

RawMat2021

www.rawmat2021.gr

International Conference on Raw Materials
and Circular Economy

05-09 September 2021 | Athens

📍 Divani Caravel Hotel

CONFERENCE PROGRAM

PLATINUM SPONSORS



TEE
TECHNICAL
CHAMBER
OF GREECE

Organized by

TEE TECHNICAL
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SCHOOL OF
MINING &
METALLURGICAL
ENGINEERING

GRawMat
Innovation Cluster

under the auspices of

SEV
Hellenic Federation of Enterprises



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PREFACE

RawMat2021 is organized by the Technical Chamber of Greece, the School of Mining and Metallurgical Engineering of the National Technical University of Athens and the Greek Raw Materials Innovation Cluster “GRawMat” under the auspices of SEV Hellenic Federation of Enterprises. In addition, **RawMat2021 is co-organized** by the: Hellenic Ministry of Environment and Energy, Association of Mining Enterprises, Hellenic Survey of Geology and Mineral Exploration, Geotechnical Chamber of Greece, Geological Society of Greece, Scientific Society of the Mineral Wealth Technologists of Greece, School of Mineral Resources Engineering (Technical University of Crete), Department of Mineral Resources Engineering (University of Western Macedonia), Department of Chemistry (Aristotle University of Thessaloniki), Department of Geology and Geo-environment (National and Kapodistrian University of Athens), Department of Geology (University of Patras) and the Materials & Metallurgy Laboratory (University of Patras).

Following the demands and trends of modern society, RawMat2021 shall address a wide range of technological developments and future challenges regarding Raw Materials with emphasis given on Circular Economy aspects. Raw materials and their exploitation are intertwined with the development and prosperity of EU. The European Green Deal adopted by the Member States shows that the future and progress of the EU are highly dependent on mining across the continent, for the benefit of technology, science, economy and sustainability. Similarly, the transition to a circular economy is both an opportunity and a need as the reduction of waste and primary raw materials extraction is promoted to achieve economic and environmental benefits and restrict dependence on non-EU resources.

RawMat2021 covers a broad list of topics as follows: **1. Minerals' exploration and resource characterisation, 2. Mining, 3. Mineral processing, 4. Sustainable Metallurgy, 5. Industrial Minerals, 6. Environment, Energy and Sustainability, 7. Reuse-Recycling-Valorisation, 8. Education, 9. EU Strategy/Circular economy, 10. Occupational Health and Safety and 11. Greece-specific issues.**

RawMat2021 shall bring together the Academic community, engineers, early-stage scientists as well as senior scientists, industry executives, stakeholders and policy makers, and other professionals in the field of raw materials for a comprehensive, cross-discipline exchange of knowledge. New tools, methods, research findings, methodological frameworks and hypotheses as well as innovative ideas are going to be presented in its scientific and technical sessions.

We are looking forward to your participation and attendance at the RawMat2021 Conference!

Prof. Anthimos Xenidis
Chair of the Scientific Committee
National Technical University of Athens

Dr. Evangelos Tzamos
President of the Organizing Committee
EcoResources | GRawMat Innovation Cluster

International Conference on Raw Materials and Circular Economy

ORGANIZING COMMITTEE

Chairpersons

- Prof. Anthimos Xenidis**, National Tech. Univ. of Athens/Tech. Chamber of Greece/GRawMat Innovation Cluster, Chair
- Prof. Anastasios Zouboulis**, Aristotle Univ. of Thessaloniki / GRawMat Innovation Cluster, Co-chair
- Prof. Konstantinos Komnitsas**, Technical Univ. Crete, Co-chair
- Prof. Michail Stamatakis**, National and Kapodistrian Univ. of Athens, Co-chair

Members

Alice Corovessi , INZEB	Kyriaki Makri , National Observatory of Athens/Committee of GEOsciences Didactics GSG
Anastasia Lakasa , GRawMat Innovation Cluster	Konstantinos Kontogiannopoulos , Ecoresources
Angeliki Christogerou , METLAB, Univ. of Patras	Konstantinos Laskaridis , Hellenic Survey of Geology and Mineral Exploration/Geological Society of Greece
Apostolos Kourtis , National Tech. Uni. of Athens/GRawMat Innovation Cluster	Konstantinos Simeonidis , Ecoresources
Athanasiros Godelitsas , Scientific Society of the Mineral Wealth Technologists of Greece/National and Kapodistrian Univ. of Athens	Maria Menegaki , National Tech. Uni. of Athens
Christos Kavalopoulos , Greek Mining Enterprises Association	Michail Galetakis , Technical Univ. of Crete
Dimitrios Panias , National Tech. Uni. of Athens	Nikolaos Xirokostas , Hellenic Survey of Geology and Mineral Exploration/Ministry of Environment and Energy
Dionysios Gkoutis , Geotechnical Chamber of Greece/Hellenic Survey of Geology and Mineral Exploration	Nikos Pasadakis , Institute of Petroleum Research, FORTH/IPR
Eirini Christodoulou , National Tech. Uni. of Athens /GRawMat Innovation Cluster	Olga Sykioti , National Observatory of Athens
Evangelos Tzamos , GRawMat Innovation Cluster/Ecoresources, President	Panagiotis Koulias , Hellenic Agricultural Organization “DEMETER”
Eugenios Kokkinos , Ecoresources	Petros Koutsovitis , Geological Society of Greece/Univ. of Patras
Georgios Banias , CERTH	Petros Tzeferis , Ministry of Environment and Energy
Georgios Kornelakis , Technical Chamber of Greece	Platon Gamaletsos , Technical Univ. of Crete
Ioanna Kaneli , GRawMat Innovation Cluster	Stavros Kalaitzidis , Univ. of Patras
Ioannis Kapageridis , Univ. of Western Macedonia	Yiannis Pontikes , KU Leuven, Belgium
Ioannis Zafeiratos , Ministry of Environment and Energy	

SCIENTIFIC COMMITTEE

- K. Adam**, National Tech. Univ. Of Athens, Greece
Z. Agioutantis, Univ. of Kentucky, USA
G. Anastasakis, National Tech. Univ. Of Athens, Greece
G. Angelopoulos, Univ. of Patras, Greece
A. Apostolikas, LARCO S.A., Greece
A. Argyraki, National and Kapodistrian Univ. of Athens, Greece
N. Arvanitidis, Geological Survey of Sweden, Sweden
A. Bajcar, Poltegor Institute, Poland
E. Balomenos, Mytilineos S.A., Greece
G. Banias, CERTH, Greece
S. Beaulieu, Aughnish Alumina, Ireland
P. Benard, Lafarge-Holcim, France
A. Benardos, National Tech. Univ. Of Athens, Greece
K. Binnemans, KU Leuven, Belgium
B. Blanpain, KU Leuven, Belgium
G. Blengini, TU Turin, Italy
A. Borst, KU Leuven, Belgium
P. Brito-Parada, Imperial College, UK
A. Cavallo, Univ. of Milano-Biccoca, Italy
A. Chagnes, Univ. of Lorraine, France
E. Chatzitheodoridis, National Tech. Univ. Of Athens, Greece
O. Chernoburova, Univ. of Lorraine, France
D. Damigos, National Tech. Univ. Of Athens, Greece
E. Deady, British Geological Survey, UK
N. Demirel, Middle East Technical Univ., Turkey
G. Demopoulos, McGill Univ., Canada
S. Diplas, SINTEF, Sweden
C. Dittrich, MEAB Chemie Technik GmbH, Germany
C. Drebendstedt, Freiberg Univ. of Mining and Technology, Germany
A. Ewing Rassios, Hellenic Survey of Geology and Mineral Exploration, Greece
G. Fermeli, Institute of Education Policy, Greece
G. Ferrier, Univ. of Hull, UK
D. Filippou, Rio Tinto, Canada
A. Finch, St. Andrews Univ., UK
K. Forsberg, KTH Royal Institute of Technology, Sweden
B. Friedrich, Aachen Univ., Germany
K. Fytas, Laval Univ., Canada
V. Gaganis, National Tech. Univ. Of Athens, Greece
G. Gaidajis, Democritus Univ. of Thrace, Greece
P. Gamaletsos, Technical Univ. of Crete, Greece
M. Genovese, EU-China office, China
T. Gentzis, Core Laboratories LP, USA
A. Georgiou, TITAN S.A., Greece
A. Godelitsas, National and Kapodistrian Univ. of Athens, Greece
K. Goodenough, British Geological Survey, UK
A. Grammatikopoulos, SGS Canada Inc., Canada
G. Grieco, Univ. of Milan, Italy
J. Hadjigeorgiou, Univ. of Toronto, Canada
E. Hartai, Univ. of Miskolc, Hungary
J. Hein, U.S. Geological Survey, California, USA
N. Horsburgh, St. Andrews Univ., UK
K. Hudson-Edwards, Camborne School of Mines, UK
J. Hughes, UWS, Glasgow, UK
I. Iliopoulos, Univ. of Patras, Greece
P.T. Jones, KU Leuven, Belgium
L. Jurdziak, Wroclaw Univ. of Technology, Poland
D. Kaliamvakos, National Tech. Univ. Of Athens, Greece
P. Kalvig, Geological Survey of Denmark and Greenland, Denmark
A. Karalis, IMERYS S.A., Greece
S. Kasmaee, Univ. of Bologna, Italy
W. Kawalec, Wroclaw Univ. of Technology, Poland

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V. Kazakidis, Laurentian Univ., Canada
P. Kinnunen, VTT, Finland
A. Korre, Imperial College, UK
N. Koukouzas, CERTH, Greece
D. Krebs, Greenland Minerals and Energy Ltd, Australia
W. Kurylak, IMN, Poland
A. Langella, Università degli Studi del Sannio di Benevento, Italy
M. Lazar, Univ. of Petrosani, Romania
P. Maraboutis, Ecoefficiency Ltd., Greece
I. Marantos, Hellenic Survey of Geology and Mineral Exploration, Greece
P. Marescotti, Univ. of Genova, Italy
A. Martinez, SINTEF, Norway
M. Mitrakas, Aristotle Univ. of Thessaloniki, Greece
J. Ohta, Chiba Institute of Technology, Japan
D. Oliveira, National Laboratory of Energy and Geology, Portugal
D. Panias, National Tech. Univ. Of Athens, Greece
I. Paspaliaris, National Tech. Univ. Of Athens, Greece
V. Papangelakis, Univ. of Toronto, Canada
N. Papassiopi, National Tech. Univ. Of Athens, Greece
N. Pasadakis, Technical Univ. of Crete, Greece
V. Pavlović, Opencast Mining Centre, Serbia
L. Perez Villarejo, Univ. of Jaen, Spain
M. Perraki, National Tech. Univ. Of Athens, Greece
Y. Pontikes, KU Leuven, Belgium
M. Pozo, Universidad Autónoma de Madrid, Spain
M. Regueiro, Instituto Geológico y Minero de España, Spain
M. Reich, Univ. of Chile, Chile
E. Remoundaki, National Tech. Univ. Of Athens, Greece
S. Roubedakis, Lafarge-Holcim, Greece
C. Roumpos, Public Power Corporation S.A., Greece

J. Safarian, Norwegian Univ. of Science and Technology, Norway
I. Sanoudos, IMERYS S.A., Greece
R. Snellings, Flemish Institute for Technological Research, VITO, Belgium
X. Spiliotis, Univ. of Thessaly, Greece
A. Stalios, European Commission, Belgium
S. Stopic, Aachen Univ., Germany
O. Sykioti, National Observatory of Athens, Greece
F. Tinti, Univ. of Bologna, Italy
A. Tkaczyk, Univ. of Tartu, Estonia
E. Topal, Curtin Univ., Australia
G. Tranell, Norwegian Univ. of Science and Technology, Norway
S. Triantafyllidis, National Tech. Univ. Of Athens, Greece
K. Tsakalakis, National Tech. Univ. Of Athens, Greece
H. Tsikos, Rhodes Univ., South Africa
E. Tzamos, GRawMat Innovation Cluster and Ecoresources, Greece
P. Tzeferis, Ministry of Environment and Energy, Greece
E. Tziritis, ELGO "DEMETER"
A. Vafeidis, Technical Univ. of Crete, Greece
C. Van der Eijk, SINTEF, Norway
L. Yurramendi Sarasola, Tecnalia S.A., Spain
T. Zampetakis, Grecian Magnesite, Greece
E. Zevgolis, National Tech. Univ. Of Athens, Greece

CONFERENCE DETAILS

RawMat2021 is organized by the Technical Chamber of Greece, the School of Mining and Metallurgical Engineering of the National Technical University of Athens and the Greek Raw Materials Innovation Cluster (GRawMat) under the auspices of SEV Hellenic Federation of Enterprises.

