

SYNOPTIC SESSIONS TABLE  
TABELLA DELLE SESSIONI

Monday September 30 09:00-12:50	OPENING SESSION				
Monday September 30 15:30-19:20	<b>A1</b> / Policies and strategies in WM	<b>B1</b> / Landfill siting approaches	<b>C1</b> / Decision support tools for biowaste management	<b>D1</b> / Strategies in waste thermal treatment	<b>E1</b> / Circular economy - Case studies in different countries
	<b>A2</b> / Waste generation	<b>B2</b> / Landfill planning and design	<b>C2</b> / Strategies for bioenergy recovery from waste	<b>D2</b> / Thermal treatment according to waste quality	<b>E2</b> / Waste management sustainability in DC's
Tuesday October 1 09:00-12:50	<b>A3</b> / Waste Characterization I	<b>B3</b> / Landfill characterization and monitoring	<b>C3</b> / Companies experiences	<b>D3</b> / Pyrolysis and gasification of biomass	<b>E3</b> / Waste management in DC's - Case Studies
	<b>A4</b> / Waste characterization II	<b>B4</b> / Landfill processes	<b>C4</b> / Anaerobic digestion - Lab scale tests for process enhancement	<b>D4</b> / Sustainable management of secondary raw materials	<b>E4</b> / Industrial waste - Strategies and treatment
Tuesday October 1 15:30-19:20	<b>A5</b> / Separate collection	<b>B5</b> / Landfill gas generation and modelling	<b>C5</b> / Anaerobic digestion processes	<b>D5</b> / Biochar from different residues	<b>E5</b> / Industrial waste - Recovery options
	<b>A6</b> / Segregation and collection	<b>B6</b> / Landfill gas emission monitoring	<b>C6</b> / Anaerobic digestion of different substrates	<b>D6</b> / Flue gas treatment	<b>E6</b> / Workshop: Industrial WM and circular economy
Wednesday October 2 09:00-12:50	<b>A7</b> / Circular Economy	<b>B7</b> / Methane oxidation in biofilters and biocovers	<b>C7</b> / Co-digestion of different substrates	<b>D7</b> / Characterization and treatment of bottom ash	<b>E7</b> / Workshop: Contaminated sites
	<b>A8</b> / Policies in plastics management	<b>B8</b> / PFAS and microplastics in landfill leachate	<b>C8</b> / Quality assessment of biostabilized waste	<b>D8</b> / Recycling of bottom ash	<b>E8</b> / Waste management education
Wednesday October 2 15:30-19:20	<b>A9</b> / Plastic waste - Recycling targets and contamination	<b>B9</b> / Leachate from specific waste	<b>C9</b> / Emissions from anaerobic digestion plants	<b>D9</b> / Characterization and treatment of fly ash	<b>E9</b> / Workshop: IWWG TG Clear Construction & operation of full-scale CH <sub>4</sub> ox. systems
	<b>A10</b> / Materials recovery	<b>B10</b> / Leachate treatment I	<b>C10</b> / Composting	<b>D10</b> / Workshop: Economics of waste	<b>E10</b> / Workshop: Hydrothermal carbonization
Thursday October 3 09:00-12:50	<b>A11</b> / Automotive shredder residues	<b>B11</b> / Landfill aeration	<b>C11</b> / WEEE - Collection and recycling	<b>D11</b> / Biofuels from waste	<b>E11</b> / Workshop: Forensic Engineering
	<b>A12</b> / Food waste - Resources	<b>B12</b> / Landfill mining	<b>C12</b> / WEEE - Metal recovery	<b>D12</b> / Plastics in marine ecosystems	<b>E12</b> / Workshop: Environmental Crime Scene Analysis
Thursday October 3 15:30-19:20	<b>A13</b> / Food waste recycling I	<b>B13</b> / Landfill remediation and aftercare	<b>C13</b> / C&D waste - Potentials	<b>D13</b> / Workshop: Plastics and environment	<b>E13</b> / Workshop: Biorefineries
	<b>A14</b> / Food waste recycling II	<b>B14</b> / Landfill mining: Thermal treatment of combustible fractions	<b>C14</b> / C&D waste - Properties	<b>D14</b> / Plastic waste - New products	<b>E14</b> / Workshop: Biological treatment of animal waste
Friday October 4 09:00-12:50	<b>A15</b> / LCA in WM	<b>B15</b> / End of life textiles management	<b>C15</b> / Workshop: Food waste prevention	<b>D15</b> / Workshop: Social aspects of environmental issues	<b>E15</b> / Workshop: Biological degradation of bioplastics
	<b>A16</b> / Environmental impact of WM facilities	<b>B16</b> / End of life textiles - Recycling and environmental impact	<b>C16</b> / Workshop: Food waste - Social aspects	<b>D16</b> / Workshop: Waste and health	<b>E16</b> / Workshop: Long term behaviour of landfill barriers
Friday October 4 15:30-19:20	CLOSING SESSION: WASTE AND HEALTH				

Monday September 30 09:00-12:50	OPENING SESSION		
Monday September 30 15:30-19:20	<b>F1 / Workshop:</b> Gender perspectives in WM	<b>G1 / Workshop:</b> Strategies for landfill mining	<b>H1 / IWWG Training Course:</b> Monitoring of landfill gas emissions
	<b>F2 / IWWG Young Round Table</b>	<b>G2 / Recycling of photovoltaic panels</b>	<b>H1 / IWWG Training Course:</b> Leachate treatment
Tuesday October 1 09:00-12:50	<b>F3 / Sewage sludge</b>	<b>G3 / Workshop:</b> Research on blue technologies	<b>H3 / Waste Architecture - New visions and perspectives</b>
	<b>F4 / Sewage sludge as a resource</b>	<b>G4 / Workshop:</b> Publishing a peer-reviewed journal article on WM	<b>H4 / Waste Architecture - Functional requalification of old landfills</b>
Tuesday October 1 15:30-19:20	<b>F5 / Workshop:</b> Landfill Mining - Myth and reality I	<b>G5 / Workshop:</b> Post-gestione delle discariche I	<b>H5 / Waste Architecture - IWRECKS</b>
	<b>F6 / Workshop:</b> Landfill Mining - Myth and reality II	<b>G6 / Workshop:</b> Post-gestione delle discariche II	<b>H6 / Waste Architecture - WM in urban and periurban areas</b>
Wednesday October 2 09:00-12:50	<b>F7 / Workshop:</b> Waste and climate change I	<b>G7 / Aspetti legali economici paesaggistici educativi nella gestione rifiuti</b>	<b>H7 / Waste Architecture DESIGN LAB</b>
	<b>F8 / Workshop:</b> Waste and climate change II	<b>G8 / L'economia circolare nella gestione dei rifiuti I</b>	<b>H8 / Waste Architecture DESIGN LAB</b>
Wednesday October 2 15:30-19:20	<b>F9 / Workshop:</b> Semiaerobic landfilling in DC's	<b>G9 / L'economia circolare nella gestione dei rifiuti II</b>	<b>H9 / Waste Architecture DESIGN LAB</b>
	<b>F10 / Workshop:</b> Asbestos WM and risks assessments	<b>G10 / Workshop:</b> End of waste	<b>H10 / Waste Architecture DESIGN LAB</b>
Thursday October 3 09:00-12:50	<b>F11 / Leachate characterization and treatment</b>	<b>G11 / Workshop:</b> Sustainable waste management at Universities I	<b>H11 / Smart &amp; Digital WM</b>
	<b>F12 / WM in small islands</b>	<b>G12 / Workshop:</b> Sustainable waste management at Universities II	<b>H12 / Companies Forum</b>
Thursday October 3 15:30-19:20	<b>F13 / Leachate treatment II</b>	<b>G13 / CIRS</b> La comunicazione nella gestione dei rifiuti	<b>H13 / Workshop:</b> WEEE - Circular economy opportunities
	<b>F14 / Workshop:</b> IWWG TG Landfill aeration	<b>G14 / CIRS</b> Comitato Interdisciplinare Rifiuti e salute - Attività	<b>H14 / Workshop:</b> Circular economy readiness
Friday October 4 09:00-12:50	<b>F15 / Workshop:</b> The science of landfill completion	<b>G15 / CIRS</b> Metodologia e affidabilità dei dati igienico sanitari	<b>H15 / Workshop:</b> Medical WM
	<b>F16 / Solid waste management in emergencies</b>	<b>G16 / Workshop:</b> la gestione dei rifiuti nei grandi eventi sportivi	<b>H16 / Workshop:</b> X-ray fluorescence for waste characterization
Friday October 4 15:30-19:20	CLOSING SESSION: WASTE AND HEALTH		

The seventeenth edition of the Sardinia Symposium will last 5 days and will include over 500 oral presentations and 63 poster presentations. The Symposium is structured in 8 parallel tracks, for a total of 128 sessions (90 oral sessions and 38 workshops).

#### TOPICS

- WM strategies and environmental issues
- Sanitary landfilling
- Biological treatment
- Thermal treatment
- Waste characterization, minimization and recycling
- WM in developing countries
- Non technical issues
- Italian sessions
- Side events

# SUNDAY SEPTEMBER 29

## SOCIAL EVENT



**WELCOME COCKTAIL / OASIS SWIMMING POOL**  
**COCKTAIL DI BENVENUTO / PISCINA OASIS**

**H. 19:00**

Get the Symposium off to a great start and meet old and new friends and colleagues in a relaxing atmosphere by the Oasis swimming pool.

*Per iniziare il Simposio con il piede giusto non c'è niente di meglio di un cocktail di benvenuto da sorseggiare insieme a nuovi colleghi e vecchi amici nella rilassante cornice delle piscine Oasis.*



DAY 1 / MONDAY  
SEPTEMBER 30

# MONDAY SEPTEMBER 30

## MORNING

### **OPENING SESSION / CENTRAL HALL / 9:00-13:00**

Chair / *Presidente*: Raffaello Cossu (IT)

### **WELCOME ADDRESSES / SALUTI DI BENVENUTO**

- 9:15-10:20** Raffaello COSSU / University of Padova (IT)  
Peter KJELDSEN / Technical University of Denmark (DK)  
Yasushi MATSUFUJI / Fukuoka University (JP)  
Rainer STEGMANN / Hamburg University of Technology (DE)  
Anders LAGERKVIST / IWWG President (SE)  
Evan DIAMADOPOULOS / Technical University of Crete (GR)

### **OPENING LECTURES / RELAZIONI DI APERTURA:**

- 10:20-10:50** Jim BRIDGES / University of Surrey (UK)  
The need to change roles - From responders to leaders
- 10:50-11:20** Coffee break
- 11:20-11:40** Annalisa OBOE / University of Padova (IT)  
Women, science, and the difference it makes
- 11:40-12:00** Rainer STEGMANN / Hamburg University of Technology (DE)  
The great transformation

### **GREECE SPECIAL GUEST COUNTRY / GRECIA SPECIAL GUEST:**

- 12:00 - 12:30** Evangelos GIDARAKOS / Technical University of Crete (GR)  
Waste management issues in Greece

# OPENING LECTURES

## RELAZIONI DI APERTURA

In accordance with a consolidated tradition, the Symposium will be opened by introductory lectures not strictly linked to sanitary landfilling. The 17th edition of the Sardinia Symposium will be opened by: Jim BRIDGES / Annalisa OBOE / Rainer STEGMANN

### THE NEED TO CHANGE ROLES - FROM RESPONDERS TO LEADERS

**Jim Bridges**, *Emeritus Professor of Toxicology and Environmental Health, University of Surrey (UK)*

Over the last four decades, I have been involved often with the waste industry, its regulators and various government advisory committees on health and the environment. I have seen a few crises and a number of major achievements in the management of waste. The industry had to respond to many human and environmental health issues, such as the effects of combustion products from incineration, increasing concerns about environmental impacts of landfills and BSE. I am fortunate enough to have been involved in all of them. Sustainable use of resources is widely recognised now as one of the world's primary objectives and every industry and citizen needs to play a part. Achieving sustainability is very challenging but leads to new opportunities. As a toxicologist I have a particular interest in the development of less toxic and readily biodegradable substances. In my view the waste industry has to decide whether to just continue dealing with whatever waste is generated or to be proactive and tell the waste producers what is acceptable. This lead role requires a new strategy for waste automated recognition, separation and processing to utilisable products.



*He obtained a PhD in Toxicology and Analytical chemistry in 1963 at St Mary's Hospital Medical School (London University). At Surrey University he initiated the first MSc programme in Europe in Toxicology. He has published over 400 scientific papers and reviews and supervised almost 100 PhD students. He was a member of the European Space Agency/NASA on the risk of samples from Mars containing life forms. His main current activities are the development of quantitative weight of evidence methodology and its application in areas of scientific controversy in both human and environmental risk assessment. From 1973 onwards he has been frequently involved in waste management issues. Initially on the application of incineration for the destruction of toxic chemicals. This led to a role as the pollution expert in a number of public inquiries on applications to build waste to energy incinerators in the UK. He was also appointed as an external advisor on the waste management plans for Honk Kong and Vancouver Metro. During the BSE crisis he had the principal role in the disposal of residue issues for the EU. In addition, he has been involved in many issues concerning the safety of industrial waste disposal.*



## WOMEN, SCIENCE, AND THE DIFFERENCE IT MAKES

**Annalisa Oboe**, *Vice Rector for Cultural Social and Gender relations, University of Padua (IT)*

In 2019 Science and Technology still seem to be no country for (young or old) women. The 2030 UN Agenda, which includes gender equality among its interconnected 17 SDGs, is a useful reminder that a liveable planet and a sustainable future need the effort of all. As predicated in SDG 5, it is necessary and urgent to acknowledge the role of women and girls in the public sphere and in the production of knowledge for an equal and inclusive society. This is something we are deeply committed to at the University of Padua, which proudly features Elena Lucrezia Cornaro Piscopia (1646 - 1684) among its graduates - the first woman in the world to earn a university degree, in 1678. However, that landmark in our 8 century-long history was not enough to guarantee an early access of women to university and academic careers, and in some disciplinary areas it is still a goal to live up to. In my talk I will sketch the work we are doing for gender equality in Padua as a way to promote a new 'grammar' in gender power relations and to produce a more hospitable and equal scientific environment, where 'difference' is a value to uphold.



*Annalisa Oboe is Professor of English and Postcolonial literatures (Department of Linguistic and Literary Studies) at the University of Padua, Italy, where she currently serves as Deputy Vice-Chancellor for Cultural, Social and Gender Relations. She is the founder and director of the 'Elena Cornaro' University of Padua Centre for Gender Studies (Centro di Ateneo 'Elena Cornaro' per i saperi, le culture e le politiche di genere). Her research focuses on postcolonial theory and cultures, contemporary Anglophone literatures, women's writing, African and Black Atlantic narratives, postcolonial Italy. She is P.I. and coordinator of the postcolonialitalia research project, and the founder and chief editor of the online open-access academic journal From the European South: a transdisciplinary journal of postcolonial humanities.*

*She was Chair of AISCLI (Associazione Italiana di Studi sulle Culture e Letterature di lingua Inglese, 2010-2016), and Advisor of the executive committee of EACLALS (European Association of Commonwealth Language and Literature Studies, 2008-2011), and she co-founded the Venice international literary festival "Incroci di Civiltà" in 2008. She has recently been elected member of the Accademia Galileiana di Scienze Lettere ed Arti (Padova, 2017) and of the Accademia Olimpica.*



## THE GREAT TRANSFORMATION

**Rainer Stegmann**, *Professor of Solid Waste Management (Retired), Hamburg University of Technology (DE)*

The Earth System is in alarming condition: Climate Change, Global Pollution, Deforestation, abundant Exploitation of non - renewable Resources, etc. influence our life on earth increasingly. Flora and fauna diversity is decreasing, weather changes, the toxicity level of water, air and soil is increasing, water levels rise, etc.

In order to assure that also future generation can live in dignity on a healthy planet we need the great transformation in almost all sectors of our life as e.g. change of abundant life style, decarbonisation of energy production, ecological economy and agriculture, eco-cities and new mobility concepts. This is a social, technical and financial challenge where research, education and scientific based information are essential and where media play a significant role.



