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Smart and Green
Mining Regions of EU



Action Plan

Stereia Ellada, Greece



National
Technical
University of
Athens



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Action Plan for the Region of Sterea Ellada: Reinforcement of research, technological development and innovation through digital metamorphosis

1. General information

Project: REMIX – Smart and Green Mining Regions of EU

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2. Policy context

The Action Plan aims to impact:

- Investment for Growth and Jobs programme
- European Territorial Cooperation programme
- Other regional development policy instrument

Name of the policy instrument addressed:

Regional Operative Program of the Region of Sterea Ellada

3. Details of the actions

3.1. Raw Materials Policy Background for the Region of Sterea Ellada

Raw Materials and Metallic minerals in particular, consist one of the most prominent sectors for the Region of Sterea Ellada. According to one recent presentation for the Region (performed during the Delphi peer review meeting) “the sector of metals employ 42% of human resources of manufacturing while the sector is responsible for 45% of the Region exports”.

Despite the economic importance of the sector for the Region, and although the significance of metal extraction, processing and manufacturing is highlighted throughout the whole ROP document, yet mining, metallurgy and all related activities are not listed in the main priorities of the Region. Contrary, research and innovation, the main drivers for development for the Raw materials Sector, are actually listed in one of the supported ROP actions, under the thematic objective: “Reinforcement of research, technological development and innovation”.

Nevertheless, the regional activity for the implementation of this thematic objective for the benefit of regional industries, institutions, research centers and universities related to the Raw materials sector is rather limited. The lack of robust actions towards meeting this end, can be attributed to three main causes:

- The Greek Governance and administration system that is central-based leaving limited jurisdiction and flexibility to the Regional authorities
- The limited personnel capacity of regional authorities
- The neutral to negative social acceptance of the Sector by local communities.

The proposed Action Plan, consisting of one Action entitled “**Reinforcement of research, technological development and innovation through digital metamorphosis**”, aspires to assist the Region in taking the first steps towards the realization of the objective “Reinforcement of research, technological development and innovation” of ROP targeting the benefit of the Raw Material Sector. Thus, the idea on how to promote the Regional Policy Instrument, that derived through the Remix processes, was to combine forces with the Ministry of Development (General Secretariat of Industry) and the General Secretariat of Research and Technology and introduce the latest technological trend to the local raw material industries.

In this respect:

- The Region can benefit from the collaboration with Central government authorities and achieve more efficient implementation of the policy instrument.
- The expertise and personnel capacity of central government can assist in by-passing the obstacle of limited personnel of local authorities.
- The collaboration of a high-tech and socially valued scientific sector such as the Digital Technologies can assist to the social acceptance of new research and innovation projects in mining, metallurgy and manufacturing industries.

At this point, it must be noted that the current political situation in Greece, and accordingly in all Regions, is relatively ambiguous. Regional and Local elections brought about changes in the regional representation scheme of Sterea Ellada. Furthermore, national elections have been, also, proclaimed (July 7th, 2019).

Therefore it is considered as a major element of success for the REMIX Project that, in this rapidly changing political scenery NTUA was able not only **to ensure the collaboration and active participation of all involved stakeholders** towards achieving the goals of the Action Plan, but also to receive **a letter of endorsement by the Regional Authorities**, supporting the specific Action Plan.

3.2. Origin, identification and context of the Action Plan

The Region of Sterea Ellada has traditionally been one of the strongest mining regions of Greece, holding the largest deposit of bauxite in the Europe as well as significant deposits of nickel, magnesite and chromite, which contributed to the creation of dynamic mining sites. Thus, the Region of Sterea Ellada has a strong mining-metallurgical background and a surrounding eco-system of secondary processing industries, rendering the raw material Sector as one of the most important economy sectors of the Region.

The promotion of the development strategy for the region of Sterea Ellada is dependent to a large extent by the effective and targeted activation of the sectoral Operational Programs resources, as well as the complementarity between national and EU programs regional actions.

The policy instrument for the Region of Sterea Ellada related to the development of the Region as well as to the REMIX project is **“ROP of Sterea Ellada”**. This policy instrument has been thoroughly reviewed during the Phase 1 of the project and especially the two main Thematic Objectives of ROP that are related to the objectives of *“Smart and Green mining regions of Europe”*:

- **Thematic Objective 1:** “Reinforcement of research, technological development and innovation”
- **Thematic Objective 6:** “ Preserving and protecting the environment and promoting resource efficiency”

The constant efforts of NTUA to improve the effectiveness of the ROP of Sterea Ellada for the Raw materials sector led to the activation of the Region representatives with their consequent participation in several Peer review meetings. Peer Review meetings served as a field for offering and receiving knowledge and experiences, and it was in one of these meetings that the basis for the Action Plan of Sterea Ellada was set: The Peer Review Meeting in Cornwall (May 2018).