TOPICS

- Minerals exploration and resource characterisation: new trends and advances
- Mining: trends and perspectives
- Mineral processing
- Sustainable Metallurgy
- Industrial Minerals
- Environment, Energy and Sustainability
- Reuse-Recycling and Valorisation
- Education
- EU Strategy / Circular economy
- Occupational Health and Safety (OHS)
- Greece-specific issues

PRESENTATION GUIDELINES

Oral contributions

Regular oral presentations will last 15 minutes which include a 12 min speech by the presenting author and another 3 min for questions by the audience. Plenary and keynote presentations will be given a 30 minutes duration (25 min speech and 5 min for discussion).

Poster presentations

All posters will be placed in a special website accessed by all participants. Authors contact details will be visible to allow questions and ideas exchange. The presenting authors with on-site participation should hang their printed posters in the morning of their presentation and remove them at the end of the poster session. The posters from those authors with Virtual attendance will appear in the monitors of the conference hall throughout the poster session. All Presentations should be prepared in English language (official language of the Conference).

AWARDS

The most outstanding presentations during RawMat2021 will receive one of the awards from the following categories:

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- **GRawMat Circular Economy Award.** For the presentation best promoting the adoption of circular economy in the raw materials sector. The award is sponsored by the GRawMat Innovation Cluster.
- **Best Oral Presentation Award.** Most distinguished paper combining high scientific quality and presentation significance. The award is sponsored by the journal Minerals MDPI.
- **Best Poster Award.** Dedicated to the best presentation during the poster sessions of the conference.
- **Young Researcher Award.** For the best presentation by a young scientist.

Selected high-impact presentations will get a waiver for full paper submission in the peer-review journals collaborating with RawMat2021.

Presented papers will be evaluated by the Award Committee according to the following criteria: Significance of the paper, Originality, Presentation impact, Young researcher. The winners of RawMat2021 awards will be announced during the closing ceremony of the conference.

PROCEEDINGS

Conference participants may submit a full paper which is oriented to be published in the RawMat2021 Proceedings Volume hosted in Materials Proceedings journal. Publication in the Proceedings Volume is free of charge for all registered participants and the paper will be available as an open access document.

PUBLICATION IN JOURNALS

For selected papers presented RawMat2021, the opportunity to publish a full paper in one of the collaborating peer-review journals will be offered after the end of the conference. Some of the mentioned journals are open access requiring an Article processing charge from the side of the authors. RawMat2021 provides a significant discount of this amount for all participant and a number of waivers for high-quality submissions.

Papers related to metallurgical processes and research aimed at improving the sustainability of metal-producing industries, with an emphasis on materials recovery, reuse, and recycling, will be invited to submit in a **Special Issue of the Journal of Sustainable Metallurgy** (Impact factor 2.109).

Papers related to mining, processing, metallurgy, industrial minerals and environmental monitoring will have an opportunity to be submitted in the Special Issue entitled "**Minerals Study, Applications and Processing: Building the Foundations of a Green Future**" of journal Minerals (ISSN 2075-163X – Impact factor 2.644).

Papers related to materials will have the chance to be submitted in the Special issue entitled "**Metals Characterization: Novel Methods, Techniques, and Instruments**" of journal Materials (ISSN 1996-1944 – Impact factor 3.623).

Papers dealing with water treatment focusing on the promotion of sustainable technologies in the field of mining practices which achieve economic viability and competence with minimum

environmental impact will be invited to submit in the Special Issue entitled “**Sustainable Approaches in Water Treatment Practices, Presenting Minimum Environmental Impact**” of journal **Water** (ISSN 2073-4441– Impact factor 3.103).

Papers related to circular economy strategies and sustainability in processes will be invited to submit in the Special Issue entitled “**Raw Materials and Circular Economy: Concepts and Evidence**” of journal **Sustainability** (ISSN 2071-1050– Impact factor 3.251).

VENUE

RawMat2021 shall take place in Athens, the historical heart of Greece known as the birthplace of democracy and home to some of the most significant philosophers. The Divani Caravel Hotel located in Athens city center, will be the conference venue. The Hotel is the perfect starting point to discover Athens and its many historic monuments, museums and major attractions.

Athens International Airport is about 30 km away from the Hotel (about 50 minutes trip by public transportation of 30 minutes' drive) and easily accessible. The Hotel is served by a metro station (Evangelismos) located within walking distance (5 minutes) which connects the Hotel to various places in Athens and also to the airport.

DIVANI CARAVEL HOTEL:

2 Vassileos Alexandrou ave., 16121 Athens Greece
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EXHIBITION

In the framework of the RawMat2021, a parallel exhibition will be organized where supporting companies and organizations dealing with the raw materials sector are going to provide detailed information on their activities and future plans to the conference participants. The exhibition area is located in the Olympia Hall outside the Olympia Plenary Room.

SOCIAL EVENTS

Opening ceremony	5/9/2021	❖ Olympia Plenary Room	18.30
Welcome reception	5/9/2021	❖ Thea Pool Bar and Restaurant	21.15
Gala dinner	7/9/2021	❖ Royal Olympic Hotel-Ioannis Roof Garden	21.00
All-day visit to Lavrion	9/9/2021	❖ Lavrion Historical Mine	Departure: 08.30 Return: 18.15

A guided visit to Lavrion Technological and Cultural Park (Mineral processing and Metallurgical plants), Archaeological Sites of Thorikos, Souriza and Poseidon Temple.

All events will follow the applied hygiene protocols valid during that date. Possible occurring restrictions maybe

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the reason for cancellation in the case of field trips. Info desk is available in the secretary.

PARALLEL EVENTS

- **Greek specific issues** 7/9/2021 09.00-13.00

Presentations and round tables by companies and government bodies discussing current situation, problems, challenges and future trends in the field of mineral raw materials in Greece. Event language will be Greek.

- **ITHACA Industrial Workshop** 8/9/2021 10.50-13.05

ITHACA Industrial Workshop will be included as a parallel event of the RawMat2021. The workshop will gather experts and stakeholders to illustrate initiatives aiming at reducing the critical raw material content and improve process efficiency and sustainability of materials for aerospace and automotive applications. The event is organized in the frame of ITHACA Project, a Network of experts from all over Europe in the area of Engineering, Chemistry, Materials Science, etc. aiming to understand the current materials' manufacturing and recycling scene and pump-prime activities to move the sector of automotive and aerospace forward.



- **INCO-Piles round table** 8/9/2021 14.30-19.00

Second Round Table of the International Consortium to recover CRMs from stockpiles/tailings targeting RIS will be included as a parallel event of the RawMat2021. The Round Table will discuss the "Opportunities for technology transfer to foster the recovery of CRM from mining residues" and will take place at 8th September 2021 in hybrid format.



CERTIFICATE OF ATTENDANCE

All registered participants are eligible to receive a certification of attendance at the end of the conference. The certificate will be available in printed form for on-site participants and will be sent electronically to online participants.

ORGANIZING PARTNER



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PROGRAM STRUCTURE

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PROGRAM AT A GLANCE

Sunday 5 September 2021

⌚ OLYMPIA	16.30-18.30	Registration
	18.30-19.00	Welcome and brief introduction
	19.00-19.30	Welcome speeches
	19.30-20.15	Sponsors speeches
	20.15-21.15	Plenary lectures
	21.15	Welcome reception

Monday 6 September 2021

⌚ OLYMPIA	09.00-10.30	Plenary lectures
	10.30-11.00	Coffee break
	11.00-13.00	Parallel sessions
⌚ OLYMPIA		A1. EU Strategy - Circular economy
⌚ VERGINA		A2. Minerals exploration - Critical Raw Materials
⌚ ILISSOS		A3. Novel metallurgical methods I
	13.00-14.30	Lunch break
		Poster Session 1 – Exhibition
	14.30-16.30	Parallel sessions
⌚ OLYMPIA		A4. Mine of the future and transition to Industry 4.0
⌚ VERGINA		A5. Advanced minerals exploration and characterization technologies I
⌚ ILISSOS		A6. Novel metallurgical methods II
	16.30-17.00	Coffee break
	17.00-19.00	Parallel sessions
⌚ OLYMPIA		A7. Mine planning, scheduling and optimization
⌚ VERGINA		A8. Advanced minerals exploration and characterization technologies II
⌚ ILISSOS		A9. Hydro-, Iono-, Solvometallurgy I

Tuesday 7 September 2021

⌚ OLYMPIA	09.00-10.30	Greek specific issues (in Greek)
	09.00-10.30	Parallel sessions
⌚ VERGINA		B1. Education I
⌚ ILISSOS		B2. Base metals recovery from waste

	10.30-11.00	Coffee break
❖ <i>OLYMPIA</i>	11.00-13.00	Greek specific issues (in Greek)
	11.00-13.00	Parallel sessions
❖ <i>VERGINA</i>	B3. Education II	
❖ <i>ILISSOS</i>	B4. Critical metals recovery from waste	
	13.00-14.30	Lunch break
	Poster Session 2 – Exhibition	
	14.30-16.30	Parallel sessions
❖ <i>OLYMPIA</i>	B5. Hydro-, Iono-, Solvometallurgy II	
❖ <i>VERGINA</i>	B6. Fossil fuels in the energy transition era	
❖ <i>ILISSOS</i>	B7. Waste valorization - Industrial Symbiosis I	
	16.30-17.00	Coffee break
	17.00-19.00	Parallel sessions
❖ <i>OLYMPIA</i>	B8. Advanced metallurgical processes	
❖ <i>VERGINA</i>	B9. Minerals exploration - Ophiolites	
❖ <i>ILISSOS</i>	B10. Waste valorization - Industrial Symbiosis II	
	21.00	Gala dinner

Wednesday 8 September 2021

❖ <i>OLYMPIA</i>	09.00-10.30	Plenary lectures
	10.30-11.00	Coffee break
	11.00-13.00	Parallel sessions
❖ <i>OLYMPIA</i>	C1. Mineral processing of ores and end-products	
❖ <i>VERGINA</i>	C2. Sustainability	
❖ <i>ILISSOS</i>	C3. Batteries and magnets recycling	
❖ <i>PELLA-MYCENAE</i>	10.50-13.05	ITHACA industrial workshop
	13.00-14.30	Lunch break
	Poster Session 3 – Exhibition	
	14.30-16.30	Parallel sessions
❖ <i>OLYMPIA</i>	C4. Industrial Minerals - Innovative processes and applications I	
❖ <i>VERGINA</i>	C5. Mine waste / Water management	
❖ <i>ILISSOS</i>	C6. Recycling / Metals recovery from end products	
❖ <i>PELLA-MYCENAE</i>	14.30-16.30	INCO-Piles round table
	16.30-17.00	Coffee break
	17.00-19.00	Parallel sessions

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❖ <i>OLYMPIA</i>	C7. Industrial Minerals - Innovative processes and applications II
❖ <i>VERGINA</i>	C8. Mine closure / Post mining
❖ <i>ILISSOS</i>	C9. Pollution abatement / Environmental performance
❖ <i>PELLA-MYCENAE</i>	17.00-19.00 INCO-Piles round table

19.00	Closing ceremony - Awards
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Thursday 9 September 2021

08.30-18.15	Field trip
❖ <i>LAVRION HISTORICAL MINE SITE</i>	Visit to Lavrion Technological and Cultural Park (Mineral processing and Metallurgical plants), Archaeological Sites of Thorikos, Souriza and Poseidon Temple

