

# SUM2024

SEVENTH SYMPOSIUM ON CIRCULAR ECONOMY  
AND URBAN MINING / 15-17 MAY 2024 / CAPRI / ITALY

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EPA - United States Environmental Protection Agency (US)  
CRAES - Chinese Research Academy of Environmental Sciences  
JSMCWM - Japan Society of Material Cycles and Waste Management  
KSWM - Korea Society of Waste Management  
IWMSA - Institute of Waste Management of Southern Africa  
AIAT - Italian Association of Environmental and Planning Engineers  
CEWMS - Circular Economy, Waste, Materials and Sustainability (IT)  
GITISA - Italian Group of Sanitary Landfilling (IT)

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# DAILY PROGRAMME

Updated on 19/04/2024



DAY 1 / WEDNESDAY  
MAY 15

# WEDNESDAY MAY 15

## MORNING

9:30 - 12:30 / CINEMA HALL

### OPENING SESSION

Chair / *Presidente*: Raffaello Cossu (IT)

9:30-10:30

### WELCOME ADDRESSES / *SALUTI DI BENVENUTO*

- Raffaello Cossu, *University of Padova (IT)*
- Paolo Russo, *Tavolo di Roma and Italian Parliament (IT)*
- Andreas Bartl, *TU Wien (AT)*
- Ian Williams, *University of Southampton (UK)*

10:30-11:00

### COFFEE BREAK

11:00-12:30

### OPENING LECTURES / *RELAZIONI DI APERTURA*

*B. Xi,*

*CRAES - Chinese Research Academy of Environmental Sciences (CN)*

*Situation and future development of Recycling in China*

*R. Stegmann, T. Liu*

*Hamburg University of Technology (DE)*

*Aspects for more attention in Circular Economy*

*M.C. Lavagnolo*

*University of Padova(IT)*

*Circular Economy & Biodiversity*

*E.A. Nanaki, S. Kiartzis, D. Malamis, K. Moustakas (GR)*

*From vision to action: climate change mitigation and energy transition –*

*The case study of hard to abate industries*

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LUNCH BREAK / 12:30-15:00



# WEDNESDAY MAY 15

## AFTERNOON

### SESSION A1 / 15:00 - 16:00 / CINEMA HALL

#### POLICIES IN CIRCULAR ECONOMY

Chair / Presidente:

*T. Galavote, T. Carvalho Coimbra, G. de Lorena Diniz Chaves, L. Harue Yamane, R. Ribeiro Siman (BR)*

Reference scenarios preposition for the implementation of urban solid waste management policies

*F. Corsini, G. Del Re, M. Di Domenico, A. Borghini, M. Frey (IT)*

Exploring the adoption of Extended Producer Responsibility for managing gypsum plasterboards in Italy

*C. Marques Leal Jorge Santos, C. Jorge Santos (BR)*

Mining the environment: legal aspects of virtual currencies' energy consumption and e-waste under Brazilian law

*M. Palermo, A. Matamoros, A. Blanco, M. Ferrando, M. Faraldi, F. Monzó Sánchez (IT)*

Simplifying complexity for adoption and replication of circular economy systemic solutions: the A2C multidimensional model

### SESSION B1 / 15:00 - 16:00 / POLLIO HALL

#### ARTIFICIAL INTELLIGENCE AND DIGITAL SOLUTIONS

Chair / Presidente:

*T. Vögele, T. Tiedemann, T. Lange, P. Meyer, M. Trost, M. Wittmaier, S. Wolff, Y. Jin, Y.-L. Liu, P. Grote, A. Auer, A. Babu (DE)*

Sorting bulky waste with the help of AI - the SmartRecycling Project

*S. Salhofer, A. Allesch (AT)*

Smart waste collection – The role of digitalisation in future waste management

*M. Al Ahimer, S. Beheiry (AE)*

Overview of Circular Economy strategies and application of Industry 4.0 technologies in the construction industry

*L. Macchion, M. Dieste, A. Galeazzo (IT)*

Understanding employee acceptance of digital technology towards a Sustainable Industry: a theoretical framework

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COFFEE BREAK / 16:00 -16:30

**SESSION C1 / 15:00 - 16:00 / HOTEL SYRENE**

**ITALIAN SESSION:**

**COMUNICAZIONE & EDUCAZIONE AMBIENTALE**

*Chair / Presidente:*

*G. De Feo (IT)*

Educazione per un futuro circolare: dalla scuola materna all'istruzione superiore

*F. Pistono (IT)*

"Fiuto il cane da rifiuto": una proposta educativa dedicata all'Economia Circolare

*F. Da Porto, M.C. Lavagnolo (IT)*

La sostenibilità ambientale presso l'Università di Padova

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**COFFEE BREAK / 16:00 -16:30**

# WEDNESDAY MAY 15

## AFTERNOON

### SESSION A2 / 17:30 - 18:30 / CINEMA HALL

#### END OF WASTE

Chair / *Presidente*:

*P. Hennebert, A. Navazas, E. Katrakis (FR)*

The tacit end-of-waste status is established in the EU and crucial for the Circular Economy

*G. Beggio, M.C. Lavagnolo (IT)*

Analysis of case-by-case end-of-waste authorizations for recycled plastics in Italy

*P. Hennebert (FR)*

The tacit end-of-waste status for MWSI bottom ashes in road foundations has been used in France since 1994

*S. Sorlini, A. Piccinalli, A. Abbà, G. Plizzari (IT)*

Characteristics of recycled aggregates from construction and demolition waste according to the Italian EoW regulation

### SESSION B2 / 17:30 - 18:30 / POLLIO HALL

#### BIOREFINERY

Chair / *Presidente*:

*A.A. Arshad, M. Miccio (IT)*

Green valorization of spent coffee grounds by extraction through combined technologies: A review

*I. Narváez-Prado, A. Arias, G. Feijoo, M.T. Moreira (ES)*

Valorisation of a waste stream from chokeberry juice production into phenols and bioethanol: a techno-environmental assessment

*V.A. Riggio, D. Panepinto, M. Zanetti (IT)*

Integrated approach for assessing microalgae cultivation efficiency and carbon dioxide sequestration potential: A case study in south Sardinia.

*M. Miccio, E. Le Nouaille, B. Tauleigne, B. Cosenza (IT)*

Aspen Plus® flowsheeting aids in investigating Soxhlet extraction of bioactive compounds from hazelnut residues

SESSION C2 / 17:30 - 18:30 / HOTEL SYRENE

WORKSHOP:

THERMAL TREATMENT IN CIRCULAR ECONOMY

Chair / Presidente:

*É. Guerreiro, H. Baier, K. Münnich, A. Felipe Simões (BR)*

Case report: waste treatment and energy recovery for alternative fuel purpose in Germany

*G. Campo, G. Zanetti, M. Zanetti (IT)*

Preliminary results from laboratory tests assessing hydrogen production utilizing slag and surplus heat in steel facilities

*G. Ye (SE)*

The role of pyrometallurgy and the importance of pilot test facilities for devel-



DAY 2 / THURSDAY  
MAY 16

# THURSDAY MAY 16

## MORNING

### SESSION A3 / 9:00 - 10:00 / CINEMA HALL

#### DECISION TOOLS IN CIRCULAR ECONOMY

Chair / Presidente:

*D. Tosches, C. Caldeira, F. Demichelis, D. Fino, S. Sala (IT)*

The role of Life Cycle Assessment in the Safe and Sustainable by Design: lessons learnt from a case study

*L.H. Xavier, L. Contador, B. Malabar (BR)*

A framework for secondary material circularity assessment

*M.A. Rosen (CA)*

Exergy as a tool for a circular economy

*A. Arias, S. Lago-Oliveira, G. Feijoo, M.T. Moreira (ES)*

Sustainability indicators to assess bio-based value chains: a methodological approach

### SESSION B3 / 9:00 -10:00 / POLLIO HALL

#### INSECTS ROLE IN CIRCULAR ECONOMY

Chair / Presidente:

*M. Henjak, G. Beggio, V. Grossule (IT)*

Biowaste treatment using Black Soldier Fly Larvae: effect of diet macronutrients on process performance

*A.P.C. Ribeiro, M.O. Martins, A.O. Figueiras, L.M.D.R.S. Martins (PT)*

Production of bioplastics from insects

*D. Caniani, R. Cossu, P. Falabella, A. Feratovic, A. Franco, V. Grossule, M.C. Lavagnolo, S. Masi, V. Pucciarelli, R. Salvia, C. Scieuzo (IT)*

Lipids deriving from *Hermetia Illucens* larvae as a feedstock for biodiesel production: relevance and perspectives

*L.M.D.R.S. Martins, A.P.C. Ribeiro, M.J.O. Martins, A. Figueiras (PT)*

Insects as tools - A key to the Circular Economy

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### COFFEE BREAK / 10:00 -10:30

### SESSION C3 / 9:00 - 10:00 / HOTEL SYRENE

#### ITALIAN SESSION:

#### BUONE PRATICHE DI CIRCOLARITÀ IN ITALIA

Chair / Presidente:

*P. Altamura, S. Baiani, F. Ceruti, L. Cutaia (IT)*

Scale-up delle buone pratiche di circolarità per l'ambiente costruito. Il contributo delle piattaforme collaborative

*E. De Marco, E. Mancuso, R. Preka, S. Scaffoni (IT)*

Environmental Technology Verification (ETV): uno strumento per confermare le prestazioni ambientali delle tecnologie innovative a supporto dell'economia circolare