*He was Professor from 1982 to 1990 at the Institute of Environmental Protection and from 1991 to 2008 Head of the Institute of Waste Management at the Technical University of Hamburg, Germany. He retired in March 2008.*

*He is one of the prominent researchers in the field of waste management and provided in particular fundamental scientific contributions on sustainable landfilling, anaerobic digestion, biogas generation and control, treatment of contaminated soil.*

*He co-ordinated several international and national research projects, and was member of the environmental advisory board of Shanks, England.*

*From 2009 until 2011 he was director of the R3C Research Center at the Nanyang University of Technology, Singapore, for which he is now scientific advisor.*

*He is co-organiser of several national and international conferences and has published more than 300 scientific papers and several books. Since 2008 he has been the chairman of IWWG (International Waste Working Group).*

# SPECIAL GUEST COUNTRY

## PAESE SPECIAL GUEST

### WASTE MANAGEMENT ISSUES IN GREECE

**Evangelos Gidarakos**, *Professor of Toxic and Hazardous Waste Management, Technical University of Crete (GR)*

Greece tries to follow closely the development of European waste management and the corresponding Directives. However, even today Greece landfills the majority of its municipal waste (81%, compared to 31% for the EU-28 average), with only 16% being recycled (EU-28: 27%) and 4% composted (EU-28: 15%). Illegal landfilling, very low recycling rates and the management of hazardous waste are criticized most and cost the country a lot of money. For example, in December 2014 a penalty of 22 million Euro and 54,450 Euro for every day for not closing several landfills was imposed, followed by a ten million Euro fine and another 30,000 Euro per every day regarding the treatment of hazardous waste in September 2016.

Statistics show that a lot of work needs to be done in order to accomplish environmentally friendly and economically profitable management of waste in Greece, which has many particularities compared to other EU country members.

### Geography

Its territory, two thirds of which is covered with mountains, is ~ 83.3% mainland and ~ 16.7% island. It has thousands of square km of sea (only the Aegean Sea covers 214.000km<sup>2</sup>) and a total coastline of around 13,676 km. The island territory enumerates ~ 6,000 islands and inlets! These geographical characteristics greatly complicate the development and application of a central and uniform waste management scheme, as sources dispersion is great and local conditions and possibilities differ significantly across the country.

### Marine environment

The Greek sea is home to 447 of the 519 species that live exclusively in the Mediterranean, 9 resident marine mammals, undersea meadows of unique beauty and value, and us. Also, the marine environment is intertwined with the Greek lifestyle, journeys and summers, history, civilization and commerce. Especially tourism, fishery and trading greatly depend on its presence and quality, making its protection from any kind of pollutant (including plastics) very important.

### Tourism

Greece is a very popular destination for tourists, due to its unique natural beauty and cultural heritage. It is estimated that in 2015 around 26,000,000 people visited Greece, the majority of which visited at least one island during their stay in the country. Especially certain islands that attract a lot of tourists, such as Mykonos and Santorini, present great seasonal increase in their population during summer. This is indicated by the fact that although their permanent population is just 10,000 and 15,000 habitants, respectively, they have 70,000 and 50,000 beds available beds for visitors, respectively. This touristic infrastructure is not always accompanied by proper infrastructure and scheme that can handle the corresponding seasonal increase in waste production, especially plastic.

### Economic restrictions

Greece experiences a very difficult economic situation with several important effects on its capability to cover even basic public provisions. At the same time, people try to deal

with this reality that greatly deteriorates their life quality. Under these circumstances, not much money is available for developing and conserving a rather complex and demanding waste management system, not much room is available for development and innovation, not much willingness is available for adopting even basic environmentally friendly habits (e.g. recycling).

### External influences

Although it is well known that contamination has no borders and external influences may greatly affect the environmental quality of any country, sometimes reality surprises us. Greece witnessed the drama of war refugees that straggle to save their lives and search for a better life in Europe. Thousands reached its islands, under unthinkable conditions, sometimes not even alive. Of course, the state, as well as local people, do their best to help these refugees and soften their physical and psychic exhaustion. However, well and deservedly hidden behind this drama a new waste management issue exists, with thousands of tons of plastic “waste” on Greek beaches (only on Lesbos island 19,000 tn were recorded). It is clear that Greece needs to deal with issues and circumstances that other EU country members do not face and therefore it is almost inevitable to fall behind with its obligations and goals. The state has to work hard and methodically in cooperation with the scientific community in order to embrace the country’s special characteristics and develop an effective and viable waste management system.



Prof. Evangelos Gidaracos has been a Full Professor at the School of Environmental Engineering and Director of the Laboratory of Toxic and Hazardous Waste Management at the Technical University of Crete in Greece since 2002. The scientific fields of his concern include: toxic and hazardous waste management, treatment and disposal, sustainable municipal solid waste management and soil and groundwater remediation, using innovative technologies. Prof. Gidaracos has collaborated with many research centers and institutes (e.g. Max-Planck, Fraunhofer, MIT, Battelle Memorial Institute, BNNL, etc.) and has been a visitor professor in many Universities, such as the Technical University of Hamburg, Dresden and Cottbus in Germany. He is a member of many international associations and working groups and has received much honourable discrimination. He has 5 patents, he has published more than 70 papers in scientific journals and has presented more than 200 papers in different international scientific conferences.

# MONDAY SEPTEMBER 30

## AFTERNOON

### SESSION A1 / CENTRAL HALL / 15:30-17:10

#### **POLICIES AND STRATEGIES IN WASTE MANAGEMENT**

Chair / *Presidente*: Thomas Astrup (DK)

*M. Abis, S. Fiore, K. Kuchta (DE)*

Assessment of municipal solid waste management in EU: the synergy between recycling and thermal treatments

*A. Allesch, P.H. Brunner, M. Huber-Humer (AT)*

Optimizing waste management systems based on material flow analysis

*T. Tasaki, R. Inaba, K. Kawai, E. Kojima, R. Tajima, K. Suzuki, R. Kubota (JP)*

Waste management in the era of population decrease and aging

*P.F. Albizzati, D. Tonini, T.F. Astrup (DK)*

Sustainability assessment of the management of second generation biomass

*H. Robinson (UK)*

Politicians, the press and the public: can they give us sustainable waste management? (or, "lifestyle, lunacy, and landfills")

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION A2 / CENTRAL HALL / 17:40-19:20

#### **WASTE GENERATION**

Chair / *Presidente*: Aldo Muntoni (IT)

*A. Gassner, J. Lederer, J. Fellner (AT)*

Material demand and waste generation of road transport infrastructure - The case of Vienna

*L. Spreutels, M. Héroux, R. Legros (CA)*

A spatial-and-scale-dependant model for predicting MSW generation, diversion and collection cost based on dwelling-type distribution

*B. Fallah, A. Richter, K.T.W. Ng (CA)*

Optimization of weekly organic waste ANN prediction model using socioeconomic and climatic factors in Austin, TX

*J.E.S. Santos, A.G.H.P. Van Elk, J. A Ferreira (BR)*

Challenges for the implementation of the national solid waste policy in Brazilian municipalities, case study of São Gonçalo, Rio de Janeiro

## **SESSION B1 / CENTRAL HALL 2 / 15:30-17:10**

### **LANDFILL SITING APPROACHES**

Chair / *Presidente*: Anders Lagerkvist (SE)

*N. Karimi, A. Richter, K.T.W. Ng (CA)*

Improving the selection process for future landfills: an approach combining RS, GIS, and MCDA tools – Applied for Vancouver, BC

*M. Gallo, L. Moreschi, A.C. Taramasso, M. Robba, A. Del Borghi (IT)*

Multicriteria analysis as decision support tool in waste management under emergency conditions: the case study of the municipality of Genoa in Italy following the closure of the Scarpino landfill

*A. Richter, N. Karimi, K.T.W. Ng (CA)*

Integration of GIS, Remote Sensing, and diversion rates to assess the efficiency of landfill regionalization in Nova Scotia, Canada

*J.M. Torrente, V.M. Giampietro, M. Ripa, R. Chifari (IT)*

The quantitative story of the environmental pressure of landfills in developing countries. Case study: Cerro Patacón

*V. Kumar, A.L. Haldar, A. Yadav, S. Shukla (IN)*

Selection of suitable landfill site for solid waste disposal using multi-criterion layers and GIS techniques

*V. Kumar, V. Ahmed, M.M. Ansari (IN)*

Quantification of solid waste and thermal variation analysis using geospatial data & GIS technique

**17:10 - 17:40** Coffee break + Poster discussion

## **SESSION B2 / CENTRAL HALL 2 / 17:40-19:20**

### **LANDFILL PLANNING AND DESIGN**

Chair / *Presidente*: Natalia Sliusar (RU)

*E. Huybrechts, P. Wens (BE)*

Challenging landfill construction

*L. Capelli, R. Arias, J. Uribe, S. Sironi (IT)*

Odour impact assessment methods overview: the odour observatory as an informative tool for citizen science based approaches to odour management

*L. Capelli, S. Sironi (IT)*

Influence of modelling choices on the results of landfill odour dispersion

*Y. Le Bihan, D. Loranger-King, N. Turgeon, N. Pouliot, N. Moreau, D. Deschênes, G. Rivard (CA)*

Field trials on the use of alternative cover materials to control surface emissions (H<sub>2</sub>S and VOCs) at an engineered landfill

*A. R. Cabral, V. Simard, M. Duarte Neto, G. Lacombe (CA)*

Design, construction and monitoring of large-scale lysimeters to assess seepage through experimental final cover designs

# MONDAY SEPTEMBER 30

## AFTERNOON

### SESSION C1 / PANORAMA HALL / 15:30-17:10

#### DECISION SUPPORT TOOLS FOR BIOWASTE MANAGEMENT

Chair / *Presidente*: Jonathan Wong (HK)

*E. Angouria-Tsorochidou, M. Klinglmair, M. Thomsen (DK)*

Evaluating a new decision support tool for biowaste management: preliminary assessment of a case study in Aarhus, Denmark

*O.H. Fjellander, D.S. Nørgaard, P.R. Jensen, V. Bisinella (DK)*

Feeding or energy purposes? Quantifying the environmental impact of alternative uses of biomass residues

*S. Andreasi Bassi, F. Valentino, G. Moretto, T. Astrup, A. Boldrin (DK)*

Environmental assessment of the production of bio-plastics from urban bio-waste

*L. Loyon (FR)*

Regulatory and incentive policies to reduce nitrogen pollution in the Brittany region (France)

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION C2 / PANORAMA HALL / 17:40-19:20

#### STRATEGIES FOR BIOENERGY RECOVERY FROM WASTE

Chair / *Presidente*: Lidia Lombardi (IT)

*A. Schüch, J. Sprafke, M. Nelles (DE)*

Role of biogenic waste and residues as an important building block forward a successful energy transition and future bioeconomy - Results of a site analysis

*M. Boccarossa, M. Di Addario, F. Tatano (IT)*

Scenarios of bioenergy recovery from organic fraction of residual municipal waste in the Marche region (Italy)

*L. Kamarád, W. Gabauer, G. Bochmann (AT)*

Challenges in the full scale operation of industrial and municipal biogas plants

*J. Sprafke, N. Engler, Q. Thabit, M. Nelles, A. Schüch (DE)*

Increasing the base load capacity of biowaste fermentation plants by optimised substrate management

*V. Pallier, G. Feuillade-Cathalifaud, M. Tcha-Thom, E. Koledzi, G. Baba (FR)*

An integrated approach for valorization of pineapple waste into biogas

*F. Ardolino, G. Colaleo, U. Arena (IT)*

Thermochemical and biochemical exploitation of biowaste: an LCA study

## **SESSION D1 / PANORAMA HALL 2 / 15:30-17:10**

### **STRATEGIES IN WASTE THERMAL TREATMENT**

Chair / *Presidente*: Michael Nelles (DE)

*R.M. Sebastian, D. Kumar, B. J. Alappat (IN)*

Assessment of incinerability of municipal solid waste in Asian countries using incinerability index

*E. Suzuki, M. Asari (JP)*

MSW incineration facility in Japan: as environmental learning and local base

*H. De Chefdebien (FR)*

Practical proposals for solving the pending issues related to the implementation of the waste incineration BREF and to compliance verification - Guidance

*K. Ishii, T. Furuichi, S. Ochiai, M. Sato (JP)*

Waste management strategies based on biomass utilization in Japan

*F. Ardolino, C. Boccia, U. Arena (IT)*

Environmental performances of a modern waste-to-energy unit in a life cycle perspective

*F.V. Andretti, J.A. Ferreira, C.F. Mannarino (BR)*

Techno economic feasibility of waste-to-energy plant – A simulation to Rio de Janeiro city, Brazil

**17:10 - 17:40** Coffee break + Poster discussion

## **SESSION D2 / PANORAMA HALL 2 / 17:40-19:20**

### **THERMAL TREATMENT ACCORDING TO WASTE QUALITY**

Chair / *Presidente*: Hua Zhang (CN)

*T. Schwarzböck, H. Rechberger, J. Fellner (AT)*

Optimization potential in waste-to-energy plants by better waste homogenisation

*Y.A. Gomez Rueda, L. Helsen (BE)*

The effect of carbon dioxide and steam on the cracking of naphthalene as tar surrogate

*S.A. Viczek, K. Khodier, R. Pomberger, R. Sarc (AT)*

Grain size dependent distribution of As, Cd, Cl, Co, Cr, Fe, Hg, Ni, Pb, Sb, Sn, Ti, V, W, and Zn in coarse-shredded commercial waste

*S.A. Iwarere, N.M. Mkhize (ZA)*

Pyrolysis of various tyre types: characteristics and kinetic studies using thermogravimetric analysis

*S.A. Viczek, A. Aldrian, R. Pomberger, R. Sarc (AT)*

Analytical determination of the material-recyclable share of SRF through co-processing in the cement industry - Comparison of ashing temperatures

*H. Zhou, D. Chen, B. Gong, L. Hong (CN)*

Changes of incineration characteristics upon carrying out source separation collection of MSW



# MONDAY SEPTEMBER 30

## AFTERNOON

### SESSION E1 / EX CHIESA HALL / 15:30-17:10

#### CIRCULAR ECONOMY - CASE STUDIES IN DIFFERENT COUNTRIES

Chair / *Presidente*: Andreas Bartl (AT)

*R. Cayumil, S. Guajardo, R. Abeliuk, M. Sánchez (CL)*

Current status of waste management in Chile: towards a circular economy

*N. Sato, C. Iida, C. Nishi (JP)*

Evaluation of organic and recyclable waste separation at generation source in Ratnapura municipal council and Kataragama Pradeshiya Sabha in Sri Lanka

*F. Villa, M. Vaccari, G. Vinti (IT)*

Appropriate solid waste management system in Quelimane (Mozambique) - Study and design of a small scale center for plastic sorting with wastewater treatment

*A. Rahimzadeh, W. Tang, W. Sher (AU)*

Spoil handling in Australia

*A. K. Awasthi, J. Li (CN)*

Evaluating situation of e-waste management in developing countries: strategies, challenges, solutions and opportunities

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION E2 / EX CHIESA HALL / 17:40-19:20

#### WASTE MANAGEMENT SUSTAINABILITY IN DEVELOPING COUNTRIES

Chair / *Presidente*: Muhammed Alamgir (BD)

*G. Addae, B. Fei-Baffoe (GH)*

Kumasi metropolitan assembly market waste compositional analysis study, Ghana

*J. Gutberlet (CA)*

Grassroots innovations in waste governance addressing sustainable development goals

*V.R. Sankar Cheela, U. Shankar, B. Dubey, M. John (IN)*

Using environmental forensics to aid landfill management in developing countries - An Indian case study

*A.F. Ali, S.K. Ilah (NG)*

Groundwater pollution risks associated with sanitation facilities in Dala Local Government Area of Kano State, Northwestern Nigeria

## SESSION F1 / NATURISTA HALL / 15:30-17:10

### WORKSHOP: GENDER PERSPECTIVES IN WASTE MANAGEMENT

Chairs / *Presidenti*: Maria Cristina Lavagnolo (IT), Cristina Trois (ZA)

How is women's involvement in the environment business considered?

