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NEWSLETTER, Issue 7 | March 2026

EDITORIAL

As START enters its final phase, this edition reflects both significant progress and meaningful moments for our community. The launch of SUSTENET marks a legacy for the project, ensuring that the work we began together will continue shaping Europe's thermoelectric landscape for years to come.

Our participation in major events since the last newsletter have further expanded our outreach. In this issue, we present the final chapter of Starty's story: "Meet the heroes behind START!", a tribute to all those who are making this journey possible, from the dedicated members of our consortium to the European Commission, whose support and funding is enabling the project to achieve its objectives.

We also highlight the START serious game, an educational tool developed to make concepts related to thermoelectrics and raw materials accessible to all audiences. We pay heartfelt tribute to our colleague Jorge Alexandre, from LNEG, whose creativity and dedication were instrumental to its development. His legacy and spirit continue to be deeply felt across the START team at LNEG.

As we prepare for our final events in Lisbon and Brussels, I invite you to explore this edition and join us in celebrating what START has achieved so far, and what it will continue to inspire.

Filipe Neves



Co-funded by
the European Union

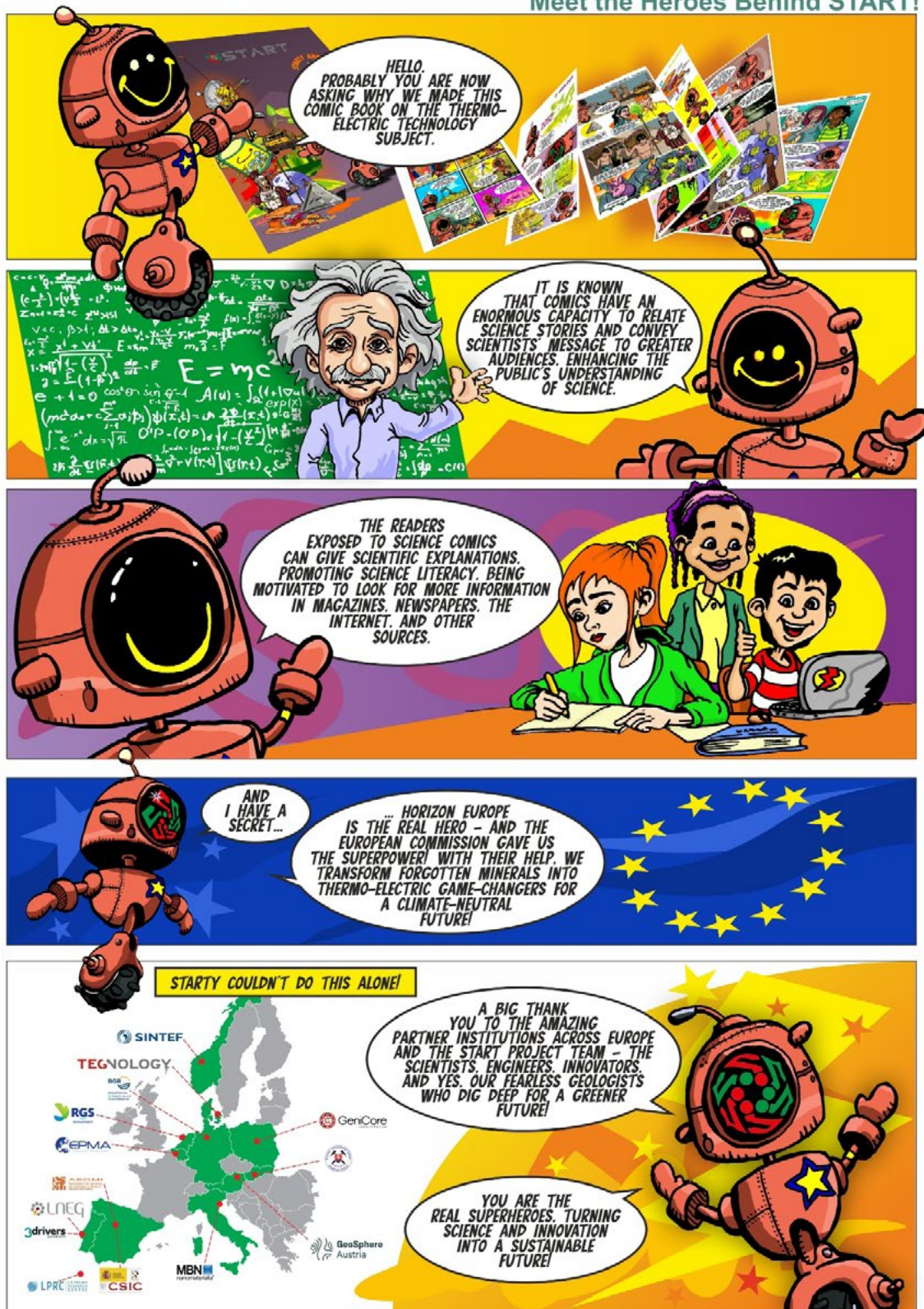
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STARTY 7 — MEET THE HEROES!

Meet the Heroes Behind START!



START CHRONICLES: GEOLOGY, THERMOELECTRICS AND MORE

THE LAUNCH OF SUSTENET: A STRATEGIC LEGACY OF START

The clustering activities of the START project have reached a significant milestone with the formal establishment of the COST Action SUSTENET (Sustainable Thermoelectrics European Network), that we had already anticipated in the previous issue. The journey began with internal strategic discussions that culminated in 2024, when the decision to move forward was finalized through a close collaboration with the THERMOS project. This led to a formal proposal submission in October 2024, with our coordinator F. Neves serving as the main proposer alongside a robust coalition of partners from both START and THERMOS, as well as numerous secondary proposers from the wider thermoelectric stakeholder community, both academicians and industrials.

Approved in April 2025, the network held its official kick-off meeting on October 24, 2025, at the COST offices in Brussels. During this inaugural session, the leadership structure was finalized, appointing key START members F. Neves (LNEG) as Action Leader, P. Carvalho (SINTEF) as Vice Leader, H. Yin (TEGnology) as the Leader of Working Group on Business Development and Supply Chain, and B. Vicenzi (EPMA) as the Leader of the Working Group on Dissemination and Communication. The Action will run until October 2029.