*S. Manca, M. Campora, R.P. Dameri (IT)*

C-CITY Genova Città Circolare

*D. Boggiani, D. Barbieri (IT)*

Economia circolare: l'Università di Pavia - Case study

### SESSION D3 / 9:00 - 10:00 / GLASS ROOM

#### WORKSHOP:

#### NEW-RE PROJECT STRATEGIES FOR CIRCULAR ECONOMY OF PERMANENT MAGNETS

Chair / Presidente:

*L. Mascheretti, A. Tori, M. Zitta, M. Piessens, J.R. Peeters (IT)*

NEW-RE Project - Strategies to improve Permanent Magnets EoL value chain: a focus on automated dismantling

*P. Romano, S. Rahmati, M. Passadoro, L. Taglieri, L. Fratocchi, F. Gallo, F. Vegliò (IT)*

Simulation and economical analysis of hydro-Nd process for the recovery of rare earth from EoL permanent magnets: NEW-RE and INSPIREE projects

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COFFEE BREAK / 10:00 -10:30

# THURSDAY MAY 16

## MORNING

### SESSION A4 / 11:30 - 12:30 / CINEMA HALL

#### SOCIAL AND ECONOMIC ASPECTS IN CIRCULAR ECONOMY OF C&D WASTE

Chair / *Presidente*:

*A. Luciano, P. Altamura, S. Baiani, L. Cutaia (IT)*

Buildings and the circular economy: estimating urban mining, recovery and reuse potential of building components

*A. Brooks, N. Bell, J. Jambeck, M. Werner, M. Bilec (US)*

Towards a community-base assessment of circular construction & demolition debris management

*C. Gatti, A. Piemonti, G. Plizzari, S. Sorlini (IT)*

Value added recycled materials from construction and demolition waste

*A. Abou Jaoude, R. Idir, K. Mantalovas, O. Yazoghli-Marzouk (xx)*

Assessing the economic, environmental, social and circularity impacts of recycled aggregates in road construction with the RE-MED application

### SESSION B4 / 11:30 - 12:30 / POLLIO HALL

#### QUALITY OF RECYCLED PRODUCTS

Chair / *Presidente*:

*J.P.D. Fonkou, G. Salviulo, C. Castiglioni, L. Brambilla, G. Beggio, M.C. Lavagnolo (IT)*

From End-of-Waste to upcycled products: preliminary results from characterization of polypropylene

*G. Bonifazi, G. Capobianco, P. Cucuzza, S. Serranti (IT)*

Hyperspectral imaging applied to quality control of post-consumer lightweight plastic packaging

*G. Beggio, M.C. Lavagnolo (IT)*

PFAS in waste and recycled products

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LUNCH BREAK / 12:30-15:00

## SESSION C4 / 11:30 - 12:30 / HOTEL SYRENE

### ITALIAN SESSION:

#### RICERCA E INNOVAZIONE DELL'ECONOMIA CIRCOLARE IN ITALIA

Chair / Presidente:

*D. Caputo, M.C. Lavagnolo (IT)*

Il progetto MICS-PNRR per il supporto dell'Economia Circolare italiana

*V. Fantin, E. De Marco, L. Cutaia, C. Chiavetta (IT)*

Valutazione ambientale di un processo di valorizzazione del materiale composto con fibre di vetro delle turbine eoliche

*V. Grossule (IT)*

LARWAR-Project: uso di larve di mosca soldato nera per il trattamento delle acque reflue e recupero di risorse

*G. Veneto (IT)*

Intelligenza Artificiale e Structural Health Monitoring applicate alla protezione delle opere civili: proposte e sviluppi futuri per le infrastrutture strategiche del servizio idrico integrato gestite da Acquedotto Pugliese S.p.A.

## SESSION D4 / 11:30 - 12:30 / GLASS ROOM

### WORKSHOP: ROLE OF YOUNG PEOPLE IN CIRCULAR ECONOMY

Chair / Presidente: Ian Williams (UK)

We all know that our modern society faces many pressing problems, one of which is the development of a sustainable approach to waste (resource) management. Modern society involves consumption on a massive scale, and this leads to massive resource use and massive waste generation. Enabling effective resource management requires appropriate infrastructure, service provision and active public engagement, and this is hugely challenging. Many political, environmental, social, technological, legal, and economic approaches have been trialed, but only slow progress has been achieved.

It is a cliché, but it is certainly true that “young people are our future.” The waste (resource) management community is good at organizing conferences to discuss and debate the complex (usually technical) aspects that influence how we manage our wastes (resources). But could we do more with and for our younger colleagues? Maybe we could listen to their viewpoints and perspectives better, with “more constructive ears”? Maybe we could help them better with their careers? Maybe we could learn from them, and support their progressive ideas with more energy and vigour?

This workshop will highlight that young waste management researchers/professionals have valuable insights to offer to their older counterparts. It will offer a forum for discussion on how the voices of young waste managers can be heard, and acted upon, and how older professionals can help to address the challenges faced by younger colleagues.