SUNDAY 5 SEPTEMBER 2021**16³⁰-18³⁰ Registration opens****OPENING SESSION****📍 OLYMPIA PLENARY ROOM***Chair: A. Xenidis, G. Stasinou, D. Kaliampakos, E. Tzamos***18³⁰-19⁰⁰ Welcome and brief introduction by the organizers representatives****Prof. Anthimos Xenidis**, Conference Chair**Prof. Andreas Boudouvis**, Rector, National Technical University of Athens**Prof. Dimitris Kaliampakos**, Dean of the School of Mining and Metallurgical Engineering, National Technical University of Athens**Mr. Nikolaos Milis**, President of Assembly Presidium of the Technical Chamber of Greece**Dr. Evangelos Tzamos**, Managing Director of GRawMat Innovation Cluster**19⁰⁰-19³⁰ Welcome speeches****Adonis Georgiadis**, Minister for Development and Investment**Konstantinos Aravossis**, Secretary General for Natural Environment and Water**Athanasiros Kefalas**, President of Greek Mining Enterprises Association**Costas Troulos**, Innovation Department, Hellenic Federation of Enterprises (SEV)**Petros Koutsovitis**, Geological Society of Greece and University of Patras**19³⁰-20¹⁵ Sponsors speeches****Stéphane Bourg**, Chairman of Prometia Association**Ioannis Karnachoritis**, Health, Safety, Environment & Continuous Improvement Director, MYTILINEOS, Aluminum of Greece, Metallurgy BU**Panos Lолос**, General Manager Copper and Alloys Extrusion Division ElvalHalcor, Hellenic Copper and Aluminium Industry**20¹⁵-20⁴⁵ Plenary lecture 1****PL01 The European mining sector- Contributing to our shared priorities****Mark Rachovides**, President Euromines**20⁴⁵-21¹⁵ Plenary lecture 2****PL02 Mining wastes: Valorization and Recycling****Georgios Kremlis**, Principal Advisor to the Greek Prime Minister on energy, climate, environment and circular economy issues**21¹⁵ Welcome reception****Schedule times refer to Eastern European Summer Time*

MONDAY 6 SEPTEMBER 2021

PLENARY LECTURES

📍 OLYMPIA PLENARY ROOM

Chair: A. Xenidis, K. Adam

09⁰⁰-09³⁰	Plenary lecture 3
<i>PL03</i>	The EU's growing awareness of the importance of raw materials for its green and digital transition Peter Handley , Head of Unit, Energy Intensive Industries and Raw Materials, DG Grow, European Commission
09³⁰-09⁴⁵	Plenary lecture 4
<i>PL04</i>	ERMA: Sustainable raw materials for the transition to the Green Economy Krzysztof Kubacki , General Manager of CLC East EIT Raw Materials
09⁴⁵-10⁰⁰	Plenary lecture 5
<i>PL05</i>	EIT RawMaterials: Leading global partnership in raw materials I. Paspaliaris , Director, <u>A. Katsiapi</u> , Project Manager, EIT RawMaterials HUB-Regional Center Greece
10⁰⁰-10³⁰	Plenary lecture 6
<i>PL06</i>	Moving towards a circular and decarbonized aluminum value chain in Europe Christian Leroy , Head of Innovation Hub, European Aluminium
10³⁰-11⁰⁰ Coffee Break – Poster session 1	

PARALLEL SESSIONS

SESSION A1
EU Strategy-Circular economy

📍 OLYMPIA PLENARY ROOM

Chair: S. Bourg, A. Kladis

11⁰⁰-11³⁰	Keynote presentation SCRREEN, the European expert network on critical raw materials <i>KN01</i> S. Bourg
11³⁰-11⁴⁵	ERA-MIN3: Raw materials for the sustainable development and the circular economy <i>MO01</i> <u>D. Carrilho</u> , J. Sotelo, J. Marchamalo, B. Gómez
11⁴⁵-12⁰⁰	Relating industrial symbiosis and sustainable development goals <i>MO02</i> <u>J. Henriques</u> , J. Azevedo, M. Estrela, R. Dias
12⁰⁰-12¹⁵	"Meta-Projects": Maximizing the value of past EU funded projects in Raw Materials (and not only) sector <i>MO03</i> <u>A. Kladis</u> , A. Preveniou, K. Papadimitriou, P. Efstathiou
12¹⁵-12³⁰	A systematic evaluation of commercially available corrosion protection coatings for NdFeB magnets with respect to performance and eco-design under circular economy aspects <i>MO04</i> <u>C. Burkhardt</u> , S. Kobe

12³⁰-12⁴⁵ How the proper management of the extractive waste can support the circular economy
MO05 P. Maraboutis, N.I. Poulimenou, E. Nikolaou

12⁴⁵-13⁰⁰ Is there a potential for the development of critical raw materials production from primary sources in the European Union?
MO06 E. Lewicka, K. Galos, K. Guzik

SESSION A2

Minerals exploration-Critical Raw Materials

⌚ VERGINA

Chair: A. Finch, C. Bauer

11⁰⁰-11³⁰ Keynote presentation

Prospective exploration potential of lithium battery and neodymium magnet minerals in Europe

KN02 N. Arvanitidis, M. Sadeghi, B. Guillaume, D. Oliveira

11³⁰-11⁴⁵ Critical minerals in the European seas: The project GeoERA-MINDeSEA

MO07 J. Gonzalez, I. Zananiri, T. Medialdea, H. Schiellerup, P. Ferreira, L. Somoza, X. Monteys, T. Kuhn, J. Nyberg, I. Melnyk, V. Magalhaes, R. Lunar, E. Marino, J.R. Hein, G. Cherkashov, Mindesea Team

11⁴⁵-12⁰⁰ The role of Poland in the European Union supply chain of raw materials, including critical raw materials

MO08 K. Galos, J. Kamyk, A. Kot-Niewiadomska

12⁰⁰-12¹⁵ Characterization of 3 bauxite residue samples with a focus on Rare Earth Elements distribution

MO09 P. Angelopoulos, M. Georgiou, P. Oustadakis, M. Taxiarchou, H. Karadag, Y. Eker, G. Dobra, A. Boiangiu, G. Demir, S. Arslan, P. Davris, E. Balomenos

12¹⁵-12³⁰ Revisiting public abandoned mine sites in Greece for the assessment of their CRM content and environmental characterization of mining wastes

MO10 V. Angelatou, A. Exikis, E. Drosos

12³⁰-12⁴⁵ Mineral raw materials' resource efficiency in selected ESEE countries: Strengths and challenges

MO11 S. Giannakopoulou, K. Adam, F. Halkiopoulou

SESSION A3

Novel metallurgical methods I

⌚ ILISSOS MEETING ROOM

Chair: C. Van der Eijk, P. Davris

11⁰⁰-11³⁰ Keynote presentation

A look at future metallurgy

KN03 D. Panias

11³⁰-11⁴⁵ First industrial scale process concept for the reengineered Pedersen process within ENSUREAL

MO12 D. Konlechner, R. Koenig, A. Preveniou, P. Davris, E. Balomenos

11⁴⁵-12⁰⁰ Exploitation of kaolin as an alternative source in alumina production

MO13 M. Bagani, E. Balomenos, D. Panias

12⁰⁰-12¹⁵ Sustainable silicon and high purity alumina production from secondary silicon and aluminium raw materials through the innovative SiSal technology

MO14 A. Toli, G.M. Tsousi, E. Balomenos, D. Panias, M. Heuer, H. Philipson, G. Tranell

12¹⁵-12³⁰ High temperature treatment of selected iron rich bauxite ores to produce calcium aluminate slags

MO15 A. Lazou, C. van der Eijk, M. Vafeias, A. Bempelou, E. Balomenos, L. Kolbeinsen, D. Panias, J. Safarian

12³⁰-12⁴⁵ A mathematical and software tool to estimate the cell voltage distribution and energy consumption in aluminum electrolysis cells

MO16 V. Vassiliadou, A. Peppas, M. Taxiarchou

12⁴⁵-13⁰⁰ Multiscale modeling of the electric submerged arc furnace

MO17 K. Karalis, A. Xenidis

13⁰⁰-14³⁰ Lunch – Poster Session 1 – Exhibition

PARALLEL SESSIONS

SESSION A4

Mine of the future and transition to Industry 4.0

❖ *OLYMPIA PLENARY ROOM*

Chair: M. Menegaki, A. Benardos

14³⁰-15⁰⁰ Keynote presentation

Managing and utilizing big data in atmospheric monitoring systems for underground coal mines

KN04 J. Diaz, Z. Agioutantis, S. Schafrik, D. Hristopulos

15⁰⁰-15¹⁵ UNEXUP, a robot-based surveying technology for flooded mines and other underwater structures

MO18 M. Tameirao, N. Zajzon, B. Bodo, L. Lopes, S. Henley, J. Almeida, J. Aaltonen, C. Rossi, G. Zibret

15¹⁵-15³⁰ Planning sustainable deep sea mining

MO19 K. Vatalis, S. Platias, G. Charalampidis

15³⁰-15⁴⁵ A critical review on evaluation of the marine resources mining versus the land-based ones for REE

MO20 K. Papavasileiou

15⁴⁵-16⁰⁰ Enhancing blockchain traceability with physical tracking technologies: a taxonomy of enabling IoT technologies for supply chains and the circular economy

MO21 A. Beckh Bacchetta, E. Cullen, V. Krümpel

16⁰⁰-16¹⁵ Risk Management: An essential “tool” for the extractive sector

MO22 P. Maraboutis, N.I. Poulimenou, E. Nikolaou

16¹⁵-16³⁰ Assessing behavior similarity of mineral raw material prices through a feature-based clustering approach

MO23 K. Oikonomou, D. Damigos

SESSION A5**Advanced minerals exploration and characterization technologies I**

▼ VERGINA

*Chair: K. Laskaridis, O. Sykoti***14³⁰-15⁰⁰ Keynote presentation****Discovering the high potential for critical raw materials in submarine Fe-Mn deposits of the European seas: A GIS multi-criteria analysis based on MINDeSEA database**KN05 E. Marino, F.J. González, L. Somoza, T. Medialdea, P. Ferreira, T. Kuhn, A. Lobato, V. Magalhaes, C. Moniz**15⁰⁰-15¹⁵ Machine learning based systems application to mineral resource estimation and compliance with reporting codes for mineral resources**MO24 I. Kapageridis, I. Sinatkas, A. Asvesta, A. Patra**15¹⁵-15³⁰ Mapping of FeNi-laterite outcrops through spectral unmixing on Sentinel-2 multispectral data: the case study of Tsouka excavation (Central Greece)**MO25 A. Anifadi, O. Sykoti, K. Koutroumbas, E. Vassilakis**15³⁰-15⁴⁵ Resource identification in asteroid & martian meteorite samples via atom probe tomography and correlative nanoscale analyses (SIMS, TEM, EPMA, SEM)**MO26 E. Christou, L. Hallis, L. Daly, I. McCarroll, C. Hayward, L. Yang, M. Garbrecht, M. Lee, J. Cairney**15⁴⁵-16⁰⁰ Rock image classification ore/waste – Cut off identification for decision making**

MO27 A. Mantela

16⁰⁰-16¹⁵ Application of machine learning to resource modelling of a marble quarry with DomainMCFMO28 I. Kapageridis, C. Albanopoulos, S. Sullivan, G. Buchanan, E. Gialamas**16¹⁵-16³⁰ Estimation of mineral resources with machine learning techniques**MO29 M. Galetakis, A. Vasileiou, A. Rogdaki, V. Deligiorgis, S. Raka**SESSION A6****Novel metallurgical methods II**

▼ ILISSOS MEETING ROOM

*Chair: W. Vereycken, D. Panias***14³⁰-15⁰⁰ Keynote presentation****The nickel production methods from laterites and the Greek ferronickel production among them**KN06 E. Zevgolis, K. Daskalakis**15⁰⁰-15¹⁵ Production of sustainable hydrogen and carbon for the metallurgical industry**MO30 C. van der Eijk, R. Jensen, A. Wærnes**15¹⁵-15³⁰ Σiderwin- A new route for iron production**MO31 S. Koutsoupa, S. Koutalidi, E. Balomenos, D. Panias**15³⁰-15⁴⁵ Production of metallic titanium by electrowinning in molten salts of titanium oxycarbide anode**MO32 B. Malek, J. Serp, A. Maitre, M. Miguiditchian, F. Doreau, Y. Lepetitcorps, N. Pradeilles**15⁴⁵-16⁰⁰ Kinetics of magnesia refractories corrosion by iron rich slags**MO33 K. Betsis, A. Kourtis, K. Karalis, A. Xenidis