What is the role of women in this sector? Are there women in top positions in waste management companies? The recent international environmental battles have seen young women lined up in the front line and environmental protection is increasingly speaking "feminine". The workshop is an opportunity to discuss the feminine participation in the technical-scientific professions that concern environmental issues and how, in particular, women are assigned the roles that concern "taking care" thus transferring also in this sector what happens in the family or in the social sphere in general (the teacher, the nurse, the care of children and the elderly, etc.), often without appropriately evaluating or recognizing the high skills achieved. *Full appetizer available on the website*

#### Introductory lecture:

*M.C. Lavagnolo, M. Fedeli, C. Tino (IT)*: To be a woman and study engineering

**17:10 - 17:40** Coffee break + Poster discussion

## SESSION F2 / NATURISTA HALL / 17:40-19:20

### IWWG-YOUNG ROUNDTABLE

Chairs / *Presidenti*: Francesco Garbo (IT), Lingyue Zhang (CN)

Although many opportunities (e.g. funding, grants, etc.) are specifically dedicated to young researchers, the current fragmentation of the young community, especially in terms of interconnections and cooperation, tends to strongly limit such possibilities. The goal of IWWGyoung is the creation of an international working group, with members coming from both developed and developing countries, based on the sharing of valuable information and on the arrangement of international collaborations within the young researchers community, in the field of solid waste management. *Full appetizer available on the website*

#### Introductory lectures:

*F. Garbo (IT)*: Sustainable decentralized waste and wastewater treatment systems

*V. Grossule (IT)*: Cost-effective appropriate solutions for sustainable waste management

*G. Beggio (IT)*: Developing waste ecotoxicity assessment for the promotion of a sustainable Circular Economy, with a focus on OFMSW digestates

*R. Malesani (IT)*: Construction and demolition waste management in renovation activities of abandoned areas

*L. Zhang (CN)*: Mechanism and control method of foam production by leachate treatment

*F.-M. Pellerà (GR)*: Biochar production from waste biomass for agronomic and environmental application

*S. Zhang (CN)*: Application of electron beam in aged landfill leachate treatment

# MONDAY SEPTEMBER 30

## AFTERNOON

### SESSION G1 / HELL'S KITCHEN / 15:30-17:10

#### WORKSHOP: STRATEGIES FOR LANDFILL MINING

Chair / *Presidente*: Juan C. Hernández Parrodi (BE)

Europe has somewhere between 150,000 and 500,000 landfill sites, with an estimated 90% of them being “non-sanitary” landfills, predating the EU Landfill Directive of 1999. These older landfills tend to be filled with municipal solid waste and often lack any environmental protection technology. “Doing nothing” or remediating them depends largely on technical, societal and economic conditions which vary between countries. Beside “doing nothing” there are different scenarios in landfill mining (LFM), from re-landfilling the waste into “sanitary landfills” to seizing the opportunity for a combined resource-recovery and remediation strategy. This workshop will address present and future issues and potential opportunities of LFM as an embedded strategy in current waste management systems through a multi-disciplinary approach.

#### Introductory lectures:

*J.C. Hernández Parrodi, H. Lucas and M. Gigantino (BE)*

Technical aspects of LFM in the context of circular economy

*G. Sauve, J. L. Esguerra and P. Einhäupl (BE)*

Multi-criteria assessment for landfill mining concepts and technologies

#### Discussion topics:

- Are current state-of-the-art practices for waste management well adapted to LFM?
- What are and what should be the techno-economic aspects to take into account for LFM?
- In what way do current regulations promote LFM?
- What policy changes are necessary to foster LFM in Europe?

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION G2 / HELL'S KITCHEN / 17:40-19:20

#### RECYCLING OF PHOTOVOLTAIC PANELS

Chair / *Presidente*: Ian Williams (UK)

*S. Scherhauser, A. Happenhofer, I. Meyer, F. Part, M. Sommer, P. Beigl (AT)*

The importance of the recycling of products used in the decarbonisation of the energy sector

*J. Bumba, V. Drinek, R. Fajgar, F. Kastanek, O. Solcova (CZ)*

Recycling of photovoltaic cells and other Si, Ge electronic waste

*L.S.S. Oliveira, L.H. Yamane, R.R. Siman (BR)*

Silver recovery from end-of-life photovoltaic panels

*V. Savvilotidou, E. Gidakos (GR)*

Reuse of glass from photovoltaic panels in construction materials

**SESSION H1 / BALDACCHINO ROOM / 15:30-17:10**

**IWWG TRAINING COURSE: MONITORING OF LANDFILL GAS EMISSIONS**

Chairs / *Presidenti*: Viktoria Wechselberger, Marion Huber-Humer (AT)

On a global level, methane emissions from landfills still represent the largest direct source of greenhouse gas emissions from the solid waste sector. Diverse technologies that should mitigate LFG emissions, like gas extraction systems, methane oxidation covers or in-situ aeration measures, are therefore implemented. For a reliable assessment of the performance of these measures, and particularly for GHG counting and inventories, methods are required, that can cope with the high spatial and temporal variability of landfill gas emission fluxes.

In the trainings course current approaches to monitor and quantify methane emissions from landfill sites will be presented. A particular focus will be set on the one hand on conventional methods like chamber systems, and on the other hand on innovative approaches, such as using the open-path tunable diode laser absorption spectrometry (OP-TDLAS). This is a method to determine path-integrated gas concentrations. Based on the measured concentrations as well as meteorological data emissions from the site can be quantified via inverse dispersion modelling. The training course will be run in an interactive manner, with lots of opportunity for questions and discussion, and for specific aspects of particular interest to delegates to be covered.

**17:10 - 17:40** Coffee break + Poster discussion

**SESSION H2 / BALDACCHINO ROOM / 17:40-19:20**

**IWWG TRAINING COURSE: LEACHATE TREATMENT**

Chair / *Presidente*: Howard Robinson (UK)

At both operational and closed landfill sites in every country, the management of leachate remains a key issue in order to prevent adverse environmental impacts. In addition, management of leachates is the most important factor that will determine the aftercare period for closed landfills; while the majority of landfill gas generation will be completed within about 50 years, the flushing out of soluble contaminants released during wastes decomposition as leachate, will take many centuries.

This training course will provide a brief introduction to processes of waste decomposition and leachate generation and composition, but will then focus on state-of-the-art leachate treatment processes, based on detailed operational data from many full-scale leachate treatment plants, in temperate and tropical climates, and in developed and developing countries. Case studies from some of the largest and most advanced leachate treatment plants in the world will be presented and discussed, with plenty of opportunity for delegates to discuss their own leachate problems, and try to find ways in which they can select appropriate technologies, or improve operation of existing treatment systems.

# MONDAY SEPTEMBER 30

## SOCIAL EVENT



### WHITE PARTY ON THE BEACH / FORTE VILLAGE'S BEACH WHITE PARTY IN SPIAGGIA / SPIAGGIA FORTE VILLAGE

**H. 21:00**

We cordially invite you to join us for an all white theme party to be held on the Forte Village beach.

Cocktails and dance music will be provided to celebrate the beginning of the conference week!

**DRESS CODE: white and cozy!**

*Siamo lieti di invitarvi ad un white party che si terrà sulla spiaggia del Forte Village, per festeggiare il primo giorno di convegno.*

*Unisciti a noi per una serata all'insegna del divertimento, con cocktail e tanta musica da ballare.*

**DRESS CODE: bianco e comodo!**



DAY 2 / TUESDAY  
OCTOBER 1

# TUESDAY OCTOBER 1

## MORNING

### SESSION A3 / CENTRAL HALL / 9:00-10:40

#### WASTE CHARACTERIZATION I

Chair / *Presidente*: Martijn Van Praagh (SE)

*P. Hennebert (FR)*

Proposition of threshold for waste contaminated with mercury (compounds) in application of the Minamata Convention on mercury and impact assessment

*G. Choi, K. Kim, S. Lee, W. Yang, J. Kang, T. Jeon, S. Shin (KR)*

Evaluation of waste characteristics carried into incineration facility

*B. Rahardyan, E. Binner (ID)*

Applicability of single measurement OxiTop for liquid samples ("BOD" - measurement) for solid waste bioreactivity determination

*S. Coussy, G. Boissard, S. Belbèze, D. Guyonnet (FR)*

French feedback on the use of inert waste landfill criteria for managing excavated soils

**10:40 - 11:10** Coffee break

### SESSION A4 / CENTRAL HALL / 11:10-12:50

#### WASTE CHARACTERIZATION II

Chair / *Presidente*: Pierre Hennebert (FR)

*A. Happenhofer, P. Beigl (AT)*

Standardization of residual waste sorting analyses – Potentials and limitations in an international comparison

*A. Khanyile, G.C. Caws, S.L. Nkomo, N.M. Mkhize (ZA)*

Characterisation study of various disposable diaper brands

*A. Gassner, T. Schwarzbock (AT)*

Waste analysis in a refugee settlement in the West-Nile region of northern Uganda

*J. Kumpiene, I. Carabante, I. Tjerngren, P. Peltola (SE)*

Leaching properties of stabilized waste in a simulated deep storage environment



## SESSION B3 / CENTRAL HALL 2 / 9:00-10:40

### LANDFILL CHARACTERIZATION AND MONITORING

Chair / *Presidente*: Toshihiko Matsuto (JP)

*I. Isunza Manrique, D. Caterina, E. Van De Vijver, G. Dumont, F. Nguyen (BE)*

Assessment of geophysics as a characterization and monitoring tool in the dynamic landfill management (DLM) context: opportunities and challenges

*D. Caterina, I.I. Manrique, C. Inauen, A. Watlet, B. Dashwood, R. De Rijdt, G. Dumont, J. Chambers, F. Nguyen (BE)*

Contribution of geophysical methods to the study of old landfills: a case study in Onoz (Belgium)

*N. Sliusar, T. Filkin, V. Korotaev (RU)*

Application of unmanned aerial vehicles for solid waste landfill management

*H. Chanakya, B. S. Jai Prakash, G. C. Ranganath, K. Naganna (IN)*

Environment hazard scene investigation (EHSI) and emerging challenges at poorly documented dumpsites

*T. Radu, R. Sreenivas, A. Mustafa, H. Albuflasa (UK)*

Towards landfill monitoring in the Kingdom of Bahrain: assesment of impact

*C. Bax, M.L. Voti, S. Sironi, L. Capelli (IT)*

Application and performance verification of electronic noses for landfill odour monitoring

**10:40 - 11:10** Coffee break

## SESSION B4 / CENTRAL HALL 2 / 11:10-12:50

### LANDFILL PROCESSES

Chair / *Presidente*: Thomas H. Christensen (DK)

*N. Fricko, C. Brandstätter, J. Fellner (AT)*

Identifying nitrogen transformation pathways in old landfills – Adaption and application of methods developed in soil chemistry

*Y. Long, W. Liu, L. Ying, D. Shen (CN)*

A novel aerobic sulfate reduction process in landfill mineralized refuse

*A.N. Srivastava, S. Chakma (IN)*

Co-disposal of organic industrial waste with municipal solid waste in lab-scale bioreactor landfills

*F. De La Cruz, M. Barlaz (US)*

Characterization of thermophilic waste decomposition at a landfill experiencing elevated temperatures

*T.F. Oliveira, F.P. Manéo, C.C. Guimarães (BR)*

Simulation of the environmental impact generated by the degradation of cell phones sent to landfills

*T. Komiya, T. Saruwatari, Y. Hakata, A. Saffarzadeh, H. Nakayama, T. Shimaoka, I. Sandambata, T. Aoki, T. Nishio, H. Akita, F. Hirotsue (JP)*

Simulating the performance of "cement-solidified landfill" of municipal solid waste incineration residues by demonstration experiment

# TUESDAY OCTOBER 1

## MORNING

### SESSION C3 / PANORAMA HALL / 9:00-10:40

#### COMPANIES EXPERIENCES

Chair / *Presidente*: Sven Andersson (SE)

*L. Nettuno, L. Pilenga, M. Heidari, Y. Lazzarini, G. Garuti (IT)*

"Waste to efficiency" approach for sustainable MSW management in emerging countries

*H. Haaring (NL)*

Sludge treatment for circular economy

*A. Bertacchini (IT)*

Decentralised energy from waste plants based on organic rankine cycle technology

*R. Eden, M. Moulden (UK)*

Pyrolysis as a method of final municipal solid waste disposal and power generation

**10:40 - 11:10** Coffee break

### SESSION C4 / PANORAMA HALL / 11:10-12:50

#### ANAEROBIC DIGESTION - LAB SCALE TESTS FOR PROCESS ENHANCEMENT

Chair / *Presidente*: Marco Ritzkowski (DE)

*J. Heerenklage, D. Rechtenbach, I. Atamaniuk, A. Alassali, A.- C. Graage, P. Pasternak, A. Krüger, A. Muntoni, M. Isipato, K. Kuchta (DE)*

Investigation of standardised and adapted inocula for biomethane potential tests

*J. Wong, L. Luo (HK)*

Improvement of food waste methane-generating platform by enriching acetate and hydrogen production in an integrated pressurized solid-liquid anaerobic reactor

*A. Cesaro, V. Belgiorio (IT)*

Advanced chemical pretreatments for the anaerobic digestion of the organic fraction of municipal solid waste

*Q. Chen, N. Wang, T. Yuan, Q. Xu (CN)*

Effect of manganese species on anaerobic digestion

*P. Ogunlode, O. Abunumah, I. Orakwe, H. Shehu, F. Muhammadsukki, E. Gobina (UK)*

Upgrading biogas to a bio-methane by use of nano-structured ceramic membranes

## SESSION D3 / PANORAMA HALL 2 / 9:00-10:40

### PYROLYSIS AND GASIFICATION OF BIOMASS

Chair / Presidente: Umberto Arena (IT)

*L. Yin, B. Yu, S. Hu, Y. Hu, D. Chen (CN)*

Study on heat and mass transfer characteristics of biomass particles during pyrolysis

*V.E. Messerle, A.B. Ustimenko, O.A. Lavrichshev, N.A. Slavinskaya, Zh.Zh. Sitdikov (KZ)*

Gasification of biomass in plasma gasifier

*G. Lisak, S. Heberlein, A. Veksha, D. Wu, A. Giannis (SG)*

Make it greener - Using renewable biomass charcoal to operate the high temperature slagging gasification facility for municipal solid waste

*A. Manali, P. Gikas (GR)*

Utilization of primary sieved solids for gasification and energy production

*A. Veksha, F. Teoh, V. Chia, A. Giannis, T.T. Lim, G. Lisak (SG)*

Recycling of gasification slag from municipal solid waste into catalysts for steam reforming of naphthalene

*G. Cali, F. Parrillo, D. Marotto, A. Pettinau, U. Arena (IT)*

Air gasification of eucalyptus biomass in a pilot scale fluidized bed reactor

**10:40 - 11:10** Coffee break

## SESSION D4 / PANORAMA HALL 2 / 11:10-12:50

### SUSTAINABLE MANAGEMENT OF SECONDARY RAW MATERIALS

Chair / Presidente: Flora Faleschini (IT)

*M. Pasetto, E. Pasquini, A. Baliello, G. Giacomello (IT)*

30 years research on C&D waste recycling in transport infrastructures: a way to minimize the waste disposal and save natural resources

*A. Santamaría, J.T. San José, I. Marcos, J.J. González (ES)*

The performance of self-compacting concrete beams incorporating Electric Arc Furnace slag

*G. Ascensão, F. Faleschini, M. Marchi, M. Segata, J. Van De Sande, H. Rahier, E. Bernardo, Y. Pontikes (IT)*

High temperature resistance of CaO-FeOx-Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub> alkali-activated materials

*E. Dziobek, A. Nowaczek (PL)*

Sustainable development in the construction industry – Usage of construction and mining waste as secondary raw materials. Polish case study

*N.L. Huong, T.V.N. Tran, L.N. Cham, N.H. Giang, K. Kawamoto (VN)*

Application of system dynamic modeling to support construction and demolition waste management policy in Hanoi City, Vietnam

*H. Alrobei, A. Sikander, A. Hafiz (SA)*

Flexural behavior of reinforced concrete beam by partial replacement of fine aggregate with pond ash

# TUESDAY OCTOBER 1

## MORNING

### SESSION E3 / EX CHIESA HALL / 9:00-10:40

#### WASTE MANAGEMENT IN DEVELOPING COUNTRIES: CASE STUDIES

Chair / Presidente: Cristina Trois (ZA)

*A. Damgaard, V. Takou, E. Ramin, M.M. Andersen (DK)*

Identifying industrial ecology options for an industrial park - Case of Ruaraka, Kenya

*B. Rahardyan, D. Saniti (ID)*

Social network analysis of community based solid waste management of Bandung City

*B. Rahardyan, R. Utami (ID)*

Material flow analysis of bulky waste in Bandung

*D. Dey, I. Krukkert (NL)*

Integrated waste management design for the town of Bogura, Bangladesh

*M. Kalina, E. Tilley, F. Ali, W. Woodenberg, B. Reimers, C. Trois (ZA)*

Blurred lines: agricultural production on the margins of a dumpsite in Blantyre, Malawi

*E. Munawar, N. Emalya, A. P. Hayati, Q. H. Ali, S. R. Sugihen, T. Schwarzböck, J. Lederer, J. Fellner (ID)*

The effect of leachate recirculation on landfill gas emissions from Municipal Solid Waste (MSW) landfills in tropical climates

**10:40 - 11:10** Coffee break

### SESSION E4 / EX CHIESA HALL / 11:10-12:50

#### INDUSTRIAL WASTE - STRATEGIES AND TREATMENT

Chair / Presidente: Frederic Coulon (UK)

*S. Dworak, J. Fellner (AT)*

Using Material Flow Analysis to estimate steel scrap quantities and qualities in the EU-28

*A. Di Maria, M. Merchan, K. Van Acker (BE)*

New strategies for circular economy in the metallurgic industry: an environmental assessment of innovative processes for waste and energy recovery

*M. Petranikova, B. Ebin, V. Ssentenza, C. M. Lousada, C. Tunsu (SE)*

Selective recovery of molybdenum from steel making dusts

*G. Belardi, F. Trapasso, D. Passeri, M. Fedon, P. Micheletti, A. Soluri, A. D'Elia, L. Montagner, D. Zonta (IT)*

Stabilization of steelmaking slag based by FMP S.r.l. patent and possible application in concrete production

*G. Shiva Kumar, A.K. Nema (IN)*

Treatment and management of real-time generated Chromite Ore Processing Residue (COPR) using integrated eco-industrial parks

## SESSION F3 / NATURISTA HALL / 9:00-10:40

### SEWAGE SLUDGE

Chair / Presidente: Evan Diamadopoulos (GR)

*T. Bauer, L. Ekman Burgman (SE)*

Effects of different implementations of sewage sludge disposal legislation in the EU

*A. Tsybina, C. Wuensch (RU)*

Assessment of the potential of reducing environmental impact at different scenarios for sewage sludge treatment

*Y. Zhu, K. Xiao, Y. Zhou, J. Yang, C. Le, D. Lu, Z. Yu, K. Pei, S. Liang (CN)*

Profiling of amino acids and their interactions with proteinaceous compounds for sludge dewatering

*K. Xiao, Z. Yu, H. Wang, Y. Chen, W. Yu, Q. Xu, B. Liu, H. Hou, S. Liang, J. Hu, J. Yang (CN)*

Enhanced sludge dewatering via oxone oxidation activated by iron-rich biochar pyrolyzed from ferric sludge at a low temperature: effects of iron species

*E. Camelin, G. Cristina, T. Tommasi, D. Fino (IT)*

Is anaerobic digestate from sewage sludge a potential solution for improvement of poor soils?

