Final Report on WIRE's Short-Term Scientific Missions (STSM) and Inclusiveness Target Countries (ITC) Conference Grants

CA 20127

Waste biorefinery technologies for accelerating sustainable energy processes (WIRE)

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Executive summary

WIRE COST Action activities are developed in the context of 4 Working Groups (WGs). WG 4. Communication and Dissemination is a crucial WG for the success of the COST Action. Proper communication and dissemination are essential to ensure success and achieve the desired impact of WIRE COST Action. Both internally and externally, a proper strategy will determine whether researchers and stakeholders become engaged and committed to the Action's mission and objectives. The main objectives of WG4 are to ensure that (i) the activities and events are adequately promoted and publicised in advance, (ii) the findings and developments of this Action are properly communicated to all the stakeholders (e.g., biorefinery and bioenergy companies, policymakers, NGOs, biomass industry associations, universities) throughout the Action, and that (iii) the dissemination effort endures and remains even after its completion. To accomplish its objectives, WG4 is conducting several tasks, including organizing, launching, reviewing, and managing short-term scientific missions (STSMs) and Conference participation, including their reporting. WIRE COST Action is aware that STSMs are essential to enable researchers to benefit from short stays at laboratories in other COST member countries and to carry out research activities that will add value to their research careers and promote international collaboration between different research groups. Additionally, awarding Inclusiveness Target Countries (ITC) Conference Grants allows researchers from ITC countries to participate in International Conferences that otherwise would have no financial means to participate. This report presents the STSMs and ITC conference grants that have been awarded during the course of WIRE COST Action. A total of 39 STSMs have been realised, and 9 ITC conference grants have been awarded.

1. What are Short-Term Scientific Missions (STSM) and Inclusiveness Target Country (ITC) Conference Grants?

Short-term scientific missions (STSM) are exchange visits between researchers involved in a COST Action, allowing a scientist to visit an institution or laboratory in a country other than their home affiliation. The start and end dates of an STSM must be within the active Grant Period of the Action. The STSM aims to support individual mobility, strengthen existing and establish new networks, foster collaboration in excellent research infrastructures, and share new techniques that may not be available in a participant's home institution or laboratory. The specific work to be carried out within the STSM must concern topics related to the WIRE COST Action and contribute to its scientific goals. Thus, the STSM topic must be framed within one of the four Working Groups: WG 1: Raw Materials; WG 2: Biorefinery Conversion Technologies; WG 3: Biorefinery Applications; WG 4: Communication and Dissemination.

ITC Conference Grants support the presentation of own work by a Young Researcher and Innovator affiliated with an Inclusiveness Target Country/Near Neighbour Country for their participation in high-level conferences fully organised by a third party, i.e., not organised nor co-organised by the COST Action. ITC Conference Grants are Open to Young Researchers and Innovators (individuals <40 years old) with a primary affiliation at an institution located in an Inclusive Target Country (ITC) or a Near Neighbour Country (NNC) participating in the WIRE COST Action. The applicant must make an oral/poster presentation at the conference and be listed in the official event/conference program. The main subject of the presentation at the approved conference must be on the topics of WIRE and must acknowledge the COST Action. The grantee delivers the approved (oral or poster) presentation in accordance with any specific acknowledgement request set by the Action MC.

1.1. How to apply for a WIRE's STSMs and ITC Conference Grants?

At the start of each grant period, WIRE COST Action announces that applications for STSMs (and ITC Conference Grants) are open. The announcement is posted on WIRE's website, where detailed application rules are available. Announcements are also made on WIRE's social networks, including LinkedIn, Instagram, Facebook, Twitter, and a WhatsApp channel, followed by WIRE's members. For the STSM application, applicants must have an e-COST profile that includes their CV. This information will be visible in the Action for evaluation purposes. Applications are then submitted electronically via the e-COST platform. The following information must be provided in the application: title; start and end dates (within the active Grant Period); the applicant's requested budget; and information about the host institution and the contact person. The three following documents must be uploaded on e-COST: application form (following the template available on e-COST) describing the goals, the work to be carried out by the applicant, the expected outcomes, and the contribution to the Action MoU objectives with a clear indication of WG; a confirmation letter from the Host Institution on its availability to receive the applicant; and a support letter from home institution (in case of PhD students).