16⁰⁰-16¹⁵ Development of Complex Concentrated Alloys (CCAs) utilizing scrap to preserve critical raw materials

MO34 S. Chaskis, M. Bouzouni, E. Gavalas, V. Loukarakis, S. Papaeftymiou

16³⁰-17⁰⁰ Coffee Break – Poster session 1

PARALLEL SESSIONS

SESSION A7

Mine planning, scheduling and optimization

📍 OLYMPIA PLENARY ROOM

Chair: C. Roumpos, D. Damigos

17⁰⁰-17³⁰ Keynote presentation

Mining in front of the 21st century challenges

KN07 D. Kaliampakos

17³⁰-17⁴⁵ Linking stability conditions and ore dilution in open stope mining

MO35 A. Delentas, A. Benardos, P. Nomikos

17⁴⁵-18⁰⁰ Parametric analysis for the sill and rib pillar stability in a longitudinal sublevel open stopping operation at an underground copper mine in southern Africa

MO36 K. Kaklis, Z. Agioutantis, M. Masialeti, J. Yendaw, T. Bineli Betsi

18⁰⁰-18¹⁵ Going underground for ferronickel mining in Greece: Preliminary feasibility and potential benefits

MO37 A. Benardos, I. Vlachogiannis, C. Stenos, S. Pappas, G. Bourmas, S. Koukoumtzis, N. Koronakis

18¹⁵-18³⁰ Ventilation design modelling and optimization for an underground bauxite mine

MO38 M. Karagianni, A. Benardos

18³⁰-18⁴⁵ The role of cutoff grade policy in the financial management of a sedimentary nickel deposit: a case study from Greece

MO39 S. Pappas, M. Menegaki

18⁴⁵-19⁰⁰ Possibility of using wind and solar sources for electric power generation on Serbian opencast coal mines

MO40 N. Pavlovic, D. Ignjatovic, T. Subaranovic

SESSION A8

Advanced minerals exploration and characterization technologies II

📍 VERGINA

Chair: F. Tinti, I. Kapageridis

17⁰⁰-17³⁰ Keynote presentation

Fluid behaviour in the genesis of critical metal deposits

KN08 A. Finch, K. Sokol, A. Borst, N. Horsburgh, W. Hutchison, E. Stueken

17³⁰-17⁴⁵ X-Mine project: Sensing technologies and 3D ore deposit modelling methods

MO41 J. Paaso, N. Arvanitidis, M. Bergqvist, J. Kolacz, R. Arvidsson, S. Sadbom

17⁴⁵-18⁰⁰	Dual and Multi Energy XRT and CT analyses applied to copper-molybdenum mineralizations in porphyry deposits
<i>MO42</i>	<u>C. Bauer</u> , R. Wagner, B. Orberger, M. Firsching, C. Wagner, O. Boudouma, K. Siahcheshm
18⁰⁰-18¹⁵	Nanoscale identification of silver in galena ores from Lavrion and Chalkidiki mines (Greece)
<i>MO43</i>	<u>M. Samouhos</u> , P. Tsakiridis, M. Taxiarchou, A. Godelitsas
18¹⁵-18³⁰	Increasing resource efficiency of bauxites using LIBS
<i>MO44</i>	<u>J. Meima</u> , B. Orberger, D. Rammlmair, C. Garcia Pina, C. Dittrich
18³⁰-18⁴⁵	Contact profile analysis of resource estimation domains: A case study on a laterite nickel deposit
<i>MO45</i>	<u>I. Kapageridis</u> , A. Apostolikas, G. Kamaris
18⁴⁵-19⁰⁰	Mapping bauxite mining residues using remote sensing techniques
<i>MO46</i>	<u>S. Kasmaeeyazdi</u> , R. Braga, F. Tinti, E. Mandanici

SESSION A9**Hydro-, Iono-, Solvometallurgy I**

▼ ILISSOS MEETING ROOM

Chair: *J. Gamarra, N. Papassiopi*

17⁰⁰-17³⁰	Keynote presentation Innovative hydrometallurgical processing for sustainable environmental technologies and advanced green energy materials
<i>KN09</i>	G. Demopoulos
17³⁰-17⁴⁵	Bioleaching of pyrrhotite tailings for nickel and sulfur recovery: A two stage remediation process
<i>MO47</i>	<u>V. Papangelakis</u> , <u>H. Shen</u>
17⁴⁵-18⁰⁰	CO₂ neutral production of magnesia and silica product by HCl based process route out of serpentine achievable
<i>MO48</i>	<u>D. Konlechner</u> , G. Kappacher
18⁰⁰-18¹⁵	Extraction of REE from clay and hard-rock ores: The two extremes
<i>MO49</i>	<u>G. Moldoveanu</u> , V.G. Papangelakis
18¹⁵-18³⁰	The effect of the concentration of sodium carbonate on carbonation precipitation of sodium aluminate solutions
<i>MO50</i>	<u>D. Marinos</u> , D. Kotsanis, E. Balomenos, D. Panias
18³⁰-18⁴⁵	Antimony recovery from galena concentrates
<i>MO51</i>	<u>K. Megaloudi</u> , A. Kourtis, E. Tzamos, K. Markogiannis, D. Dimitriadis, A. Xenidis
18⁴⁵-19⁰⁰	Recovery of copper from dilute ammoniacal leachates by ion flotation
<i>MO52</i>	<u>P. Xanthopoulos</u> , K. Binnemans

19⁰⁰*End of sessions*

TUESDAY 7 SEPTEMBER 2021

PARALLEL EVENT

Greece specific issues (in Greek)

❖ **OLYMPIA PLENARY ROOM**

Chair: C. Kavalopoulos, A. Xenidis, P. Tzeferis, E. Tzamos

09⁰⁰-09³⁰ Προκλήσεις και προβλήματα της εξορυκτικής βιομηχανίας

GS01 Προοπτικές ανάπτυξης της εξορυκτικής βιομηχανίας

Α. Κεφάλας, Πρόεδρος του ΣΜΕ/Πρόεδρος των Imerys Greece και Imerys Greece Bauxites

GS02 Τροποποιήσεις περιφερειακών χωροταξικών σχετικών με την αξιοποίηση ορυκτών πρώτων υλών

Ε. Μπακογιάννης, Γενικός Γραμματέας Χωρικού Σχεδιασμού και Αστικού Περιβάλλοντος

09³⁰-10³⁰ Συζήτηση στρογγυλής τράπεζας

Συντονιστής: X. Καβαλόπουλος

Α. Σδούκου, Γενική Γραμματέας Ενέργειας και Ορυκτών πρώτων υλών

Κ. Αραβώσης, Γραμματέας Φυσικού περιβάλλοντος και Υδάτων

Α. Κεφάλας, Πρόεδρος του ΣΜΕ/Πρόεδρος των Imerys Greece και Imerys Greece Bauxites

Ι. Χαϊδά, Πρόεδρος του Συνδέσμου Επιχειρήσεων Μαρμάρου Μακεδονίας-Θράκης

Π. Μαραμπούτης, Διευθύνων Σύμβουλος Eco-efficiency Consulting and Engineering Ltd.

10³⁰-11⁰⁰ Coffee Break – Poster session 2

11⁰⁰-13⁰⁰ Το μέλλον της εξορυκτικής βιομηχανίας

GS03 Σχέδιο δίκαιης αναπτυξιακής μετάβασης για τη Δ. Μακεδονία και Μεγαλόπολη

Μ. Χαλκιαδάκης, Μέλος της Συντονιστικής Επιτροπής του Σχεδίου Δίκαιης Αναπτυξιακής Μετάβασης

GS04 Η πρόκληση της απολιγνιτοποίησης (The lignite phase-out challenge)

Δ. Μετικάνης, Γενικός Διευθυντής Λιγνιτικής Παραγωγής, ΔΕΗ Α.Ε.

GS05 Roadmap for exploration and exploitation of mineral resources in Greece (Οδικός χάρτης για την έρευνα και εκμετάλλευση ορυκτών πρώτων υλών στην Ελλάδα)

D. Lampou, C. Karathanassis, I. Zafiratos, P.G. Tzeferis, Mineral Raw Materials Directorate, Greek Ministry of Environment and Energy

GS06 Regulatory roadmap to the present and future of geothermal energy in Greece (Οδικός χάρτης για το παρόν και το μέλλον της γεωθερμίας στην Ελλάδα)

E. Varvitsioti, G. Tsifoutidis, Mineral Raw Materials Directorate, Greek Ministry of Environment and Energy

PARALLEL SESSIONS

SESSION B1

Education I

▼ VERGINA

Chair: K. Adam, K. Makri

09⁰⁰-09³⁰ Keynote presentation

Innovative teaching and learning pathways for responsible use of resources focusing on the ESEE region

KN10 C. Pacher, M. Murphy**09³⁰-09⁴⁵** Systematic development of generic skills to enhance innovation capacity of Eastern and Southeastern European universitiesTU01 P. Grgasovic, S. Borojevic Sostaric**09⁴⁵-10⁰⁰** "Mineral Resources to Circular Economy": a new transdisciplinary curricular unit for innovative Raw Materials Master's Programmes

TU02 S. Barbosa

10⁰⁰-10¹⁵ The significance of SDGs for the Raw Materials sector: A stakeholders' approach in three ESEE countriesTU03 S. Tomazinakis, G. Valakas, A. Gaki, D. Damigos, K. Adam**10¹⁵-10³⁰** "Geology in everyday life": Designing educational programmes with students of geology in the Science and Technology Museum (STM) of the University of PatrasTU04 P. Theologi-Gouti, I. Iliopoulos, M. Kokkaliari

SESSION B2

Base metals recovery from waste

▼ ILISSOS MEETING ROOM

Chair: O. Chernoburova, K. Karalis

09⁰⁰-09¹⁵ Aluminum recovery from calcium rich Bauxite Residue slags: Lab and Pilot scale experimentsTU05 M. Vafeias, P. Davris, E. Balomenos, D. Panias**09¹⁵-09³⁰** Production of Al-Sc alloy by electrolysis from cryolite melt using secondary feedstock materialTU06 A.M. Martinez, S. Senanu, H. Gudbrandsen, K. Osen, A. Store, Z. Wang, O. Kjos**09³⁰-09⁴⁵** High Temperature Reduction of Bauxite Residue at 1450°CTU07 T. Hidayat, Z. Zulhan, L. Grahita**09⁴⁵-10⁰⁰** H2-based processes for Fe and Al recovery from bauxite residue (red mud): comparing the optionsTU08 S. Kapelari, P. Gamaletsos, Y. Pontikes, B. Blanpain**10⁰⁰-10¹⁵** Tailings reprocessing technologies: experiences in Lower Silesian copper district, Poland – FLOT-BUD ProjectTU09 K. Witecki, A. Grotowski, A. Potulska-Bazan**10³⁰-11⁰⁰** Coffee Break – Poster session 2

PARALLEL SESSIONS

SESSION B3
Education II

VERGINA

Chair: E. Yaneva, M. Menegaki

11⁰⁰-11³⁰ Keynote presentation

The role of Engineering Education in the achievement of SDGs by the raw materials industries

KN11 K. Adam

11³⁰-11⁴⁵ The mining history of Greece in school textbooks: The case of lignite

TU10 K. Makri, C. Roumpos, A. Antoniadis

11⁴⁵-12⁰⁰ Women in Stone Sector: Challenges and opportunities from an educational point of view

TU11 M. Maniou, M. Perraki, A. Mavrikos, M. Menegaki

12⁰⁰-12¹⁵ Cancelled

TU12

12¹⁵-12³⁰ Evolution of health and safety training needs of the mining sector in Greece and EU

TU13 K. Tsichla, K. Adam

12³⁰-12⁴⁵ Rethinking education in the raw materials sector through tailor-made teaching methodologies