**10:40 - 11:10** Coffee break

## SESSION F4 / NATURISTA HALL / 11:10-12:50

### SEWAGE SLUDGE AS A RESOURCE

Chair / Presidente: Hongtao Wang (CN)

*S. Vaclavkova, V. Kerberová, B. Zach, T. Krejčí, M. Krňávek, P. Maléř, M. Šyc (CZ)*

Sewage sludge as an important secondary source for agriculture and phosphorus industry

*J. Chen, S. Tang, Z. Zhang (CN)*

Novel phosphorus recovery from sewage sludge through calcium oxide-enhanced pyrolysis technique

*A. Kolosionis, E. Kastanaki, E. Gidarakos, A. Giannis (GR)*

Conversion of sewage sludge to clean fuel using pyrolysis and washing methods

*E. Diamandopoulos (GR)*

Biochar from sludge

*Z. Mei, D. Chen, J. Zhang, L. Yin, Y. Hu (CN)*

Integrated continuous sewage sludge pyrolysis-volatile reforming reactor and its performance

# TUESDAY OCTOBER 1

## MORNING

### SESSION G3 / HELL'S KITCHEN / 9:00-10:40

#### WORKSHOP: RESEARCH ON BLUE TECHNOLOGIES

Chair / *Presidente*: Raffaello Cossu (IT)

Leachate management represents one of the main problem in landfill sustainability. The complex treatment processes which have been used so far might result too expensive and not always affordable (e.g.in developing countries). The interest for developing innovative sustainable leachate management techniques is growing worldwide favouring the application of concepts such as the Blue economy one. This concept, introduced by Gunter Pauli in 2009, aims to find solutions inspired by Nature, trying to move from environmental problems to opportunities for business and innovation. Blue technologies should be simple, cost-effective and should allow to recover viable resources in terms of energy and material. Objective of the Workshop is to discuss the practical feasibility of the concept and related issues.

#### Introductory lectures:

*F. Garbo, M.C. Lavagnolo, R. Cossu (IT)*

Unconventional leachate treatment: the use of energy crops

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

Potential treatment of MSW leachate by BSF larvae

**10:40 - 11:10** Coffee break

### SESSION G4 / HELL'S KITCHEN / 11:10-12:50

#### WORKSHOP: PUBLISHING A PEER-REVIEWED JOURNAL ARTICLE ON WASTE MANAGEMENT: WHAT ARE THE EXPECTATIONS AND WHAT ARE REVIEWERS LOOKING FOR?

Chair / *Presidente*: Umberto Arena (IT)

It is known that, when compared to journal papers, Symposium papers are normally shorter and are structured to attract the attention of Symposium delegates, who need an idea of what the presentation will look like. Therefore, not all symposium papers should be submitted to a scientific journal, and in most cases will require improvements to be considered. Additionally, the restructuring should be done based on the requirements set by specific journals. For this reason, as a special feature of 2019 Edition of Sardinia Symposium, a Workshop is scheduled with the participation of Editors-in chief of some of the main journals in the area of waste management. After introductory presentations by the Editors-in chief, we will have an open discussion with potential Authors and Referees. The focus will be on the characteristics that a journal paper should have: what are the editor and the reviewer looking for in a manuscript? Is the topic within the scope of the journal and of interest for the journal? Journals require novelty: what is new?... *Full appetizer available on the website*

#### Confirmed speakers:

*U. Arena (IT), P.J. He (CN)*: Waste Management Journal, Elsevier

*R. Cossu (IT)*: Detritus Multidisciplinary Journal for Waste Resources & Residues, Cisa Publisher

*G. Lyberatos (GR)*: Journal of Hazardous Materials, Elsevier

## SIDE EVENT

# INTERNATIONAL WORKSHOP ON WASTE ARCHITECTURE / WASTE MANAGEMENT IN LANDSCAPE AND URBAN AREAS



### SESSION H3 / BALDACCHINO ROOM / 9:00-10:40

#### WASTE ARCHITECTURE: NEW VISIONS AND PERSPECTIVES

Chairs / *Presidenti*: Anna Artuso, Elena Cossu (IT)

*E. Cossu, A. Artuso (IT)*

New visions for landfill architecture

*D.J.M. Marshall (US)*

Computational arrangement of demolition debris

*E. Gasparini (IT)*

Landscape integration of a waste disposal plant: a case study

*G. Bassi (IT)*

Contaminated urban areas and redevelopment: analysis and assessments on the TMB Salario's case study

**10:40 - 11:10** Coffee break

### SESSION H4 / BALDACCHINO ROOM / 11:10-12:50

#### FUNCTIONAL REQUALIFICATION OF OLD LANDFILLS: CASE STUDIES AND TECHNICAL ASPECTS

Chair / *Presidente*: Marina Rigillo (IT)

*D. Martin, M. Héroux (CA)*

Frederic-Back Park, Montreal, Canada: how 40 million tonnes of MSW supports a public park

*A. Pederzoli, B.N. Cerqueira, C.A.A. Catapreta, M.C.S. Ribeiro, P.G.B. Heller (BR)*

Restoration of sanitary landfills in public park: the case study of Belo Horizonte Landfill, Brazil

*S.M. Colombo (IT)*

The naturalistic recovery of an old landfill: the case of Vizzolo Predabissi, Milano

*K. Haarstad (NO)*

Can we build on old landfills?

*R. Congiu, B. Caschili, F. Secchi, G. Agate, , P. Cossu (IT)*

Use of pistacia lentiscus in the revegetation of landfill sites - Selection and crop-soil simulation



# TUESDAY OCTOBER 1

## AFTERNOON

### SESSION A5 / CENTRAL HALL / 15:30-17:10

#### SEPARATE COLLECTION

Chair / *Presidente*: Cristophe Cord'Homme (FR)

*L. Lombardi, L. Pacini, G. Francini, F. Cristo, P. Daddi (IT)*

Material recovery from the separate collection of municipal solid waste

*M. Struk, M. Pojezdná (CZ)*

Non-market value of waste separation from municipal perspective

*R. Oliveira (BR)*

Economic sustainability in solid waste management: critical success factors for Brazil's replication of pay-as-you-throw system

*G. De Feo, C. Ferrara, R. Rosania (IT)*

Optimizing the cost of separate collection systems: the case study of Salerno

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION A6 / CENTRAL HALL / 17:40-19:20

#### SEGREGATION AND COLLECTION

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

*S. Lee (UK)*

A qualitative look at English local authority recycling rates

*M. Pamperl, P. Beigl, S. Salhofer (AT)*

Is there unutilised resource potential in the Austrian economy? Results of a macro-economic model

*R. Kubota, H. Yokoo, E. Kojima, T. Tasaki, I. Utomo (JP)*

Transition of community-based waste bank development in Indonesia accelerated by multiple actors' key actions

*P. Hennebert (FR)*

Sorting of waste for circular economy: sampling when (very) few particles have (very) high concentrations of contaminant or valuable element

## SESSION B5 / CENTRAL HALL 2 / 15:30-17:10

### LANDFILL GAS GENERATION AND MODELLING

Chair / *Presidente*: Marco Ritzkowski (DE)

*C. Scheutz, A. Kjeld, A.M. Fredenslund (DK)*

Methane emissions from Icelandic landfills - A comparison between measured and modelled emissions

*R. Lotito, S. Nanda, C. Barbiero, F. Berruti, M. L. Mastellone (IT)*

Estimation of H<sub>2</sub>S emission from a Canadian landfill site during winter using inverse modelling: a case study

*W. H. Stachowitz (DE)*

33 years experience of LFG extraction from theoretically gas prognoses to realistic gas extraction systems with LFG2E-energy by CHP units and flares

*J. Velasco, F. Maya, D. Solarte, A. Villegas, J. Sanchez (CO)*

Case study: biogas to energy project in Cerro Patacón landfill, Panama City, Republic of Panama

*H. Yoshida, V. Quang Huy (JP)*

Landfill gas and temperature distributions in a closed semi-aerobic landfill with passive aeration system

**17:10 - 17:40** Coffee break + Poster discussion

## SESSION B6 / CENTRAL HALL 2 / 17:40-19:20

### LANDFILL GAS EMISSION MONITORING

Chair / *Presidente*: Susan Thorneloe (US)

*A.R. Abedini, J.W. Atwater, K.U. Mayer (CA)*

Quantifying fugitive methane emission rates from municipal landfills based on surface methane concentrations

*Y.M. Kim, M.H. Park, J.Y. Kim (KR)*

Correction of error-inducing factors in an UAV-based measurement system for fugitive methane emission

*L. Fjelsted, A. G. Christensen, J.E. Larsen, P. Kjeldsen, C. Scheutz (DK)*

Closing the methane mass balance for an old Danish landfill

*G. Draughon, J. Lynch, D. Zekkos, S. O'Laughlin (US)*

Development of an autonomous flux chamber for continuous methane measurements at MSW landfills

# TUESDAY OCTOBER 1

## AFTERNOON

### SESSION C5 / PANORAMA HALL / 15:30-17:10

#### ANAEROBIC DIGESTION PROCESSES

Chair / Presidente: Jonathan Wong (HK)

*T. Yuan, Q. Xu, S. Bian (CN)*

Co-production of hydrogen and methane from two-stage food waste anaerobic digestion

*S. Önen Cinar, K. Kuchta (DE)*

Adaptation of anaerobic digestion process to temperature changes

*C. Li, Y. Tao, I. A. Nges, W. Lu (CN)*

Impact of continuous leachate recirculation during solid state anaerobic digestion of miscanthus

*L. Digan, P. Horgue, G. Debenest, S. Pommier, E. Paul, C. Dumas (FR)*

An improved hydrodynamic model for percolation and drainage dynamics in leach bed reactors

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION C6 / PANORAMA HALL / 17:40-19:20

#### ANAEROBIC DIGESTION OF DIFFERENT SUBSTRATES

Chair / Presidente: William Clarke (AU)

*J-C. Frigon, F. Ngoundjo, C. Roy, P. Salama (CA)*

Optimization of the operating conditions of a screw press to maximize the biodegradable fraction and methane production in the liquid fraction from fruit and vegetable waste

*S. Papirio, G. Mancini, F. Pirozzi, P.N.L. Lens, G. Esposito (IT)*

Solvent pretreatment and dosing of trace metals in the anaerobic digestion of rice straw

*L.P. Gomes, M.O. Caetano, L.A.S. Miranda, A. Deitos, L.B. Dai-Prá, M.A. Santos (BR)*

Evaluation of the treatment of sanitary waste with solid waste of restaurant in UASB reactor

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

Bio-H<sub>2</sub> production from cheese whey and wastewater sludge in semi-continuous systems

## SESSION D5 / PANORAMA HALL 2 / 15:30-17:10

### BIOCHAR FROM DIFFERENT RESIDUES

Chair / Presidente: Gerasimos Lyberatos (GR)

*F.-M. Peller, P. Regkouzas, P. Velli, I. Manolikaki, E. Diamadopoulos (GR)*

Reuse of waste biomass in biochar production for agronomic and environmental applications: materials characterization

*M. Rudakova, P. Galitskaya, S. Selivanovskaya (RU)*

Quality of biochar and fuels obtained in the process of slow pyrolysis of chicken manure

*C. Keske, T. Godfrey, D. Hoag, J. Abedin (US)*

Economic feasibility of biochar production from Canadian black spruce forest residue

*S. Tao, J. Yang, H. Hou, S. Liang, K. Xiao, J. Qiu, J. Hu, B. Liu, W. Yu, H. Deng (CN)*

Sludge-derived Fe-rich biochar as functional material for enhanced sludge dewatering: towards sustainable sludge recycling in wastewater treatment plant

*V.P.R. Batista, S. Melgaço, A. Feitosa, W.G. Teixeira, E. Ritter (BR)*

Ammonium sorption for banana peel biochar and soil

**17:10 - 17:40** Coffee break + Poster discussion

## SESSION D6 / PANORAMA HALL 2 / 17:40-19:20

### FLUE GAS TREATMENT

Chair / Presidente: Dezhen Chen (CN)

*B. Zach, M. Šyc, M. Pohořelý, J. Moško, J. Brynda, Š. Václavková, K. Svoboda, M. Punčochář (CZ)*

Removal of HCl and SO<sub>2</sub> from flue gas on a small scale

*X.T. Guo, L.J. Yin, J.Q. Xu, M.Q. Lu, Y.Y. Hu, D.Z. Chen (CN)*

Study on competition between SO<sub>2</sub> and HCl in wet flue gas deacidification

*H. Zhang, L.M. Shao, P.J. He (CN)*

Inhibiting formation of chlorobenzenes by NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub> during incineration

*S. Andersson, P. Lindgren (SE)*

Upgrading flue gas treatment systems for the new waste incineration BREF

# TUESDAY OCTOBER 1

## AFTERNOON

### SESSION E5 / EX CHIESA HALL / 15:30-17:10

#### INDUSTRIAL WASTE - RECOVERY OPTIONS

Chair / Presidente: Evangelos Gidakos (GR)

*J.D. Carlier, S. Sathityatiwat, A.B. Melka, M.G. Miguel, J.P. Lourenço, C.A. Nogueira, A.P. Pava, M.C. Costa (PT)*

Combining chemical and biological strategies for the recovery of metals from metals bearing wastewaters (METALCHEMBIO project)

*N. Stahre, M. Bäckström, L. Sartz (SE)*

Element leaching from green liquor dregs from 16 Swedish paper mills

*T. Niemelin, T. Suikkanen, H. Jyrävä, N. Lindroos, M. Autiola, M. Helaakoski, A. Nassinen, J. Österbacka, A. Kulmala, A. Virtanen, M. Hänninen, P. Rantala (FI)*

Industrial by-products in environmental protection structures in mine construction

*A. Taskin, S. Ivannikov, O. Danilov, O. Elkin, D. Fedotov (RU)*

Recovery of coal underburning from industrial ash and slag waste

*M. Marafi, M.S. Rana (KW)*

Extraction of metals from spent hydrotreating catalysts using chelating agent: preliminary process design and feasibility

*T.S. Leme, S.R. Teixeira, L.S. Silva, R.S. Magalhães, L.F. Santos, G.T.A. Santos, A.E. Souza (BR)*  
Crystallization kinetics of glasses prepared with foundry slag

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION E6 / EX CHIESA HALL / 17:40-19:20

#### WORKSHOP: INDUSTRIAL WASTE MANAGEMENT AND CIRCULAR ECONOMY

Chairs / Presidenti: Evangelos Gidakos, Maria Aivalioti (GR)

The inadequate management and disposal of industrial waste has been identified historically and continues to be so today under some conditions, particularly in developing countries, as a cause underlying severe environmental impacts, both in terms of air pollution, water quality degradation, and soil contamination. However, over time, waste has come to be viewed more and more as a valuable resource for industry, and in the same way as municipal waste, industrial waste has now been included in the urban mining concept. The scope of this workshop is to present industrial waste management under the prism of circular economy, focusing on emerging opportunities & benefits, as well as difficulties & restrictions.

