

SUM 2022



DAILY PROGRAMME

UPDATED ON 27/04/2022

OPENING SESSION // 18th May 2022 09:00-11:00

9:00-10:30: INTRODUCTION AND WELCOME ADDRESSES

- **Raffaello Cossu**, University of Padova (IT)
- **Marino Lembo**, Mayor of Capri (IT)
- **Paolo Russo**, Chamber of Deputies, Italian Parliament (IT)
- **Fulvio Bonavitacola**, Regional Councilor, Environment Department, Campania Region (IT)
- **Alessandro Bratti**, ISPRA - Italian Institute for Environmental Protection and Research (*to be confirmed*)
- **Claudia Brunori**, ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development (IT)
- **Johann Fellner**, Technical University of Wien (AT)
- **Ian Williams**, University of Southampton (GB)
- **Evangelos Gidarakos**, President of IWWG - International Waste Working Group, Technical University of Crete (GR)

10:30 -11:00: OPENING LECTURE

R. Cossu, J. Fellner, I. Williams (SUM 2022 Symposium Chairs)
"Present and future of Circular Economy and Urban Mining"

SESSION A01 / / 18th May 2022 11:30-12:30

STRATEGIES AND POLICIES

Chair / *Presidente*: To be defined

O. Johansson (SE)

Did End of Waste bring the End of Waste?

C. Dalhammar, L. Milios (SE)

The evolving European policy mix for longer product lifetimes: implications for policymakers and corporations

A. Luciano, L. Cutaia, F. Cioffi, C. Sinibadi (IT)

A multi-user platform to enhance the use of recycled products in public works

T. Siderius, T. Zink (US)

Markets and the future of the Circular Economy

SESSION B01 / / 18th May 2022 11:30-12:30

C&D WASTE MANAGEMENT

Chair / *Presidente*: To be defined

O. Trotta, G. Bonifazi, G. Capobianco, S. Serranti (IT)

Detection of asbestos in post-earthquake building waste through hyperspectral imaging and micro-X-ray fluorescence

F. Carollo, F. Ceruti, L. Rigamonti (IT)

Economic evaluation of the Construction and Demolition waste management chain through the Life Cycle Costing methodology.

M. Rigillo, S. Russo Ermolli, G. Galluccio, S. Piccirillo, S. Tordo, F. Galdi, M. Musto (IT)

Digital process for non-standard elements fabrication from C&D materials

J.D. Cabrera Gómez, P. Velasco Espín (EC)

Construction and demolition waste in Tungurahua: a case study from Ecuador

SESSION C01 / / 18th May 2022 11:30-12:30

WASTE MATERIAL SORTING

Chair / *Presidente*: To be defined

A.-M. Lipp, D. Blasenbauer, J. Lederer (AT)

Increasing local recycling rates of plastic packaging waste through mechanical sorting of mixed municipal solid waste: a case study from Austria

D. Blasenbauer, A.-M. Lipp, J. Fellner, J. Lederer (AT)

Recovery potential of recyclables from mixed MSW applying automatic waste sorting - Preliminary results from a one year investigation into two industrial-scale facilities

A. Pivato, G. Beggio, C. Mensi, L. Maggi (IT)

Refining the calculation of the mass of solid waste samples: tentative estimation of the shape factor based on a large number of measurements of particles dimensions

M. Castro-Díaz, M. Osmani, S. Cavalaro, I. Cacho, I. Uria, P. Needham, J. Thompson, B. Parker, T. Lovato (GB)

Laboratory scale evaluation of hyperspectral imaging sorting of refurbishment plasterboard waste

SESSION A02 / / 18th May 2022 15:00-16:00

TEXTILE WASTE

Chair / *Presidente*: To be defined

A. Shtukaturova, M. Šyc, B. Zach, M. Pavlas, R. Šomplák (CZ)

Material flow analysis of textile waste: A case study of the Czech Republic

D. Mehanni, E. Boschmeier, F. Quartinello, A. Bartl (AT)

Evaluation of recycling fibres from blend materials via enzymatic hydrolysis

F. Quartinello, G. M. Guebitz (AT)

Biotechnological approaches for textile waste recycling

P. Kählig, W. Ipsmiller, A. Bartl (AT)

Alkaline and enzymatic hydrolysis of different PET / cotton blends from textile waste

SESSION B02 / / 18th May 2022 15:00-16:00

TECHNICAL RECOVERY OF RESOURCES FROM WASTEWATER

Chair / *Presidente*: To be defined

V. Grossule, R. Cossu, M.C. Lavagnolo (IT)

Wastewater treatment using Black Soldier Fly larvae: effect of organic content quality on treatment and on resource recovery from biomass

J. Sansalone, I. Gnecco, A. Palla (US)

Economy of nutrient and particulate recovery versus structural treatment of urban drainage

L. Thumeyer, P. Fröhlich, S. Pavón, M. Bertau (DE)

Recovery of ammonia in the calcination of struvite

R. Pulcher, N. Greggio, C. Carlini, E. Dinelli, A. Buscaroli (IT)

Functionalization of carbon-based materials for Critical Raw Materials (CRMs) removal from aqueous solution

SESSION C02 // 18th May 2022 15:00-16:00

METAL RECOVERY

Chair / *Presidente*: To be defined

S. Dworak, J. Fellner (AT)

Past and future of steel scrap – A detailed analysis of the European scrap arisings and its quality

L. Ciacci, C. T. de Matos, B. K. Reck, D. Wittmer, E. Bernardi, F. Mathieux, F. Passarini (IT)

Material system analysis of manganese, nickel and natural graphite in the EU

I. Tezyapar, N. Marsay, V. Huntington, F. Coulon, M.C. Alamar, M. Capstick, S. Higson, A. Buchanan, S.T. Wagland (GB)

Assessing metal recovery opportunities from past metallurgical sites and waste deposits: UK case study