As a critical vehicle for expanding the impact of thermoelectric research across Europe, SUSTENET is designed to support the EU Green Deal by leveraging technology for greater energy efficiency and renewable energy integration. The network is driven by several key objectives, including the development of a mature European thermoelectric market by bridging the gap between academia and industry, thanks to the presence of several key industrials in the team. Furthermore, it aims to spearhead innovation by utilizing Artificial Intelligence for material discovery and establishing standardized measurement protocols. A major focus is also placed on capacity building, which involves supporting young researchers and defining a strategic roadmap for a future European Thermoelectric Centre of Excellence.

To manage these ambitious goals, the network is structured into four specialized Work Groups. The first focuses on Scaling Sustainability through AI, while the second explores Applications and User Cases. The third group is dedicated to Business Development and Supply Chain, and the fourth manages Dissemination, Communication, and Training. Through these comprehensive efforts, SUSTENET will serve as a primary legacy activity, ensuring the continued growth and influence of the research foundations laid by the START project. Many START members will in fact be members of the SUSTENET Working Groups.

Among its activities, SUSTENET is planning grants to fund Short Term Scientific Missions, participation of young researchers and researchers from the so-called "Inclusiveness Target Countries", and dissemination about thermoelectric research in the major scientific events.

The Action has just recently launched its website, that you are welcome to access to read more details, get in touch and, why not, choose to join the Action (this is one of the features of a network!). SUSTENET is also present on LinkedIn and will make use of a YouTube channel and a Zenodo Community for further impact, so you know what to do!





Figure 1 | Photo from the SUSTENET kick-off meeting, Brussels, 24 October 2025

NEWS FROM WORK PACKAGES

News From Work Package 5: “Device Production, Validation & Demonstration”

The fabrication and validation of the WP5 thermoelectric module progressed through several key phases, beginning with the procurement of spark plasma sintered Mg_3Sb_2 and tetrahedrite discs from GeniCore. Before further processing, the sintered discs were sent to LNEG and SINTEF for elemental characterization and to establish a baseline for their thermoelectric properties.

Temperature-dependent Seebeck coefficients, electrical resistivities, thermal conductivities, and specific heat capacities have been measured, which will also be used in the thermoelectric simulation of the TEG module. Subsequently, a sputtering process was employed to deposit a diffusion barrier layer on both the top and bottom surfaces of the discs.

<https://www.cost.eu/actions/CA24120/>

<https://www.sustenet.eu>

<https://www.linkedin.com/company/sustenet>

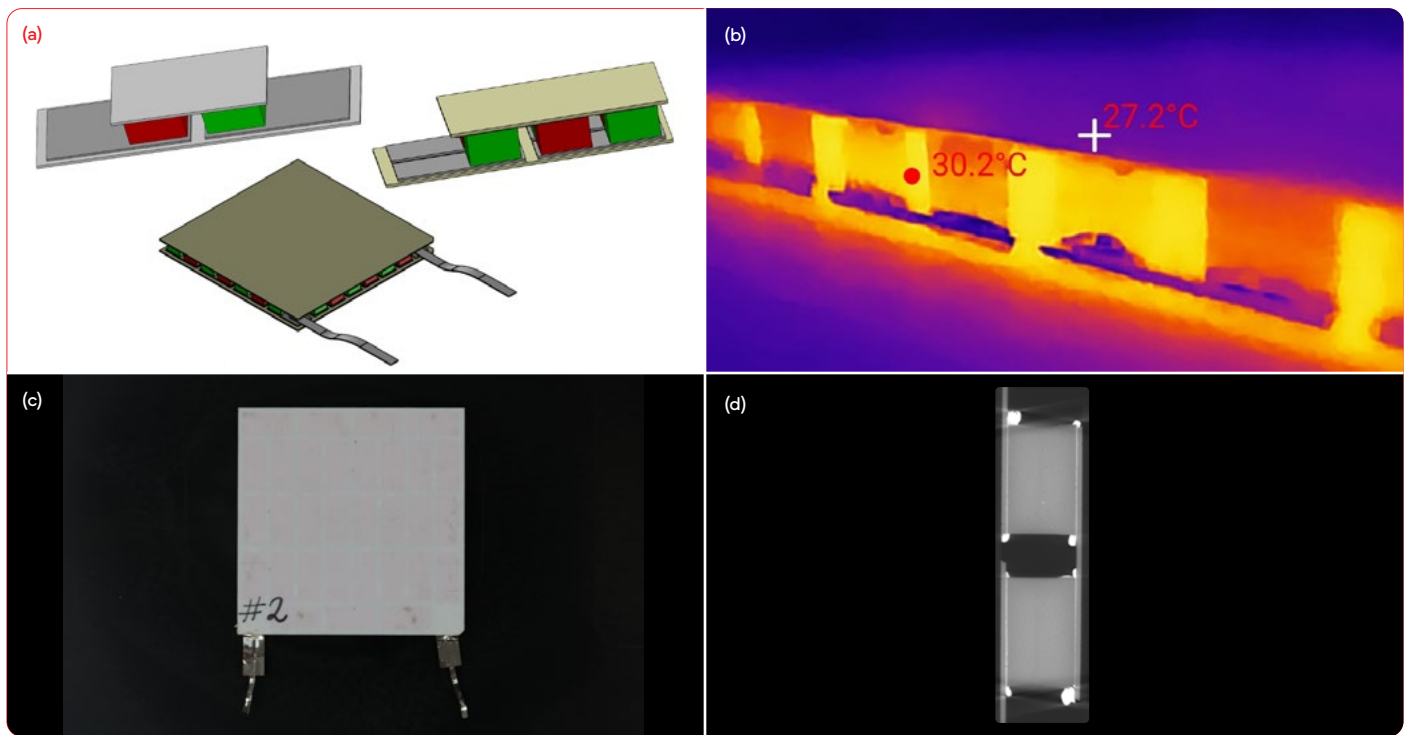


Figure 2 | (a) Schematic illustration of the unicouple, tricouple, and the TEG module | (b) Thermal image of the fabricated module | (c) Non-destructive evaluation of unicouples | (d) START module