#### Introductory lectures:

*E. Gidakos (GR):* Industrial waste management: current situation and problems

*M. Aivalioti, F.-M. Peller, E. Gidakos (GR):* Adoption of circular economy in industrial waste management

*V. Savvilotidou, E. Gidakos (GR):* A circular economy of critical raw materials

## SESSION F5 / NATURISTA HALL / 15:30-17:10

### WORKSHOP: LANDFILL MINING - MYTH AND REALITY I

Chairs / *Presidenti*: Claudia Neculau, Marta Popova (BE)

During the two workshop sessions, the partners of both EU-funded projects (RAWFILL and SMART GROUND) will emphasize the necessity of broad data collection in order to redesign the traditional risk-based landfill management into a dynamic resource supplying system. The inventory of landfills will be explained in relation to a comprehensive Conceptual Site Model taking into account cross-cutting policies such as sustainable development goals, climate change and land management as well as resource recovery through landfill mining opportunities.

#### Introductory lectures:

*M. Popova (BE)*: Introduction to landfill mining

*C. Neculau (BE), F. Coulon (UK)*: Scope and focus of Smart Ground and Rawfill

*E. Wille (BE)*: Data mining as first step of landfill mining

*C. Neculau (BE)*: Overview of critical factors for landfill mining projects - Drivers, health and safety measures

*D. Caterina (BE)*: Landfill investigation by using geophysical prospection multi-methods

*R. De Rijdt (BE)*: Landfills and their environment (threats and opportunities measured through RAWFILL Enhanced Landfill Inventory Structure)

#### Landfill Mining case studies: lesson learnt

*C. Neculau (BE)*: The landfill of Onoz (Jemeppe-sur-Sambre, BE) and the Green deal

*F. Coulon (UK)*: Landfill Mining & Reclamation at Sandford Farm (Reading, UK)

*S. Wagland (UK)*: Energy recovery opportunities from landfill mining

*E. Wille (BE)*: Brownfield redevelopment and LFM: 5 landfills but 5 different projects

**17:10 - 17:40** Coffee break + Poster discussion

## SESSION F6 / NATURISTA HALL / 17:40-19:20

### WORKSHOP: LANDFILL MINING - MYTH AND REALITY II

Chairs / *Presidenti*: Claudia Neculau, Marta Popova (BE)

Interactive session with participants about RAWFILL DST phase II - Dr. eng. Claudia Neculau (BE), Prof. Frederic Coulon (UK), Eddy Wille (BE), Eng. Renaud De Rijdt (BE), Dr. Stuart Wagland (UK), Dr. David Caterina (BE)

#### Introductory lectures:

*Sebastien Moreaux (BE)*: The ELIF software

*E. Wille (BE)*: Stepwise Decision making (ranking, categorizing, time management)

*E. Wille (BE)*: Dynamic Landfill Management as innovative concept. Decision support tools: RAWFILL DST phase I – linkage to SMARTGROUND DST

# TUESDAY OCTOBER 1

## AFTERNOON

### SESSION G5 / ITALIAN / HELL'S KITCHEN / 15:30-17:10

#### WORKSHOP: POST-GESTIONE DELLE DISCARICHE I

Chair / *Presidente*: Fabrizio Finotelli (IT)

Buona parte delle discariche per RSU indifferenziati cd. moderne di 1a generazione (ante D. Lgs. 36/2003, post D.P.R. 915/1982 e D.C.I. 27/7/1984) hanno raggiunto una durata della gestione post-operativa (GPO) nettamente superiore a quella in origine prevista, senza tuttavia raggiungere un soddisfacente livello di qualità ambientale finale, a conferma di quanto già da tempo affermato dalla comunità scientifica. Tali sottostime sono state input nei relativi piani finanziari e nelle determinazioni delle altre componenti economiche (tariffe, fidejussioni, accantonamenti), risultate quindi inadeguate poiché, alle scadenze erroneamente prefissate, la vita della discarica non è risultata conclusa, con emissioni ancora attive e residui rischi ambientali. Lo scopo del workshop è pertanto quello di approfondire le numerose problematiche della GPO (tecniche, amministrative, giuridiche, economiche), presentando casi concreti ed evidenziando le criticità da risolvere onde arrivare a proposte condivise e praticabili.

#### Relazioni introduttive:

*F. Finotelli (IT)*

Gestione post-operativa (GPO) di discariche per RSU c.d. moderne di prima generazione (ante D. Lgs. 36/2003 e post D.C.I. 27/7/1984). L'attualità di criticità ambientali (in)aspettate derivanti dalla sotto-stima della durata della GPO

*G. Gallina (IT)*

GPO: esperienze e indirizzi della Regione Lombardia

*F. Finotelli (IT)*

Il decorso degli assestamenti in discariche in fase di gestione operativa e post-operativa: case histories, con valutazioni sullo stato d'avanzamento/durata della gestione post-operativa (GPO) e relative problematiche

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION G6 / ITALIAN / HELL'S KITCHEN / 17:40-19:20

#### WORKSHOP: POST-GESTIONE DELLE DISCARICHE II

Chair / *Presidente*: Fabrizio Finotelli (IT)

#### Relazioni introduttive:

*P. Ferraris, P. Simone, A. Angeloni (IT)*

Discariche ante norma e cessate. Problema amministrativo o ambientale? La normativa rilevante e la sua evoluzione. Casi giurisprudenziali. Discariche ante norma e cessate. Problema amministrativo o ambientale?

*F. Finotelli (IT)*

Le discariche orfane. Un caso reale di GPO di carattere emergenziale, con attivazione di procedure sostitutive da parte della P.A. in danno al gestore. Aspetti tecnici, procedurali ed economici

*D. Biondi (IT)*

Discarica in post gestione: una risorsa o solo un costo?



## SIDE EVENT

# INTERNATIONAL WORKSHOP ON WASTE ARCHITECTURE / WASTE MANAGEMENT IN LANDSCAPE AND URBAN AREAS



## SESSION H5 / BALDACCHINO ROOM / 15:30-17:10

### **IWRECKS - Industrial Wrecks: Reusing, Enhancing, aCKnowledging Sheds**

Chair / *Presidente*: Stefanos Antoniadis (IT)

iWrecks is a research project funded by POR FSE 'Veneto' 2014-2020. iWrecks aims to provide innovative visions and operational tools to professionals, investors, stakeholders and citizens involved in the retraining of abandoned, decommissioned and dismissed industrial sheds. In Veneto a huge amount of industrial estate demands for new uses. An important part of the research programme concerns useful practices for the recognition of what really must be reduced to waste and what can instead be maintained, transformed, reinterpreted avoiding the threatening obsolescence.

The multidisciplinary approach of the research project, as well as the dedicated slot, helps the actors, involved in the production industry of reuse, in the pursuit of the goals of significant demolition reduction – so waste reduction – and programmatic practices of circular economy

#### **Introductory lectures:**

*L. Stendardo (IT)*

The power of the wreck: orienting visions

*S. Antoniadis (IT)*

iWrecks pilot scenarios: reducing waste and avoiding the threatening obsolescence in Architecture

*R.A. Bernardello, R. Malesani (IT)*

BIM and Urban Mining: information models for the C&D waste management and computation

**17:10 - 17:40** Coffee break + Poster discussion

## SESSION H6 / BALDACCHINO ROOM / 17:40-19:20

### **WASTE MANAGEMENT IN URBAN AND PERI-URBAN AREAS**

Chair / *Presidente*: Maria Cristina Lavagnolo (IT)

*C. Cord'Homme (FR)*

New "material-from-waste" facility in Paris (France)

*E.W. Rutkowski, E.Z. Monteiro, R.A. Freire, A.M. Reis de Goes Monteiro (BR)*

Acknowledging waste pickers cooperatives as prime urban facilities

*J. Zeilinger, M. Huber-Humer (AT)*

Sustainable temporary housing in urban areas - The role of waste resource management

*M. Russo, L. Amenta, A. Attademo, M. Cerreta, E. Formato, F. Garzilli, C. Mazzarella, M. Rigillo, V. Vittiglio (IT)*

Short supply chain of waste flows for landscape regeneration in peri-urban areas

# TUESDAY OCTOBER 1

## SOCIAL EVENT



### SARDINIAN DINNER / 'CORTE NOA' RESTAURANT CENA SARDA / RISTORANTE 'CORTE NOA'

**H. 21:00**

A variety of typical Sardinian hors d'oeuvres, pasta dishes and barbecued meats, tasty side dishes and sweets will be served accompanied by local wines in the traditional restaurant 'Corte Noa', a typical *campidanese* house located near the Forte Village Resort. During the evening music and entertainment will be provided. Bus transport will be arranged by the Symposium Organizing Secretariat.

Delegates wishing to participate are requested to book tickets at a cost of 65 euros + VAT 22% per person. Places are limited so please book early. Residents of the Forte Village Resort, who already have their evening meal included in half board accommodation, may request that lunch be provided at Forte Resort instead of dinner.

*Una selezione di piatti tipici sardi (antipasti, carne grigliata, contorni e dolci) saranno serviti nell'affascinante e suggestivo ristorante 'Corte Noa', un'antica casa campidanese situata nelle vicinanze del Forte Village Resort. Un gruppo folkloristico intratterrà gli ospiti con musiche e balli tipici sardi. I trasporti saranno garantiti dalla segreteria organizzativa del simposio.*

*Per partecipare alla serata è necessario acquistare il biglietto (65 euro + IVA 22% a persona) presso il banco registrazione. I posti sono limitati, si prega di prenotare il prima possibile. Coloro che risiedono al Forte Village potranno eccezionalmente consumare il pranzo al posto dell'abituale cena.*



**DAY 3 / WEDNESDAY**  
OCTOBER 2

# WEDNESDAY OCTOBER 2

## MORNING

### SESSION A7 / CENTRAL HALL / 9:00-10:40

#### CIRCULAR ECONOMY

Chair / *Presidente*: Ian D. Williams (UK)

*A. Bartl (AT)*

The EU circular economy package: are new paths being taken or is it an old story?

*E. Schmied, G. Obersteiner (AT)*

Re-use in practical implementation. A long lasting case study in Austria with direct impact to circular economy

*J. Slavík, K. Rybová (CZ)*

Recycling behavior and its relevance in increasing the effectiveness of waste management strategies - The case study of the Czech Republic

*M. Pamperl, P. Beigl, S. Salhofer (AT)*

Secondary resource price as a key factor in the circular economy – Analysis of drivers of supply and demand within the recycling sector

*K. Friedrich, S. Holzschuster, D. Vollprecht (AT)*

Benchmark analysis for different recyclates in the Austrian waste management

*C. Neculau, R. De Rijdt, E. Wille and the RAWFILL team (BE)*

RAWFILL Project: innovative characterization of landfills and smart decision-making as part of the circular economy, through landfill mining operations

**10:40 - 11:10** Coffee break

### SESSION A8 / CENTRAL HALL / 11:10-12:50

#### POLICIES IN PLASTICS MANAGEMENT

Chair / *Presidente*: Marion Huber-Humer (AT)

*R. Maletz (DE)*

Calculation of eco-efficiencies of different actions increasing substitution rates of plastic material

*A. Brock, I. Williams (UK)*

Life cycle assessment of drinks packaging: are there environmentally-friendly alternatives to plastics?

*E. Verdejo, E. Moliner, S. Albein Urios (ES)*

Circular economy of commercial plastic packaging in urban environments - LIFE RE-CYPACK

*C. Peñalva, M. Pérez, F. Braca, D. Redondo (ES)*

Reducing the effects of plastic waste in agricultural applications by developing new OK soil biodegradable plastics

## **SESSION B7 / CENTRAL HALL 2 / 9:00-10:40**

### **METHANE OXIDATION IN BIOFILTERS AND BIOCOVERS**

Chair / Presidente: Peter Kjeldsen (DK)

*R. Rosendal, H. Rolsted, O. Elmoose (DK)*

Mitigation of methane emissions in an active biofilter system at Glatved landfill, Denmark

*D. Huang, L. Yang, Q. Xu (CN)*

Methane-oxidizing capacities of biochar-amended landfill cover soil

*M. Kriipsalu, K.-M. Pehme, K. Orupõld, V. Kuusemets, M. Truu, J. Truu, H. Nõlvak (EE)*

Performance of methane degradation layer of Kudjape landfill during the four years following to the closure

*J. Gebert, C.J.W. Van Verseveld, H.P.W. Blom, T.J. Heimovaara (NL)*

Effect of compaction and moisture on gas diffusivity and conductivity of soils for use in methane oxidation systems

*L. Fjelsted, A.G. Christensen, J.E. Larsen, P. Kjeldsen, C. Scheutz (DK)*

Biofiltration of dilute landfill gas in an active loaded open bed compost filter

**10:40 - 11:10** Coffee break

## **SESSION B8 / CENTRAL HALL 2 / 11:10-12:50**

### **PFAS AND MICROPLASTICS IN LANDFILL LEACHATE**

Chair / Presidente: Howard Robinson (UK)

*H. Modin, P. Hallgren, A. Roslund, N. Törneman (SE)*

PFAS in Swedish landfill leachate

*N. Simmons (AU)*

PFAS concentrations of landfill leachates in Victoria, Australia – Implications for discharge of leachate to sewer

*S. Harrad, D. Drage, M. Sharkey, H. Berresheim (UK)*

Concentrations of polybrominated diphenyl ethers, hexabromocyclododecane, and perfluoroalkyl substances in landfill leachate from Ireland

*M. Van Praagh, B. Liebmann (SE)*

Microplastics in landfill leachates in Iceland, Finland and Norway

# WEDNESDAY OCTOBER 2

## MORNING

### SESSION C7 / PANORAMA HALL / 9:00-10:40

#### CO-DIGESTION OF DIFFERENT SUBSTRATES

Chair / *Presidente*: Giuseppe Mancini (IT)

*I. Pecorini, E. Albin, R. Iannelli, G. Ferrara (IT)*

Comparison of one stage and two-stage anaerobic co-digestion process of food waste and activated sludge

*C. Urtnowski-Morin, M. Héroux, L. Spreutels, R. Legros (CA)*

Simulation of the im-pact of co-digesting municipal organic waste from different streams

*M. Carchesio, M. Di Addario, F. Tatàno, S. de Rosa, A. Gambioli (IT)*

Biochemical methane potential of residual organic waste and MBT organic outputs

**10:40 - 11:10** Coffee break

### SESSION C8 / PANORAMA HALL / 11:10-12:50

#### QUALITY ASSESSMENT OF BIOSTABILIZED WASTE

Chair / *Presidente*: Mait Kriipsalu (EE)

*A. Lieto, I. Chiapperini, I. Verginelli, D. Zingaretti, F. Lombardi (IT)*

Screening model for the evaluation of the metal release from biostabilized wastes

*L. Gomes, I. Becker, M. Caetano, L. Miranda, P. Ghelsa, L. Rosa, M. Grando (BR)*

Anaerobic digestion of organic waste: analysis of the biofertilizer generated

*E. Albin, I. Pecorini, R. Iannelli, G. Ferrara (IT)*

Effect of two stage anaerobic digestion process on digestate stability

*J.E. Sánchez-Ramírez, L. Pastor, S. Doñate, E. Aymerich, M. Esteban-Gutiérrez, J. Garcia-Aguirre, R. Romaguera, C. Lardin, E. Mino (ES)*

Implementation of dry anaerobic digestion of sewage sludge in small and medium WWTP

*G. Beggio, A. Pivato (IT)*

Improving solid-liquid separation of OFMSW digestate through chemical conditioning

## SESSION D7 / PANORAMA HALL 2 / 9:00-10:40

### CHARACTERIZATION AND TREATMENT OF BOTTOM ASH

Chair / *Presidente*: Susan Thorneloe (US)

*S. K. Back, K. Ueda, M. Ueshima, M. Nakagawa, H. Sakanakura (JP)*

Estimation of element distribution in MSW incinerator bottom ash by size and density applying air table separator

*G. Flesoura, B. Garcia-Banos, J.M. Catala-Civera, G. Dimitrakis, J. Vleugels, Y. Pontikes (BE)*  
Microwave processing of municipal solid waste incinerator bottom ash

*M. Šyc, J. Výravský, H. Muniz, S. Bhattarai, E. Korotenko, B. Zach (CZ)*

Fe, Cu, Al, and Zn content and chemical speciation in incineration bottom ash fine fraction

*R. Spagnuolo, G. Costa, F. Lombardi (IT)*

Combined treatments for improving the leaching behaviour of the mineral fraction of waste incineration bottom ash in view of recycling

*Y. Tang, W. Ma, Y. Xia (CN)*

Co-immobilization mechanisms of lead, zinc, copper in low-temperature glass-ceramics from sewage sludge incineration residues