Applications to the ITC Conference Grants are submitted online in e-COST at least one month before the Conference using dedicated forms. Applicants must upload their CVs to their e-COST profile. Applicants are informed that their applications and CVs may be accessed by holders of leadership positions and any evaluation committees for evaluation purposes. Applications will be evaluated until the budget is available. The application content to be filled on e-COST should include the conference title, date (within the active Grant Period, i.e., no overlap across two consecutive Grant Periods), country, the requested budget, and the attendance type. The application form (with the template available on e-COST) should describe the relevance of the conference topic to the Action and the potential for impact on the applicant's career. It must include a copy of the abstract of the accepted oral or poster presentation, the acceptance letter from the conference organisers, a short description of the applicant's involvement in WIRE COST Action, and a recommendation letter from the supervisor for PhD student candidates. Upon approval of the application, the Grantee receives a Grant Letter from the Grant Holder stating the approved amount and the conditions for receiving the grant.

1.2. Funding

STSM applications are evaluated continuously until the budget is available. Evaluation criteria are based on the consistency of the proposed activity with the Action MoU objectives and on the consistency of the requested amount with the time duration and location, maximising the number of granted participants and countries. Priority is given to Young Researchers (i.e., non-tenured PhDs and post-docs under 40 years old) and to Innovators (individuals). Specifically for WIRE, after the submission of an STSM or ITC conference grant proposal, the grant awarding coordinator (GAC), Mara de Joannon, analyses the eligibility criteria and, if eligible for funding, shares the application with the other members of the Core group, asking for their evaluation and comments. The GAC gives 48 hours to receive the comments; otherwise, they consider the tacit consent. If accepted, the candidate is informed that their STSM has been selected for funding and the awarded value. Thus, after approval, the financial support for the STSM takes the form of a travel grant awarded to individuals, which is not intended to cover employment costs. It contributes to travel, accommodation, and subsistence expenses, to the implementation of the project, to the delivery of the report to the COST Action MC, and to the overall effort. To ensure the widest possible participation in the STSM program, the suggested maximum grant amount for each STSM has been set at 1,000€ for 1 week, 1,500€ for 2 weeks, and 1,750€ for 3 or more weeks. The grants are paid after the completion of the activity and approval of all required documentation. However, STSM grantees may request up to 50% pre-payment of the approved grant. This amount is subject to the availability of funds and approval by the Grant Holder Institution. Once the STSM has ended, the grantee must submit a report on the visit's outcomes and a letter from the hosting institution acknowledging the STSM. The report must be submitted within 30 days after the STSM end date or within 15 days after the Grant Period end date. Failure to submit the required report on time will result in the grant being cancelled. The grant will be paid in full within 30 days of the report's approval.

Regarding ITC conference grants, the financial support provides a contribution for travel, accommodation and subsistence expenses, registration fees, the printing of scientific posters, and overall effort. Conference Grants do not necessarily cover all the expenses of participating in a given conference. For this reason, the maximum amount awarded is 2,000 € per grant for face-to-face conferences and 500 € for virtual conferences. Still, the final decision on the awarded amount will consider the duration and location of the Conference, as well as the actual conference fee. Upon approval of the application, the Grantee receives a Grant Letter from the Grant Holder stating the approved amount and the conditions for receiving the grant. Once the activity has ended, the Grantee must submit the required reports and relevant documentation in e-COST within 30 days after the activity's end date or 15 days after the end of the Grant Period, whichever date comes first, and claim the payment by submitting the report via e-COST. The latter requires the submission of (i) the report to the Action MC on the outcome of the presentation of the accepted contribution in terms of the Grantee’s visibility, including the establishment of new contacts for future collaborations, (ii) the certificate of attendance, (iii) the programme of the conference or book of abstracts/proceedings indicating the presentation (oral or poster) of the Grantee, and (iv) a copy of the given presentation (oral or poster). Finally, the grants are paid by the Grant Holder Institution after the completion of the activity and approval of all required reports/documentation.

2. WIRE COST Action's STSMs – A global balance from the 1st to the 4th Grant period (GP)

2.1. 1st Grant period

During WIRE's 1st GP, there was 1 STSM call, which opened in January 2022 and stayed open until the STSM budget was fully attributed (May 2022). The STSM program received 5 applications in total, and all of them were approved.