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## LUNCH BREAK / 12:30-15:00

# THURSDAY MAY 16

## AFTERNOON

### SESSION A5 / 15:00 - 16:00 / CINEMA HALL

#### COMMUNICATION AND EDUCATION

Chair / Presidente:

*G. De Feo (IT)*

Educating for a circular future: from kindergarten to higher education

*I.D. Williams, T. J. Roberts, L.M. Zapata-Restrepo, M. Neophytou, A. Ktoris, A. Maragkidou, J.-P. Jalkanen (GB)*

Communicating outputs, outcomes and impacts of waste-related research: the "EMERGE" case study

*R.C.C.M. Micaroni, A.R. de Almeida, W.R. Rodrigues da Silva (BR)*

Local waste management plans as a tool for waste management and prevention at University of Campinas (UNICAMP)

*M.C. Lavagnolo, F. Da Porto (IT)*

Circular Economy at the University of Padova

### SESSION B5 / 15:00 - 16:00 / POLLIO HALL

#### WEEE AND PHOTOVOLTAIC WASTE

Chair / Presidente:

*S. Oñate, S. Rosado, L. Gullón (ES)*

Waste valorisation from photovoltaic panels and analysis of the business potential from recycling in Spain and Italy

*A. Šperlich, M. Šyc, H. Muñiz Sierra (CZ)*

New perspective on the composition of photovoltaic solar panels and the possibility of pre-treatment for recycling

*E. Soares de Carvalho Freitas, L. Contador, L.H. Xavier (BR)*

Value chain integration for e-waste management: a system dynamics approach

*M. Paciolla, M. La Monica, F. Ceruti, F. Ferrero, G. Seravalli, T. Beltrani (IT)*

Investigating good practices in the circular economy related to Electrical and Electronic Equipment (EEE) through the European Circular Economy Stakeholder Platform (ECESP)

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COFFEE BREAK / 16:00 -16:30

## SESSION C5 / 15:00 - 16:00 / HOTEL SYRENE

### WORKSHOP:

#### CIRCULAR ECONOMY & BIODIVERSITY

Chair / *Presidente*:

The loss of biodiversity is one of the most dramatic consequences of climate change and human impact. For several years, the importance of biodiversity for our planet has been underestimated, especially for its economic relevance on our extractive economies. Biodiversity provides several ecosystem services essential for human life such as food, materials, clean water, climate regulation, and many others. Therefore, a relationship of impact and/or dependency between biodiversity and economic activities exists. The circular economy, aiming to reduce the exploitation of non-renewable resources and the ever-increasing production of waste, can play a crucial role in reducing negative impacts on the environment and be one of the main drivers for the protection of biodiversity and ecosystems. In this session, researchers of the National Biodiversity Future Center will discuss the current practices for evaluating the impacts of business activities on biodiversity and/or ecosystem services and to explore the economic valuation methods for valuing ecosystem services in the framework of waste management.

#### Introductory lectures:

*S. Tessitore, F. Testa, N.M. Todaro, D. Tosi, V. di Iorio (IT)*

Managing the business and biodiversity relationship: a systematic review

*G. Felici, M.C. Lavagnolo (IT)*

Economic valuation of ecosystem services in the waste management framework: case study of Aquanova

## SESSION D5 / 15:00 - 16:00 / GLASS ROOM

### WORKSHOP:

#### CIRCULAR ECONOMY IN AGROINDUSTRY

Chair / *Presidente*:

*I. Pölönen, J. Föhr, R. KC, S. Leppäkoski (FI)*

Circular economy in farms – Testing farm-scale manure pasteurization device

*M. Schiavon, G. Beggio, G. Concheri, V. Grossule, A. Sandon, A. Squartini, M.C. Lavagnolo (IT)*

Agricultural waste pyrolysis and thermocomposting for renewable energy in a sustainable agri-food sector: the teapots project

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## COFFEE BREAK / 16:00 -16:30

# THURSDAY MAY 16

## AFTERNOON

### SESSION A6 / 17:30 - 18:30 / CINEMA HALL

#### PARTICLES AND MICROPLASTICS FROM CIRCULAR ECONOMY

Chair / *Presidente*:

*Z. Tariq, I. D. Williams, M. D. Hudson, A. B. Cundy, L. M. Zapata-Restrepo (GB)*  
Distinctive trails: reviewing markers for tyre and road wear particles

*A. Ndiforngu, R. Cossu, M.C. Lavagnolo (IT)*  
Presence and fate of Microplastics in the Agriculture Soil System

*A. Sivyer, Z. Tariq, G. J. Langley, I. D. Williams (GB)*  
Physical and chemical characterization of laboratory-generated tyre wear particles

### SESSION B6 / 17:30 - 18:30 / POLLIO HALL

#### CRITICAL AND STRATEGIC RAW MATERIALS

Chair / *Presidente*:

*A. Piepoli, R. Pellegrino, P. Pontrandolfo (IT)*  
How does urban mining contribute mitigating critical raw material supply risks? Evidence from the waste management industry

*A. Bonoli, A. Fiorucci (IT)*  
Critical Raw Materials recovery from Electrical Electronic Equipment Waste. An overview

*S. Rosado, L. Camporro, L. Gullón, S. Oñate, L.F. Mazadiego, J. Llamas, Y. Moratilla, S. Lumbreras (ES)*  
Assessing the business potential, price volatility and supply chain challenges of metallic silicon in the European Union

*D. Eheliyagoda, B. Veluri, G. Liu, D. Ramanujan (DK)*  
Multiregional perspectives of the global dysprosium demand and supply with technological transition



## SESSION C6 / 17:30 - 18:30 / HOTEL SYRENE

### WORKSHOP:

### LANDFILL MINING

Chair / *Presidente*:

Landfill Mining has gained increasing attention in recent years, due to its potential in circular economy strategies.

Several different approaches and different technologies for processing excavated waste are available. However, the economic feasibility of full scale applications is still the bottleneck for the valorization of landfilled waste as materials and/or energy and most reported case studies refer to the simple excavation and further deposit in new landfill sectors. Research projects are being carried out with the aim of developing cost effective technologies for the application of LFM for resource recovery.

Goal of this session is to present the state of the art in Landfill Mining research.

#### Introductory lectures:

*J.H. Potgieter, C. Mahlangu (ZA)*

Separating titanium and iron from an old Ferrovanadium producer waste dump

*R. Cossu (IT)*

Landfill mining: investigations, technologies and opportunities for resources recovery

DAY 3 / FRIDAY  
MAY 17 

# FRIDAY MAY 17

## MORNING

### SESSION A7 / 9:00 - 10:00 / CINEMA HALL

#### TERRITORIAL CASE STUDIES

Chair / Presidente:

*J. J. Stanković, I. Marjanović (RS)*

Territorial resource efficiency in Circular Economy

*K. Kawai, K. Nakagawa, N. Hatanaka, Y. Inoue, S. Matsumoto (JP)*

How did a small town in Japan achieve the recycling rate of over 80%?

*V. Kafarov, V. A. Lizcano-González, K. Mahkamov (CO)*

Ecotourism and renewable energies as promoters of development in environmentally protected high mountain areas

*T. J. Roberts, I. D. Williams (GB)*

Implementing sustainable development in port-cities

### SESSION B7 / 9:00 - 10:00 / POLLIO HALL

#### OPEN ISSUES IN CIRCULAR ECONOMY AND HEALTH PERSPECTIVES

Chair / Presidente:

*D. Panepinto, M. Ravina, M. Zanetti (IT)*

Consequences and risk modeling of NaTech in industrial environments

*A. Arias, E. Entrena-Barbero, S. González-García, G. Feijoo, M.T. Moreira (ES)*

Eco-labelling dietary patterns under a life cycle assessment approach and health perspective

*S. Malinconico, F. Paglietti, S. Bellagamba, S. Serranti, G. Bonifazi, D. Gattabria, I. Lonigro, R. Gasbarrone (IT)*

A preliminary study on real-time asbestos recognition in tunnel spoil of green stones

*L.M. Zapata-Restrepo, I.D. Williams, M.D. Hudson, G. Freeman, B. Lee, C. Prieul (GB)*

Wastes from international shipping: ecotoxicological assessment of scrubber water in unicellular algae (*Tetraselmis suecica*) and blue mussel (*Mytilus edulis*) larvae

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COFFEE BREAK / 10:00 -10:30

## SESSION C7 / 9:00 - 10:00 / HOTEL SYRENE

### WORKSHOP: RECOVERY & RECYCLING FROM PV PANELS

Chair / *Presidente*: Marco Tammaro (IT)

The exponential growth of cumulative global photovoltaic (PV) waste, driven by the market expansion of the last two decades, requires a focus on efficient End of Life (EoL) PV recycling methods.

The proper decommissioning of PV panels is crucial for recovering value-added materials, which can be reused in the PV sector or in different production chains, thus sustaining the efficient use of resources, in line with the principles of Circular Economy (CE). **Full appetizer available on thw website and app.**

#### Introductory lectures:

*F. Coustier, R. Riva, M. Pliquet, A. Saluel, J. Aimé M. Tammaro, V. Piergrossi, L. Cafiero, S. Pucciarmati (FR)*

EVERPV project: PV panels recycling using grinding process and IR equipment

*E. Tolusso, F. Marzullo, A. Centurioni, F. Fattori, J.V. Barile (IT)*

Closing the loop: forecasting end-of-life PV panel waste generation and building a circular value chain

*P. Cerchier, F. Miserocchi, L. Pezzato, F. Nisato, G. Tassinato, K. Brunelli, M. Dabalà (IT)*