*G. Costa, A. Poletini, R. Pomi, R. Spagnuolo (IT)*

Analysis of the composition and environmental behaviour of incinerator bottom ash fractions from enhanced mechanical separation

**10:40 - 11:10** Coffee break

## SESSION D8 / PANORAMA HALL 2 / 11:10-12:50

### RECYCLING OF BOTTOM ASH

Chair / *Presidente*: Jurate Kumpiene (SE)

*D. Blasenbauer, F. Huber, J. Fellner (AT)*

Bringing light into the legal jungle of incinerator bottom ash utilisation in Europe

*P. Rabelo Monich, H. Lucas, B. Friedrich, M. Segata, A. Morbi, E. Bernardo (IT)*

Upcycling of vitrified residues by alkali activation and sinter-crystallization

*F. Huber, D. Blasenbauer, P. Aschenbrenner, J. Fellner (AT)*

Generating a knowledge base for the sustainable utilisation of MSWI bottom ash

*L. Taddei, M. Marcantoni, R. Usci, M. Molica Colella, A. Sconfiatti (IT)*

LIFE-CHIMERA - CHICKENS Manure Exploitation and Revaluation: turning combustion ashes into a rich N-P-K fertilizer

*A.M. Doyle, I.V. Joseph, D. Shaw, L. Tosheva (UK)*

Transformation of waste materials used in electricity generation to high surface area zeolites

# WEDNESDAY OCTOBER 2

## MORNING

### SESSION E7 / EX CHIESA HALL / 9:00-10:40

#### CONTAMINATED SITES

Chair / *Presidente*: Roberto Raga (IT)

*O. Solcova, J. Bumba, M. Spacilova, F. Kastanek (CZ)*

Brownfield water pollution and purification

*M.-L. Wei, Y.-J. Du, Q. Xue (CN)*

Effect of carbonation on leaching properties of Zn and Pb-contaminated soils stabilized with KMP: semi-dynamic leaching test evaluation

*A. Ribeiro, A. Mota, J. Araújo, J. Carvalho (PT)*

Development of a pilot-scale prototype for electrokinbarrier technology

*X. Kong, H. Wang (CN)*

Removal of vanadium from groundwater by layered double hydroxide supported nanoscale zerovalent iron

*T. E. Butt, J. A. Entwistle, A. S. Sagoo, G. Massacci (IT)*

Combined risk assessment for landfill gas and leachate – Informing contaminated land reclamation for appropriate construction projects

*S. Xu, Y. Xing, Q. Huang, W. Chen (CN)*

Role of novel bacterial *Raoultella* sp. strain X13 in plant growth promotion and cadmium bioremediation in soil

**10:40 - 11:10** Coffee break

### SESSION E8 / EX CHIESA HALL / 11:10-12:50

#### WASTE MANAGEMENT EDUCATION

Chair / *Presidente*: Rainer Stegmann (DE)

*G. De Feo, F. Faiella (IT)*

Waste management education: from kindergarten to higher education

*K. Manskinen, A.-M. Tuomala, G. Azimbayeva (FI)*

Opportunities and challenges in developing a waste management curriculum in Kazakhstan

*S. Lee, A. Reid, C. Banks (UK)*

An Erasmus+ waste education initiative

*C.C. Guimarães, T.F. Oliveira, F.P. Manéio, L.S. Macedo, C.E. Teixeira (BR)*

Environmental education and popular mobilization for the implementation of integrated waste management systems



## **SESSION F7 / NATURISTA HALL / 9:00-10:40**

### **WORKSHOP: WASTE AND CLIMATE CHANGE I**

Chair / *Presidente*: Cristina Trois (ZA)

The main scope of this workshop is to explore the nexus between waste management and climate change as a global challenge and in the context of international imperatives, sustainable development goals and the dichotomy between the Global North and Global South with respect to both mitigation and adaptation viewpoints. The first part of the workshop will deal with the impacts of waste on climate change and the most appropriate mitigation strategies.

#### **Introductory lectures:**

*C. Trois (ZA)*

Brief introduction on the South African Chair in Waste and Climate Change and rationale of the workshop. The nexus between waste and climate change in Southern Africa

*C. Trois (ZA)*

Introducing the WROSE model (Waste Resource Optimisation and Scenario Evaluation) as stabilization wedge for climate change

*S. Kissoon, C. Trois (ZA)*

Application of the WROSE model to municipal integrated waste management plans: focus on socio-economic and institutional indicators

*M.C. Lavagnolo (IT)*

Impacts of open burning in developing countries and solutions

*C. Wunsch, R. Kocina (DE)*

Global development of greenhouse gas emissions in the waste management sector

**10:40 - 11:10** Coffee break

## **SESSION F8 / NATURISTA HALL / 11:10-12:50**

### **WORKSHOP: WASTE AND CLIMATE CHANGE II**

Chair / *Presidente*: Cristina Trois (ZA)

The second part of the workshop will deal with impacts of climate change on the waste sector from the adaptation point of view, including (i) how changing climates are affecting waste, (ii) risks of disaster waste and intervention strategies, (iii) drought impacts on waste composition, (iv) community displacement and waste.

#### **Introductory lectures:**

*M. Klinglmair, M. Thomsen (DK)*

Climate change mitigation services rendered by organic-waste-derived fertiliser: a dynamic model of a Danish case study

*S. Nilsson Påledal, M. Gålfalk, D. Bastviken (SE)*

Quantification and reduction of greenhouse gas emissions from storage of dewatered sludge at waste water treatment plants

# WEDNESDAY OCTOBER 2

## MORNING

### SESSION G7 / IN ITALIANO / HELL'S KITCHEN / 9:00-10:40

#### ASPETTI LEGALI, ECONOMICI, PAESAGGISTICI ED EDUCATIVI NELLA GESTIONE DEI RIFIUTI

Chair / Presidente: Annamaria Ribaudò (IT)

*M. Chianura (IT)*

Necessità di una legislazione ambientale uniforme per la tutela del Mar Mediterraneo

*B. Orrico, A. Marotta (IT)*

Bonifica del bacino idrografico del fiume Sarno

*G. De Feo, C. Ferrara, R. Rosania (IT)*

Ottimizzazione del costo dei sistemi di raccolta differenziata: il caso studio di Salerno

*P. Simone, A. Bertelli, F. Bernar, M. Gubertini, P. Vasino, A. Angeloni (IT)*

Discariche per rifiuti inerti e paesaggio: punti di forza e occasioni mancate in 5 casi di studio

*G. De Feo, F. Faiella (IT)*

Educazione alla gestione dei rifiuti: dalla scuola dell'infanzia all'Università

*M. Dassisti, A. Di Roma, B.D' Aquino (IT)*

Insegnamento implicito della sostenibilità: il macchinario "polifunzionale" per il trattamento della materia seconda nelle Università

**10:40 - 11:10** Coffee break

### SESSION G8 / IN ITALIANO / HELL'S KITCHEN / 11:10-12:50

#### L'ECONOMIA CIRCOLARE NELLA GESTIONE DEI RIFIUTI I

Chair / Presidente: Fabio Tatàno (IT)

*F. Ruggero, E. Carretti, T. Lotti, C. Lubello, R. Gori (IT)*

Bioplastiche in compostaggio: metodologie per il monitoraggio della biodegradazione applicate ad un caso studio

*G. Dolci, M. Grosso, A. Catenacci, F. Malpei, R. Fancello (IT)*

Valutazione dell'utilizzo di sacchetti in carta e bioplastica nella gestione del rifiuto organico

*S. Cappa, A. Ribaudò, M. Severgnini (IT)*

Esperienze di landfill mining in Regione Lombardia

*F. Villa, M. Vaccari, G. Vinti (IT)*

Tecnologie appropriate e accessibili per il trattamento delle acque reflue nella gestione dei rifiuti: progettazione per un piccolo impianto di separazione manuale della plastica in Mozambico

*R. Spagnuolo, G. Costa, F. Lombardi (IT)*

Trattamenti combinati per migliorare il comportamento ambientale della frazione minerale di scorie da incenerimento rifiuti ai fini di un suo riciclo come materiale da costruzione

*A. Basti (IT)*

Il riutilizzo a chilometro zero dei detriti da terremoto: un'ipotesi progettuale per il piano di ricostruzione di Poggio Pienze (AQ)

## SIDE EVENT

# INTERNATIONAL WORKSHOP ON WASTE ARCHITECTURE / WASTE MANAGEMENT IN LANDSCAPE AND URBAN AREAS



## SESSION H7 / BALDACCHINO ROOM / 9:00-10:40

### DESIGN LAB

Chairs / Presidenti: *Anna Artuso, Elena Cossu, Stefanos Antoniadis (IT)*

On 2nd October a practical landscape design lab session will be coordinated by Studio Arcoplan with the collaboration of Raffaello Cossu, Professor of the University of Padova and Stefanos Antoniadis, research fellow at the University of Padova.

The laboratory will be preceded by an introductory lecture on the topic. The lab session will give participants the opportunity to share their views with colleagues and experts within their working groups on a real case study.

The participants will elaborate a concept for the valorisation and/or requalification of the plant proposed and will be invited to illustrate the final project at the end of the laboratory. Two case studies, selected by the Scientific Committee among the numerous proposals received, will be evaluated and assessed during the planning and design workshop.

The selected proposers will present the case studies to participants, illustrating the specific details of the plant, any issues that need solving, and basic requirements or preferences to allow the planning and design team to draw up the best solution in terms of site requalification or functional reuse.

The proposers are Ecoserdiana Spa and Ecofer Ambiente Srl.

The Workshop is a Sardinia 2019 Parallel Event and **participation is free** for all Symposium delegates.

**10:40 - 11:10** Coffee break

## SESSION H8 / BALDACCHINO ROOM / 11:10-12:50

### DESIGN LAB

Chairs / Presidenti: *Anna Artuso, Elena Cossu, Stefanos Antoniadis (IT)*

In session H8 the activity started in the previous session will be continued.

# WEDNESDAY OCTOBER 2

## AFTERNOON

### SESSION A9 / CENTRAL HALL / 15:30-17:10

#### PLASTIC WASTE - RECYCLING TARGETS AND CONTAMINATION

Chair / *Presidente*: Roman Maletz (DE)

*E. Van Eygen, J. Fellner (AT)*

How can the ambitious recycling targets for plastic packaging be reached and what are the ecological and economic consequences – Insights from Austria

*A. Alassali, K. Kuchta (DE)*

Evaluation of the degree of contamination of recycled plastics

*S. Möllnitz, K. Khodier, R. Pomberger, R. Sarc (AT)*

Grain size dependent distribution of plastic types in coarse-shredded mixed municipal solid waste

*A. Alassali, T. Bébien, D. Barouta, K. Kuchta (DE)*

The impact of new regulations on the recycling quota of plastics from waste electrical and electronic equipment

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION A10 / CENTRAL HALL / 17:40-19:20

#### MATERIALS RECOVERY

Chair / *Presidente*: Ayah Alassali (DE)

*A. Mrotzek-Bloess, A. Haas, D. Goldmann, J. Nuortila-Jokinen, J. Kulczycka, M. Smol, E. Pędziwiatr, M. Petranikova, B. Ebin (DE)*

On the way to a circular economy: obstacles and challenges in the metal value chain

*R. Warrings, J. Fellner (AT)*

New recycling targets for aluminium packaging - A comparison of waste management strategies in selected European member states

*B. Ebin, L. Bauhn, M. Tao, B.-M. Steenari (SE)*

Recovery of silver from flexible thin-film solar panels

*M. Borzęcka, A. L. Fernando, J. Costa, D. Boulday, P. Antoine, M. Cocchi, L. Bern, H. Forsgren, L. Detterfelt, K. Supancic, M. Marinova (PL)*

European wood waste platform - Best practices in wood waste management

*R. Oliveira (BR)*

Intelligent reverse logistic: case study on glass recovery in São Paulo

## **SESSION B9 / CENTRAL HALL 2 / 15:30-17:10**

### **LEACHATE FROM SPECIFIC WASTE**

Chair / *Presidente*: Dongbei Yue (CN)

*N.L. Ho, H. Tamura, T. Komiya, T. Shimaoka (JP)*

Effect of heavy rain due to climate change on leaching behavior of landfill with municipal solid waste incineration bottom ash

*M. Abis, G. Bido, R. Raga, M. Ritzkowski, K. Kuchta, B. Walker (DE)*

Landfilled bottom ash characterisation and assessment of leachate properties in a long-term scenario

*J. Qiu, F. Lü, H. Zhang, W. Liu, J. Chen, Y. Deng, L. Shao, P. He (CN)*

Molecular characteristics of DOM in municipal solid waste leachate from a perspective of chemodiversity

*M. Marchesi, L. Alberti, O. Shouakar-Stash, R. Aravena, M. Caschetto (IT)*

Iso-tope tools in forensics and groundwater quality impact assessment of landfills and contaminated sites: results from EU case studies

**17:10 - 17:40** Coffee break + Poster discussion

## **SESSION B10 / CENTRAL HALL 2 / 17:40-19:20**

### **LEACHATE TREATMENT I**

Chair / *Presidente*: Pinjing He (CN)

*H. Robinson, I. Hopewell, A. Brooks, J. Olufsen, T. Robinson (UK)*

Full scale treatment of strong, methanogenic leachates, with full nitrification and denitrification, at Bletchley landfill site, UK

*S. Dever, J. Gray, M. Winser (AU)*

Design, construction, and commissioning of the Kimbriki landfill leachate treatment plant: an Australian case study

*T. Saur, E. Wong, J.C. Alibar, E. Ip, O. Oberti, B. Barillon (FR)*

Deammonification as a low opex biological treatment of nitrogen in mature leachates

*R. Eden, M. Moulden, J. Westwood, T. Thomas (UK)*

Waste-heat driven thermal ammonia stripping as a means of ammoniacal nitrogen control

# WEDNESDAY OCTOBER 2

## AFTERNOON

### SESSION C9 / PANORAMA HALL / 15:30-17:10

#### EMISSIONS FROM ANAEROBIC DIGESTION PLANTS

Chair / *Presidente*: Charlotte Scheutz (DK)

*V. Wechselberger, M. Huber-Humer, K. Meixner, L. Knoll, M. Hrad (DE)*

Evaluation of methane emissions from different Austrian biogas plants using harmonized methods including an open-path technology

*P. Dirrenberger, J. Grosjean, N. Monta, T. Nicot, J. Kunz-Iffli, C. Coulais, V. Koehler, A. Pedros, B. Facon (FR)*

Occupational exposure to bioaerosols and ammonia in anaerobic digestion units

*Y. Shao, X. Liu, L. Xu, Z. Li (CN)*

The characteristic of odor gas produced from different components of wastes: a degradation experiment inoculated pure bacteria

*G. Francini, T. Bartolucci, M. Lasagni, L. Lombardi (IT)*

Biogas to biomethane: environmental comparison of different upgrading technologies

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION C10 / PANORAMA HALL / 17:40-19:20

#### COMPOSTING

Chair / *Presidente*: Takaiyuki Shimaoka (JP)

*R. Sherman (US)*

Large-scale vermicomposting around the world: using earthworms to recycle waste into valuable products

*S. Balasubramanian, M. Kranert, L. Philip (DE)*

Implementation of composting in Chennai, India

*K. Orupõld, I. Tust, M. Kriipsalu (EE)*

Compost quality assurance in Estonia: evaluation of compost stability

## **SESSION D9 / PANORAMA HALL 2 / 15:30-17:10**

### **CHARACTERIZATION AND TREATMENT OF FLY ASH**

Chair / *Presidente*: Alessandra Poletti (IT)

*E. Korotenko, M. Šyc, J. Jadrný, P. Mašín, P. Krystyník, P. Klusoň (CZ)*

Resource recovery potential of MSWI fly ash acid extraction

*T. Karlsson, B. Ebin, B.-M. Steenari (SE)*

Stabilization of antimony and lead in municipal solid waste incinerator fly ash by controlled metal extraction and complexation reactions

*Y. Tojo, Y. Itoga, M. Kobori, T. Matsuo, T. Matsuto (JP)*

Insolubilization of cesium contained in fly ash by aluminosilicate

*L. Tong, Q. Hu, Y. Tang, F. Wang, B. Hu (CN)*

Validation of the BCR sequential extraction procedure for metals fractionation in municipal solid wastes incineration fly ash

**17:10 - 17:40** Coffee break + Poster discussion

## **SESSION D10 / PANORAMA HALL 2 / 17:40-19:20**

### **WORKSHOP: ECONOMICS OF WASTE**

Chair / *Presidente*: Jan Slavik (CZ)

The main aim of the workshop is to increase awareness about the scientific contribution of social sciences (especially economics) to the current waste management research. We will provide information about the usefulness of economics, including its applications, in the waste management research and how economics can support the research based on other scientific approaches. Furthermore, the role of economics in the current waste management policy of the European Union will be emphasized, with a focus on circular economy.