TU14 E. Yaneva, S. Papaefthymiou, L. Daling, S. Borojevic Sostaric, I. Merta

12⁴⁵-13⁰⁰ Development of lifelong learning course for rising innovativeness of raw materials professionals in Eastern and Southeastern Europe

TU15 S. Borojevic Sostaric, V. Bohanek, A. Zrno

SESSION B4
Critical metals recovery from waste

ILISSOS MEETING ROOM

Chair: C. Mori De Oliviera, N. Papassiopi

11⁰⁰-11³⁰ Keynote presentation

Viable Scandium extraction from bauxite residue at pilot scale

KN12 E. Balomenos, P. Davris, G. Nazari, S. Patkar, W.-Q. Xu, Y. Karnachoritis

11³⁰-11⁴⁵ The concern of critical raw materials: ITHACA Project and other ongoing EU efforts to face CRMs shortage

TU16 M.L. Grilli

11⁴⁵-12⁰⁰ Sustainable supply of Sc for the EU industries from liquid iron chloride based TiO₂ plants

TU17 B. Yagmurlu, B. Orberger, C. Dittrich, G. Croisé, R. Scharfenberg, E. Balomenos, D. Panias, E. Mikeli, C. Maier, R. Schneider, B. Friedrich, P. Dräger, Frank Baumgärtner, M. Schmitz, P. Letmathe, K. Sakkas, C. Georgopoulos, H. van den Laan

12⁰⁰-12¹⁵ Recovery of metal values from Ni-Cd cake waste residue of an Iranian Zinc plant by hydrometallurgical route

TU18 A. Chagnes, S. Kumar Sahu, M. Kargar Razi, M. Beuscher

12¹⁵-12³⁰ Sustainable chelating surfactants: Synthesis, surface activity and potential for application in

metal recovery from mining wasteTU19 D. Kalebic, K. Binnemans, W. Dehaen12³⁰-12⁴⁵ **Development of Rare Earth Elements separation processes from Coal Fly Ash**TU20 A. Tsachouridis, F. Pavloudakis, N. Kiratzis12⁴⁵-13⁰⁰ **The future of scandium recovery from wastes**TU21 O. Chernoburova, A. Chagnes**13⁰⁰-14³⁰ Lunch – Poster Session 2-Exhibition****PARALLEL SESSIONS****SESSION B5****Hydro-, Iono-, Solvometallurgy II**📍 **OLYMPIA PLENARY ROOM***Chair: D. Konlechner, E. Balomenos*14³⁰-15⁰⁰ **Keynote presentation****Forward Osmosis-Freeze Crystallization: A Novel Concept for Water Recovery from Industrial Streams**KN13 N. Devaere, R. Yuan, V.G. Papangelakis15⁰⁰-15¹⁵ **Separation of rare-earth elements by nonaqueous solvent extraction using the neutral extractant Cyanex 923**TU22 B. Dewulf, V. Cool, K. Binnemans15¹⁵-15³⁰ **Recovery of tungsten from downstream mineral processing fractions by deep eutectic solvents**TU23 L. Yurramendi, J. Nieto, A. Siriwardana15³⁰-15⁴⁵ **Fe-Mn alloys electroforming process using choline chloride based deep eutectic solvents**TU24 V. Sales, C. Paternoster, D. Mantovani, G. Kolliopoulos15⁴⁵-16⁰⁰ **Separation of iron, zinc and lead from a choline chloride: ethylene glycol deep eutectic solvent by solvent extraction**TU25 S. Spathariotis, N. Peeters, K.S. Ryder, A.P. Abbott, K. Binnemans, S. Riaño16⁰⁰-16¹⁵ **Separation of precious and base metals with undiluted halide ionic liquids: non-equilibrium solvent extraction in milliflow**TU26 W. Vereycken, J. van Stee, S. Riano Torres, T. van Gerven, K. Binnemans

SESSION B6

Fossil fuels in the energy transition era

VERGINA

Chair: S. Kalaitzidis, N. Pasadakis

14³⁰-15⁰⁰ Keynote presentation

The fossil fuel industry in the energy transition era, a vision for Greece

KN14 A. Stefatos

15⁰⁰-15¹⁵ Source rock evaluation: Analytical approach, uncertainties and the advantages of organic petrology

TU27 S. Kalaitzidis, G. Siavalas, M.-E. Damoulianou, K. Christanis

15¹⁵-15³⁰ Evaluation of gas generation potential using thermal maturity modelling; The Katakolon case: A probable pathway to energy transition

TU28 V.I. Makri, G. Panagopoulos, K. Nikolaou, S. Bellas, N. Pasadakis

15³⁰-15⁴⁵ Assessing natural gas versus CO₂ potential underground storage sites in Greece; a pragmatic approach

TU29 V. Makri, S. Bellas, V. Gaganis

15⁴⁵-16⁰⁰ Physicochemical properties and REE distribution of the Northwest and Central Greece coal deposits

TU30 N. Koukouzas, S. Kalaitzidis, P. Koutsovitis, A. Bouzinos, C. Karkalis, P. Tyrologou, D. Karapanos

16⁰⁰-16¹⁵ A comparative study of the properties of biomass and coal fuels from Greece

TU31 C. Vasilatos, D. Cheimarios, T. Theodorou, C. Stouraiti, M. Andreadi, N. Koukouzas

16¹⁵-16³⁰ Numerical reservoir modeling of high enthalpy geothermal fields in Greece

TU32 V. Gaganis, S. Stamataki

SESSION B7

Waste valorization-Industrial Symbiosis I

ILISSOS MEETING ROOM

Chair: I. Giannopoulou, K. Tsakalakis

14³⁰-15⁰⁰ Keynote presentation

Can the Greek islands set an example on sustainability and autonomy? A proposal

KN15 Y. Pontikes

15⁰⁰-15¹⁵ Carbon dioxide: a raw material for cementitious mortar

TU33 A.P. Fantilli, R. Calvi, E. Quiet, P.L. Radavelli

15¹⁵-15³⁰ Hematite addition to serpentinized by-products of the "Grecian Magnesite SA" mine at Gerakini (Halkidiki) for the production of refractories

TU34 K. Kalaitzidou, E. Pagona, P. Stratigousis, X. Ntampou, E. Tzamos, V. Zaspalis, A. Zouboulis, M. Mitrakas

15³⁰-15⁴⁵ Alternative alkali activating solutions in the synthesis of IP binders

TU35 L. Kriskova, E. Tatsis, A. Muhammad, D. Delaere, Y. Pontikes

15⁴⁵-16⁰⁰ Diabase mud based geopolymers paste: formulation and properties

TU36 M. Spanou, S. Luhar, P. Savva, S. Ioannou, M.F. Petrou, D. Nicolaides

16⁰⁰-16¹⁵ Potential uses of copper wastes in the building sector: inertization and added value solutions
TU37 S. Rosado, L. Gullon

16¹⁵-16³⁰ Morphology and properties of glass-ceramics produced from hospital waste incineration ash and different coal fly ashes
TU38 A. Kritikaki, G. Bartzas, K. Komnitsas

16³⁰-17⁰⁰ *Coffee Break – Poster session 2*

PARALLEL SESSIONS

SESSION B8 Advanced metallurgical processes

▼ OLYMPIA PLENARY ROOM

Chair: M. Taxiarchou, P. Oustadakis

17⁰⁰-17³⁰ Keynote presentation
Heap leaching of Greek low-grade nickel oxide ores by dilute sulphuric acid at a pilot-plant scale
KN16 S. Agatzini-Leonardou, P. Oustadakis, P. Tsakiridis, J. Zafiratos, D. Dimaki, J. Drougas, E. Frogoudakis

17³⁰-17⁴⁵ Novel process and alloy for automotive Market
TU39 D. Spathis

17⁴⁵-18⁰⁰ Reduction of ferric iron in pregnant leaching solution of laterites using Zero Valent Iron
TU40 C. Mystrioti, N. Papassiopi, A. Xenidis

18⁰⁰-18¹⁵ How to design the utilization of larger scrap share in aluminum production
TU41 M. Bouzouni, S. Papaefthymiou

18¹⁵-18³⁰ Regeneration and synthesis of NMC811 from cathode waste using oxalic acid based deep eutectic solvents
TU42 J. Gamarra, R. Younesi

18³⁰-18⁴⁵ Innovative recovery method for critical elements from metallic end-of-life products
TU43 B. Yagmurlu, C. Dittrich, G. Dunn

SESSION B9 Minerals exploration-Ophiolites

▼ VERGINA

Chair: E. Tzamos, K. Laskaridis

17⁰⁰-17⁴⁵ Keynote presentation
Raw materials provided by ophiolitic complexes: From primary metallic ores to alteration of ultramafic rocks
KN17 A. Rassios, E. Tzamos, M. Bussolesi

17⁴⁵-18⁰⁰ Serpentinites: from dimension stones to valuable industrial minerals
TU44 A. Cavallo, M. Bussolesi, G. Grieco

18⁰⁰-18¹⁵ Mineralogical and isotopic study of magnesite veins in the Evia and Gerakini ultramafites (Greece)
TU45 M. Bussolesi, G. Grieco, E. Tzamos, A. Cavallo, P. Marescotti, L. Crispini, A. Kasinos, A. Zouboulis

- 18¹⁵-18³⁰** Investigation of the effects of magnetic separation and thermal treatment combined with additives on the serpentинized peridotites of the Gerakini (Chalkidiki, N. Greece) magnesite mine
TU46 D. Papargyriou, E. Tzamos, A. Kasinos, P. Papageorgiou, M. Mitrakas, A. Zouboulis
- 18³⁰-18⁴⁵** The impact of forefront technology on mine geological methods at Olympias Mine that drive improvements on orebody knowledge through decades
TU47 R. Vagklj, G. Gkekas
- 18⁴⁵-19⁰⁰** Diagenesis of the sedimentary Fe-Ni deposits of Euboea: Evidence based on phyllosilicate mineralogy
TU48 S. Cheliotis-Chatzidimitriou, G. Christidis, I. Marantos

SESSION B10

Waste valorization-Industrial Symbiosis II

♦ ILISOS MEETING ROOM

Chair: P. Tsakiridis, D. Panias

- 17⁰⁰-17¹⁵** Effect of fly ash and other supplementary corrosion inhibitor on the tensile performance of 316L stainless steel concrete reinforcement during accelerated saline corrosion test
TU49 S. Tsouli, A.G. Lekatou, S. Kleftakis, I.K. Tragazikis, T.E. Matikas
- 17¹⁵-17³⁰** Performance of a Fe-rich inorganic polymer in a Na₂SO₄ solution: role of Mg/(Mg+Ca) in the slag
TU50 N. Wen, A. Peys, T. Hertel, Y. Pontikes
- 17³⁰-17⁴⁵** Formation, characterization and SEM microanalysis of yeelimite
TU51 M. Kamitsou, I. Kostakopoulos, D. Kanellopoulou, A. Christogerou, G. Angelopoulos
- 17⁴⁵-18⁰⁰** Porous materials from Fe-rich slags: challenges and best practices
TU52 R. Murillo Alarcon, T. Hertel, H. Rahier, Y. Pontikes
- 18⁰⁰-18¹⁵** Bogue equations from thermodynamic modelling for low-carbon ferrite-belite clinkers
TU53 R. Roy, T. Hertel, Y. Pontikes
- 18¹⁵-18³⁰** Phosphogypsum-paraffin composites for low temperature thermal energy storage applications
TU54 A. Anagnostopoulos, H. Navarro, Y. Ding, G. Gaidajis

19⁰⁰ End of sessions

21⁰⁰ Gala dinner

PLENARY LECTURES

▼ OLYMPIA PLENARY ROOM

Chair: D. Panias, A. Zouboulis

09⁰⁰-09³⁰	Plenary lecture 7 The contribution of the EU cement sector to the circular economy
<i>PL07</i>	Nikos Nikolakakos , Environment and Resources Manager, European Cement Association CEMBUREAU
09³⁰-10⁰⁰	Plenary lecture 8 Mitigating the European Dependency of Mineral Raw Materials: The role of the Mineral Resources Expert Group and GeoERA Raw Materials
<i>PL08</i>	Daniel Oliveira , Chair of EuroGeoSurveys Mineral Resources Expert Group, Critical raw materials in Europe
10⁰⁰-10³⁰	Plenary lecture 9 Circular Economy: from Theory to Practice
<i>PL09</i>	Lena Belsi , CEO of Geecycle Hellas, member of HERACLES Group