Photovoltaic panel recycling: tests in the pilot plant in Venice and silicon applications for ferroalloy production

*M.L. Protopapa, G. Ansanelli, M. Pietrantonio, M. Tammaro (IT)*

Research activity on PV waste recycling in ENEA

## SESSION D7 / 9:00 - 10:00 / GLASS ROOM

### WORKSHOP:

#### INTERNET OF THINGS APPLICATION IN BIOREFINERIES

Chairs / *Presidenti*: Maria Rosa Di Cicco, Carmine Lubritto (IT)

The workshop aims to explore the intersection of cutting-edge technologies and biological systems in addressing pressing environmental and industrial challenges. Focused on the innovative landscape of biorefineries, our contributions will delve into two key aspects: the implementation of IoT-based photobioreactors and the pivotal role of extremophilic microalgae in recovering critical elements from waste streams.

The session will begin with an overview of the current landscape of biorefineries, highlighting the growing importance of sustainable and efficient processes in resource recovery. **Full appetizer available on thw website and app.**

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COFFEE BREAK / 10:00 -10:30

# FRIDAY MAY 17

## MORNING

### SESSION A8 / 11:30 - 12:30 / CINEMA HALL

#### CIRCULAR ECONOMY IN DEVELOPING COUNTRIES

Chair / Presidente:

*R. Meira de Sousa Dutra, R. Ribeiro Siman (BR)*

Assessment of the financial sustainability of solid waste management services in Brazilian municipalities

*M. Yudistira Rahayu, N. Raihanah (IT)*

Banyumas' local approach to zero waste: evaluating the efficiency of sustainable waste management strategies in developing countries

*R. Schenck, H. Tyrrell, R. Niyobuhungiro (ZA)*

Learnings from a disposable diaper collection programme in an African township: the 'Bright Bin' case study in Langa, Cape Town, South Africa

### SESSION B8 / 11:30 - 12:30 / POLLIO HALL

#### WASTEWATER TREATMENT & CIRCULAR ECONOMY

Chair / Presidente:

*G. Dolci, I. Crippa, M. Grosso, E. Ficara, L. Rigamonti (IT)*

Coupling of wastewater treatment and algal biomass cultivation and valorisation: a Life Cycle Assessment

*V. Grossule (IT)*

LarWaR Process – BSF Larvae for Wastewater treatment and Resource recovery: Influence of larval density and solid support

*A. Dotti, A. Basso Peressut, P. Gallo Stampino, G. Dotelli, S. Latorrata (IT)*

Titanium dioxide and graphene oxide-based coatings for photocatalytic wastewater treatment

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LUNCH BREAK / 12:30-15:00

## SESSION C8 / 11:30 - 12:30 / HOTEL SYRENE

### BATTERIES

Chair / *Presidente*:

*C. Maucieri, S. Gross, M. Carraro (IT)*

DESs for the extraction of metal ions from spent lithium-ion batteries (LIBs)

*A. Barrera, C. Binet, I. Benabela, P. Supiot, C. Foissac U. Maschke (FR)*

Gel polymer electrolytes elaborated by Uv-Irradiation for the eco-design of Li-ion batteries

*F. Pagnanelli, P. Altimari, P.G. Schiavi, L. D'Annibale, A. Mancini, M. Colasanti, E.*

*Moscardini, L. Toro, L. Baldassari, L. Toro (IT)*

Li-ion battery recycling at pilot scale: demonstrating the re-synthesis route also for NMC-LFP mixed black mass

*D.S. Premathilake, C. Milanese, M. Vaccari (IT)*

Assessing the energy storage potential of Graphene Oxide synthesized from hydrometallurgically recovered Graphite from End-of-Life Electric Vehicle Lithium-Ion batteries (EoL EV LIBs)

## SESSION D8 / 11:30 - 12:30 / GLASS ROOM

### WORKSHOP:

### WOOD RECYCLING

Chair / *Presidente*:

*N. Bertoldo, A. Salvi, G. Dotelli, P. Gallo Stampino, A. Bianchi, F. Frigerio, G. Scaccabarozzi, V. Arosio (IT)*

Dynamic Life Cycle Assessment meets Circular Strategies: a wooden playground case study

*G. Galluccio (IT)*

Reclaimed wood as a computational material: technological design for circular economy in the digital age

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LUNCH BREAK / 12:30-15:00

# FRIDAY MAY 17

## AFTERNOON

### SESSION A9 / 15:00 - 16:00 / CINEMA HALL

#### CIRCULAR ECONOMY IN INDUSTRIES

Chair / Presidente:

*S. Potgieter-Vermaak, B. Sibiyi, S. Mafulul, C. Candeias, J.H. Potgieter, H. Mouri (GB)*

Consequences of a non-circular economy approach in the mining industry

*E. Giansante, G. Timelli, A. Fabrizi (IT)*

Impact of chemical composition on hot tearing in secondary wrought aluminum alloys