#### **Introductory lectures:**

*J. Slavik (CZ)*

Introduction to economics of waste

*M. Struk (CZ)*

Economics of waste in the current environmental policy

# WEDNESDAY OCTOBER 2

## AFTERNOON

### SESSION E9 / EX CHIESA HALL / 15:30-17:10

#### WORKSHOP: IWWG TASK GROUP CLEAR - CONSTRUCTION AND OPERATION OF FULL-SCALE CH<sub>4</sub> OXIDATION SYSTEMS

Chairs / *Presidenti*: Julia Gebert (NL), Marion Huber-Humer (AT)

During the past years the first full-scale methane oxidation systems have been implemented to reduce landfill methane emissions, benchmarking the transition from research and pilot scale to full field application. Scaling up entails challenges, for example with respect to the desired evenness of spatial gas distribution in the gas distribution layer, construction methods to attain evenness of soil physical and mechanical properties or full system performance assessment... *Full appetizer available on the website.*

#### Introductory lectures:

*C. Scheutz, P. Kjeldsen (DK)*: Challenges in the up-scale to full bio-mitigation systems implemented at landfills and future research needs

*R. Rosendal, M. Holt, H. Rolsted, S.B. Andersen (DK)*: Implementation of full-scale biocover systems - Site investigation, design and monitoring

*A. Fredenslund, K.B. Sundbaek, P.H. Petersen (DK)*: Biocovers on landfills - Variations in project complexity

*A.R. Cabral, B. Ahoughalandari (CA)*: Elements of design of passive methane oxidation bi-systems - Fundamental and practical considerations about hydraulic characteristics affecting biogas migration and oxidation efficiency

*M. Huber-Humer (AT)*: Biowindows for the degasification of an older Austrian MSW landfill after the removal of the active gas extraction system - Lessons learned

*J. Gebert, J. Streese-Kleeberg (NL)*: Experiences from full scale operation of methane oxidation windows for biological treatment of landfill gas

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION E10 / EX CHIESA HALL / 17:40-19:20

#### WORKSHOP: HYDROTHERMAL CARBONIZATION

Chair / *Presidente*: Andrea Schüch (DE)

The very old HTC technology is successfully implemented in practice plants and research and development is still in process to optimize it. But is the hydrothermal carbonization a true panacea or a promising technology with pros and cons? This workshop should find answers to this and other questions and lead to a fruitfully exchange of experiences. The workshop participants will also discuss about quality parameters for hydrochars, collect ideas how an "end of waste" of hydrochars from waste could be defined and identify what are the most valuable HTC products and which sources are best suitable for that.

#### Introductory lectures:

*M. Nelles, M. Klemm, J. Köchermann, T. Lühmann (DE)*: Status and prospects of hydrothermal carbonization (HTC) for biogenic waste and residues

*M.L. Mastellone, L. Zaccariello, R. Lotito, D. Battaglia (IT)*: An experimental study on hydrothermal carbonization of anaerobic digestion residue



## SESSION F9 / NATURISTA HALL / 15:30-17:10

### WORKSHOP: SEMIAEROBIC LANDFILLING IN DEVELOPING COUNTRIES

Chairs / *Presidenti*: Maria Cristina Lavagnolo (IT), Yasushi Matsufuji (JP)

What is the semi-aerobic landfill? Why to apply in DCs? What pro & cons? The semiaerobic landfill will be explained directly by the researchers of the Fukuoka University, where the system was invented and now applied in many countries all over the world. During this workshop advantages and drawbacks of semiaerobic landfill will be pointed out and some applications will be illustrated and discussed.

#### Introductory lectures:

*M.C. Lavagnolo (IT)*: Findings in semi-aerobic landfilling

*Y. Matsufuji, A. Tanaka (JP)*: Transfer of Appropriate Technology by Semi-aerobic Landfill Concept (Fukuoka Method) in DCs

*T. Mito (JP)*: Application of semi-aerobic landfilling in developing countries - Lessons learned through its application in Rwanda and other African countries

*V. Grossule, M.C. Lavagnolo (IT)*: Optimised management of semi-aerobic landfilling under tropical wet-dry conditions

**17:10 - 17:40** Coffee break + Poster discussion

## SESSION F10 / NATURISTA HALL / 17:40-19:20

### WORKSHOP: ASBESTOS WASTE MANAGEMENT AND RISK ASSESSMENT

Chairs / *Presidenti*: Giuseppe Bonifazi, Silvia Serranti (IT)

The Workshop will represent an opportunity to discuss some critical aspects of asbestos containing materials and waste management.

#### Introductory lectures:

*F. Paglietti, D. Taddei (IT)*: Classification and properties of asbestos containing waste

*S. Malinconico, S. Bellagamba, C. Massaro (IT)*: Safety measures and waste management at naturally occurring asbestos (NOA) sites

*B. Conestabile della Staffa, I. Lonigro, P. De Simone (IT)*: The disposal of asbestos containing waste in Italy

*G. Bonifazi (IT)*: New technologies for identification and classification of asbestos

*S. Serranti (IT)*: Hyperspectral imaging for asbestos recognition

*M. Musacchio, L. Colini, M. Silvestri, M.F. Buongiorno (IT)*: Asbestlib: a spectral library of MCA to support environmental monitoring activities

*A. Valouma, E. Gidarakos (GR)*: Mechanical treatment of asbestos containing waste and safe recycling on the production of alkali activated materials

*T. Sattler, R. Pomberger, J. Schimek, D. Vollprecht (AT)*: Mineral wool waste in Austria, associated health aspects and recycling options

# WEDNESDAY OCTOBER 2

## AFTERNOON

### SESSION G9 / IN ITALIANO / HELL'S KITCHEN / 15:30-17:10

#### L'ECONOMIA CIRCOLARE NELLA GESTIONE DEI RIFIUTI II

Chair / Presidente: Francesco Di Maria (IT)

*G.C. Faussone (IT)*

Il recupero dei rifiuti plastici marini e terrestri tramite pirolisi: una nuova prospettiva per il riciclo chimico

*F. Asunis, M.R. Boni, A.P. Brundu, G. Cappai, A. Carucci, F.G. Cocco, G. De Gioannis, M. Isipato, S. Milia, A. Muntoni, A. Poletti, R. Pomi, A. Rossi, D. Spiga (IT)*

Processo in tre fasi per la produzione di idrogeno e PHA da siero di latte ovino

*C. Oggeri, P. Simone, M. Maroni, M. Scudu, G. Ansinello (IT)*

Attività sperimentali per la caratterizzazione geotecnica di sfridi di lavorazione di guarnizioni O-ring per utilizzo in strutture di copertura di discarica

*A. Di Maria, M. Merchan, K. Van Acker (IT)*

Strategie per l'economia circolare nell'industria metallurgica: un'analisi ambientale di processi innovativi per il recupero di materiali ed energia

*G. Belardi, F. Trapasso, D. Passeri, M. Fedon, P. Micheletti, A. Soluri, A. D'Elia, L. Montagner, D. Zonta (IT)*

Stabilizzazione delle scorie di acciaieria secondo il brevetto FMP S.r.l. e loro possibile impiego nella produzione di calcestruzzi

*J. Domizi, E. Fratolocchi, M. Felici, F. Pasqualini (IT)*

Prestazioni idrauliche di miscele cemento-bentonite tradizionali e speciali in soluzioni solfatiche

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION G10 / HELL'S KITCHEN / 17:40-19:20

#### WORKSHOP: END OF WASTE

Chairs / Presidenti: Raffaello Cossu, Alberto Pivato (IT)

Promoting waste recycling is crucial to "close the loop" of raw materials. In this context, adopting sustainable End Of Waste criteria to legally establish when a waste ceases to be considered waste and obtains the status of a marketable product, is a fundamental step to achieve the objectives of a circular economy.

During the workshop, the following topics will be discussed by using the web-based platform padlet ([www.padlet.com](http://www.padlet.com)): Regulations / Applications / Discussion about the general End Of Waste criteria based on the experiences of the participants.

Platform registration is required to attend the workshop. Willing participants can register at [https://unipd.padlet.org/alberto\\_pivato/rneyxih79ju5](https://unipd.padlet.org/alberto_pivato/rneyxih79ju5).

Registered participants will be able to post comments and documents related to the discussion topics before the starting of Sardinia Symposium, to improve the discussion and include additional topics to the debate.

## SIDE EVENT

### INTERNATIONAL WORKSHOP ON WASTE ARCHITECTURE / WASTE MANAGEMENT IN LANDSCAPE AND URBAN AREAS



#### SESSION H9 / BALDACCHINO ROOM / 15:30-17:10

##### DESIGN LAB

Chairs / Presidenti: *Anna Artuso, Elena Cossu, Stefanos Antoniadis (IT)*

In session H9 the activity started in sessions H7 and H8 will be continued.

**17:10 - 17:40** Coffee break + Poster discussion

#### SESSION H10 / BALDACCHINO ROOM / 17:40-19:20

##### DESIGN LAB

Chairs / Presidenti: *Anna Artuso, Elena Cossu, Stefanos Antoniadis (IT)*

At the end of the design lab, the participants will produce a concept for the valorisation and/or requalification of the plant proposed and will be invited to illustrate and discuss the final project.

# WEDNESDAY OCTOBER 2

## SOCIAL EVENTS



### INTERNATIONAL FOOTBALL TOURNAMENT / FOOTBALL PITCHES TORNEO INTERNAZIONALE DI CALCETTO / CAMPI DA CALCETTO

**H. 21:00**

Don't miss the traditional international six-a-side football tournament at Forte Village's professional floodlit pitches. A poster on which potential players may sign up will be displayed at the registration desk; teams will then be formed by selecting randomly from registered players.

A buffet dinner will be served to football players at Hotel Castello at the end of the tournament.

*La partita di calcio a sei è ormai una tradizione irrinunciabile al Sardinia. Gli interessati sono pregati di scrivere il proprio nome sull'apposito cartellone che sarà affisso vicino al banco registrazioni del Simposio. Le squadre saranno formate tramite sorteggio.*

*Alla fine del torneo ai giocatori sarà offerto un buffet freddo presso l'Hotel Castello.*



DAY 4 / THURSDAY  
OCTOBER 3

# THURSDAY OCTOBER 3

## MORNING

### SESSION A11 / CENTRAL HALL / 9:00-10:40

#### **AUTOMOTIVE SHREDDER RESIDUES**

Chair / *Presidente*: Maria Chiara Zanetti (IT)

*M. Sarkkinen, K. Kujala, S. Gehör (FI)*

Recycling of automotive shredder residue (ASR) waste in concrete for environmental and infrastructural construction applications

*D. Panepinto, B. Ruffino, M.C. Zanetti (IT)*

Evaluation of automotive shredder residues thermal valorization

*Y. Belyakov, V. Petukhov, A. Taskin, D. Fedotov (RU)*

Production of modified road bitumen from recycled car tyres

*S.M. Sadrameli, Y. Azizi (IR)*

Temperature control and thermal management of cylindrical lithium batteries at extreme weather conditions using Phase Change Materials (PCMs)

**10:40 - 11:10** Coffee break

### SESSION A12 / CENTRAL HALL / 11:10-12:50

#### **FOOD WASTE - RESOURCES**

Chair / *Presidente*: Gudrun Obersteiner (AT)

*D.A. Teigiserova, M. Marini, L. Hamelin, M. Thomsen (DK)*

Transparent valorization of food waste in the circular economy: clarifying definitions, policy and closed-loop pathways

*G. Hafner, D. Leverenz, P. Fuchs, K. Owusu-Sekyere, M. Kranert (DE)*

Quantification of food waste and optimizing of food management with digital tools

*T. Okayama, K. Watanabe, H. Yamakawa (JP)*

Composition of household food waste in an urban area: a case study in Japan

*A. F. Patti, J. Banerjee, S. Talekar, S. Banerjee, T. Carruthers-Taylor, K. Little, V. Ranganathan, A. Arora (AU)*

Biomass valorisation - Finding value in food waste

## SESSION B11 / CENTRAL HALL 2 / 9:00-10:40

### LANDFILL AERATION

Chair / *Presidente*: Raffaello Cossu (IT)

*M. Huber-Humer, M. Fritz, M. Hrad (AT)*

An approach to benchmark in-situ aeration projects

*H. Lammen, A. Van Zomeren, J.J. Dijkstra, R.N.J. Comans (NL)*

Sustainable landfill management: solid waste sampling and geochemical characterization prior to (an)aerobic stabilization of three old landfills

*M. Ritzkowski, K. Kuchta, R. Stegmann, B. Walker (DE)*

Opportunities and challenges of full-scale landfill aeration

*E. Binner, A. Pukhnyuk, P. Lechner, M. Huber-Humer (AT)*

Carbon sink landfill - Influence of aerobisation on carbon content

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

Semi-aerobic landfilling under different waste and water availability conditions

**10:40 - 11:10** Coffee break

## SESSION B12 / CENTRAL HALL 2 / 11:10-12:50

### LANDFILL MINING

Chair / *Presidente*: Roberto Raga (IT)

*J.C. Hernández Parrodi, K. Raulf, D. Vollprecht, T. Pretz, R. Pomberger (BE)*

Mechanical processing of fine fractions from landfill mining for material and energy recovery

*M. Somani, M. Datta, G.V. Ramana, T.R. Shreekrishnan (IN)*

Feasibility of bulk re-use of soil-like material excavated from a MSW dump: case study of Okhla landfill, India

*G. Sauve, K. Van Acker (BE)*

Integrating life cycle assessment and risk assessment to define a consistent reference scenario in the environmental feasibility assessment of (enhanced) landfill mining

*P. Einhäupl, K. Van Acker, S. Van Passel (BE)*

Integrating societal impacts into enhanced landfill mining assessment

*C. Neculau, F. Nguyen, D. Caterina, I. Isunza Manrique, the RAWFILL team (BE)*

Innovative landfill characterization: the case study of Onoz landfill (Wallonia, Belgium)

*S. Cappa, A. Ribaudo, M. Severgnini (IT)*

Landfill mining applications on aggregate landfills in Lombardy region

# THURSDAY OCTOBER 3

## MORNING

### SESSION C11 / PANORAMA HALL / 9:00-10:40

#### WEEE - COLLECTION AND RECYCLING

Chair / *Presidente*: Kaimin Shih (HK)

*A.Y. Wilkinson, I.D. Williams (UK)*

Why do (W)EEE hoard? the effect of consumer behaviour on the release of (W)EEE from home entertainment products into the circular economy

*A. Sharma, Arvind K. Nema (IN)*

Performance evaluation of waste lithium-ion battery recycling technologies using multi criteria decision analysis (MCDA) methods

*A. Winterstetter, U. Kral (BE)*

WEEE collection and recycling - A resource classification approach for the circular economy

*J. Yu (CN)*

Synergistic effect of grinding characteristics between LiCoO<sub>2</sub> and graphite on their recycling process from spent lithium-ion batteries

*G. Bonifazi, R. Gasbarrone, R. Palmieri, S. Serranti (IT)*

Plastic identification from end of life flat monitors by hyperspectral imaging methods

**10:40 - 11:10** Coffee break

### SESSION C12 / PANORAMA HALL / 11:10-12:50

#### WEEE - METAL RECOVERY

Chair / *Presidente*: Giuseppe Bonifazi (IT)

*B. Kopacek (AT)*

Recovery of precious and critical metals as a service

*I.V. Moreira, L.H. Yamane, R.R. Siman (BR)*

Influence of printed circuit boards' components on acidithiobacillus ferrooxidans-LR growth

*M.F. Godoy León, G.A. Blengini, J. Dewulf (BE)*

Recycling of cobalt in end-of-life products - The MaTrace approach

*M. Dunker, H. Hiller, M. Beckmann (DE)*

Bromine recovery for the polymer fraction of waste electronical and electrical equipment by thermal treatment in an internal circulating fluidized bed reactor

*L. Călin, A. Cătinean, M. Bilici, A. Samuilă (RO)*

Recovery of zinc and brass from spent alkaline and zinc-carbon batteries



## SESSION D11 / PANORAMA HALL 2 / 9:00-10:40

### BIOFUELS FROM WASTE

Chair / *Presidente*: Aldo Muntoni (IT)

*Y. Zhao, A. Damgaard, T.H. Christensen (CN)*

How is bioethanol from lignocellulosic waste a sustainable fuel? Quantification of sustainability from a statistical perspective

*F. Meng, J. Mckechnie (UK)*

Environmental performance of municipal solid waste-derived butanol and ethanol

*S.M. Sadrameli, M. Maghami (IR)*

Transportation biofuels with improved cold properties by thermal cracking of waste fish oil

*K. Melin, A. Oasmaa, J. Strueven, P. Eidam, J. Appelt, C. Hummel, U. Armbruster, A. Martin, Y. Chapelliere, C. Mirodatos, Y. Schuurman (FR)*

From black liquor to second generation transportation fuels

**10:40 - 11:10** Coffee break

## SESSION D12 / PANORAMA HALL 2 / 11:10-12:50

### PLASTICS IN MARINE ECOSYSTEMS

Chair / *Presidente*: Marion Huber-Humer (AT)

*J. Mayerhofer, G. Obersteiner, S. Lenz (AT)*

Plastic free Danube: composition of macro plastic waste in the project area of Donau-Auen Nationalpark

*M. Mičušík, J. Kuliček, A. Kleinová, M. Procházka, S. Podhradská, M. Omastová, G. Obersteiner (SK)*

Chemical analysis of plastic waste in and along the Danube river - Donau-Auen sampling

*M. Mičušík, J. Kuliček, A. Kleinová, M. Procházka, S. Podhradská, A. Rabayová, G. Bodor, M. Omastová (SK)*

Chemical analysis of plastic waste in and along the Danube river - Bratislava sampling

*F. Ruggero, E. Paris, R. Gori (IT)*

Plastic waste delivery from the Arno catchment to the Tyrrhenian sea

# THURSDAY OCTOBER 3 MORNING

## SESSION E11 / EX CHIESA HALL / 9:00-10:40

### WORKSHOP: FORENSIC ENGINEERING

Chairs / *Presidenti*: Alberto Pivato (IT), Claire Gwinnett (UK), George K. Varghese (IN)

This workshop is aimed at giving a broad introduction to the new science of Environmental Forensic Engineering and facilitate discussion about key current issues.