I. Isunza Manrique, D. Caterina, M. Dumont, B. Mignon, A. Masse, P. Kessouri, J. C. Gourry, F. Nguyen (BE)

Characterization of past metallurgical residues using geophysical imaging: a case study of Duferco site (Belgium)

SESSION D02 // 18th May 2022 15:00-16:00

WORKSHOP: REGENERATIS - DEVELOPING THE METHODOLOGY FOR RECOVERING RAW MATERIALS

Chair / *Presidente*: Stuart Wagland (GB)

This workshop will present the REGENERATIS work completed to date, including the data collected from historical studies, the 3x pilot sites and the methodology planned for the SMARTIX tool development. The aim of the workshop will be to discuss the approach taken so far and to assess any additional information the project team can include from attendees. The recovery methods and approaches will be analysed with input from workshop delegates, with the key technical, environmental and economical considerations explored.

FOCUS SESSION I // 18th May 2022 16:30-17:20

RECYCLING OF FAST FASHION (TEXTILE) AND BEAUTY WASTE

Chair / *Presidente*: To be defined

The Symposium includes five plenary Focus Sessions, dedicated to specific Themes of high public interest. A moderator, after a state of the art presentation and statement made by 2-3 experts in the field, will guide the discussion among the experts and the audience. The format and the session settings will be similar to a "talk show".

Further details will be soon available.

SESSION A03 / / 18th May 2022 17:30-18:30

MANAGEMENT OF PLASTIC WASTE

Chair / *Presidente*: To be defined

C.A. Fletcher (GB)

Implications of consumer confusion, unrealistic expectations, and the value-action gap on the use and disposal of bioplastics

G. Oliveri Conti, E. Pulvirenti, C. Favara, A. Cristaldi, E. Aquilia, M. Ferrante (IT)

Evaluation of the different management ways of plastic wastes focusing on their human health effects prevention: a review

L. Grabuschnig, H. Rechberger (AT)

Production, consumption and waste management of plastics in Austria – a comprehensive analysis of national plastic flows

M. Arnold (FI)

Forecasting the generation of plastic packaging waste until 2030. Case Finland

SESSION B03 / / 18th May 2022 17:30-18:30

MANAGEMENT OF RESOURCES FROM WASTEWATER

Chair / *Presidente*: To be defined

M. Pettersson, O. Johansson (SE)

How cautious should we be? The role of the precautionary principle in the regulation of sewage sludge in Sweden

G. Campo, A. Cerutti, M. Zanetti, G. Scibilia, M. De Ceglia, B. Ruffino (IT)

Toward the energy self-sustainability of a WWTPs. Thermophilic Temperature-Phased Anaerobic Digestion (TPAD) as biological pretreatment to increase the WAS anaerobic biodegradability

R. Cossu (IT)

End of WAS issues in the recovery of energy from bilge water

G. Cipolletta, M. Parlapiano, M. Sgroi, A.L. Eusebi, F. Fatone (IT)

Optimization of brine management towards the zero/minimal liquid discharge approach

SESSION C03 // 18th May 2022 17:30-18:30
METAL RECOVERY FROM INDUSTRIAL WASTE

Chair / *Presidente*: To be defined

F. Rossetti Cúnico, L.H. Xavier O. Estevam Alarcon (BR)

Urban mining and circular economy approach in the material recovery from permanent Nd-Fe-B magnets

J.H. Potgieter, S. Teimouri (ZA)

A preliminary feasibility investigation into a novel method for leaching vanadium from waste vanadium slag using ionic liquids

G. Mancini, F. Palmeri, G. Benina, S. Cacciola, A. Luciano, D. Fino (IT)

Cost analysis of FCC spent catalyst sustainable use in molybdenum contaminated hazardous wastes stabilization

M. La Monica, L. Cutaia, P. Altamura, V. Squicciarino (IT)

Valuing metal waste produced by micro and small enterprises in the electrical, plumbing and other installation activities for construction: a study on the potentiality in Rome

SESSION D03 // 18th May 2022 17:30-18:30

WORKSHOP: THE ROLE OF MATERIALS FOR CIRCULAR DESIGN OF CONSUMER PRODUCTS

Chair / *Presidente*: Mateusz Wielopolski (DE)

The sustainability of a product and most of its environmental impact is determined by the material choice already at the initial product design stages. Hence, understanding the material value chains allows product designer not only to define what will happen to the product at the end of its lifecycle but also what is the value of sustainability features for the end user. This interactive workshop will cover the fundamental principles of product design for a circular economy and focus on the impact of material choices on the entire product value chain. The participants will get the chance to explore and test themselves how the perception of sustainability and willingness to pay is driven by the knowledge of material concepts, recyclability and technology expertise.

M. Wielopolski (DE)

Introduction into the fundamental concepts of circular design

M. Wielopolski (DE)

Interactive Mentimeter quiz exercise about sustainable and circular material concepts based on examples from various consumer products

M. Wielopolski (DE), A. Guerreschi (IT)

Interpretation of quiz results and correlation with customer awareness studies

Joint discussion, Q&A

SESSION A04 / / 19th May 2022 09:00-10:00
TECHNICAL RECOVERY FROM PLASTIC WASTE

Chair / *Presidente*: To be defined

J. Guo, K. Kuchta (DE)

A compositional analysis of the mixed plastic fraction (DKR-350) from a Lightweight Packaging (LWP) sorting plant: a case study of Northern Germany