Once the diffusion barrier layers are sputtered, the coated discs undergo precision dicing to reach the final required pellet dimensions for module assembly. Pellets with matching heights are chosen, and the initial tests are performed with unicouples, tricouples, and pentacouples. Before making a complete module, thermoelectric simulations of unicouple, tricouple and pentacouple were performed to compare the experimental performance. To build the TEG module, both the Top and Bottom Diffusion Barrier Coated (DBC) substrates were screen-printed with bonding agent, and the pellets were placed precisely in their corresponding positions on the bottom DBC substrate. Finally, to complete the assembly, the top DBC substrate is placed on top of the pellets. The entire assembly is then subjected to a thermal cycle to bond the module. The produced module is then evaluated for defects using visual inspection, internal resistance estimation, non-destructive testing, and thermography. Additionally, the thermomechanical stress simulations were performed on the module to understand the effect of thermal stresses on the TEG module at operating temperatures.

News From Work Package 7: “Innovation and Exploitation Strategy”

• Innovation Agenda and Roadmapping

The START consortium is collaborating towards the creation of a common Innovation Agenda and Roadmap for the commercialization of sustainable thermoelectrics. These strategic documents, once launched, will allow the START consortium and START partners to better plan their future research and commercialization activities at joint and individual levels. On one hand, the Innovation Agenda will offer a generalised understanding of the START value chain potential and the possibility to foster internal innovation processes to upgrade the START thermoelectric ecosystem and to identify key innovation paths that need to be followed in the near future. For the creation of the Innovation Agenda, internal and external experts were consulted through several innovation-based questionnaires.

On the other hand, the roadmap will showcase the actions, key performance indicators and signposts that should be met in the upcoming years for the success of the START value chain. The roadmap will focus on the years 2026-2030 under 6 main areas of relevance: Raw Materials, Processing, Production, Application, End-of-Life and PESTEL (Political, Economic, Social, Technological, Environmental and Legal) aspects. The final Roadmap will be built based on the information collected via desk research and on the interactions with internal and external experts via thematic workshops.

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• START Alliance and Service Company

Following extensive discussions throughout the project lifecycle, the consortium agreed to establish the START Alliance to ensure the long-term continuity of the START network beyond the EC-funded period. The Alliance is designed to sustain and expand the project's impact by fostering a robust and self-supporting thermoelectric ecosystem in Europe.

The START Alliance will function as a central knowledge hub, supporting the creation, growth, and market uptake of sustainable thermoelectric technologies supported by the START Service Company (SSC) acting in alignment with the START Strategic Plan and the Innovation and Commercialization Roadmap. The SSC will serve as a long-term catalyst for commercialization, providing tailored support to consortium members and will also deliver value-added commercial services across the thermoelectric value chain, in line with its business plan and identified market opportunities.

Key actions of the START Strategic Plan include the creation and maintenance of the START Technology Marketplace digital platform, promotion of START services across the thermoelectrics value chain, support for systemic transformation toward a sustainable thermoelectric ecosystem, identification of new European research opportunities, and expansion of the START Alliance by demonstrating its added value to relevant stakeholders

• Have Fun and Learn With the START Game!

The “Energy from Waste Heat” serious game is an online game designed for 1 to 4 players, combining learning and fun. Through playful gameplay, it introduces key ideas about how thermoelectric devices are made, used, and managed at the end of their life. The game highlights innovative devices produced using tetrahedrites recovered from mine waste, offering a sustainable alternative to traditional tellurium-based thermoelements — the main goal of the START project.

As players progress, they earn points by making smart choices linked to circular economy and sustainability principles, such as recycling mine waste, selecting responsible materials, designing better products, and choosing sustainable production, use, and end-of-life solutions.

The game blends luck and strategy, featuring random cards and questions that guide players through four main stages of the thermoelectric device value chain. With its colourful and attractive graphic design, the game also features Starty — the hero from the START project comics — as the game pawn. We recommend reading the comics before playing to get the most out of the experience.

The “Energy from Waste Heat” game is currently in an open testing phase, and everyone is invited to try it out! It's available in all languages of the project (DA, DE, EN, ES, FR, HU, IT, NL, NO, PL, PT, SK).

The game is available through our website or directly here: <https://start-game.eu/>. Have fun and learn thermoelectrics! If you would like to help us improve this fun and educational element of the START project, please get in touch with us:

✉ cristina.rocha@lneg.pt | david.camocho@lneg.pt



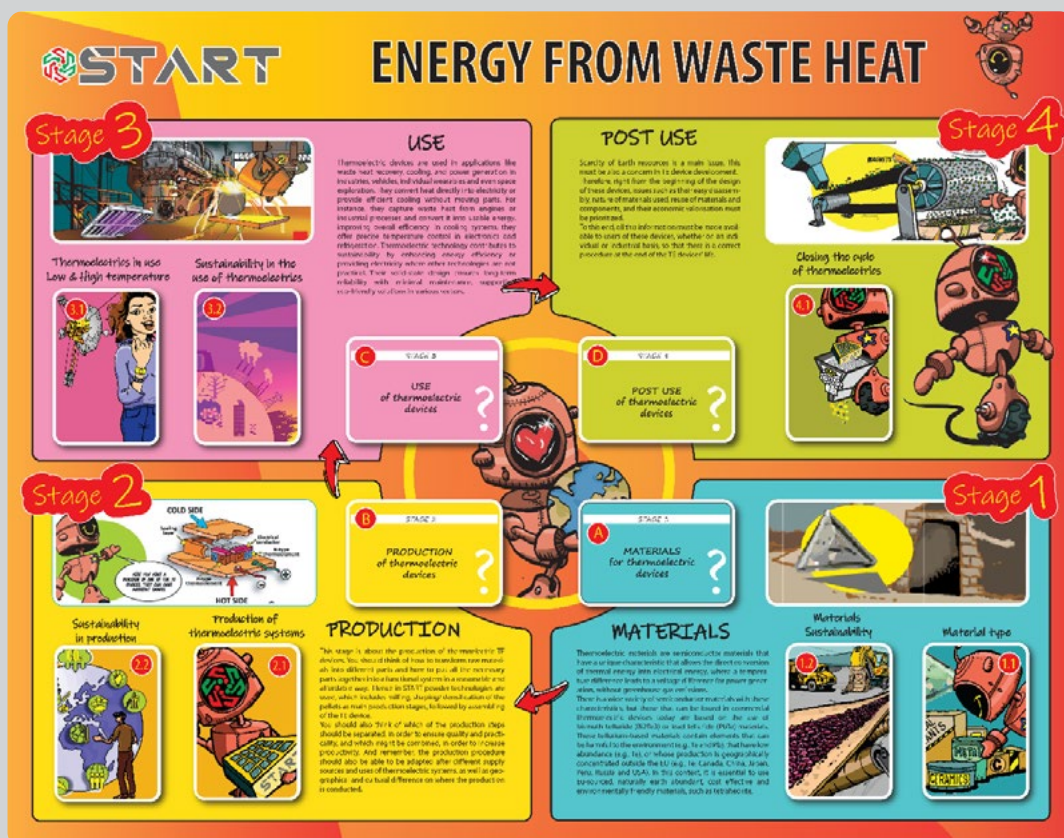


Figure 3 | The board of the START Serious Game “Energy from Waste Heat” in its English version

News From Work Package 6:

“Dissemination of Start Activities and Results Approaches the Final Steps”

- Goldschmidt 2025, Prague, 6-11 July 2025

In July 2025, the START project took to the international stage in Prague for the Goldschmidt Conference to discuss the future of the circular economy. The team presented cutting-edge findings on how mining wastes can be repurposed for high-tech thermoelectric applications, specifically focusing on the Iberian Pyrite Belt. The research poster, authored by I. Morais and colleagues at LNEG, was featured in a specialized session dedicated to non-traditional mineral resources. By engaging with global stakeholders, START continues to advance Horizon Europe’s goals for resource efficiency, proving that mining by-products are vital to the continent’s transition toward a more sustainable and technologically advanced future.



<https://goldschmidtabstracts.info/abstracts/abstractView?doi=10.7185/gold2025.25345>



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Use of mining wastes for high-tech thermoelectric applications – The case of START project in Iberian Pyrite Belt

POSTER

Presented by Igor Moroz

Thursday, 10 July 2025

17:30 - 19:30

📍 Poster Hall 3A (3rd floor, Prague Congress Centre) - Poster #289

Subsession: 05g-P1 - Non-traditional critical mineral resources: Tailings, Coal, Organic-rich Sedimentary Rocks

Session: 05g - Non-traditional critical mineral resources: Tailings, Coal, Organic-rich Sedimentary Rocks

Theme: Theme 05: Earth Resources and Energy

Abstract

Europe aims to become the first climate neutral continent by 2050, which means rapidly implementing a green transition to which the European Union (EU) is strongly committed through the European Green Deal. This green transition leverages unprecedented pressure on the intensive use of mineral resources. In this context the START project 'Sustainable Energy Harvesting Systems Based on Innovative Mine Waste Recycling' emerged with the objective to use mining waste as a source of raw materials for the development of advanced energy conversion devices. Thermoelectric materials (TE) are functional materials that can directly convert thermal energy into electricity. Tetrahedrite, a copper antimony sulfosalt, possesses such properties, and when antimony is replaced by arsenic, it forms tennantite ($\text{Cu}_{12}\text{As}_4\text{S}_{13}$). Portugal has a long mining history, resulting in large amounts of mining waste. In the Iberian Pyrite Belt in the south of the country, which is one of the world's largest repositories of massive sulphide deposits, VhIMS and vein-type deposits contain significant quantities of tetrahedrite. Mineralogical and chemical quantification and metallogenetic studies are conducted on samples from Neves-Corvo (VhIMS), Barrigão and Brancancas (vein-type) to characterise the quantities of minerals of interest. The major mineralogical phases identified were: (chalcopyrite $\pm$ pyrite $\pm$ quartz $\pm$ tennantite $\pm$ sphalerite $\pm$ stannite) in Neves-Corvo; (quartz $\pm$ dolomite $\pm$ chalcopyrite $\pm$ tennantite) in Barrigão; (dolomite $\pm$ chalcopyrite $\pm$ quartz $\pm$ tennantite) in Brancancas. Chemical analyses show in Neves-Corvo (0.3% As and 349 mg/kg Sb); Barrigão (1.7% As and 11549 mg/kg Sb) and Brancancas (0.3% As and 1069 mg/kg Sb). The Neves-Corvo samples show a high content in Ag (120 mg/kg) and Se (327 mg/kg) WHICH can be used as a sub-product.

Current data support the presence of tennantite-tetrahedrite group minerals in IPB mines, which can be exploited as a secondary resource. Previous data show that As has neither a beneficial nor a detrimental influence on the thermoelectric properties of tetrahedrites. More studies should be performed to evaluate the tetrahedrite volume in these and other deposits in Iberian Pyrite Belt for their application in TE materials.

Funding and Acknowledgments: START project (project number: 101058632) is co-funded by the European Union.

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• START Makes Waves at ECT2025!

The START project continued its tradition of excellence at the 21st European Thermoelectric Conference ECT2025 in Nancy, France, this past September. Building on the momentum from our high-visibility appearance at ECT 2024 in Krakow, the consortium once again took centre stage with a dedicated project booth and a wealth of scientific insights.

As this was START's final official appearance at the ECT series before our formal conclusion as a Horizon Europe project, we went all out to ensure a «grand finale». Besides being sponsors in the event, our team focused on maximizing every connection and conversation, leaving a lasting legacy within the international thermoelectric community. Our booth in Nancy (see Figure 5) became a vibrant meeting point, specifically fostering connections between our team and academic researchers. Visitors were greeted by Starty, our project mascot, in a continuous video presentation, alongside a suite of materials designed to bring our work to life:

- Visual deep-dives into every stage of the START value chain via samples of the different intermediate products.
- Latest project literature and dissemination materials.
- A brand-new «Results» banner, spotlighting our most significant breakthroughs to date.