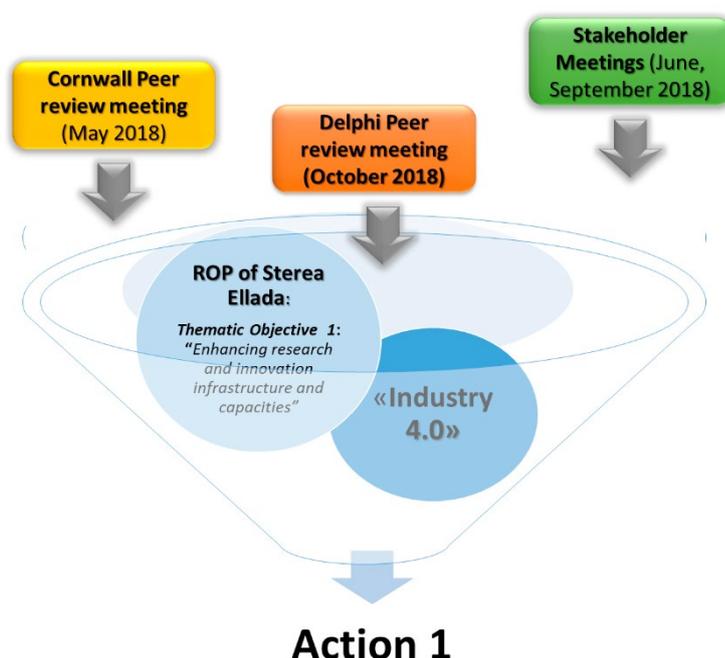
One of the principal axis of the Cornish policy instrument revision and the topic of one of the Round Tables was **“How can mining-related businesses benefit from the digital economy?”**. It was the first time that a link between mining and digital technologies was attempted and discussed and it had a significant impact

to the Greek stakeholders who recognized a unique opportunity for the Region of Sterea Ellada. The outputs of the Cornwall Peer Review Meeting provided the Greek representatives with substantial incentives over the idea of introducing the prospective of digitalization in the Greek extractive industries' ecosystem.

This prospective was introduced during the subsequent stakeholder meetings by the representative of General Secretariat for Industry who presented the National Digitalization Strategy Plan 2016-2021, as a challenge and an opportunity for the Mining and Metallurgy Sector. The importance of introducing the extractive industries and the surrounding ecosystem to the new digital era began to gain more ground between the local stakeholders, and it was selected as one of the topics for discussion in the round tables for the Greek peer review meeting at Delphi, Greece, which took place in October 2018.

Thus, the Delphi meeting round Table "Digitising Mining and Metallurgy Industries- Prospects, Benefits and Challenges", concluded that the fourth industrial revolution extends to the whole of the economy, affecting radically the raw material industry. The benefits of digital transformation need to be accessible by all enterprises, including SME's that have limited capacity to invest in innovation and skilled workforce. The inclusiveness must also extent to the level of Regions by securing the necessary funding in order to avoid major disparities.

Therefore, taking into account the discussions in the Cornwall peer review meetings along with the findings and conclusions of the Greek peer review meeting, the logical consequent step was to design an Action Plan that will serve as a link between the ROP with *Industry 4.0*.



As discussed in the beginning of this section, one of the reviewed thematic objectives of the ROP of Sterea Ellada, involves the promotion of research and innovation within the Region. Digital technologies constitute the state-of-the-art innovations in many technological fields, therefore, there is plenty of room for the synergies between the ROP for Sterea Ellada and the Industrial Digitalisation, the National Strategy foreseen in Industry 4.0. Preliminary case studies present the implementation of the digital solution as a potential game changer concerning the overall operational efficiency and productivity in mining and metallurgy industrial ecosystems, tackling also with energy-related and consumption of raw materials challenges.