V. Santucci, S. Fiore (IT)

Re-use of waste polyurethane from e-waste

I. Berkane, A. Cabanes, O. Horodytska, I. Aracil, A. Fullana (ES)

Thermal drying of flexible plastic waste

S.S. Núñez, J. Moltó, J.A. Conesa, A. Fullana (ES)

PAHs and POPs present in recycled plastic samples

SESSION B04 / / 19th May 2022 09:00-10:00

WEEE MANAGEMENT

Chair / *Presidente*: To be defined

H. Habib, M. Wagner, C.P. Baldé, L. Herreras Martínez, J. Huisman, J. Dewulf (BE)

Mind the gap - Scanning WEEE complementary flows in the European Union

I. Williams, O.S. Shittu (GB)

Circular economy thinking to develop sustainable electronic products, business models and designs

F.C. Ballesteros, L. de Sales, R. Pahunang , R. C. Camaclang III, J.C.L. Tembresa, L.N.C. Sanchez (PH)

Supporting a circular economy through E-waste management: formalizing the informal in global south countries

K. Habib, C.G. Tutton, S.B. Young (DK)

Mapping the material flows through an e-waste pre-processing facility in Canada

SESSION C04 / / 19th May 2022 09:00-10:00
WORKSHOP: CIRCULAR ECONOMY FOR FOOD

Chair / *Presidente*: Peter Shaw, Ian Williams (GB)

This workshop will address the nature and scope of avoidable food waste, with emphasis on how we can apply our understanding of associated problems to seek and identify circular economy solutions. An initial overview presentation will set the context for the workshop; this will outline the food waste problem at global level and with illustrative examples. As an introductory exercise, participants will be asked to indicate their perceptions of food waste in terms of its relative environment, economic, and social impacts, and the balance between these. Working in small groups, participants will be tasked to: 1. Share their own reasons for how they perceive the relative importance of impacts of food waste in environmental, economic and social terms; 2. Discuss if and how circular economy actions might be taken to ameliorate the impacts as identified; 3. Share the outcomes of small group discussions in a plenary session involving all participants.

SESSION D04 / / 19th May 2022 09:00-10:00

WORKSHOP: SUSTAINABILITY OF THERMOSET MATERIALS

Chair / *Presidente*: Julio Vidal (ES)

The workshop will expose the different approaches that are being followed for the treatment of thermosets at their end of life currently, while providing the new solutions that are being explored to optimize the maximum value that can be obtained from the thermoset materials and avoid downgrading. The idea of the workshop is to show the technological advancements and the current TRL of the technologies that are being developed in the field of thermoset waste management and recovery of raw materials.

FOCUS SESSION II // 19th May 2022 10:30-11:20

HOW TO IMPLEMENT CIRCULAR ECONOMY STRATEGIES IN TOURISTIC AREAS?

Chair / *Presidente*: To be defined

The Symposium includes five plenary Focus Sessions, dedicated to specific Themes of high public interest. A moderator, after a state of the art presentation and statement made by 2-3 experts in the field, will guide the discussion among the experts and the audience. The format and the session settings will be similar to a "talk show".

Further details will be soon available.

SESSION A05 / / 19th May 2022 11:30-12:30

PLASTICS AND BIODEGRADATION

Chair / *Presidente*: To be defined

M.C. Lavagnolo, V. Poli, A.M. Zampini (IT)

Facts or myth: biodegradability of biodegradable bioplastics in different ecosystems

G.M. Guebitz, F. Quartinello, D. Ribitsch (AT)

Enzyme based recycling processes

K. Kremser, P. Gerl, A. Pellis, G.M. Guebitz (AT)

Bacterial sulfuric acid production for bio-recycling of plastic and aluminium from multilayer packaging waste

F. Fabbri, F. A. Bertolini, G. M. Guebitz, A. Pellis (AT)

Bio-based building blocks for enzymatic synthesis of polyesters: a Design of Experiments (DoE) study

SESSION B05 // 19th May 2022 11:30-12:30
CIRCULAR ECONOMY IN DEVELOPING COUNTRIES

Chair / *Presidente*: To be defined

R.D. Lee, D. Blasenbauer, R. Weber, J. Lederer J. Fellner (AT)

A practitioner's toolkit for devising integrated solid waste management plans

L.H. Xavier (BR)

Aspects of the urban mining in Brazil

C.M. Nell, C.J. Schenck (ZA)

Cross-case analysis of four household waste characterisation studies in South Africa

J. Gutberlet, T. Bramryd (CA)

Social, environmental and climate implications of waste management: waste-to-energy and recycling in a global South context

SESSION C05 // 19th May 2022 11:30-12:30

WORKSHOP: CIRCULAR CONSTRUCTIONS IN REGENERATIVE CITIES

Chair / Presidente: Kerstin Kuchta, Marco Abis (DE)

The development of large and attractive metropolitan regions needs to be supported by the sustainable growth of their built environment. On one hand this means that future building stock must be adaptive, environmentally compatible and regenerative. On the other hand, existing building stock must be preserved as long as possible through refurbishment and transformation activities, and the embedded materials must be promptly identified to enable their reuse in new structures. Currently, more than 80 % of construction and demolition waste is recycled in EU, but a large part of this is downcycled.

The objective of the H2020 project CIRCuIT is to tackle these aspects in the metropolitan regions of Copenhagen, Helsinki - Vantaa region, Hamburg and London, and to showcase through 36 demonstrations best practices for the circularity of materials, refurbishment activities and adaptive buildings development.

The aim of this workshop is to discuss the advancements in the development of circular and regenerative cities and to present the progresses achieved so far in CIRCuIT.