10³⁰-11⁰⁰ Coffee Break – Poster session 3

PARALLEL SESSIONS

SESSION C1

Mineral processing of ores and end-products

▼ OLYMPIA PLENARY ROOM

Chair: D. Mesa, G. Anastasakis

11⁰⁰-11³⁰	Keynote presentation Putting the ‘Smart’ into ‘Smart sorting’: Novel methods to identify ore and gangue on run-of-mine
<i>KN18</i>	N. Horsburgh, A. Finch
11³⁰-11⁴⁵	Development and validation of a dynamic model for flotation predictive control incorporating froth physics
<i>WE01</i>	P. Quintanilla, S.J. Neethling, P.R. Brito-Parada
11⁴⁵-12⁰⁰	Modeling approaches in ball milling of bauxite ores
<i>WE02</i>	E. Petrakis, K. Komnitsas
12⁰⁰-12¹⁵	Retrofit designs for the pulp-froth interface: impacts on froth stability, entrainment, and fine particles’ flotation performance
<i>WE03</i>	D. Mesa, S. Neethling, P. Brito-Parada
12¹⁵-12³⁰	From mineral processing to recycling; The case of end-of-life printed circuit boards physical processing
<i>WE04</i>	K. Syrmakezis, K. Tsakalakis, I. Sammas

12³⁰-12⁴⁵ Engineering bio-colloids as sustainable reagents in mineral froth flotation

WE05 R. Hartmann, R. Serna-Guerrero

12⁴⁵-13⁰⁰ Assessment of desulfurization process of polymetallic ore based on flotation

WE06 Y. Botero, L. Cisternas, M. Benzaazoua

SESSION C2 Sustainability

📍 VERGINA

Chair: K. Adam, G. Gaidajis

11⁰⁰-11³⁰ Keynote presentation

MinLand-Mineral Resources in Sustainable Land-Use Planning

KN19 R. Arvidsson, N. Arvanitidis

11³⁰-11⁴⁵ The dual paradigm of mine waste: “from ecotoxicological sources to potential polymetallic resources” – an example from Iberian Pyrite Belt (Portugal)

WE07 S. Barbosa, A. Dias, A. Ferraz, S. Amaro, M. da Graça Brito, J.A. Almeida, S. Pessanha

11⁴⁵-12⁰⁰ Responsible mining: A literature review of voluntary initiatives

WE08 A. Garidi, G. Gaidajis

12⁰⁰-12¹⁵ MCDM applied to the evaluation of transitional and post-mining conditions – an innovative perspective developed through the EIT ReviRIS project

WE09 S. Lourenço Amaro, S. Barbosa, G. Ammerer, A. Bruno, J. Guimera, I. Orfanoudakis, A. Ostrega, E. Mylona, M. Hitch, J. Strydom, J. Sinkovic, M. Kaleta

12¹⁵-12³⁰ Novel techniques for anticipating the focus of visual attention across different mining landscapes

WE10 L.-M. Misthos, M. Menegaki

12³⁰-12⁴⁵ Development of emission factor equations for surface mining activities: the case of a stacker

WE11 A. Triantafyllou, I. Kapageridis, S. Garas, F. Pavloudakis

12⁴⁵-13⁰⁰ The implementation of recycling philosophy in the Greek fertilizers industry

WE12 T. Kouloura

SESSION C3 Batteries and magnets recycling

📍 ILISSOS MEETING ROOM

Chair: A. Chagnes, E. Balomenos

11⁰⁰-11³⁰ Keynote presentation

Upscaling of permanent magnet dismantling and recycling through VALOMAG project

KN20 F. Coelho, V. Decottignies, Y. Yang, B. Sprecher, B. Saje, C. Rado, N. Menad, S. Abrahami, Z. Li, K. Bru, T. Marcon

11³⁰-11⁴⁵ Recovery of metals from NdFeB magnets using trichloride ionic liquid

WE13 X. Li, K. Binnemans

11⁴⁵-12⁰⁰ Evaluation of graphite separation from metallic oxides by flotation in recycling of Li-ion batteries

WE14 J. Yang, A. Torppa, K. Kärenlampi

12⁰⁰-12¹⁵ Resource recovery from lithium-ion batteries-challenges and opportunities for precipitation and crystallization processes

WE15 Y. Ma, M. Svärd, X. Xiao, S. Ashoka Sahadevan, J.M. Gardner, R.T. Olsson, K. Forsberg

12¹⁵-12³⁰ A sustainable process for the recovery of valuable metals from spent lithium ion batteries by deep eutectic solvents leaching

WE16 L. Yurramendi, J. Hidalgo, A. Siriwardana

12³⁰-12⁴⁵ Microstructure-efficiency relationship in liquid-liquid extraction

WE17 A. El Maangar, M. Spadina, J. Duhamet, J.-C. Gabriel, T. Zemb

12⁴⁵-13⁰⁰ Sulphuric acid leaching of spent nickel metal hydride car batteries

WE18 E. Polychronopoulou, P. Oustadakis, P. Tsakiridis, K. Betsis, A. Xenidis

13⁰⁰-14³⁰ *Lunch – Poster Session 3-Exhibition*

PARALLEL SESSIONS

SESSION C4

Industrial Minerals-Innovative processes and applications I

❖ OLYMPIA PLENARY ROOM

Chair: M. Taxiarchou, C. Vasilatos

14³⁰-15⁰⁰ Keynote presentation

The 20th century world was made of industrial minerals; disruptive and sustainable mineral solutions are required for the 21st century world

KN21 A. Karalis

15⁰⁰-15¹⁵ Comparative study of acid activated nontronite and montmorillonite in oxalic acid of various concentrations

WE19 D. Tsakiri, I. Douni, M. Taxiarchou

15¹⁵-15³⁰ Physical mechanical properties and producing areas of Greek dimension stones

WE20 K. Laskaridis, A. Arapakou, M. Patronis, I. Kousseris

15³⁰-15⁴⁵ Thermal activation of kaolin: effect of kaolin mineralogy on the activation process

WE21 D. Kosmudi, C. Panagiotopoulou, P. Angelopoulos, M. Taxiarchou

15⁴⁵-16⁰⁰ CO2-mineralised nesquehonite: a new “Green” building material

WE22 A. Kastrinakis, V. Skliros, P. Tsakiridis, M. Perraki

16⁰⁰-16¹⁵ MASTERFLOOR: The new application of pumice stone as lightweight floor filling material

WE23 M. Nomikou, V. Kaloidas, C.T. Galmpenis, G. Tzouvalas

SESSION C5

Mine waste/Water management

❖ VERGINA

Chair: G. Grieco, E. Gazea

14³⁰-15⁰⁰ Keynote presentation

The technology of dry-stack tailings and the implementation at the Kassandra mines

KN22 D. Dimitriadis, E. Zachareas, E. Gazea

15⁰⁰-15¹⁵	Implementation of a procedure for buffering acid mine drainage waters from pyrite-rich tailings at Fushë Arrëz copper enrichment flotation plant
WE24	<u>G. Cocomazzi</u> , G. Grieco, A. Sinojmeri, A. Cavallo, M. Bussolesi
15¹⁵-15³⁰	Rational and sustainable water resources management in the Ptolemais lignite basin using remotely sensed data
WE25	<u>G. Louloudis</u> , C. Roumpos, E. Mertiri, G. Kasfikis, F. Pavloudakis
15³⁰-15⁴⁵	Bathymetry surveys of post mining pit lakes formed after exploitation of lignite
WE26	<u>A. Bajcar</u> , J. Szczepiński, B. Rogosz
15⁴⁵-16⁰⁰	Long-term slope stability of abandoned mine lake – numerical modelling and risk assessment
WE27	<u>V. Renaud</u> , M. Al Heib, R. Muller, J. Burda
16⁰⁰-16¹⁵	Assessment of advantages and limitations of installing PV on abandoned dumps
WE28	<u>M. Al Heib</u> , A. Cherkaoui
16¹⁵-16³⁰	Hydrogeochemical and environmental evaluation of mining water from Chalkidiki area, Northern Greece
WE29	<u>K. Sachsamanoglou</u> , E. Tziritis, E. Tzamos, D. Ballas, E. Gazea, A. Xenidis, A. Zouboulis

SESSION C6

Recycling/Metals recovery from end products

¶ ILISSOS MEETING ROOM

Chair: L. Yurramendi, E. Kaklamanos

14³⁰-14⁴⁵	Study of metal recovery from printed circuit boards by physical-mechanical treatment processes
WE30	<u>C. Mori De Oliveira</u> , <u>R. Bellopede</u> , A. Tori, P. Marini
14⁴⁵-15⁰⁰	Delamination of waste printed circuit boards using microwave-assisted organic swelling
WE31	<u>B. Monteiro</u> , <u>L. Martelo</u> , P. Sousa, M. Bastos, H. Soares
15⁰⁰-15¹⁵	A hydrometallurgical process for Cu recovery from waste printed circuit boards
WE32	<u>D. Vlasopoulos</u> , P. Oustadakis, P. Tsakiridis, E. Remoundaki, S. Agatzini-Leonardou
15¹⁵-15³⁰	Recovery of gold from waste printed circuit boards using sustainable technologies
WE33	<u>P. Sousa</u> , <u>L. Martelo</u> , M. Bastos, A. Marques, <u>H. Soares</u>
15³⁰-15⁴⁵	Green zero-waste metal extraction and recycling from printed circuit boards
WE34	<u>H. Askari Sabzkoohi</u> , G. Kolliopoulos
15⁴⁵-16⁰⁰	Hydrometallurgical treatment for the separation and recovery of Indium and Gallium from end-of-life CIGS photovoltaic panels
WE35	<u>M. Theocharis</u> , P. Tsakiridis, P. Kousi, A. Hatzikioseyan, I. Zarkadas, E. Remoundaki, G. Lyberatos
16⁰⁰-16¹⁵	DES-based solution for Regenerating the catalyzed-diesel particulate filters of Euro 5/6 diesel vehicles
WE36	<u>H. Papadopoulou</u> , S. Papagianni, A.-M. Moschovi, K.M. Sakkas, I. Yakoumis
16¹⁵-16³⁰	Opportunities of AI and ICME in metals recycling, production and processing
WE37	<u>S. Papaefthymiou</u> , M. Bouzouni, V. Loukarakis

16³⁰-17⁰⁰ Coffee Break – Poster session 3

PARALLEL SESSIONS

SESSION C7

Industrial Minerals-Innovative processes and applications II

📍 OLYMPIA PLENARY ROOM

Chair: G. Anastasakis, A. Peppas

17⁰⁰-17¹⁵ GUNITECH: An innovative pumice based dry shotcrete applicationWE38 M. Nomikou, V. Kaloidas, C.T. Galmpenis, N. Anagnostopoulos, G. Tzouvalas**17¹⁵-17³⁰ Development of high added values products from industrial minerals for hybrid energy storage**WE39 A. Peppas, C. Politis**17³⁰-17⁴⁵ Modification of the color properties of natural hydraulic and air lime binders using pyroclastic rocks as natural pigments**WE40 G. Triantafyllou, O. Kalagri, G.E. Christidis, I. Marantos**17⁴⁵-18⁰⁰ Perspectives of lithium mining in Quebec, potential and advantages of integration into a local battery production chain for electric vehicles**WE41 S. Ibarra-Gutiérrez, J. Bouchard, M. Laflamme, K. Fytas**18⁰⁰-18¹⁵ Quantitative analysis of Portland cement clinker with Rietveld refinement: Implications of the amorphous matter.**WE42 G. Christidis, M. Dimitriadis, G. Triantafyllou, C. Tsoumeleas**18¹⁵-18³⁰ The Italian zeolite tuffs used in the construction industry**WE43 M. Stamatakis, C. Vasilatos, I.S. Stamatakis**18³⁰-18⁴⁵ Petrographic, mineralogical and geochemical characterization of Greek Triassic gypsum-anhydrite deposits and their industrial applications**WE44 I. Badouna, S. Neokosmidis, M. Stamatakis, C. Karkalis, N. Koukouzas, P. Koutsovitis