It must be noted that currently **no actions deriving from ROP of Sterea Ellada** have been established towards the support of mining and metallurgical industries. The REMIX stakeholder meetings gave the opportunity to the main stakeholders to exchange views and ideas and to contemplate on the bottlenecks and the reasons behind the lack of activity. One of the outcomes from the discussions that took place during the stakeholder meetings suggested **the introduction of technological fields with a wider societal acceptance**, such as the digital technologies, **along with research and innovation** in the raw material Sector, **as a lever for the promotion of the regional policy instrument**.

So the proposed action plan, consisting of one Action entitled **“Reinforcement of research, technological development and innovation through digital metamorphosis”**, targets the establishment of activities that can benefit the Raw Material sector and can be the first out of a series of steps towards the successful implementation of ROP of Sterea Ellada. In order to **initiate reaction** related to the Raw Material Sector of the Region, it was deemed important by all involved stakeholders, to proceed according to four suggested actions (that are described in detail the following section).

Summarizing, the key aspects for the successful start-up and establishment the Action **“Reinforcement of research, technological development and innovation through digital metamorphosis”** are related to:

- The continuous communication and collaboration of involved stakeholders (Activity 1)
- The thorough investigation and review of the environment in which the action will be evolving. (Activity 2)
- The continuous promotion and dissemination of the action to all interested parties (authorities, industries and local communities) (Activities 3 and 4)

3.3. Nature of the action

The concept behind the realization of the Action Plan is for the Region of Sterea Ellada to adopt and promote some basic principles of digital transformation in the regional Industrial eco-system, in full compliance with the Digital Strategy of Greece. This attempt can benefit all enterprises relevant to the mining sector, including SMEs that have limited capacity to invest in innovation and skilled workforce.

The ambitious Action of bridging digital technologies with the mining industry is foreseen to be achieved through a series of four interrelated activities. It must be highlighted that the four activities that will be described in the following section of the Action Plan, are not district actions but on the contrary they consist the roadmap for the successful realization of the Action **“Reinforcement of research, technological development and innovation through digital metamorphosis”**.

Roadmap for the implementation of Action 1: “Reinforcement of research, technological development and innovation through digital metamorphosis”.

1. Setting up of meetings between the policy makers from the Region, the National authorities and the industries aiming, at the identification of common ground and synergies.

One of the needs for the promotion of policymaking and development in the Region that was identified during the REMIX project, was the efficient communication between the key stakeholders. The REMIX stakeholder meetings gave the opportunity to people from different principles and from different institutions to discuss over the problems of the sector and to identify opportunities for recovery and development.

Therefore, the first and most important action towards the digitalisation of mining and metallurgy industries for the Region of Sterea Ellada is to ensure that the authorities and institutions that are involved in financing, as well as in research and innovation communicate efficiently and that they receive the much-valued input from the industries (mining, metallurgy and secondary processing). NTUA, as an educational institution, plans to take advantage of the already established links with all the major stakeholders and will act as an intermediate and independent body for the facilitation of the dialogue between them through the setting up of bilateral or plenary meetings, that can be either physical (in case there is a specific opportunity) or through teleconferences.

2. Mapping of the skills needed for the digitalisation of needs in the Region of Sterea Ellada

A second very important action that can guarantee the efficient introduction of digitalization into the Regional Raw Materials Industrial Sector is the mapping of all educational needs and skills that will be necessary.

During the REMIX peer review meetings, one of the most important problems that emerged in almost all the reviewed Regions was the lack of educated and skilled personnel. Also for the case of Sterea Ellada, the industries have identified a lack of experienced and skilled technical personnel even for the traditional mining, metallurgical and processing activities.

The introduction of new technologies in the raw Material sector will require a whole new set of highly specialised professions. In case those professions are not available in close proximity, then any effort of introducing the new technologies into the Extractive Industries of the Region will be less effective, since the necessary personnel will not be available to support them. Therefore, as one of the primary steps of great importance is to map the already existing educational capacities and skills in the field of IT and digital technologies and to identify deficiencies or additional needs. The results will be communicated to the Region and to the related authorities and ministries, as a first basic step towards the new professions of the future.

3. Activities for the promotion of industrial interest (including SMEs) for digitalisation and raising awareness on funding opportunities

The third axis of the proposed action plan is the promotion of the opportunities as well as the new requirements that the 4th industrial revolution will bring to all industries.

According to a recent survey performed by the Hellenic Federation of Enterprises, close to 40% of the industries believe that their business will not be affected by the change of environment and the digital transformation and only 20% considered that they should make steps towards incorporating the new technologies. The reality for the Extractive Industries, as presented by the Greek mining Enterprises Association, is that the future for the Sector is Digital and that if the Extractive industries fail to proceed along with the new era, they will be left behind.