K. Kuchta (DE)

Introduction to the workshop

A. Bernhardt (DE)

CIRCuIT - Circular construction in Regenerative Cities

J. Bromisch (DE)

Climate protection potential through the use of recycled concrete in Hamburg

M. Abis (DE)

Advancements in Pre-Demolition Audit processes

Circular cities road map – Open discussion

SESSION D05 / / 19th May 2022 11:30-12:30

WORKSHOP: THERMAL TREATMENT RESIDUES

Chair / *Presidente*: To be defined

E. Korotenko, M. Šyc, L. Grič, T. Baloch (CZ)

Optimization of water washing for recovery of salts from calcium-based APCr

M. Syc, J. Hyks, T. Baloch, J. Valentin, E. Korotenko, B. Zach (CZ)

Steps towards modern bottom ash utilization in the Czech Republic

H. Muñiz Sierra, M. Syc, B. Zach, A. Shtukaturova, E. Korotenko (CZ)

The use of wet magnetic separation technology and liberation processes for the improvement of the copper concentrate product obtained by gravimetric concentration treatment from the fine fraction of incineration bottom ash

A. Piemonti, A. Conforti, L. Cominoli, A. Luciano, S. Sorlini, G. Plizzari (IT)

Concrete mixtures with EAF slags as partial replacement of natural aggregates: a preliminar study

SESSION A06 / / 19th May 2022 15:00-16:00

PACKAGING WASTE

Chair / *Presidente*: To be defined

D. Schuch, J. Lederer, J. Fellner, C. Scharff (AT)

Performance of separate collection systems for plastic packaging – A regional analysis for Austria

P. Shaw (GB)

Identifying plastics used for food and beverage packaging: needs and challenges

E. Bottani, G. Vignali, R. Montanari (IT)

Valorization of packaged food waste from retailing: a framework

I. Berkane, A. Cabanes, O. Horodytska, I. Aracil, A. Fullana (ES)

Microperforation in the delamination process of multilayer metallized packaging

SESSION B06 / / 19th May 2022 15:00-16:00

CIRCULAR ECONOMY POLICIES IN DIFFERENT COUNTRIES

Chair / *Presidente*: To be defined

K. Haarstad, H.K. French, G. Okkenhaug, O.J. Hanssen, M. Sjøvaag (NO)

earthresQue- an eight year programme for circular waste management in Norway

I. Williams (GB)

A review of recycling in Wales

T.Y. Chitaka, L. Grobler, A. Lötter, K. Gokul, H. Mostert, J. Petersen, A. Stark, C. Trois, C. Schenck (ZA)

South Africa's transition to a circular economy: critical perspectives on EPR integration measures

S. Hossaini, G. McCarney (CA)

Strategic circular economy considerations to enable Canada's low carbon transition

SESSION C06 // 19th May 2022 15:00-16:00

WEEE TREATMENT

Chair / *Presidente*: To be defined

M. Bruno, S. Fiore (IT)

Pre-treatments of Lithium Iron Phosphate cathodes for Lithium ion batteries recycling

L. Nastasi, V. Santucci, M. Bruno, S. Fiore (IT)

Critical analysis of life cycle assessment studies on Lithium ion batteries

M. Bruno, F. Biossa, S. Fiore (IT)

Analysis of waste LCDs' dismantling operations

Y. Sagrillo Pimassoni, L. H. Yamane, R. Ribeiro Siman (BR)

Recovery of rare earth elements from WEEE: challenges and research needs

SESSION D06 / / 19th May 2022 15:00-16:00

WORKSHOP: QUALITY CONTROL ALONG CIRCULAR ECONOMY CHAIN: VIRGIN PRODUCTS, RECYCLING PROCESS, RECYCLED PRODUCTS, SINKS

Chair / *Presidente*: To be defined

Further details will be soon available.

FOCUS SESSION IV // 20th May 2022 10:30-11:20

ELECTRIC VEHICLES: WHICH SORT OF WASTE DO THEY PRODUCE? HOW CAN THEY BE RECYCLED?

Chair / *Presidente*: Ian Williams (GB)

The Symposium includes five plenary Focus Sessions, dedicated to specific Themes of high public interest. A moderator, after a state of the art presentation and statement made by 2-3 experts in the field, will guide the discussion among the experts and the audience. The format and the session settings will be similar to a "talk show".

Further details will be soon available.

SESSION A07 // 19th May 2022 17:30-18:30
CONSUMERS PERCEPTIONS AND EDUCATION

Chair / *Presidente*: To be defined

A. Guerreschi, M. Wielopolski (IT)

The importance of knowing what your customers know to drive ecologically and economically effective circular design in sports

L. Milius, C. Dalhammar (SE)

Consumer attitudes towards product lifetimes: implications for eco-labelling

G. De Feo, C. Ferrara, F. Minichini (IT)

Comparison between perceived and actual environmental sustainability: the case of beverage packaging

G. De Feo (IT)

Environmental education as a bridge between scientists and non-scientists to remove barriers and prejudices

SESSION B07 // 19th May 2022 17:30-18:30

GLASS AND CERAMIC WASTE RECOVERY

Chair / *Presidente*: To be defined

G. Tameni, F. Cammelli, H. Elsayed, F. Stangherlin, E. Bernardo (IT)

Upcycling of pharmaceutical glass in sustainable construction materials

A. Karamanov, P. Paunović, A. Kamusheva, E. Ljatifi, E. Karamanova, B. Ranguelov, G. Avdeev, A. Grozdanov, D. Karashanova (BG)

Nano glass-ceramic by Fe-Ni wastes

F. Faleschini, M. A. Zanini, V. Ortega-Lopez, R. Bertani, C. Pellegrino (IT)

Valorization of marble sawdust waste in a circular economy perspective

N.B. Jordanov, A. Karamanov (BG)

Synthesis and kinetics of sintering of glass-ceramics in air and argon obtained from industrial waste

SESSION C07 // 19th May 2022 17:30-18:30

WORKSHOP: RECYCLING OF TEXTILES

Chair / *Presidente*: Andreas Bartl, Wolfgang Ipsmiller (AT)

First, five research projects (national or EU) will be presented in the form of short presentations (5 minutes). Based on these pitches, questions will be collected from the audience, which will be divided into different topics (technical difficulties, legal framework, economic interests, etc.). Afterwards the participants will be divided into groups (break-out groups) to work out solutions and answers to the questions. After that, the results of each subgroup will be presented to all participants. In a discussion, the participants can then try to weigh the solutions proposed by the break-out groups against each other and ideally find compromises. The aim is not only to highlight the different interests of the stakeholders, but also to find solutions.