The project's industrial strength was also on full display, as partners GeniCore and RGS Development hosted their own booths nearby, creating a powerful START «footprint» across the exhibition floor.



Figure 5 | The START booth at ECT 2025, with roller banners, video roll, samples and literature



Figure 6 | The START consortium members present in Nancy, from the partners LNEG, GeniCore, EPMA, TEGnology and RGS Development

• START Workshop at ECT2025

In addition to its exhibition presence, START organised a dedicated workshop session within the official ECT scientific programme. Due to the density of the conference schedule, the workshop was condensed into a single session held on Tuesday 9th September 2025 (15:15–17:00), structured around short expert interventions followed by a panel discussion.

The session, titled “How to take TE to the market by academia – industry collaboration?”, focused on the central challenge of translating European thermoelectric research excellence into industrial deployment and market-ready solutions. Speakers included representatives from START, European industry and EU-funded projects:

- Hao Yin (TEGnology – START)
- Aniruddha Ray (RGS Development – START)
- Kornelius Nielsch (IFW Dresden – THERMOS project)
- Vicente Pacheco (Fraunhofer IFAM)
- Frédéric Lani (Thermopowersystems)
- Filipe Neves (LNEG – START Coordinator)
- Marisol Martin Gonzalez (CSIC)

The session was highly attended, with a full room and strong audience engagement. The panel discussion generated a lively debate on industrialisation barriers, value-chain structuring, scaling challenges and the need for stronger academia – industry interfaces in European thermoelectrics.

The impact of the workshop extended beyond the session itself: throughout the following days of the conference, numerous participants visited the START booth for follow-up discussions, technical exchanges and exploration of future collaboration opportunities, confirming the workshop’s strong visibility and relevance within the community.

AGENDA			
 START			
9th September 2025, 15:15-17:00, Room 101			
Round Table: How to take TE to the market by academia-industry collaboration?			
Part 1: Academic and Industrial contributions			
15:15	15:19	Welcome	Filipe Neves - LNEG, START Project
15:19	15:27	Needs and Challenges in Re-shaping TEG Supply-Chain in EU	Hao Yin - TEGnology ApS
15:27	15:35	Thermoelectric Modules and Applications: An Industrial Perspective	Aniruddha Ray - RGS Development
15:35	15:43	Durable and sustainable thermoelectric devices made from zinc- and magnesium-antimony alloys	Kornelius Nielsch - IFW Dresden
15:43	15:51	Towards industrial production of high-temperature thermoelectric modules	Vicente Pacheco - Fraunhofer IFAM Dresden
15:51	15:59	How to Successfully Transfer Thermoelectric Technology from Academia to Industry? The Case of ThermoPower Systems.	Frédéric Lani - Thermopowersystems
15:59	16:07	Driving thermoelectric innovation through research-industry collaboration	Filipe Neves - LNEG
16:07	16:15	Bridging Nanoscale Thermoelectrics and Triboelectrics: From Lab-Scale Innovations to Prototypes	Marisol Martin Gonzalez - CSIC
Part 2: START Round Table			
16:15	16:56	Round Table Discussion: "How to boost TE use in Europe?"	Moderator: Kornelius Nielsch - IFW Dresden
16:56	17:00	Recap and End	Filipe Neves - LNEG, START Project



Figure 7 | The graphics used to advertise the workshop online, detailing the programme



Figure 8 | The session opening by F. Neves



Figure 9 | All the panellists during the discussion. Left to right: K. Nielsch, V. Pacheco, A. Ray, H. Yin, F. Lani, F. Neves, M. Martin Gonzalez

• START at Euro PM2025 (European Powder Metallurgy Congress & Exhibition)

START continued its long-standing engagement with the European Powder Metallurgy Congress & Exhibition (EuroPM), organised by EPMA, following its participation in previous editions in Lyon (World PM2022), Lisbon (2023) and Malmö (2024). At EuroPM2025 in Glasgow, START combined its project booth presence with active participation in a series of Critical Raw Materials (CRM)-focused activities organised through EPMA-coordinated EU projects.

– CRM Clustering Workshop (14 September 2025)

On Sunday 14 September, START contributed to the joint RESQTOOL–BLOOM workshop titled “Primary and Secondary Raw Materials: how can Europe reduce scarcity risks and boost the Green Transition”. The workshop brought together scenario analyses, project contributions and a strategic round table discussion. START was represented by its coordinator Filipe Neves, who:

- Delivered a project pitch: “STARTing the Future: Transforming Mine Waste into Sustainable Energy Harvesting Materials”
- Participated in the round table discussion: “CRM Act and 2030: where are we?”



Figure 10 | F. Neves presenting START at the RESQTOOL/BLOOM Clustering Workshop on 14th September 2025



Figure 11 | F. Neves during the Round Table in the RESQTOOL/BLOOM Clustering Workshop on 14th September 2025

If you weren't one of the 27 participants who joined us live, you can watch the full workshop at your convenience. The entire session has been uploaded to the RESQTOOL YouTube channel, organized into a three-part series. The START project takes centre stage in Parts 2 and 3, though you will spot our signature roller banner right from the start of Part 1. For a highlight you will not want to miss, head over to Part 2 at the 44:05 mark to catch the insightful pitch by F. Neves.

– Activities Within EuroPM2025

START also featured in several activities within the official EuroPM programme:

- Participation in the “Critical Raw Materials Corner” session (PM Forum stage), organised by the REPTiS project, with a project presentation titled “START Project – Sustainable Energy Harvesting Systems Based on Innovative Mine Waste Recycling”
- Representation in the Special Interest Seminar panel discussion: “PM and Critical Raw Materials: Issues and Opportunities”, again organised by REPTiS

Throughout the congress, START maintained the usual a dedicated booth in the exhibition area, showcasing project results through videos, banners, posters, literature and a small selection of project samples, supporting networking, dissemination and stakeholder engagement.