Among the grantees, 60% were female, 80% came from Inclusiveness Target Countries (ITC), and 80% were young researchers (less than 40 years old). The average STSM duration was 2.5 weeks, and the average grantee age was 32.

The total budget for STSMs in this GP was 9,500 €. Research centres and universities have participated as primary and host institutions from 9 different countries. Primary institution countries: Türkiye (1), Germany (2), France (1), and the United Kingdom (1); Host institution countries: Portugal (1), Italy (1), Austria (1), Slovenia (1), and Latvia (1). Table 1 lists the STSM participants, their work titles, and the institutions involved during WIRE's 1st GP.

Table 1. List of the STSMs granted during the 1st GP.

Name	Work title	Primary institution	Host institution
Gul Ebru Orhun	Biorefinery approach to the valorization of hazelnut shells as a source of antioxidant extracts and biochars	Canakkale Onsekiz Mart University, Türkiye	NOVA University of Lisbon, Portugal
Krishna Prasad Shrestha	Investigating the influence of nitrogen compounds on syngas and biogas oxidation	Brandenburg University of Technology, Germany	STEMS – CNR, Italy
Philipp Graefe	Commissioning of 1 barrel per day Fischer-Tropsch slurry bubble column reactor	Karlsruhe Institute of Technology (KIT), Germany	Bioenergy and Sustainable Technologies (BEST), Austria
Elsa Duret	Valorization of tannin extraction residues	University of Pau and Adour's Country, France	InnoRenew CoE, Slovenia
Morgen Mukamwi	Review of existing biomass feedstock databases and design of a conceptual database architecture for biorefinery conversion	University of Strathclyde, United Kingdom	University of Latvia, Latvia

2.2. 2nd Grant period

During WIRE's 2nd GP, there was 1 STSM call, which opened in January 2023 and stayed open until all the STSM budget was fully attributed (July 2023). The STSM program had 9 approved applications.

Among grantees, 44.4% were female, 66.7% came from ITC, and 88.9% were young researchers (less than 40 years old). The average STSM duration was 5 weeks, and the average age of the grantees was 35.

The total budget for STSMs in this GP was 21,900 €. Research centres and universities have participated as primary and host institutions from 12 different countries. Primary institution countries: Greece (1), Serbia (1), Germany (1), Türkiye (4), Italy (1), and Netherlands (1); Host Institution countries: Finland (1), Italy (1), Greece (1), Denmark (1), Spain (1), United Kingdom (1), Norway (2), and Germany (1). Consequently, during the 2nd GP, there was an 80% increase in applications and a 33.3% increase in the number of countries involved. Table 2 lists the STSM participants, their work titles, and the institutions involved during WIRE's 2nd GP.

Table 2. List of the STSMs granted during the 2nd GP.

Name	Work title	Primary institution	Host institution
Charikleia Poravou	Upgrading of hydrothermal liquefaction bio-oils by catalytic hydrotreatment	CERTH, Greece	Technical Research Centre of Finland (VTT), Finland
Nataša Nastić	Biohydrogen production using fruit waste as substrate by batch dark and photo fermentation	University of Novi Sad, Serbia	University of Naples Federico II, Italy
Chris Fritsche	Investigation of the corrosion behaviour of high-temperature materials in biohydrogen combustion atmospheres	TU Freiberg, Germany	CERTH, Greece
Gokcen Akgul	Electrocatalyst for PEM fuel cells based on biomass	Recep Tayyip Erdoğan University, Türkiye	University of Southern Denmark, Denmark
Milton van Putten	Development and Synthesis of High-Performance Thermoset Polyurethanes from Biobased Polyols	University of Amsterdam, Netherlands	University of the Basque Country, Spain
Davide Amato	X-ray characterization of contaminated biomass derived char	STEMS-CNR, Italy	University of Edinburgh, United Kingdom
Abdullah Bilal Ozturk	Utilization of regional lignocellulosic waste in Norway for renewable biofuel production	Yildiz Technical University, Türkiye	University of Stavanger, Norway
Haci Mehmet Guzey	Switched Activation Functions-Based Machine Learning Algorithms for Feedstock Characterization of (bio)waste	Sivas University of Science and Technology, Türkiye	Norwegian University of Science and Technology, Norway
Mine Gungormusler	Exploring Integrated Systems for Biorefinery Applications: A Study of Thermochemical Processes at KIT-EBI	Izmir University of Economics, Türkiye	Karlsruhe Institute of Technology (KIT), Germany

2.3. 3rd Grant period

During WIRE's 3rd GP, there was 1 STSM call that opened in November 2023 and closed in September 2024. The STSM program approved 19 applications.