G. Guebitz (AT)

The Resyntex Project

A. Bartl (AT)

The TEX2MAT Project

P. Kaelig (AT)

Christian Doppler Lab for "Design and assessment of an efficient, recycling-based Circular Economy"

E. Boschmeier (AT)

The SCIRT Project

TDB

The EnzATex Project

SESSION D07 // 19th May 2022 17:30-18:30

WORKSHOP: EMERGING IDEAS AND TECHNOLOGIES TO ENABLE CIRCULAR ECONOMY

Chair / *Presidente*: To be defined

J. Gutberlet (CA)

Grassroots innovations driving inclusive circular economy

Further details will be soon available.

SESSION A08 / / 20th May 2022 09:00-10:00

RECOVERY OF RESOURCES FROM VEHICLES

Chair / *Presidente*: To be defined

G. Torta, F. Passarini, L. Ciacci, I. Vassura (IT)

Developing an industrial recycling process of rare earth elements from electric motors of the e-mobility

M. Ravina, I. Bianco, M. Minardi, D. Panepinto, M. Zanetti (IT)

Analysis of the economic and environmental cost of dismantling and recovering plastic components from vehicles

M. Sanclemente Crespo, X. Gabarrell i Durany, L. Talens Peiró (ES)

Progress in 'Database of Semiconductors and other components' as a public decision support tool for automotive electronics sustainability assessment

A. Holzer, M. Baldauf, S. Windisch-Kern, L. Wiszniewski, H. Raupenstrauch (AT)

New insights into the influence of impurities on the high-temperature behavior of the lithium-ion battery cathode material NMC (LiNi_{0.6}Mn_{0.2}Co_{0.2}O₂) under reducing conditions for use in the InduRed process

A. Farsi, M.A. Rosen (CA)

Thermal management of a hydrogen electric vehicle integrating a fuel cell and battery

SESSION B08 / / 20th May 2022 09:00-10:00

COMPOSTING

Chair / *Presidente*: To be defined

Z.K. Chong, K. Kuchta (DE)

Industrial composting of biodegradable plastic packaging: Lab-scale and on-field disintegration tests

J. Polanšek, L. Luskar, Ž. Trošt, B. Čeh (SI)

Correlation between precipitation and leachate at on-farm composting

R. Malesani, A. Schievano, A. Pivato (IT)

Process optimization measures for heat recovery systems: results from pilot scale experiments

A. Karničnik, M. Rak Cizej, B. Čeh (SI)

Diversity of fauna in composting hop waste biomass in winter

SESSION C08 / / 20th May 2022 09:00-10:00

EXPLORING NEW OPTIONS IN CIRCULAR ECONOMY

Chair / *Presidente*: To be defined

E. Ribeiro-Rodrigues, A. P. Bortoleto (BR)

Exploring social norms influence on waste prevention behavior through an agent-based modeling and simulation

G. Mancini, L. Lombardi, A. Luciano, D. Bolzonella, P. Viotti, D. Fino (IT)

Industrial symbiosis in the waste-wastewater-energy nexus: LCA of different management scenario

F. Ardolino, G.F. Cardamone, U. Arena (IT)

Environmental performances of alternative management schemes for plastics from Construction & Demolition waste: the long forgotten fraction

G. Fiorentino, A. Zucaro, M. Tammaro, G. Ansanelli (IT)

Environmental and economic evaluation of a new PV waste recycling process

SESSION D08 / / 20th May 2022 09:00-10:00

WORKSHOP: URBAN MINING - CHALLENGES AND PERSPECTIVES

Chair / *Presidente*: Lucia Helena Xavier (BR)

Further details will be soon available.

FOCUS SESSION IV // 20th May 2022 10:30-11:20

ELECTRIC VEHICLES: WHICH SORT OF WASTE DO THEY PRODUCE? HOW CAN THEY BE RECYCLED?

Chair / *Presidente*: Ian Williams (GB)

The Symposium includes five plenary Focus Sessions, dedicated to specific Themes of high public interest. A moderator, after a state of the art presentation and statement made by 2-3 experts in the field, will guide the discussion among the experts and the audience. The format and the session settings will be similar to a "talk show".

Further details will be soon available.