Figure 12 | F. Neves during his presentation in the CRM Corner at Euro PM2025 – Figure 13 | The panel discussion in the Special Interest Seminar at Euro PM2025, featuring F. Neves as panellist – Figure 14 | The START booth at Euro PM2025

www.youtube.com/watch?v=hSixTQyNNiQ

www.youtube.com/watch?v=j3Jetacu8al

- START at the MacaroNight on 26th September 2025

START was always present at the MacaroNight event organised in the Canary Islands as part of the European Researchers' Night. This was repeated in 2025 (on the 26th of September). Starty comics and other project material were available for participants. Specifically, in part of the event hosted in the island of Gran Canaria, LPRC displayed the Starty comics and project videos for a total of 1005 visitors. Figure 15 showcases the Starty comics displayed and available for participants during the event.



Figure 15 | Starty's comics were offered to the participants at the Gran Canaria event inside the Macaronight on 26th September 2025

- International Professional Geology Conference, Zaragoza (Spain), 5-7 November 2025

Our partners IGME and LNEG prepared a presentation titled « Tetrahedrite: A mineral for a changing world. Its potential in the Iberian Peninsula», to be presented at the fifth edition of the International Professional Geology Conference (IPGC), held in Zaragoza, Spain, from 5 to 7 November 2025, and organised by the Spanish Official Association of Geologists (Colegio Oficial de Geólogos), the European Federation of Geologists (EFG) and the Portuguese Association of Geologists (Associação Portuguesa de Geólogos). Ester Boixereu of IGME presented it to the audience on 6th November, 11:00 AM.



Figure 16 | The first slide of the presentation given by E. Boixereu at the IPGC2025

- START at the Raw Materials Week 2025

The START project participated in the Raw Materials Week 2025 in Brussels. In addition to attending the main conference, START joined forces with ten other Horizon Europe projects to co-organise and co-fund a dedicated clustering side event focused on innovation, collaboration and Critical Raw Materials (CRMs).

Responding to shared challenges faced by EU-funded innovation projects across the CRM value chain, START co-hosted the interactive workshop titled «Crossroads of Innovation: Shared Challenges and Joint Solutions in Raw Materials», together with the REESOURCE project and nine other Horizon Europe initiatives.

The workshop was designed as a collaborative platform to connect innovation efforts, generate actionable solutions, and accelerate Europe's transition towards a resilient, sustainable and strategically autonomous CRM supply system.

https://single-market-economy.ec.europa.eu/sectors/raw-materials/week_en

Its objectives were to:

- Share hands-on solutions developed within Horizon Europe projects
- Identify common barriers to scale-up and deployment
- Build cross-project synergies and cooperation pathways
- Support the translation of innovation into policy-relevant impact



START contributed directly to the “Secondary Raw Materials – Waste to Value” session through a keynote intervention by its coordinator Filipe Neves (LNEG) “Engineering Sustainable Thermoelectrics from Secondary Raw Materials: The START Approach”, and his participation in the following round table on secondary raw materials.

The presentation highlighted START’s strategy for transforming secondary raw materials and mine waste into sustainable thermoelectric solutions, positioning thermoelectrics as a concrete “waste-to-value” pathway within Europe’s circular economy and CRM strategy.

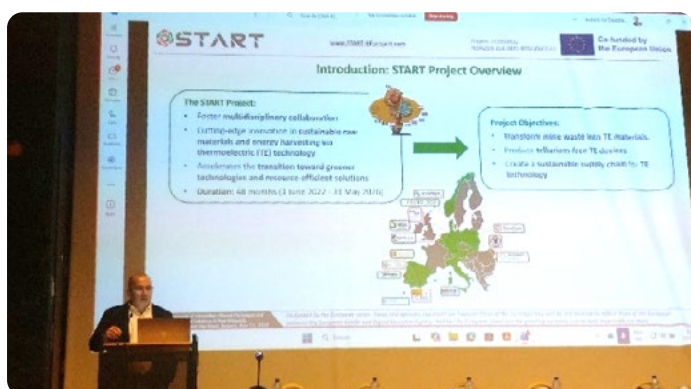


Figure 17 | F. Neves presenting START in the Side Event of the Raw Materials Week, and the panel discussion at the end of the second session

The side event attracted 115 registrations, 91 of which were registrations for on-site presence. Final participation included 52 in-person attendees and 25 remote participants, that is more than 77 active participants, a strong attendance level for a Friday side event following the official Raw Materials Week programme.

Representatives from START partners EPMA, ASGMI and IGME-CSIC were also present, contributing to networking, dissemination and stakeholder engagement.

Beyond the side event, START partners actively participated in the wider Raw Materials Week programme, focusing on:

- Distribution of project materials
- Stakeholder engagement
- Liaison with institutional, industrial and policy actors
- Preparation of pathways for future exploitation and deployment of project results

This coordinated presence reinforced START’s positioning within the European CRM and sustainability ecosystem and strengthened its role in cross-project clustering and cooperation dynamics.

• The START Project Reaches Future Engineers at Nebrija University (Madrid)

On 17th February 2026, Paula Adanez Sanjuan and Ester Boixereu i Vila (IGME-CSIC) brought the START project to the classroom, visiting first-year Civil Engineering students at Nebrija University in Madrid.

As part of their core Geology curriculum, ten students were introduced to the real-world applications of their studies. The session began with an overview of the START project’s mission, highlighting the vital role geologists play within the interdisciplinary team.

Highlights of the day were :

- The «Starty» Comics: The students were delighted to receive the project comics, praising them for being both fun and informative. A special shout-out goes to João Mascarenhas, the students were particularly impressed by his illustrations!
- The Serious Game: The students split into four teams to tackle the Spanish version of the START Serious Game. While the experience was highly educational, it provided valuable feedback for the project: some first-year students found the technical text length a bit challenging, suggesting a «level-up» opportunity for their future studies.

The event was a resounding success, successfully bridging the gap between academic theory and practical applications in mineralogy, chemistry, and materials science.



Figure 18 | The students at the Nebrija University while playing the START Serious Game and reading the Starty comics

• Future Events

START is organizing several more events in the next, final months of its activity!

- A Training workshop in Lisbon, 26th March 2026: see dedicated chapter below.
- Two Final Events at the EIT Raw Materials Summit 2026 on 19th and 20th May 2026: see dedicated chapter below.