Among the current grantees, 66.7% are female, 77.8% are from ITC, and 88.9% are young researchers (less than 40 years old). The average STSM duration is 2.7 weeks, and the average age of the grantees is 30.7 years.

The total budget for STSMs in this GP was 30,500 €. Research centres and universities have participated as primary and host institutions from 20 different countries. Primary institution countries: Portugal (2), Spain (2), Greece (1), Serbia (3), Türkiye (2), Poland (1), Italy (3), Hungary (1), Germany (1), France (3); Host Institution countries: Sweden (3), Türkiye (1), Germany (3), Croatia (2), Italy (4), Netherlands (1), Belgium (2), Lithuania (1), Slovenia (1), United Kingdom (1). The 3rd GP presented several applications, 111% higher than the 2nd GP, and showed a 66.7% increase in the number of countries involved. Table 3 lists the STSM participants in WIRE's 3rd GP, their work titles, and the institutions involved.

Table 3. List of the STSMs granted during the 3rd GP.

Name	Work title	Primary institution	Host institution
Santa Margarida Dos Santos	Waste-to-Gas: valorization of refuse-derived fuel through gasification to produce renewable gases	NOVA University of Lisbon, Portugal	Royal Institute of Technology (KTH), Sweden
Jaime Moreno García	Bacterial whole cell immobilization in fungal pellets for sustainable biohydrogen production strategies	University of Córdoba, Spain	Izmir University of Economics, Türkiye
Alexandra Bakratsa	Supported iron-based nanomaterials for the valorization of carbon dioxide	CERTH, Greece	Karlsruhe Institute of Technology (KIT), Germany
Mirjana Sulejmanović	Encapsulation of ginger herbal dust extracts obtained by Ultrasound-assisted extraction	University of Novi Sad, Serbia	University of Osijek, Croatia
Ramiro Ruiz Rosas	Biomass waste-based catalysts for dry reforming of biogas	Málaga University, Spain	CNR – ISMN, Italy
Abdullah Bugra Senol	Effects of micro and nano scale magnetite on EPS and SMP during anaerobic digestion of phenolic wastewater	Marmara University, Türkiye	TUDelft, Netherlands
Gözde Duman Tac	Evaluation of synergistic effect between biomass and plastic wastes during pyrolysis using Py-GC/MS technique	Ege University, Türkiye	Ghent University, Belgium

Marta Goliszek	Microscopic and spectroscopic characterization of sustainable films based of polyvinyl alcohol (PVA) and lignin nanoparticles of different origin	Maria Curie-Sklodowska University, Poland	Royal Institute of Technology (KTH), Sweden
Slađana Krivošija	Encapsulation of extracts of orange peel herbal dust and onion agricultural waste in different types of matrices	University of Novi Sad, Serbia	University of Osijek, Croatia
Anja Saveljic	Formulation of nutriosomes as carriers for bioactive compounds isolated from Poncirus trifoliata's peel	University of Novi Sad, Serbia	Università degli Studi di Cagliari, Italy
Biagio Cassese	Numerical modeling of a MILD combustion burner for biorefinery products valorization	Università degli Studi di Napoli Federico II, Italy	BTU Cottbus, Germany
Boyang Su	Enhancing combustion mechanism validation through experimental insights in rapid compression machine techniques	Eötvös Loránd University (ELTE), Hungary	Karlsruhe Institute of Technology (KIT), Germany
Claudio Clemente	Electrochemical characterization of biomass-derived materials for biosensor applications	Università degli Studi di Napoli Federico II, Italy	Center for Physical Sciences and Technology, Vilnius, Lithuania
Corinna Maria Grottola	Optical/laser diagnostic for biochar characterization	Consiglio Nazionale delle Ricerche - CNR - Istituto di Scienze e Tecnologie per L'Energia e La Mobilità Sostenibili, Italy	Lund University, Sweden
Henrique Federico Fichera Araujo	Assessing alternative feedstocks for hydrogen production via electrolysis	Instituto Superior Técnico, Portugal	Ulster University, Belfast, United Kingdom
Marianna Cafiero	Investigation of thermo-kinetic instabilities during NH_3 MILD combustion in a semi-industrial scale furnace	RWTH Aachen University, Germany	Aero-Thermo-Mechanics Department (ATM) of the Université Libre de Bruxelles, Belgium
Nidal Del Valle Raydan	Advanced characterization of keratin extracted from duck feathers for sustainable packaging applications	Université de Pau et des pays de l'Adour, France	InnoRenew CoE, Slovenia