SESSION A09 / / 20th May 2022 11:30-12:30

LANDFILL MINING

Chair / *Presidente*: Raffaello Cossu (IT)

G. Denafas, I. Pitak, J. Kruopienė, D. Streikus, K. Romaneckas, A. Jasinskas (LT)

Comparison of stored and renewable energy potentials in landfill conditions: case study for Kaunas waste management region, Lithuania

W. Wulyapash, A. Phongphiphat, S. Towprayoon, J. Fellner (TH)

Characterisation and carbon intensity of RDF from landfill mining: a case study in Samut Prakan, Thailand

D. Parida, M. Datta, G.V. Ramana (IN)

Physical characteristics and contaminants of potential concern in gravel like material reclaimed from an old MSW dump in India for reuse in off-site applications

M.C. Lavagnolo, P. Fankou, E. Elame (IT)

Recovery of abandoned waste disposal areas in the framework of circular economy in Yaoundé, Cameroon

SESSION B09 / / 20th May 2022 11:30-12:30

RECOVERY FROM ORGANIC WASTE: CASE STUDIES

Chair / *Presidente*: To be defined

S. Srivastava, C. Trois (ZA)

Characterisation of waste Fat, Oil and Grease (FOG) for sustainable treatment options with emphasis on gross heat value

C. Andreola, V. Maceratesi, J. González-Camejo, A.L. Eusebi, F. Fatone (IT)

Hydrolysis and thermochemical technologies for the recovery of bio-based fertiliser from fishery waste

K. Sobieraj, K. Świechowski, K. Pawęska, A. Białowiec (PL)

Characteristics and phytotoxicity assay of biochar derived from rose pruning waste

M. Miccio, M. Fraganza, A. Zainutdinova, P. Brachi, M. Casa, G. Ferrari, M. Iannuzzo (IT)

A preliminary assessment of lab techniques for valorization of toasted hazelnut cuticles

SESSION C09 / / 20th May 2022 11:30-12:30

RECYCLING OF C&D WASTE

Chair / *Presidente*: To be defined

S. Sorlini, A. Diotti, A. Abbà, L. Cominoli, G. Plizzari (IT)

Reuse of recycled aggregate for concrete: preliminary results on mechanical and environmental behaviour

S. Lee, E. Randviir, E. Horwich, D. Lacy, N. Hurst, C. Banks (GB)

Using recycled fine aggregate for use in 3D concrete printing: a circular approach to demolition waste

V. Ruffini, G.M. Cappucci, P. Neri, A. Sirico, F. Zanotto, A. Balbo, B. Belletti, P. Bernardi, A. Malcevschi, C. Monticelli, A.M. Ferrari (IT)

Life cycle assessment of a bridge column made of concrete and biochar

K. Mantalovas, I.P. Dunn, F. Acuto, B. Barakat, A. Abou Jaoude, O. Yazoghli-Marzouk, I. Srour, G. Di Mino (IT)

State of practice in the C&DW sector while pursuing circular economy: the Italian recycled materials market in road engineering

SESSION D09 // 20th May 2022 11:30-12:30

WORKSHOP: WHY DON'T THE PUBLIC TRUST EVIDENCE AND ADVICE PROVIDED BY ENVIRONMENTAL EXPERTS?

Chair / *Presidente*: Ian Williams, Peter Shaw (GB)

The title of this workshop is clearly a huge, sweeping statement and a massive over-simplification! Or is it?

We expect many reading this text will agree with the general standpoint expressed by the question. In our experience, (academic) environmental scientists and engineers are often regarded by the public as competent but remote and “untrustworthy”. Reasons given for distrust in environmental science / engineering include that:

- Academics receive funding from (government-run) research agencies and/or private companies and so cannot be impartial / objective.
- Academics use their papers and presentations to promote particular “liberal” political, social and/or cultural agendas.
- Academics are arrogant about their expertise and dismissive of non-evidence-based views.
- Academics over-complicate their research findings and fail to communicate with the public in a clear, comprehensible, and straightforward fashion.
- Academics give the impression of being cold, superior and aloof, in contrast to the warmth and accessibility shown by “caring” professions such as teachers, nurses, doctors and care workers.
- Academics appear “angry” about lack of political / public response to environmental issues such as eWaste mountains, climate change and plastic pollution.
- Academics seem to have soft, easy jobs, with relatively low workloads and long holidays, and thus “don't live in the real world.”

This is very frustrating for those of us who have spent a lifetime gaining expertise by studying a subject in detail and working hard to produce evidence-based research that only has the best interests of society at its heart. Think about this as a “member of the public”: when we want fruit, we trust the greengrocer. When we want a haircut, we trust the hairdresser. When we have heartburn, we trust the pharmacist. If we want a car fixed, we trust the mechanic. So, when advice is needed on climate change or waste (resource) management, why don't people trust environmental scientists and engineers?

There are theories that people acknowledge the expertise of scientists but will only “trust” them if they feel that their interests coincide. Thus, if environmental scientist and engineers are presenting evidence that is perceived to require a change in lifestyle, or is perceived to threaten job security or economic interests, then they must be “untrustworthy”.

What do you think? Do you have the same or a different perspective? How do these issues make you feel? Is there something we could / should do about this situation

This workshop will address the question “Why don’t the public trust evidence and advice provided by environmental experts?” from a waste and resource management perspective. An initial overview presentation will set the context for the workshop; this will outline the reasons for asking this question with illustrative examples.

As an introductory exercise, participants will be asked to provide their views on the topic, and the other questions it generates. Working in small groups, participants will be tasked to:

1. Share their views on this question, how it makes them feel as “experts”, how the views of the public impact on waste / resource management in public health, environmental, economic and social terms;
2. Discuss if and how actions might be taken to increase trust in environmental expertise;
3. Share the outcomes of small group discussions in a plenary session involving all participants.