In this concept, it is very important to promote this link between innovation and digital transformation and to try to highlight the funding possibilities that may arise and are either related to the ROP or the Industry 4.0.

4. Collaboration with EIT Raw materials- Regional Center Greece

This fourth action is in close relation with the previously mentioned promotion of industrial interest. EIT RawMaterials and Regional Center Greece organise events aiming to bring together the industry (large and SME), the governance (national and regional), academia and research institutes of Greece in order to foster, facilitate and enhance the Greek Raw Materials Community with strategic actions. Therefore the collaboration with this entity will allow to take advantage of the publicity of the events they organise for promoting the target of Digital Transformation in the Extractive Industries Ecosystem.

5. Digital Practice in Mining in the Region of Sterea Ellada: Recommendations towards possible Policy Actions”.

This final action constitutes the main output of the overall Action Plan, as it is going to combine the outcomes of the aforementioned Actions and produce a final deliverable with recommendations regarding the prospects of Digitalized Mining Activities. This deliverable will be presented to the Region of Sterea Ellada as a source of possible Policy Actions that could be taken into consideration by both the current Policy Instrument and its revision, scheduled to initiate in year 2021.

The content of this deliverable will review the digital prospects that have emerged in the context of the Actions 1-4, focusing on:

- Current digital technologies applied by relevant stakeholders
- Upscaling digital technological trends according to the research programs that stakeholders are involved aiming to increasing operational efficiency, maximizing health and safety factors and finally, contributing to the strengthen of SME's that can lead to job openings
- the results of the deliverable “Mapping of the skills needed for the digitalization of needs in the Region of Sterea Ellada” so as to link, in a quality manner, the existing digital literacy and the digital operation in the Region.

In this respect, the appointed authorities will receive more information regarding the implementation of digital technologies, the opportunities they offer, their benefits for local industries, their requirements in human and knowledge

potential, will be able to pursue (if evaluated as relevant) possible links with the National Digitalization Strategy Plan 2016-2021 and as a result, will be able to better navigate towards securing finances for the local stakeholders not only through the ROP but also through the national policy instrument as well. The assessment of Strengths and Weaknesses of digital practice in mining in the Region of Sterea Ellada will be facilitated, thus the possibility of implementation of digitalization in the mining industry (if feasible) both in the current and in the next version of the Regional Operative Program can be better evaluated.

3.4. Stakeholders involved

Regarding the stakeholders that have expressed their will to actively support the Action Plan, the first and most important is the Region of Sterea Ellada. As elaborated in the previous sections of the Action Plan, Sterea Ellada addresses the implementation of funding policies related to ROP with the assistance of the General Secretariat of Research and Technology (GSRT). Therefore, the second key-stakeholder is GSRT which along with the General Secretariat for Industry will support the region with their experienced personnel and know-how.

The Hellenic Federation of Enterprises and the Greek Mining Enterprises Association will provide the industrial view for the definition of the objectives as well as their network for the promotion and dissemination of the Action.

Regional Center Greece will also offer their network and their events for the promotion of the Action. Finally, NTUA will be responsible for facilitating the communication between the key-players and for the monitoring of the implementation of the actions. The Figure below presents the stakeholders are involved in the implementation of the suggested Action.



1. Region of Sterea Ellada

The Region of Sterea Ellada is the key actor and the main beneficiary of the Action Plan. The ROP of Sterea Ellada is the main policy instrument for research and innovation (and other issues supported by Regional RIS3) thus the implementation of any research and innovation actions must be strongly connected to it.

As explained in the relative documents of the Remix Project, the Region of Sterea Ellada is currently assisted by the central government concerning the implementation of funding policies related to ROP.

2. General Secretariat for Research and Technology (GSRT)

General Secretariat for Research and Technology is the appointed body for:

- the coordination of the national policy for Research, Technological Development and Innovation,
- the implementation of the national funding schemes related to technology and innovation and defining and as well as
- the definition of National RIS.

Furthermore, it supervises research and technology bodies, which provide local communities with the necessary skills for producing knowledge and boosting innovation, while is the only channel for funding allocation at national level.

GRST provides assistance to all Regions concerning ROP implementation.