Pierre Brequigny	Hydrogen enriched biogas for power generation	Universite d'Orléans, France	Universita degli Studi della Campania Luigi Vanvitelli, Italy
Seif Zitouni	Interaction of nitrogen containing species on the reactivity of Syngas and Biogas mixtures	Universite d'Orléans, France	Consiglio Nazionale delle Ricerche (CNR) - Istituto di Scienze e Tecnologie per L'Energia e La Mobilità Sostenibili, Italy

2.4. 4th Grant period

During WIRE's 4th GP, 1 STSM call opened in January 2025 and closed in September 2025. The STSM program approved 6 applications.

Among the current grantees, 33.3% are female, 83.3% are from ITC, and 100% are young researchers (less than 40 years old). The average STSM duration is 4 weeks, and the average age of the grantees is 31.2 years.

The total budget for STSMs in this GP was 30,500 €. Research centres and universities have participated as primary and host institutions from 5 different countries. Primary institution countries: Serbia (5), and Italy (1); Host Institution countries: Portugal (3), Croatia (2), Spain (1). Table 4 lists the STSM participants in WIRE's 4th GP, their work titles, and the institutions they are affiliated with.

Table 4. List of the STSMs granted during the 4th GP.

Name	Work title	Primary institution	Host institution
Dejan Dobrijević	Exploring the Digestibility and Permeability of Edible NADES Extracts from Fruit and Vegetable Waste: Applications in Food and Cosmetics	University of Novi Sad, Serbia	NOVA School of Science and Technology, Portugal
Kristian Pastor	Sustainable Recovery of Bioactive Compounds from Fruit and Vegetable Waste Using NADES: Extraction Efficiency and Chemical Characterization	Faculty of Technology Novi Sad, University of Novi Sad, Serbia	NOVA School of Science and Technology, Portugal
Luca Consentino	Efficient Light Olefin Production over Fe/ZrO_2-CeO_2 Catalysts	CNR - Istituto per lo Studio dei Materiali	Department of Chemical Engineering of

		Nanostrutturati (ISMN), Palermo, Italy	University of Malaga, Spain
Marko Zeljko	Biotechnological waste valorization as a type of waste biorefinery technology: Examining different cold-pressed oil production wastes as feedstock for biosurfactant production	Faculty of Technology Novi Sad, University of Novi Sad, Serbia	Instituto Superior Técnico, Universidade de Lisboa, Portugal
Mirjana Sulejmanović	Novel Insights into the Recovery and Stabilization of *Zingiber Officinale* Volatile Aroma Compounds Using Green Solvents	Faculty of Technology Novi Sad, University of Novi Sad, Serbia	Faculty of Food Technology and Biotechnology, University of Zagreb, Croatia
Slađana Krivošija	Innovative encapsulation of onion waste extracts: Harnessing ionic gelation and polyelectrolyte complexation for sustainable applications	Faculty of Technology Novi Sad, University of Novi Sad, Serbia	Faculty of Food Technology and Biotechnology, University of Zagreb, Croatia

3. WIRE COST Action's ITC conference grants. A global balance from the 1st to the 4th Grant period (GP)

WIRE COST Action opened calls for ITC conference grants during the 2nd and 4th GPs. At the 2nd GP, WIRE approved 4 ITC conference grants totalling 5,150 €. The grantees were all young researchers with an average age of 34 years, all from ITCs, and all females. The primary institutions of the grantees were from 3 countries: Serbia (1), Slovenia (1), and Türkiye (2). The grantees, work titles, primary institution, and conference name are presented in Table 5.

Table 5. List of ITC conference grants awarded during the 2nd GP.