SESSION A10 / / 20th May 2022 15:00-16:00

ENERGY RECOVERY FROM WASTE

Chair / *Presidente*: To be defined

C. Cord'Homme (FR)

Integrated residual municipal waste treatment combining material from waste, organic recovery and energy from waste. Case studies

T. Schwarzboeck, M. Hahn, P. Aschenbrenner, S. Spacek, J. Fellner (AT)

In search for the material composition of refuse-derived fuels by means of balance equations

B. Ruffino, M. Minardi, M. Guglielmino, F. Bonino, M. Zanetti (IT)

Assimilation of automobile shredder residues (ASRs) to a solid recovered fuel (SRF): a step towards the increase in material recovery

C. Nell, C. Trois (ZA)

The development of a Waste-to-Energy Roadmap for South Africa – Findings from stakeholder engagements

SESSION B10 // 20th May 2022 15:00-16:00

WEEE: DIFFERENT ASPECTS

Chair / *Presidente*: To be defined

A. Brock, R. Browning, A. Campanie, S. Pal, Ian D. Williams (GB)

Using intergenerational influence and the creative arts to develop public communication methods about e-waste

R. Bruning, J. Bruning (DE)

Key findings from a study on the treatment of waste lamps in Germany

P.H. Guedes, L.H. Xavier, M. Souza (BR)

Circular economy applied to the oil recovery from refrigerators: a Brazilian case study

L.H. Xavier (BR)

Boundaries and perspectives of (in)formality on e-waste urban mining

SESSION C10 // 20th May 2022 15:00-16:00

BIODEGRADABLE WASTE

Chair / *Presidente*: To be defined

S. Castelluccio, C. Comoglio, S. Caruso, S. Fiore (IT)

Environmental reporting in the Italian biodegradable waste treatment plants

P.J. Shaw, H. Barker, D.M. Smith (GB)

Unavoidable and potentially avoidable food waste from domestic households:
preparation residues

A. Zucaro, G. Ansanelli, M. Tammaro, L. Cutaia, R. Chifari, G. Fiorentino (IT)

BIOCIRCULARCITIES project: circular bioeconomy in urban contexts

F. Eblagon, Z. Trost, B. Ceh (PT)

End of life biomass waste management: impact of guiding material on supported crops

SESSION D10 / / 20th May 2022 15:00-16:00

WORKSHOP: FUTURE OF SINGLE-USE CONSUMER PRODUCTS

Chair / *Presidente*: To be defined

Further details will be soon available.

SESSION A11 / / 20th May 2022 16:30-17:30

LCA AND MATERIAL FLOW ANALYSIS

Chair / *Presidente*: To be defined

G. Moscatelli, T. Fruergaard Astrup (DK)

Cascading recycling: opportunities and challenges

F. Ardolino, C. Di Domenico, F. Costarella, U. Arena (IT)

An information system to enhance the sustainability of solid waste management

J. Lederer, A. Gassner, M. Pölzler, J. Fellner (AT)

The consumption-based carbon and material footprint: an indicator in the context of urban mining in cities

D. Ita-Nagy, I. Vázquez-Rowe, R. Kahhat (PE)

Using Material Flow Analysis to assess the flows of mismanaged solid waste into the ocean – A case study of Peru

A.B. Moldes, X. Vecino, J. Bombín, A. Ortega, J.M. Cruz (ES)

A circular economy model for the winery industry

SESSION B11 // 20th May 2022 16:30-17:30

ANAEROBIC DIGESTION

Chair / *Presidente*: To be defined

G. De Gioannis, M. Falzarano, A. Muntoni, A. Polettini, R. Pomi, A. Rossi, D. Spiga (IT)

Anaerobic co-digestion of single-use bioplastics and food waste

D. Panepinto, A. Casasso, M. Puleo, M. Zanetti (IT)

Economic viability and greenhouse gas budget of the biomethane retrofit of a biogas plant

E. Ciotola, A. Cesaro, G. Esposito, F. Pirozzi (IT)

The sustainable use of anaerobic digestate: closing the material loop in a circular perspective

A. Kosheleva, K. Kuchta (DE)

Implementation of in-situ biomethanation within PtX at a biogas plant

SESSION C11 / / 20th May 2022 16:30-17:30

INDUSTRIAL WASTE

Chair / *Presidente*: To be defined

V.A. Riggio, J. Seccatore, M.C. Zanetti (IT)

Preliminary study on phytoextraction of heavy metals from copper mining wastes in Chile

B. Velappan, N. Vedaraman, S. Abinandan, J. Kanagaraj (IN)

Closed loop integrated resource recovery from liming process waste - A pathway for sustainable leather processing

J. Menendez, R. Alvarez, A. Ordoñez, J. Loredó (ES)

Coal mining closure and circular economy

P. Crocetti, J. González-Camejo, K. Li, A.L. Eusebi, F. Fatone, A. Graziani (IT)

Preliminary study for the circular application of treated dredged sediments as road infrastructures

SESSION D11 / / 20th May 2022 16:30-17:30

**WORKSHOP: OPPORTUNITIES OF MATERIAL RECOVERY FROM LANDFILL
MINING**

Chair / *Presidente*: Raffaello Cossu (IT)

R. Cossu (IT)

Landfill mining: Resource recovery feasibility

Further details will be soon available.

FOCUS SESSION V // 20th May 2022 17:40-18:30

LIGHTS & SHADES IN CIRCULAR ECONOMY

Chair / *Presidente*: Rainer Stegmann (DE)

The Symposium includes five plenary Focus Sessions, dedicated to specific Themes of high public interest. A moderator, after a state of the art presentation and statement made by 2-3 experts in the field, will guide the discussion among the experts and the audience. The format and the session settings will be similar to a "talk show".

Further details will be soon available.