More events might see START participating in addition to these, and we will inform you in due time – just check our social media channels and website! If you are from a similar initiative or project and would like to organise something together, please get in touch with us!

A START PAPER PUBLISHED ON “INNOVATION NEWS NETWORK” AND “THE INNOVATION PLATFORM”

START has published an article on the website “Innovation News Network”, a news agency dedicated to research, emerging science, policy and innovation topics across the globe. The two-page article, titled “START drives EU innovation in tellurium-free thermoelectric materials”, was published on the INN website on 31st October 2025. It was prepared by many partners in the consortium: LNEG, EPMA, MBN, GeniCore, SINTEF, RGS, TEGnology, 3Drivers. It summarises the results that could be published to this date. In early December it was included in issue 24 of their Open-Access downloadable magazine “The Innovation Platform”. In Figure 57 a screenshot of the website is visible.

As the Magazine is normally distributed to more than 200k readers, we expect that our article be read by many stakeholders that we were not able to contact in our communication and dissemination activities.

<https://www.innovationnewsnetwork.com/start-drives-eu-innovation-in-tellurium-free-thermoelectric-materials/63199/>



Figure 19 | The article as published on the magazine “The Innovation Platform”. Read it on the original magazine!

REGISTER FOR THE TRAINING WORKSHOP!

As part of its final phase of activities, the START project will organise a Final Training Workshop on 26th March 2026 in Lisbon, hosted at the Ikonik Lisboa 3* Hotel. This event will represent a key knowledge-transfer milestone of the project and will be open to scientists, researchers, industry stakeholders and innovation actors.

This training workshop is designed as a capacity-building and skills-transfer event, aimed at sharing the scientific, technological and sustainability knowledge developed throughout the START project. Particular attention will be given to the long-term sustainability and reuse of project results, making the training relevant not only for materials scientists and thermoelectric experts, but also for professionals working in sustainability, energy systems, circular economy, raw materials, and industrial innovation.

The workshop will focus on:

- Thermoelectric tetrahedrites from secondary raw materials
- Sustainable raw material sourcing from mine waste
- Thermoelectric materials and devices
- Applications of thermoelectrics for energy production and cooling
- Non-bulk thermoelectric technologies
- Sustainability, life-cycle thinking and circularity in thermoelectrics
- Industrial perspectives and deployment pathways

Lecturers and speakers will be drawn from the START consortium and its expert network, ensuring a high-level scientific and industrial perspective, while respecting all confidentiality and IPR constraints related to project results.

Location: Ikonik Lisboa 3* Hotel, Lisbon (venue details to be confirmed)

Date: 26th March 2026, 9:30-17:30

Audience: Researchers, PhD students, engineers, industry professionals, innovation managers, sustainability experts, policy and technology stakeholders

Further details on the programme, registration and logistics are available on our website, so check it out! Save the date, register and stay tuned!

REGISTER FOR THE FINAL EVENTS!

As the START project approaches its completion phase, the consortium will organise its final dissemination sessions in Brussels, in conjunction and inside the EIT Raw Materials Summit 2026, taking place from 19 to 21 May 2026. A dedicated technical workshop will run on 19th May 2026, practically a side event of the Summit, and a Side Session will be inside the Summit itself, on 20th May 2026. These will serve as the last public dissemination and legacy events of the project. They will mark a key milestone for START, not only as project's dissemination events, but as a launchpad for its long-term legacy, ecosystem and sustainability beyond EU funding.

FINAL EVENT «THE START SOLUTION: THERMOELECTRIC TETRAHEDRITES FROM SECONDARY RAW MATERIALS FOR SUSTAINABLE ENERGY PRODUCTION FROM WASTE HEAT»

The START Final Event on 19th May (9:00-17:30, Hotel Thon Centre, Brussels), titled «The START Solution: Thermoelectric Tetrahedrites from Secondary Raw Materials for Sustainable Energy Production from Waste Heat» will be showcasing the full value chain developed throughout the programme — from secondary raw materials and mine waste recovery to sustainable thermoelectric (TE) materials, devices and applications for waste heat harvesting, and the legacy activities after the end of the project.

This Final Event will play a strategic role in the project's dissemination and impact strategy, as it will present the START technological and scientific results in an integrated and structured way, highlight the sustainability, circularity and industrial relevance of tetrahedrite-based thermoelectrics, connect research, industry, policy and innovation communities, and support the long-term legacy and ecosystem-building objectives of START (START Alliance and START Service Company).

The focus of the full day event will be on:

- Sustainable sourcing of raw materials from mine waste
- Enrichment and processing of tetrahedrite-containing minerals
- Advanced materials engineering and consolidation
- Thermoelectric materials characterisation
- Mid- and low-temperature thermoelectric devices
- Waste heat harvesting applications
- Sustainability, life-cycle assessment and circularity
- Industrial deployment perspectives
- START's long-term legacy structures, including ecosystem building and service models

Speakers will be drawn from the START consortium, ensuring high scientific quality, strong industrial relevance, and full coherence with the project's results, while respecting all confidentiality and IPR management constraints.

A final round table discussion will address the future of thermoelectrics in Europe, including long-term coordination, structuring of the ecosystem, and the potential creation of durable cooperation frameworks beyond the project lifetime, like a Thermoelectrics Industrial Association.

Full programme details, speakers and agenda will be communicated once finalised.

The registration for the workshop will be available very soon. Please follow the website and our social media to be informed promptly. The seats are limited, so please register early!

Location : Brussels, Belgium (Hotel Thon Centre – room Bergen)

Date : Before the EIT RawMaterials Summit 2026, on 19th May 2026

Audience : Researchers, industry stakeholders, innovation actors, policy representatives, sustainability experts, investors, and EU project communities

FINAL EVENT: SIDE SESSION OF THE EIT RAWMATERIALS SUMMIT «A THERMOELECTRICS ECOSYSTEM FROM SUSTAINABLE SECONDARY RAW MATERIALS»

The START project is a sponsor of the EIT RawMaterials Summit 2026, and as such it was granted the possibility of organising a dedicated 1-hour session inside the programme of the Summit.