SESSION C8

Mine closure/Post mining

📍 VERGINA

Chair: C. Roumpos, A. Antoniadis

17⁰⁰-17¹⁵ Introducing the IDEFO methodology in the strategic planning of projects for the surface mine land reclamation and repurposingWE45 P.-M. Spanidis, F. Pavloudakis, C. Roumpos**17¹⁵-17³⁰ Restoration of Old Olympias arsenopyrite concentrate storage area (former METBA plot)**WE46 E. Gazea, D. Dimitriadis, A. Galatsianou**17³⁰-17⁴⁵ Lignite deposits in the post-coal era: alternative utilization in the agriculture and horticulture sectors**WE47 K. Christianis, A. Giannouli, S. Kalaitzidis, A.-M. Rizos, K. Perleros**17⁴⁵-18⁰⁰ Geotechnical engineering perspectives: challenges and solutions in the transition to a post-lignite era**WE48 I. Zevgolis, A. Theocharis, N. Koukouzas**18⁰⁰-18¹⁵ Correlation of ambient air quality with the sudden reduction of mining activity in a complex of**

lignite mines

WE49 C. Sachanidis, F. Pavloudakis, C. Roumpos

18¹⁵-18³⁰ Planning RES projects in exhausted surface lignite mines. Challenges and solutions

WE50 A. Antoniadis, C. Roumpos, P. Anagnostopoulos, N. Paraskevis

18³⁰-18⁴⁵ Examination of the potential utilization of phosphogypsum as an alternative material for the reclamation of mines and quarries

WE51 G. Gaidajis

18⁴⁵-19⁰⁰ Risk assessment methodology for pit lakes instabilities

WE52 M. Galetakis, V. Deligiorgis, E. Steiakakis, S. Raka, M. Al Heib

SESSION C9

Pollution abatement/Environmental performance

¶ ILLISSOS MEETING ROOM

Chair: M. Menegaki, S. Kalaitzidis

17⁰⁰-17¹⁵ CO2 sequestration using fly-ash from lignite-fired power plants

WE53 K. Karalis, K. Kollias, G. Bartzas, C. Mystrioti, A. Xenidis

17¹⁵-17³⁰ Simulating the use of a smelter off-gas in the precipitation stage of the Pedersen process

WE54 A. Manataki, J. Mwase, C. van der Eijk

17³⁰-17⁴⁵ Valorization of bottom oil sludge in red ceramics – Inertization of the contained heavy metals in the ceramic matrix

WE55 X. Spiliotis, D. Kasiteropoulou, D. Kaffe, D. Chistodoulou, G. Papapolymerou, G. Banias

17⁴⁵-18⁰⁰ Investigation of the freezing-thawing effect on the slip resistance of natural stones

WE56 A. Arapakou, K. Laskaridis, M. Patronis, I. Kouuseris

18⁰⁰-18¹⁵ Application of TiO₂ nanoparticles in clay roofing tiles as a photocatalytic active material

WE57 M. Kouroutzi, A. Stratidakis, M. Kermenidou, S. Karakitsios, D. Sarigiannis

18¹⁵-18³⁰ LCA and LCC of emerging and incumbent technologies on energy harvesters

WE58 A. Malagnino, M. Rostagno, G. Gaspare Amaro, A. Vlysidis, A. Gkika, E. Koumoulos, Y. Qin

18³⁰-18⁴⁵ Correlation between physical mechanical properties of Greek dimension stones

WE59 A. Arapakou, K. Laskaridis, M. Patronis, I. Kouuseris

18⁴⁵-19⁰⁰ Project risk management adaptations of infrastructures in the Greek context

WE60 G. Demertzis, K. Vatalis

PARALLEL EVENT

¶ PELLA-MYCENAE HALL

ITHACA industrial workshop

COST INNOVATORS' GRANT IG15102: Innovative and sustainable Technologies for reducing critical raw materials dependence for Cleaner transportation Applications- ITHACA

10⁵⁰-11⁰⁰ Welcome

M.L. Ruello, UnivPM, Ancona, Chair COST Action CRM-Extreme

11⁰⁰-11²⁰	Intermetallics for automotive engine valves and engine valve sets
	P. Novak, University of Chemistry and Technology, Prague
11²⁰-11⁴⁰	3D printed copper based catalytic emission control devices for addressing automotive, marine and industrial applications
	I. Yakoumis, Monolithos, Athens
11⁴⁰-12⁰⁰	Novel materials based on zirconia doped with mixed rare earth oxides for thermal barrier coatings
	R.R. Piticescu, IMNR, Bucharest
12⁰⁰-12²⁰	Holistic approaches in designing and manufacturing aircraft components under the viewpoint of ecological and economic sustainability
	S. Pantelakis, Honorary Chairman of EASN- European Aeronautics Science Network
12²⁰-12⁴⁰	Circular economy in the aerospace sector
	G. Acieno, President of Apulia Aerospace Technological District (DTA)
12⁴⁰-13⁰⁰	The extreme materials in the future of the automotive sectors: full electric vs hybrid vs Internal combustion powertrains
	S. Durante, Executive Vice President, D4S Group Durante Space Tech
13⁰⁰-13⁰⁵	Closing remarks
	M.L. Grilli, ENEA, Casaccia Research Centre, Chair COST IG ITHACA

PARALLEL EVENT

PELLA-MYCENAE HALL

INCO-Piles round table

Opportunities for technology transfer to foster the recovery of Critical Raw Materials (CRM) from tailings

14⁰⁰-14¹⁰	Welcome and a glance at the INCO-Piles project
	F. Tinti, University of Bologna
14¹⁰-14¹⁵	Agenda and general information on the round table
	G. Sonnemann, University of Bordeaux
14¹⁵-14³⁰	EIT RawMaterials contributions on mining residues
	F. Ferri, EIT Raw Materials
14³⁰-14⁴⁰	INCO-Piles project: Characterization and sampling
	D. Sparis, National Technical University of Athens
14⁴⁰-14⁵⁰	INCO-Piles project: Laboratory analysis
	J. Schick, Orano
14⁵⁰-15⁰⁰	INCO-Piles project: Environmental and economic assessments
	P. Altamura, ENEA
15⁰⁰-15¹⁰	Assessing natural radionuclide content for the valorization of bauxite residue
	A.H. Tkaczyk, University of Tartu
15¹⁰-16³⁰	First round of discussions

16³⁰-16⁴⁵ Coffee Break

16⁴⁵-16⁵⁵	Reprocessing of old copper tailings to recover base metals and CRMs at Cobre Las Cruces mine in Andalucia (Spain)
	C. Frias, Rio Tinto Proyectos

16⁵⁵-17⁰⁵ CRM recovery from Ti-pigment production

B. Yagmurlu, MEAB Chemie Technik GmbH

17⁰⁵-17¹⁵ Secondary resources from industrial tailings

D. Runciman, Alconex Metrology & Services

17¹⁵-18²⁵ Second round of discussions

18²⁵-18³⁰ Sum-up and conclusion of the event

F. Tinti, University of Bologna

19⁰⁰ Closing ceremony-Awards

THURSDAY 9 SEPTEMBER 2021

Field Trip

📍 *Lavrion Historical Mine Site*



**08³⁰-18¹⁵ Visit to Lavrion Technological and Cultural Park
(Mineral processing and Metallurgical plants),
Archaeological Sites of Thorikos, Souriza and Poseidon
Temple**

POSTER SESSION 1**Mineral exploration and characterization / EU Strategy on Circular economy /
Mining trends and perspectives / Waste Valorization****MONDAY 6 SEPTEMBER 2021****FOYER OLYMPIA**

- P1-01** **Metrology for the recycling of technology critical elements to support Europe's circular economy agenda**
J. Noireaux, J. Vogl, G. D'Agostino, S. Hill, R. Gendre, O. Cankur, J.-P. Ghestem, C. Haraldson, J. Irrgeher, R. Jacimovic, A. Jotanovic, T. Naykki, D. Proefrock, O. Rienitz, G. Umbricht
- P1-02** **Rock image classification ore/waste – Cut off identification for decision making-Related work**
A. Mantela
- P1-03** **Development and study of MgO-C refractories containing magnesia and SiC nanoparticles**
S. Gkiouzel, K.C. Vasilopoulos, I. Kitsou, E. Roussi, E. Kagiaras, M.A. Karakassides, A. Tsetsekou
- P1-04** **Ornamental stone cutting processing and sludge production evaluation with the goal of ending waste**
L. Zichella, R. Bellopede, P. Marini
- P1-05** **Image analysis and microanalysis of sulfobelite clinkers**
E. Vougioukalakis, M. Kamitsou, D. Kanellopoulou, A. Christogerou, G. Angelopoulos
- P1-06** **Challenges in managing waste from extractive industries during the transition to a circular economy model in Poland**
J. Kulczycka, E. Dziobek
- P1-07** **Mineralogical and geochemical investigation of nickeliferous lateritic ore of Mamez region (Albania)**
A. Stratakis, I. Gkikas, G. Alevizos, A. Apostolikas
- P1-08** **Kaoline mapping using ASTER satellite imagery: the case study of Kefalos Peninsula, Kos Island**
M. Kokkaliari, C. Kanellopoulos, I. Iliopoulos
- P1-09** **Comparison of static and dynamic Young's modulus of prasinites**
D. Kotsanis, P. Nomikos, D. Rozos
- P1-10** **Preliminary feasibility assessment and SWOT analysis of a fast pyrolysis pilot furnace for the management of marine and hazardous waste**
A. Malamakis, M. Batsioula, G. Banias, E. Tzamos, G. Palantzas, K. Triantafyllidis, A. Zoumpoulis, K. Rekos
- P1-11** **Green coatings for the protection of concrete sewer pipes**
G. Fytianos, E. Papastergiadis, P. Samaras
- P1-12** **Dealkalization process of bauxite residue: from laboratory to industrial implementation**
G. Flesoura, E. Mikeli, P. Davris, E. Balomenos, D. Panias

POSTER SESSION 2

Recycling / Waste Valorization / Sustainable Metallurgy / Education

TUESDAY 7 SEPTEMBER 2021

FOYER OLYMPIA

- P2-01 **An integrated approach for the recovery of used Tin as water adsorbent**
E. Kaprara, E. Daskalopoulou, K. Simeonidis, M. Mitrakas
- P2-02 **Magnesite ore washing facilities wastewater treatment and recovered water reuse**
I. Tsilogeorgis, E. Tzamos, E. Kokkinos, A. Zouboulis
- P2-03 **A preliminary study on the potential of the LARCO laterite ore tailings as secondary source of cobalt**
E. Tzamos, G. Grieco, P. Marescotti, K. Simeonidis, A. Zouboulis, A. Xenidis
- P2-04 **Components' Characterization of End-of-Life Dishwashers**
E. Evangelou, G. Anastassakis, S.D. Karamoutsos, A. Stergiou
- P2-05 **Valorisation of aluminium salt slag washed residue in the production of portland cement clinker**
K. Piperopoulos, A. Kaldellis, P. Oustadakis, M. Perraki, P. Tsakiridis
- P2-06 **ReActiv: Industrial Residue Activation for Sustainable Cement Production**
P. Benard, E. Balomenos
- P2-07 **Adding value to waste marble powder: Utilization as micro/nano-filler of protective epoxy polymer composites**
D. Gkiliopoulos, K. Simeonidis, D. Efstathiadis, G. Raska, I. Polychroniadis, K. Triantafyllidis
- P2-08 **Separation of transition metals and rare earths using ionic liquid-based aqueous biphasic systems**
X. Li, J.J.M.M. van de Ven, K. Binnemans
- P2-09 **Development of STEM educational application with easy java simulation in mining & metallurgical engineering educational procedure. case study on mineral processing**
K. Syrmakezis, K. Tsakalakis
- P2-10 **Recovery of scandium as $(\text{NH}_4)_3\text{ScF}_6$ by crystallization**
E.M. Peters, M Svärd, K Forsberg
- P2-11 **Bioleaching of mining wastes from Kirki abandoned public mine ((prefecture of Evros, Greece)**
V. Angelatou, E. Drosos
- P2-12 **Effect of fly ash on the mechanical performance of 316L and 304L stainless steel concrete reinforcement during accelerated saline corrosion tests**
S. Tsouli, A.G. Lekatou, S. Kleftakis, I.K. Tragazikis, T.E. Matikas
- P2-13 **Solar-assisted development of carbonate-derived nanoadsorbents for the hydrogen sulfide capture**
I. Kellartzis, D. Karfaridis, K. Simeonidis, C. Martinez-Boubeta, L. Balcells, P. Koulias
- P2-14 **Efficient recovery of solid waste units as substitutes for raw materials to produce different types of ceramics**