POSTER SESSION / 18th - 20th May 2022

I. Bonadies, R. Capuano, R. Avolio, R. Castaldo, M. Cocca, G. Gentile, M.E. Errico, M. Avella (IT)

Sustainable composites from beverage cartons scraps

R. Savio, G. Ferrari, A. Pezzuolo, M. Guidolin, M.C. Lavagnolo (IT)

Agricultural by-products for hydrogen production: current status and results

A.C. Revelo Rodríguez, C.J. Cobo Ceacero, T. Cotes Palomino, A.B. López García, C. Martínez García (ES)

Solid biofuel in the form of coffee grounds pellets

M.A. Mistoh, J. Janaun, A. Galassi (MY)

Appropriate technology pyrolysis processor for production of fuel from plastic waste: a mini review

J. Rastelli, M. Alvarado Chinchilla, F. Heredia, J.C. Navarro Bautista, A.B. López García, T. Cotes Palomino, C. Martínez García (ES)

Valorisation of organic waste (almond and hazelnut shells) to obtain sustainable construction materials. Applying the circular economy

F. Feher, J. Lederer, J. Mühl (AT)

Properties of concretes containing treated waste incineration bottom ash as partial substitute for natural aggregate

P. Frontera, A. Malara, A. Macario (IT)

Reuse and recycling strategies of new "critical raw materials"

A. Del Borghi, L. Moreschi, M. Gallo (IT)

A critical environmental analysis of strategic materials towards energy transition

L. Wiszniewski, K. Doschek-Held, Z. Raonic, A. Holzer, H. Raupenstrauch, P. Presoly (AT)

Physical and chemical characterizations of high-value residues for a pyrometallurgical recycling process

E. Hroncová, J. Ladomerský, D. Ladomerská (SK)

The cooperation between research-educational institution and manufacturing companies in the implementation of cleaner production projects

D. Camana, A. Fedele, F. Gallo, A. Manzardo (IT)

Assessing environmental sustainability of projects with different tools. A life cycle perspective

M. Holosova, A. Estokova, M. Smolakova, A. Luptakova (SK)

Waste in cement composites exposed to the biocorrosion

T. Distler, K. Steiner, K. Huemer, S. España Orozco, G.M. Guebitz (AT)

UV-detoxification of a sulfite liquor and separation by column chromatography

E. Karamanova, G. Avdeev, S. Atanasova, I. Piroeva, A. Karamanov (BG)

Structure and phase composition of ceramics from municipal incinerator bottom ashes

D. Caracciolo, F. Montagnaro, M. Balsamo, F. Di Lauro, M. Urciuolo, R. Migliaccio, G. Ruoppolo (IT)

Tannery sludge: the new biomass

I. Gabriele, M. Race, S. Papirio, G. Esposito, F. Pirozzi (IT)

Use of Cannabis sativa L. to implement the phytoremediation of soil contaminated by pyrene

M. Muradin, J. Kulczycka, G. de Clercq, R. Verhe (PL)

Zero waste bioethanol production technology. applying the LCA tool to assess environmental impacts in a circular economy context

A. Estokova, M. Fabianova (SK)

Simplified LCA analysis of waste treatment from the wooden building

S. Mihalyi, F. Quartinello, G.M. Guebitz (AT)

Recovery of cellulases for circular application in textile waste recycling

D. Panepinto, I. Bianco, M. Zanetti (IT)

Comparison between direct combustion and gasification with the LCA methodology

C.M. Warne, F. Quartinello, D. Ribitsch, G.M. Guebitz (AT)

New tools in the plastics circular economy: rumen fluid for hydrolysis of polyesters

Z. Trost, B. Ceh (SI)

Waste hop biomass management options

J.M. Cruz, C. González, X. Vecino, A. B. Moldes (ES)

Biodegradation study of polyethylene based plastics in presence of corn steep liquor

N. Junakova, J. Junak, M. Balintova (SK)

Production of sustainable concrete based on reservoir sediments in accordance with the principles of the circular economy

S. das Neves Silva, L.Frisso, L.H. Yamane, R. Ribeiro Siman (BR)

Implantation of a printed circuit board recycling industry in Brazil: environmental aspects

K. Steiner, M. Egermeier, R. Putz, G.M. Guebitz, F. Quartinello, D. Ribitsch (AT)

Enzymatic reprocessing and recycling of textile waste

E. Dziobek, A. Nowaczek (PL)

Supporting SMEs in the development in accordance with circular economy – SPIN Project in Poland

P. Donyanavard, Q. Yuan (CA)

Potential for extracting rare earth metals from today's electronic devices

C. Siracusa, F. Quartinello, A. Pellis, G.M. Guebitz (AT)

Study of polyester specific hydrolysis performed by two different cutinases

L. Hernández-Pérez, M.C. Martí-Calatayud, M.T. Montañés, V. Pérez-Herranz (ES)

Electrorecovery of bismuth from a copper waste effluent: an initial approach

M. Wojnicki, P. Zabinski, R. Kowalik, K. Kolczyk-Siedlecka (PL)

Pt, Pd, Rh and Au ions adsorption on activated carbon in a continuous flow reactor supported by microwaves radiation

P. Żabiński, R. Kowalik, K. Kołczyk-Siedlecka, M. Wojnicki (PL)

Pt, Pd, Rh and Au ions adsorption on activated carbon in batch reactor supported by microwaves

E. Paone, M. Miceli, A. Malara, G. Ye, E. Mousa, E. Bontempi, P. Frontera, F. Mauriello (IT)

Spent Lithium-Ion batteries: from waste to an efficient heterogeneous catalyst for the reductive upgrading of biomass-derived furfural

VIDEO SESSION / 18th - 20th May 2022

This virtual session includes pre-recorded video presentations by Authors who cannot attend in person, due to travel restrictions. Their videos will be made available on our virtual platform, where attendees will be able to send their questions and chat with the Authors.

N.R. Khandaker, M.M. Rahman, Md.A. Rabby, T.K. Ray, M. Alam, T. Ahmad (BD)

The role of bhandari (treasure hunters) in resource recovery from Municipal Solid Waste in Dhaka Bangladesh

Y. Zhou, C. Liao, S. Ma, K. Shih (HK)

Pb stabilization by a new chemically durable orthophosphate phase: insights into molecular mechanism with X-ray structural analysis