The Session has been planned on 20th May 2026, 11:45-12:45. To harmonize with the topics and audience of the conference, the title «A Thermoelectrics Ecosystem from Sustainable Secondary Raw Materials» was chosen, and the focus has been placed on the raw materials implications of START.

The preliminary programme, to be confirmed, includes a few short pitches to present the project, the use of raw materials coming from European mine wastes (tetrahedrites) instead of tellurium-containing imported materials, the processes used for the fabrication of the thermoelectric devices, and the launch of the legacy activities, namely the START Alliance and the START Service Company. The conclusion of the session will be a 30' Round Table on the subject "Mine Wastes as a Pillar for Resilience" with guests also from outside the START consortium.

Participation in the START Side Session will be subject to registration for the EIT RawMaterials Summit 2026. All registration details are available on the official EIT Raw Materials Summit website.

Full programme details, speakers and agenda will be communicated once finalised, both on our communication media and on the EIT Raw Materials Summit website.

Location: Brussels, Belgium (EIT RawMaterials Summit venue – The Egg Conference Centre – room to be confirmed)

Date and time: 20th May 2026, 11:45-12:45

Audience: Researchers, industry stakeholders, innovation actors, policy representatives, sustainability experts, investors, and EU project communities

We sincerely hope that you will take the chance of joining both events, our workshop on 19th May and the whole EIT Raw Materials Summit including our Side Session. So, save the date(s) and follow START communication channels for programme updates and registration information! See you all there!



<https://eitrmsummit.com/>

CONSORTIUM TOUR

We continue our tour of consortium members: in this issue, meet GeoSphere Austria (GBA) and 3drivers!

GEOSPHERE

As the national geological, geophysical, climatological and meteorological service, GeoSphere Austria is responsible for advising the federal government and warning the public on geological, geophysical, climatological and meteorological matters.

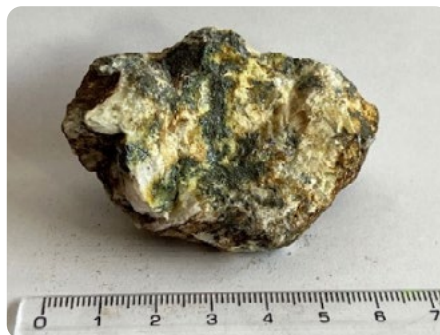
GeoSphere Austria collects, interprets, and archives geoscientific data for Austria. Its core tasks include geological mapping, the assessment of geogenic natural and environmental hazards, as well as the identification of national potential in areas such as renewable energy, groundwater resources, and exploitable mineral resources.

Our experts make their specialised knowledge available in the form of geological maps and models. These serve as a foundation for infrastructure planning, climate change adaptation, and the sustainable use of natural resources. In the service of science and society, we promote a better understanding of Austria's geology while making an important contribution to the safety, resilience, and quality of life. The Mineral Resources Department of GeoSphere Austria collects geologically relevant rock samples and compiles data on active and abandoned mining regions as well as raw material deposits.

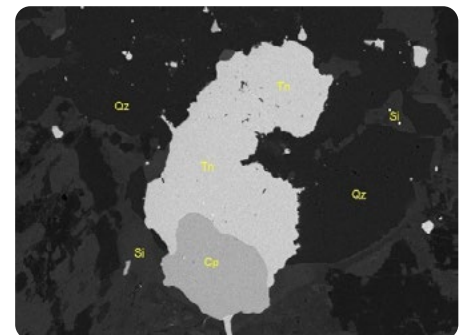
The role of GeoSphere in START is focussed on the selection of mine waste sites (WP2), the collection of raw material from these sites (T2.1), and the separation, concentration and characterization of ore minerals suitable for use in TE devices (T4.1).



Mine waste heap



Ore-rich rock fragment



SEM analysis of ore

3DRIVERS

3drivers is an environmental consultancy created in 2003 by a group of inspired sustainability experts from Instituto Superior Técnico in Lisbon, Portugal. Since 2024, it is part of the Quadrante Group.



With solid technical backgrounds in environmental, materials, chemistry and mechanical engineering, we provide a cross-cutting and multidisciplinary approach to sustainability, with an analytical and innovative vision of the critical challenges that the environmental transition imposes. 3drivers supports partners and clients in areas such as circular economy, waste management and decarbonization. Beyond R&D, we indeed focus on public policy, strategy and planning in the circular economy and waste management domains, corporate sustainability and environmental compliance.

<https://www.geosphere.at>

<https://3drivers.pt>

In the START project, we have been developing the life cycle assessment (LCA) and life cycle cost analysis (LCC) of the tetrahedrite-based TEGs developed by our partners (RGS Development; TEGnology). We also contributed to the industrial viability assessment and in the definition of a commercialization roadmap and commercial ecosystem (WP7, led by LPRC), as well as in dissemination and communication tasks.



CONTACTS

START regularly updates its website and social media with news about its activities, but also with more general documents and info on the topics of relevance for the project. Thermoelectricity, waste heat recovery, mine waste remining, sustainability, raw materials and critical raw materials, energy efficiency, and many others.

If you are interested in receiving this newsletter and other special news from the project directly in your mailbox, consider subscribing our mailing list on the website ("Contacts" page, "subscribe" section)! Clicking on the "Subscribe" button, you will fill a form generated by Brevo, our mailing system, and will subsequently receive an E-Mail to confirm your address. Your data will be treated and stored in accordance with the EU GDPR Regulation. And do not forget to follow all our social media accounts! Here is the list of the important links to click to reach our news:

Website: <https://www.start-heproject.com/>

Twitter: https://twitter.com/START_HEproject

LinkedIn: <https://www.linkedin.com/company/86266991/>

Twitch: https://www.twitch.tv/start_he_project

YouTube: <https://www.youtube.com/channel/UCHVJEhpVz9uaEgzICj2InPA>

SlideShare: <https://es.slideshare.net/StartProject/>

Zenodo: <https://zenodo.org/communities/start-heproject/>

If you have special queries, you can contact us at the following addresses:

- ✉ contact@start-heproject.com
- ✉ filipe.neves@lneg.pt | Filipe Neves, LNEG (coordinator)
- ✉ bv@epma.com | Bruno Vicenzi, EPMA (dissemination manager)