Name	Work title	Primary institution	Conference
Jovana Kojić	Potential renewable energy production from the anaerobic digestion of urban food waste in Serbia	University of Novi Sad, Serbia	15th Mediterranean Congress of Chemical Engineering (MECCE), Barcelona, Spain
Mariem Zouari	Valorization of forest residue, a step towards cleaner air	Innorenew CoE, Slovenia	19th International Conference on Renewable Resources & Biorefineries (RRB2023), Riga, Latvia

Yasemin Ozliman Farimaz	Investigation of $ZnCl_2$ Removal Efficiency of Activated Carbons Obtained from Pellet and Pomace by Chemical Activation Method	Solar Energy Institute, Türkiye	International Conference on Global Renewable Energy and Climate Change (ICGRECC-23), Rome, Italy
Fikret Müge Alptekin	Energy Applications of Phase Change Materials: A Bibliometric Analysis	Solar Energy Institute, Türkiye	International Conference on Global Renewable Energy and Climate Change (ICGRECC-2023), Rome, Italy

During the 4th GP, WIRE approved 5 ITC conference grants totalling 9,000 €. The grantees were all young researchers with an average age of 29.8 years, all from ITCs. The primary institutions of the grantees were from 4 countries: Serbia (2), Croatia (1), Poland (1), and Portugal (1). The grantees, work titles, primary institution, and conference name are presented in Table 6.

Table 6. List of ITC conference grants awarded during the 4th GP.

Name	Work title	Primary institution	Conference
Dario Balaban	Thermodynamic, economic, and environmental performance of hydrogen production via gasification of refuse-derived fuel and carbon capture	Faculty of Technology, Novi Sad, Serbia	3rd GREENERING International Conference, Abu Dhabi, UAE
Jovana Pantić	Antioxidative Potential of Plum Oil-Cake-Based Biofilms	Faculty of Technology, Novi Sad, Serbia	3rd GREENERING International Conference, Abu Dhabi, UAE
Manuela Panić	Introduction of a Novel Plant Extract Composition using Multicomponent Natural Deep Eutectic Solvents (NADES)	Faculty of food technology and biotechnology, Zagreb, Croatia	3rd GREENERING International Conference, Abu Dhabi, UAE
Marta Goliszek-Chabros	Biodegradable packaging materials based on poly(vinyl alcohol) and lignin – sustainable approach toward green economy	Maria Curie-Sklodowska University, Lublin, Poland	3rd GREENERING International Conference, Abu Dhabi, UAE
Ricardo Hipólito	Computational design & Supercritical CO_2–assisted development of tyrosol–molecularly imprinted polymers for their selective recovery from olive extracts	Nova.ID.FCT-Associação para a inovação e desenvolvimento da FCT, Caparica, Portugal	14th International Symposium on Supercritical Fluids, Bali, Indonesia

4. Conclusions

Globally, 39 STSMs have been conducted in the context of WIRE COST Action: 5 in the 1st GP, 9 in the 2nd GP, 19 in the 3rd GP, and 6 in the 4th GP. This corresponded to an 80 % increase from 1st to 2nd GP and a 111 % increase from 2nd to 3rd GP. The number decreased for the 4th GP as the available budget was lower, so there would be additional budget available for ITC CGs. Thirteen countries have been involved in STSMs as primary institutions. The countries at the top of the list of the primary institutions have been Serbia (9), Türkiye (7), Italy (5), and Germany (4). The first two countries are ITCs, which shows they have taken advantage of WIRE COST Action's support to promote new research collaborations. Additionally, 20 countries have hosted STSMs, with the top host institution countries being Croatia (4), Portugal (4), Germany (4), and Italy (4). The last two are non-ITC countries, indicating they have been actively working on capacity-building for researchers from ITC countries. The total budget allocated to STSMs was 71,900 €: 9,500 € in the 1st GP, 21,400 € in the 2nd GP, 30,500 € in the 3rd GP, and 10,500 € in the 4th GP. Furthermore, during the Working Groups Workshop of the 2nd GP, WIRE COST Action organised a special session in which some of the STSM awardees had the opportunity to present the work they performed during their STSM and what they had benefited from it. In the WG Workshop of the 3rd GP and the 4th GP, four STSM awardees (two on each) were also invited to present their work during the WG4 session of each of those Workshops. Regarding ITC conference grants, they were awarded during the 2nd and 4th GPs, when WIRE approved 9 grants totalling 14,150 €.

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