*G. Mancini, A. Luciano, L. Lombardi, D. Fino (IT)*

Smart cities and industrial districts development through the Is-based waste-wastewater-energy nexus

*N. Daza-Marquez, A. Guzmán, Y. Ávila, J. Abellán-García (CO)*

Incorporating industrial wastes into mortar mix production: a step towards sustainable construction

### SESSION B9 / 15:00 - 16:00 / POLLIO HALL

#### BIOPLASTICS

Chair / Presidente:

*V. Poli, M.C. Lavagnolo (IT)*

Is bioplastics a real sustainable alternative to conventional plastics? A focus on their biodegradability in different aquatic environments

*I. Oliver, N. Martínez-Pérez, J.A. Conesa, A. Fullana (ES)*

Bioplastic formulation effects on anaerobic digestion

*V. Grossule, G. Oliveri Conti, P. Rapisarda, E. Pulvirenti, M. Ferrante, M.C. Lavagnolo (IT)*

Treatment of food waste contaminated by starch-based bioplastic films using Black Soldier Fly larvae: formation and fate of biodegradable micro-plastics

*N. Martínez-Pérez, I. Rodríguez-Pastor, J.C. García Quesada, I. Martín-Gullón (ES)*

Reprocessing and mechanical recyclability for circular economy. Comparative study of TPS/PVA blends and other commercial biopolymers

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COFFEE BREAK / 16:00 -16:30

## SESSION C9 / 15:00 - 16:00 / HOTEL SYRENE

### WORKSHOP:

#### ENVIRONMENTAL SUSTAINABILITY OF ELECTRIC VEHICLES

Chair / *Presidente*:

A. Accardo, G. Gentilucci, M. Golabchi, G. Dotelli, E. Spessa (IT)

Environmental sustainability assessment of an electrified light commercial vehicle

## SESSION D9 / 15:00 - 16:00 / GLASS ROOM

### WORKSHOP:

#### COLLABORATIVE WASTE MANAGEMENT IN DEVELOPING COUNTRIES

Chair / *Presidente*: Catherina Schenck (ZA)

WM problems, in particular in underserved communities in developing countries are wicked problems. The workshop will be facilitated according to an adapted Emerging Transition Design (ETD) approach by Irwin (2018). Irwin (2018) developed the ETD approach to address “wicked” problems. Wicked problems are seen as systems problems which requires new and multiple problem solving approaches.

Irwin’s Emerging Transition Design approach include the following:

- Vision: A clear visions is needed for transition. In this research the vision is to move towards a collaborative waste management system;
- Theories of Change: A variety of theories and methodologies are needed that explain the dynamics of change within complex systems;
- Mindset and Posture imply the development of open, collaborative and self-reflective mindsets and attitudes which is needed for a just transition;
- New Ways of Designing - which will arise out of the previous three areas.

During this workshop, roundtable discussions will be facilitated. The roundtable discussions will consist of two separate rounds. Firstly, a problem map will be created identifying political, economic, sociological, and technological barriers towards effective waste management in developing countries (with particular focus on low income resource constrained communities). The following question will be posed: What challenges do we face to deliver effective waste management service in low income (rural and urban) communities in DC’s?

Secondly, the stakeholders will discuss the following question: How can collaborative, (participatory) processes achieve the more effective and efficient waste management? What should be the vision? The theory? The mindset? The design process?

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COFFEE BREAK / 16:00 -16:30



# FRIDAY MAY 17

## AFTERNOON

### SESSION A10 / 16:30 - 17:30 / CINEMA HALL

#### ECONOMY & FINANCING IN CIRCULAR ECONOMY

Chair / *Presidente*:

*B. Steuer (HK)*

Hong Kong's circular economy on plastics: are the economics failing?

*A. Zatti (IT)*

Economic instruments for the circular economy transition: the (neglected) role of virgin materials and landfill taxation in Italy

*S. Torvi, D. Delfrate, M. Colledani, M. Diani, F. Cortinovia (IT)*

DeremCo: De and remanufacturing for Circular Economy investments in the composite Industry

### SESSION B10 / 16:30 - 17:30 / POLLIO HALL

#### ROLE OF CIRCULAR ECONOMY IN FASHION INDUSTRY

Chair / *Presidente*:

*L. Macchion (IT)*

Circular economy in the fashion industry to foster the sustainable supply chains traceability

*M.C. Lavagnolo (IT)*

An example of industrial symbiosis in the textile industrial sector

*P.M. Falcone (xx)*

Exploring consumer behaviours and nudging for circular bio-economy development: a study on sustainable processing of food waste for the fashion industry

## SESSION C10 / 16:30 - 17:30 / HOTEL SYRENE

### WORKSHOP:

### ENVIRONMENTAL EDUCATION & COMMUNICATION

Chair / *Presidente*: Giovanni De Feo (IT)

This workshop aims to explore innovative and engaging approaches to environmental education and communication, with a focus on sustainability and circular economy principles. Prof. Giovanni De Feo, the creator of the Greenopoli project, will guide participants through the methodology and practices that have proven successful in over 600 environmental education sessions involving more than 80,000 students.