3. Ministry of Economy and Development - General Secretariat for Industry

The mission and objectives of General Secretariat for Industry are:

- to create an appropriate business environment,
- to develop business innovation,
- to facilitate the operation of industries and SMEs,
- to develop and promote appropriate policies to enhance entrepreneurship,
- to improve the competitiveness of the economy,
- to ensure the operation of industrial and craft activities and the exercise of technical professions, as well as
- to enhance the safety and quality of industrial products and services whilst ensuring a smooth functioning of the market and competition the market and competition

Currently, one of the priorities of GGB is raising awareness and promoting the Industry 4.0 for Greece and they can act as a catalyst for the transition of the Mining and Metallurgy Sector in the digital era.

4. Associations

The main targets of the association is the promotion of the Greek mining sector as a nucleus for regional and national development as well as the cultivation of good relations between the employees and the local communities in the regions where its members are active.

- **The Greek Mining Enterprises Association** (SME) is anticipated to act as a strong communication link between the Region, the ministries and the local mining industries.
- **Hellenic Federation of Enterprises** (SEV) represents the largest business network in Greece. Within the framework of the Action Plan implementation SEV is anticipated to play a diverse role, especially focused in creating networking prospective for the promotion of mining industrial interest

5. Regional Center Greece- RC Greece

Regional Center Greece has as objective to mobilize all stakeholders within the Knowledge Triangle and to support the local ecosystem in order to enhance the innovative potential of the region, in line with European strategies. Therefore, the participation in the RC- Greece activities will allow the promotion of the Action Plan goals and objectives.

3.5. Timeframe

The timeframe of the proposed Action Plan will be from July 2019 until June 2021. Activity 2 will kick-off the implementation phase of the Action Plan by initiating a preliminary research for data regarding the mapping of skills, as mentioned above. In overall, the deployment of the Action Plan foresees that all activities will be taking place in parallel, so as to continuously amplify their impact.

3.6. Deliverables

Deliverable 1 (Document): “Mapping of the skills needed for the digitalization of needs in the Region of Sterea Ellada”. *Delivery date June 2021*

Deliverable 2 (Document): “Summary Report on activities for the implementation of Actions 1, 3 and 4”. *Delivery date June 2021*

3.7. Costs

NTUA will fully undertake, in terms of cost, the implementation of the proposed Action Plan. The Region of Sterea Ellada has agreed to provide best possible assistance within its remit (human resources, data provision, communication schemes etc). In this respect, NTUA will report strictly staff costs and travel expenses accounting for Remix Project meetings.



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On behalf of NTUA,

Date: 25 / 6 . 2019

Signature:

A handwritten signature in blue ink, written over a horizontal line. The signature is stylized and appears to be 'Ioannis Paspaliaris'.

Professor Ioannis Paspaliaris,
Scientific Responsible for the implementation of Remix Project



Letter of Endorsement

May 9th, 2019

To: Whom it may concern

Subject: Endorsement for REMIX-Smart and Green Mining Regions of EU Action Plan for the Region of Sterea Ellada

The Region of Sterea Ellada is the designated authority for the implementation of the Regional Operational Programme of Sterea Ellada 2014-2020 (*ROP*), the Policy Instrument connected to Interreg Europe project Remix.

The Region of Sterea Ellada has followed the procedures of Remix (local stakeholders' meetings and interrégional events) and thus, acknowledges the efforts of Remix Partner National Technical university of Athens towards the improvement of the ROP for the Raw Material Sector.

In this respect the Action Plan which has been submitted by NTUA within the context of Remix project and proposes the introduction of Industrial Digitalization to the regional industrial ecosystem, in compliance with the National Digital Strategy, is considered to be in accordance with the Thematic Objective 1: "Reinforcement of research, technological development and innovation" of the ROP and the Region's overall perspective. Within this context, four distinct actions are suggested:

1. Setting up of meetings between the policy makers from the Region, the National authorities and the industries aiming, at the identification of common ground and synergies.
2. Mapping of the skills needed for the digitalization of needs in the Region of Sterea Ellada
3. Activities for the promotion of industrial interest (including SMEs) for digitalization and raising awareness on funding opportunities
4. Collaboration with EIT Raw materials- Regional Center Greece

Accordingly, the Region of Sterea Ellada endorses the Action Plan submitted by NTUA and will support the activities during its implementation from July 2019 until June 2021.

Sincerely,

Themistoklis Cheimaras
Regional Appointee of Development Planning,
Entrepreneurship & Extroversion