- I. Makrygiannis, A. Tsetsekou
- P2-15** **Mechanochemical activation of muscovite mica-rich sulfidic mining waste rock for alkali activation with implication of grinding process simulation**
H. Niu, L. Adrianto, A. Escobar, P. Kinnunen, M. Illikainen
- P2-16** **A date seed-based carbons for methane storage and carbon capture and storage (CCS)**
A. Altwala, R. Mokaya
- P2-17** **Overview of the ERA MIN2 project "nanoBT: Application of nanobubble technologies to mining industry operations"**
N. Kalogerakis, K. Komnitsas, Q.P. Botha, G. Kolliopoulos
- P2-18** **Distribution of radon concentrations in active and inactive underground mines**
K. Asimakou, N. Kallithrakas-Kontos, A. Vafeidis, E. Manoutsoglou
- P2-19** **Machine learning-assisted selection of elemental composition for refractory high-entropy alloys**
B. Postolnyi, V. Buranich, J.P. Araujo, A. Pogrebnyak, V. Rogoz
- P2-20** **Self-assessment tool for OSH Management in SMEs extractive enterprises**
P. Maraboutis, E. Nikolaou, N.I. Poulimenou

POSTER SESSION 3

Environment, Energy and Sustainability / Industrial Minerals

WEDNESDAY 8 SEPTEMBER 2021

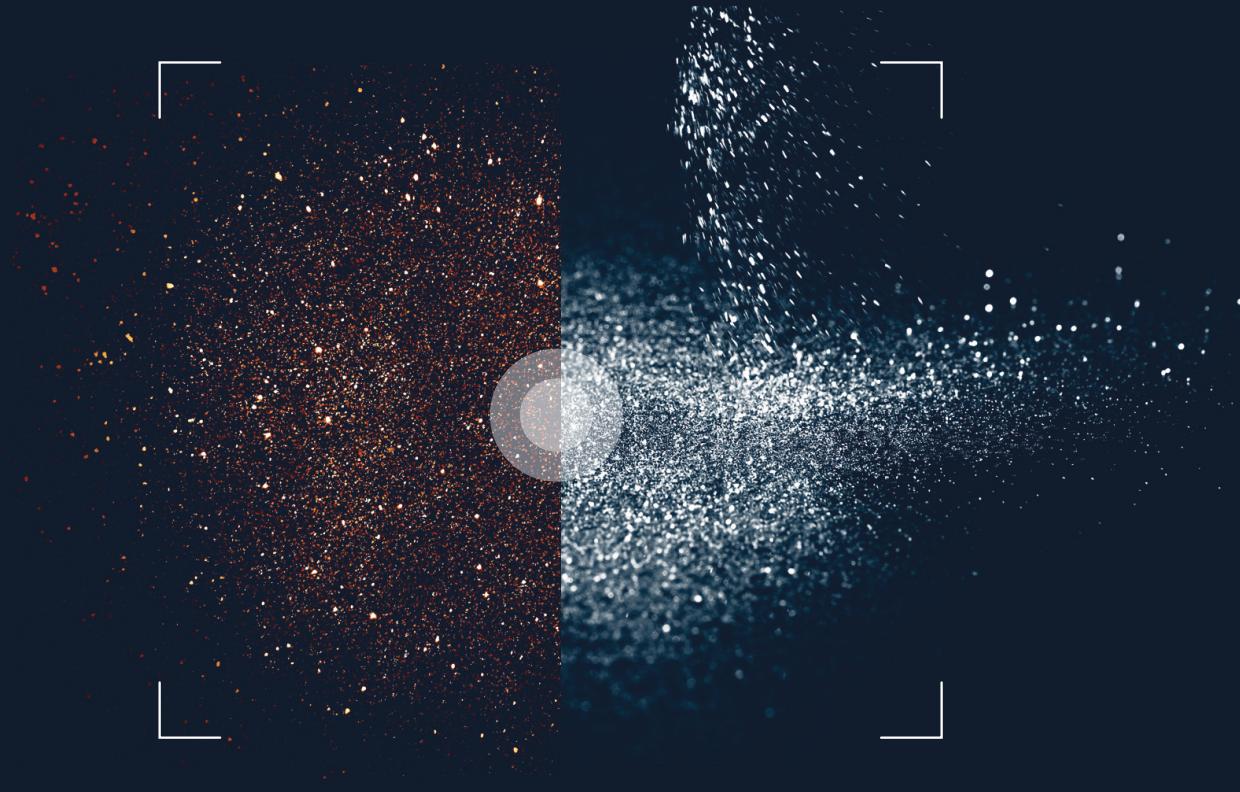
FOYER OLYMPIA

- P3-01** **Catalytic action of zeolite in micropollutants' ozonation. Application in a continuous flow pre-industrial unit**
E. Kaprara, S. Psaltou, M. Salapasdou, P.-A. Palasantza, P. Diamantopoulos, A. Zouboulis, M. Mitrakas
- P3-02** **Synthesis and Characterization of Magnesium Silicide formed by thermochemical diffusion process**
D. Stathokostopoulos, A. Teknetzi, K. Chrissafis, D. Karfaridis, G. Vourlias
- P3-03** **Uptake of high-valent heavy metals from water by magnetite nanoparticles**
E. Chioti, K. Kalaitzidou, T. Asimakidou, K. Simeonidis, M. Mitakas
- P3-04** **Retention of Pb using thermally-treated palygorskite under dynamic sorption conditions**
Z. Kypritudou, M.-A. Gatou, A. Argyraki, E. Pavlatou
- P3-05** **Determination of the slagging and fouling tendency of the ashes from North Greece lignites, based on their chemical and mineralogical composition**
A. Stratakis, G. Kostakis
- P3-06** **Proposed methodology to evaluate innovative Phosphogypsum processing routes through LCA, ESIA Impact Matrix and Global Geoethical Balance**
S. Barbosa, S. Lourenço Amaro, M. Silva, J. Do Rosário, J. Almeida, J. Kullberg
- P3-07** **Novel age-estimation model for petroleum middle distillate release in the environment**

K. Selecou, E. Chamilaki, N. Pasadakis

- P3-08 Research and innovation in exploration and mining of raw materials: The ROBOMINERS project**
E. Koutsopoulou, A. Servou, G. Aggelopoulos, K. Laskaridis
- P3-09 Sustainable development goals in mine tailings management: targets and indicators**
N. Araya, O. Mamani Quinonez, A. Kraslawski, L. Cisternas
- P3-10 A review about the sustainability of pit lakes as a rehabilitation factor after mine closure**
C. Sakellari, C. Roumpos, G. Louloudis, E. Vasileiou
- P3-11 Using expanded perlite as additive in ceramic mass of a brick and tile industry to study the reduction of density on the final products**
I. Makrygiannis, A. Tsetsekou
- P3-12 Low -temperature synthesis of SiC worm-like nanoparticles and their catalytic activity for reduction of hexavalent chromium**
S. Gkiouzel, G. Asimakopoulos, I. Kitsou, K.C. Vasilopoulos, E. Roussi, E. Kagiaras, A. Tsetsekou, M.A. Karakassides
- P3-13 Comparative life cycle assessment of green sand casting and low pressure die casting for the production of self-cleaning AlMg₃-TiO₂ metal matrix composite**
M. Santiago-Herrera
- P3-14 Minerals as potential catalysts in heterogeneous catalytic ozonation: A kinetic study of p-CBA degradation in aqueous solutions at pH 7**
S. Psaltou, E. Kaprara, M. Mitrakas, A. Zouboulis
- P3-15 Study of magnesium hydroxide protective coating against corrosion applied on poly(methyl methacrylate) plates, by using the sulfuric acid attack acceleration test**
D. Merachtsaki, E.-C. Tsardaka, E. Anastasiou, A. Zouboulis
- P3-16 The contribution of geological maps and mapping to industrial scale design**
E. Manoutsoglou, N. Papageorgiou, E. Georgiou
- P3-17 Assessment of the suitability of clayey raw materials from the argillic alteration zones from Sappes area, Thrace, Northern Greece in ceramic production**
E. Koutsopoulou, I. Marantos, V. Xanthopoulou, N. Xirokostas, I. Iliopoulos
- P3-18 Natural hydraulic lime masonry mortars: effect of pozzolan addition and aggregate type on their mechanical properties**
G. Triantafyllou, A. Samiotaki, M. Galetakis, G. Alevizos
- P3-19 A palygorskite-smectite specialty clay from Ventzia Basin, Western Macedonia, Greece, showing enhanced metal sorption capacity**
Z. Kypridou, A. Argyraki, G. Chryssikos, M. Stamatakis
- P3-20 Bionanocomposites as a market potential from Greek bentonite resources: Preparation of chitosan-clay bio-nanocomposites**
E. Koutsopoulou, I. Marantos, G. Christidis, N. Xirokostas

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That's why, today, we are taking action. We are fully embracing ESG principles for Environment, Society and Governance, putting them at the centre of our strategy. We are committed to achieve a 30% reduction of CO₂ emissions across our entire business activity by 2030 and become a Net Zero industry by 2050. By raising our commitment and further integrating sustainability into the core of our business model, we pave the way to a new era of sustainable excellence.



New, ambitious CO₂ emission reduction targets

Overall Targets

→ **-30%**
Minimum reduction in total emissions → **2030**

Net Zero → 2050

Targets by Business Unit:

Sustainable Engineering Solutions and Renewables & Storage Development BUs:

Power & Gas BU:
~50% of emissions / MWh generated by 2030

Metallurgy BU:
-65% of absolute emissions
-75% of emissions / ton of Al produced



Sustainability. Our DNA for the future.



Further Integrating
the concept of sustainability into our organization's DNA.



Adopting ESG
as a core part of our strategy, decisions and operation.



Constant Monitoring & Transparent Reporting
through performance management forums, public reports & website.

PROMETIA is an international non-profit association promoting innovation in mineral processing and extractive metallurgy for mining and recycling of raw materials, **with the mission of making raw materials accessible for European industries and citizens.**

PROMETIA contributes to:



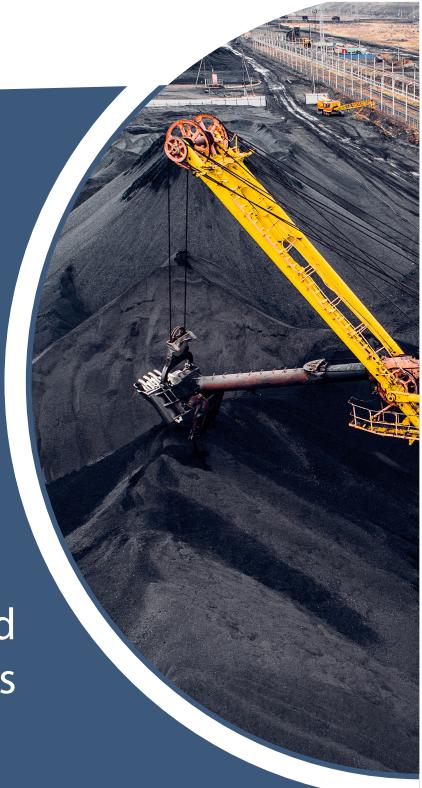
Developing innovative technological solutions to optimise raw materials & waste treatment



Enhancing EU skills in mineral processing and extractive metallurgy of ores and industrial residues



In the longer term, boosting the innovation capacity of the EU raw materials related sectors



PROMETIA association gathers industries, SMEs, research organisations and academia covering all the skills and Technology Readiness Levels (TRLs) from the mineral processing to the extractive metallurgy (hydro and pyro) domains.

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