This workshop promises an interactive and informative session, offering participants practical insights into effective environmental education and communication strategies. Attendees will gain valuable tools and inspiration to incorporate innovative methods into their own educational initiatives.

#### AGENDA:

- Introduction to Greenopoli
- Key Themes and Initiatives
- Exploration of the primary themes covered in Greenopoli's educational sessions
- Greenopoli's Educational Methodology
- Green Rapping and the Use of Songs in Education
- Creative Approaches to Teaching

#### Q&A and Interactive Session:

- Open floor for questions and discussions
- Interactive session involving a live demonstration of the "tùttu-cià" technique

POSTER SESSION  
SESSIONE POSTER

# POSTER SESSION

## SESSIONE POSTER

Posters will be accessible to Symposium delegates at all times in digital format through our Symposium app. Three designated computers are always available in the foyer of the Congress Centre to browse through all posters (PDF files) and watch the pre-recorded presentations by their authors.

Delegates will be able to send questions to the authors via chat, Q&A or video call through the symposium app.

*La sessione Poster sarà accessibile digitalmente per l'intera durata del Simposio, attraverso la app ufficiale del Simposio. Tre postazioni pc saranno sempre disponibili nel foyer del Centro Congressi per visualizzare tutti i poster in PDF, guardare eventuali presentazioni pre-registrate dagli autori e inviare le proprie domande tramite la sezione Q&A e la chat.*

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**Po1** / C. Álvarez-Alonso, M.D. Pérez-Murcia, N. Manrique, S. Sánchez Méndez, E. Martínez-Sabater, I. Irigoien, M. López, R. Moral, M.A. Bustamante (ES)

Exploring decentralized composting models: a case study of municipal waste management in Spain

**Po2** / C. Álvarez-Alonso, M.A. Bustamante, N. Manrique, S. Sánchez Méndez, E. Martínez-Sabater, E. Agulló, I. Irigoien, M. López, R. Moral, I. Nogués, M.D. Pérez-Murcia (ES)

Management of municipal organic waste in a circular economy context: evaluation of the process and quality of compost produced in rural areas of the Valencian Community (Spain)

**Po3** / M. Cambal Holosova, A. Estokova, A. Sicakova (SK)

Evaluating the suitability of secondary raw materials in cement composites for enhanced durability against sulfate attack

**Po4** / D. Fico, D. Rizzo, F. Malinconico, C. Esposito Corcione (IT)

Innovative methodology for recycling organic and inorganic waste for the production of three-dimensional objects by means of 3D printing

**Po5** / E. Gagliano, L. Moreschi, M. Gallo, A. Del Borghi (IT)

Development of new LCA-based indicator in the framework of WEF Nexus

**Po6** / J. Havranová, S. Čerňanský (SK)

Fungal biosorption as promising tool for bioremoval of arsenic from aqueous solutions

**Po7** / F. Cecchini, G. Mazziotti di Celso, K. Ayedi, V. Innocenzi, M. Prisciandaro (IT)

Integrated process scheme of wastewater treatment and desalination to encourage the reuse of water

**P08** / *S. Ronconi, L. Di Paola, A. Vincenti, V. Piemonte, M. Capocelli, M. Prisciandaro (IT)*

Biogas and leachate production in MSW landfill: experimental data and statistical modeling

**P09** / *P.M.S.M. Rodrigues, J. Esteves da Silva (PT)*

Towards a Circular Economy: A comprehensive policy framework for packaging waste management in the European Union

**P10** / *A. Accardo, G. Gentilucci, M. Golabchi, G. Dotelli, E. Spessa (IT)*

How important is vehicle recycling?

**P11** / *M.A. Sánchez-Burgos, B. Blandón-González, E. Conradi-Galnares, P. Porras-Pereira, P. Mercader-Moyano (ES)*

Comparative analysis of scientific papers on LCA applied to nanoparticulated building materials

**P12** / *A. Sharifi, G. Campo, A. Cerutti, B. Ruffino, M. Zanetti (IT)*

Biological methane production from hydrogen and carbon dioxide

**P13** / *D. Karimian, Z. Smania, S. Gross, M. Carraro (IT)*

Valorizing textile wastes through the extraction of nanocellulose utilizing DEEP eutectic solvents

**P14** / *M. Bullo, M. Ragazzi, F. Romagnoli, E.C. Rada (IT)*

An integrated research on modular gasification of municipal solid waste – LCA on Riga's cement factory

**P15** / *V. Correa Gallego, Omar D. Gutiérrez, P.A. Villegas-Bolaños (CO)*

Effect of acidity and olivine loading on the catalytic pyrolysis of sugarcane bagasse