Sustainable Thermoelectric Alliance

STRATEGIC PLAN 2026-2028

for the creation and extension of a sustainable thermoelectric ecosystem

START (Sustainable energy harvesting systems based on innovative mine waste recycling) is an Innovation Action co-funded by the European Commission's Horizon Europe Programme aiming at the establishment of a sustainable innovation ecosystem for thermoelectrics (TE) in the European Union based on the development of sustainable and economically viable TE waste heat harvesting systems. The project supports a transformational change across the entire value chain of TE devices towards sustainable solutions. As a result of in-depth discussions along the project run, the consortium decided to establish the Sustainable Thermoelectric Alliance (STA) with the aim to convert the START network into a permanent and broadened character after the EC-funded period. The Alliance enables the inclusion of additional members who are willing to contribute to the advancement and strengthening of the European sustainable thermoelectric community, while also benefiting from collaboration, knowledge exchange, and opportunities for innovation and commercialization. The STA will be supported by the START European Thermoelectric Systems ÖÜ (SETS), a service company established to support Alliance members in the creation of a sustainable TE commercial ecosystem in Europe.

STA role: it supports the creation and growth of a sustainable thermoelectric ecosystem along the STA Strategic Plan. It serves as a hub for the industrialization and commercialization of sustainable TE devices. STA Vision: A climate-neutral, technologically sovereign Europe where thermoelectric generation and cooling are widely deployed as efficient, reliable, and sustainable solutions. STA Mission: To represent, connect, and strengthen the European thermoelectric ecosystem by accelerating innovation, enabling market uptake, shaping supportive policy, and fostering collaboration across industry, research, and public stakeholders.

STA Core Values:

- Sustainability: Contributing to decarbonization and resource efficiency
- Scientific Excellence: Evidence-based positions and technological rigor
- Collaboration: Cross-border and cross-sector cooperation
- Industrial Competitiveness: Strengthening European value chains
- Integrity and Transparency: Trust-based governance and advocacy

SETS role: it becomes an intermediate in establishing and nurturing the sustainable thermoelectric ecosystem. It supports the members of the STA in their individual efforts to promote their products and technologies.

KEY ACTIONS

1. Policy Advocacy and Representation

Aims	Specific actions	Timeline
Objectives: Influence EU and national policies to support thermoelectric deployment and innovation. **KPIs:** - References to thermoelectrics in EU policy documents - Participation in advisory groups and consultations	- Develop common policy positions and white papers - Engage with EU institutions (European Commission, Parliament, Council) - Contribute to standards and regulatory frameworks - Coordinate national advocacy through member chapters	2026 - 2028

2. Market Enablement and Commercialization

Aims	Specific actions	Timeline
Objectives: Reduce barriers to adoption and increase market pull. **KPIs:** - Number of pilots supported - Growth in deployed TE capacity and cooling systems	- Adopt the publication of application-specific use cases and business cases - Support pilot and demonstration projects - Engage end users in industry, mobility, ICT, and healthcare - Facilitate access to finance and public procurement - Develop lifecycle and sustainability assessments	2026 - 2028

3. Research, Innovation, and Technology Roadmapping

Aims	Specific actions	Timeline
Objectives: Align R&D priorities with industrial and societal needs. **KPIs:** - Joint R&D projects initiated - Technology readiness level (TRL) progression	- Adopt a European thermoelectric technology roadmap - Foster collaboration between academia, RTOs, and industry - Support scale-up of materials and manufacturing processes - Promote open innovation and shared test facilities	2026 - 2028

4. Industrial Ecosystem and Value Chain Development

Aims	Specific actions	Timeline
Objectives: Strengthen European manufacturing and supply chains. **KPIs:** - Number of cross-border industrial collaborations - Reduction in supply chain dependencies	- Adopt the mapping of the European thermoelectric value chain - Encourage partnerships between SMEs and large industry - Adopt and support standardization and interoperability - Engage with raw material and recycling initiatives	2026 - 2028

5. Communication, Awareness, and Skills

Aims	Specific actions	Timeline
Objectives: Build recognition and human capital for the sector. Key Actions: - **KPIs**: - Membership growth - Media reach and event participation	- Develop a strong European brand for thermoelectrics - Adopt the organization of annual conference and thematic workshops - Engage with media, policymakers, and the public - Support education, training, and PhD/industrial programmes	2026 - 2028

6. Critical Raw Materials, Mining, and Circular Value Chains

Aims	Specific actions	Timeline
Objectives: Position thermoelectric generation and cooling as a strategic downstream sector within European Critical Raw Materials (CRM) policy, **KPIs** - Inclusion of thermoelectric use cases in CRM policy documents or funding programmes	- Align the Alliance's strategy with the European Critical Raw Materials Act (CRMA) and national CRM strategies - Establish structured dialogue with European mining companies, refineries, and material processors - Support R&D into CRM-efficient, substitute, and low-criticality thermoelectric materials - Advocate inclusion of thermoelectrics in CRM-related IPCEIs, Innovation Fund calls, and strategic projects	2026 - 2028

7. Collaboration with SETS

Aims	Specific actions	Timeline
Objectives: Facilitate the evolution of the sustainable thermoelectric ecosystem **KPIs**: Established and well-functioning Alliance- SETS collaboration	- Collaboration in STA key actions 1 - 6 - Support services via engaging in activities based on existing competences and interests, such as: ○ digital TM platform ○ matchmaking, networking and communication services covering the full TE value chain ○ fundraising services ○ niche market investigation services ○ regulatory compliance assistance ○ sustainability assessments (LCA, LCC) ○ - evaluation of mining byproducts' potentials	2026 -2028