grateful for the support offered by the Ibero-American Program of Science and Technology for Development (CYTED)[**]. It is also worth highlighting the funding and patronage provided to the RIBIERSE-CYTED network by the University of Jaén, UTM, and all the participating universities and companies external to the network for its activities.

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[*]∗The CYTED program was created by the governments of Ibero-American countries to foster cooperation in science, technology, and innovation while aiming for harmonious development.

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