The first part of the workshop (1 h) is dedicated to the introduction of the following concepts:

A. *Pivato (IT)*: Introduction to environmental forensic engineering: definitions, aims, and applications.

A. *Pivato (IT)*: Announcement for the constitution of a new international group on Environmental Forensic Science.

G.K. *Varghese (IN)*: Presentation of a guideline on selecting pollution signatures for environmental forensic investigation.

C. *Gwinnett (UK)*: Presentation of basics in crime scene analysis: scene documentation, sampling and continuity of evidence, evidence packaging & labelling, etc.

T. *Nigl, W. Rübénbauer, R. Pomberger (AT)*: Cause-oriented investigation of the fire incidents in Austrian waste management systems

The second part of the workshop will be opened to a guided discussion of the new research topics: bias in environmental forensics, correlation VS causation, new environmental crimes, etc.

The workshop will be preparatory for the following crime scene investigations (session E12) that will be held outside.

**10:40 - 11:10** Coffee break

## SESSION E12 / EX CHIESA HALL / 11:10-12:50

### WORKSHOP: ENVIRONMENTAL CRIME SCENE ANALYSIS

Chairs / *Presidenti*: Claire Gwinnett (UK), George K. Varghese (IN), Alberto Pivato, Francesco Garbo, Giovanni Beggio (IT)

Have you ever been into a crime scene? Would you like to be involved in the investigation of the case like a CSI? But which role does an environmental engineer play at a crime scene? This all depends on the case!

In groups, the participants will actively conduct the required procedures to investigate the scene of an environmental disaster, under the supervision of experts in forensic science. Aims of Workshop:

1. To introduce key crime scene activities that can be employed in an environmental based scenario, including scene documentation, sampling and continuity of evidence.
2. To apply new crime scene knowledge to a landfill leachate spill scene.
3. To identify key issues in scene investigation that would need consideration by a forensic engineer.

## **SESSION F11 / NATURISTA HALL / 9:00-10:40**

### **LEACHATE CHARACTERIZATION AND TREATMENT**

Chair / *Presidente*: Howard Robinson (UK)

*F. Garbo, A. Pivato, B. Manachini, M.C. Lavagnolo (IT)*

Assessment of the ecotoxicity of phytotreatment substrate soil as landfill cover material for in situ leachate management

*N.M. Lanzarini, R.M. Mata, C.F. Mannarino, J.C. Moreira, M.P. Miagostovich (BR)*

Detection and quantification of viruses in solid waste landfill leachate

*T. Robinson (UK)*

Treatment of landfill leachate at a remote closed landfill site on the Isle of Wight

**10:40 - 11:10** Coffee break

## **SESSION F12 / NATURISTA HALL / 11:10-12:50**

### **WASTE MANAGEMENT IN SMALL ISLANDS**

Chair / *Presidente*: *Evan Diamadopoulos (GR)*

Solid waste management remains a rather challenging and complicated task with different characteristics and demands from country to country, defined by a large number of factors, among which social, economic and geographical ones. Especially small islands, that are mainly characterized by isolated geographies and tourism dominated economies, present many particularities that make sustainable waste management a goal rather hard to accomplish. The situation can get even more complicated in the case of large complexes of small islands, where a whole network must be developed in order to promote optimum and holistic solutions. The scope of this workshop is to present the particularities, the difficulties, the limitations, as well as potential solutions for solid waste management on small islands, focusing on defining factors, real case examples and existing potentialities, having Greece, a country of 6,000 islands and islets, as a background.

#### **Introductory lectures**

*E. Gidarakos (GR)*

Solid waste management at a country of 6,000 islands and islets

*A. Giannis, E. Gidarakos (GR)*

Solid waste management on small island destinations

*R. Cossu (IT)*

Solid waste management in the Venice Lagoon

*A. Valouma, E. Gidarakos (GR)*

Construction and Demolition Waste management: recycling routes on islands

*F.-M. Pelleri, E. Gidarakos (GR)*

Opportunities for agro-industrial waste valorization on Greek islands

# THURSDAY OCTOBER 3 MORNING



## SESSION G11 / HELL'S KITCHEN / 9:00-10:40

### WORKSHOP: SUSTAINABLE WASTE MANAGEMENT AT UNIVERSITIES I

Chairs / *Presidenti*: Daria Prandstraller, Eleonora Perotto (IT)

Universities can be considered like small towns where students and staff spend part of their days working, studying, eating and in many cases living on campus. These activities produce a wide variety of waste streams: from laboratory waste to assimilated urban waste (plastic, glass, paper, food waste). In the last years - in the framework of the Agenda 2030 - the awareness on the waste management problem inside Universities has increased and now Universities are taking a leading role in educating people about the need to develop a sustainable society. Furthermore, Universities provide a good opportunity to understand the options for sustainable waste management for wider applications. Among the activities developed, the more diffused are: (i) waste production monitoring and analysis, (ii) community engagement strategies (events, interviews, conferences, open days, flash mobs) (iii) creation of a strong interconnection between Procurement Department and Waste Management in order to close the loop of materials (i.e. actual Circular Economy). The workshop is an opportunity to compare, share and discuss good practices developed around the world, intended not only as correct and safe collection, transportation, processing and disposal of the waste streams, but primarily as reducing the amount of waste to be disposed of (zero-waste strategy).

#### Introductory lectures:

*D. Prandstraller, E. Perotto (IT)*

Sustainable waste management at Universities

*C. Guevara Fletcher, L. Segura, C. Useche, J. Plaza, J.L. Solarte (CO)*

Characterization and management of solid waste at the Santiago de Cali University, Colombia

**10:40 - 11:10** Coffee break

## SESSION G12 / HELL'S KITCHEN / 11:10-12:50

### WORKSHOP: SUSTAINABLE WASTE MANAGEMENT AT UNIVERSITIES II

Chairs / *Presidenti*: Daria Prandstraller, Eleonora Perotto (IT)

#### Introductory lectures:

*C. Camolesi Guimarães, T. Freire de Oliveira, C. Echevengúá Teixeira, F. Peixoto Manéo (BR)*  
Sustainable IPT: strategies of a waste management program in a Brazilian public research institute

*D. Minervini, E. Esposito (IT)*

University as promoter of sustainability culture and practices

## SIDE EVENT

### WORKSHOP: SMART AND DIGITAL WASTE MANAGEMENT



#### SESSION H11 / BALDACCHINO ROOM / 9:00-10:40

### WORKSHOP: SMART AND DIGITAL WASTE MANAGEMENT

Chair / *Presidente*: Stefano Carosio (IT)

Over the past 10 years, the frontier of digital technologies has advanced at a dizzying speed, changing completely our life. At Sardinia 2019 we want to explore how the field of Waste Management will be changed and will be improved thanks to the digital revolution, with a specific focus on the management of wastes in the city of the future.

#### Introductory lectures:

*S. Carosio (IT)*

How to support innovative projects at EU scale: lessons learnt from H2020 and access to funding for start-ups

*W. Lu, Z. Bao, J. Hao (CN)*

Big data analytics for construction waste management: fad or fashion?

*G. Xu, D. Chen, J. Luo, B. Zhang, Z. Li, Y. Zang (CN)*

Classification and recognition of typical inorganic municipal solid wastes components with help of deep learning tool

*G. Fiorentino, A. Zucaro, S. Portofino, M. Tammaro (IT)*

Innovative WEEE traceability and collection system: the Cava de' Tirreni pilot

**10:40 - 11:10** Coffee break

#### SESSION H12 / BALDACCHINO ROOM / 11:10-12:50

### COMPANIES FORUM

Chair / *Presidente*: Stefano Carosio (IT)

*R. Gregory / Gregory Environmental Consulting Ltd (UK)*: GECL's recent experiences in landfill gas management - from active landfills to development on closed landfills

*S. Andersson / Babcock & Wilcox Volund AB (DK)*: ADIOX for memory effect prevention and dioxin removal from flue gases

*N. Eickhoff / Martin GmbH für Umwelt - und Energietechnik (DE)*: Company Martin supplying systems for treating municipal waste, biowaste and sewage sludge

*E. Saturno / Exxro srl (IT)*: Treatment of landfill leachate with reverse osmosis with flat membranes

*A. Kihl / EasyMining, Ragn-Sells Företagen AB (SE)*: Ash2Phos and Ash2Salt - Innovative recovery of critical resources from WWT sludge and MSW incineration ash

*R. Tarasz, F. Korpe / Mivanor AS (NO)*: Magnetic Particle Separation - Innovative leachate treatment

*B. Wight / GHGsat Inc. (CA)*: Satellite based monitoring of methane emissions

*A. Bertacchini / Turboden SpA (IT)*: Turboden ORC Solutions

# THURSDAY OCTOBER 3

## AFTERNOON

### SESSION A13 / CENTRAL HALL / 15:30-17:10

#### FOOD WASTE RECYCLING I

Chair / *Presidente*: Kohei Watanabe (JP)

*C. Peñalva, J. Vidal, S. Verstichel, P. Fajs, V. Žepič Bogataj, M. Cruz Arcas (ES)*

Revalorization strategies for the use of citrus waste in green packaging and cosmetics

*G. Hafner, D. Leverenz, K. Owusu-Sekyere, M. Kranert (DE)*

Food waste from bakeries: management strategies and quantification of food waste

*K. Little, W.R. Jackson, A. Swann, A. Patti (AU)*

Options for dealing with cooking oils and grease-trap waste

*G. Vega Rodriguez, M. Monzon, N. Diaz (ES)*

LIFE BAQUA - Solutions through the new use for a waste of banana crop to develop products in aquaculture and plastics sector

*F. Ali, C. Trois (ZA)*

A methodological application for the optimisation of Berea red sand as reactant in permeable reactor barrier systems for the treatment of high strength landfill leachate: focus on activation methods

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION A14 / CENTRAL HALL / 17:40-19:20

#### FOOD WASTE RECYCLING II

Chair / *Presidente*: Silvia Scherhauser (AT)

*K. Papadopoulou, G.M. Lytras, D. Mathioudakis, G. Lyberatos (GR)*

Fermentable household waste management in a circular economy: the municipality of Halandri, Greece case

*H. Yamakawa, T. Okayama, K. Watanabe, K. Sawada, Y. Shiro, H. Koizumi, T. Saitoh (JP)*

Composition of household food waste in rural area: a case study in Japan

*G. Obersteiner, M. Hrad, S. Luck, J. Mayerhofer, R. Ottner, E. Schmied (AT)*

Food losses in Austrian agriculture and its potential of prevention

*L. Archilletti, L. Medeghini, C. De Vito, S. Mignardi (IT)*

Eggshell waste as a valuable resource for cobalt remediation

## SESSION B13 / CENTRAL HALL 2 / 15:30-17:10

### LANDFILL REMEDIATION AND AFTERCARE

Chair / *Presidente*: Rainer Stegmann (DE)

*R.G. Gregory, H. Robinson, T. Robinson (UK)*

The science of landfill surrender

*R. Lansley, S. Nazaruk, K. Wilson (UK)*

A case study of environmental investigation, interpretation and remediation of a source of leachate contamination for a landfill in Gloucestershire, UK

*S. Dever, P. Lightbody, M. Winser (AU)*

Provisioning for landfill closure and post-closure management costs: an Australian case study

*R. Stegmann (DE)*

Landfill aftercare in times of climate change

*J. Domizi, E. Fratalocchi, M. Felici, F. Pasqualini (IT)*

Hydraulic performance of traditional and special cement bentonite mixtures in sulphate solutions

*J. Wu (CN)*

Sustainable management of dumping site in China: problems and developments in mining and reuse projects

**17:10 - 17:40** Coffee break + Poster discussion

## SESSION B14 / CENTRAL HALL 2 / 17:40-19:20

### LANDFILL MINING: THERMAL TREATMENT OF COMBUSTIBLE FRACTIONS

Chair / *Presidente*: Michael Nelles (DE)

*K. Kim, S. Lee, K. Choi, T. Jeon, S. Shin (KR)*

Current status and management of excavated materials containing waste in Korea

*S.M.Al- Salem, G.A. Leeke, R. Al- Enezi, H.H. Sultan, H.J. Karam, M.H. Al- Wadi, A.T. Al- Dhafeeri, A.A. Boota, J. Wang (KW)*

Potential for thermal and solar power pyrolysis in treating reclaimed real life solid waste from a landfill disposal site

*I.N. Zaini, C. Garcia López, Y. Gomez Rueda, T. Pretz, L. Helsen, P.G. Jönsson, W. Yang (SE)*

Gasification of refuse derived fuel obtained from a ballistic separation process of landfill waste

*G.C. Faussonne (IT)*

Slow pyrolysis to recycle marine litter and landfill plastic: a new perspective for chemical recycling

# THURSDAY OCTOBER 3

## AFTERNOON

### SESSION C13 / PANORAMA HALL / 15:30-17:10

#### C&D WASTE - POTENTIALS

Chair / Presidente: Weisheng Lu (CN)

*H. Hoang, T. Ishigaki, R. Kubota, M. Yamada, K. Kawamoto, G. Nguyen, K. Tong (JP)*

An empirical investigation of generation rate, composition and handling practices of construction and demolition waste in Hanoi, Vietnam

*C. Ying, Z. Ren, X. Zhang, C. Dai, X. Wu, C. Hou (CN)*

Feasibility study of recycled concrete engineering based on the status quo of Chinese concrete resources

*F. Di Maria, J. Li Hao (IT)*

Comparative study of on-site sorting for C&D in China and Europe

*Z. Bao, W. Lu, B. Chi, J. Hao (HK)*

Construction waste management performance in green buildings: a PEST analysis of China

*H.T. Nghiem, P.Q. Minh, K. Kawamoto, K.T. Ngo, H. G. Nguyen, T.D. Nguyen, Y. Isobe, M. Kawasaki (VN)*

An investigation on the generation and management of construction and demolition waste in Vietnam

*M. Severgnini, F. Dallari, S. Curi, Y. Borbon, G. Ghiringhelli, E. Amodeo, A. Cappello (IT)*

GETRI Project: cross-border intermodal transport management of aggregate and construction and demolition waste (C&DW)

**17:10 - 17:40** Coffee break + Poster discussion

### SESSION C14 / PANORAMA HALL / 17:40-19:20

#### C&D WASTE - PROPERTIES

Chair / Presidente: Marco Pasetto (IT)

*M. Abdulkareem, J. Havukainen, M. Horttanainen (FI)*

Environmental assessment of alkali-activated mortars using different activators

*O. Hjelm, J. Hyks, T. Hougaard, S. Butera (DK)*

Content and leachability of potentially problematic substances in recycled crushed concrete from demolition and renovation of Danish buildings

*A. Kato, R. Ito, A. Matsuno, T. Uchimura, N. V. Tuan, H. G. Nguyen, K. Kawamoto (JP)*

Water retention and gas transport characteristics of recycled graded roadbed materials blended with AAC grains

*M.S. Al-Hwaiti, O.A. Al-Khashman, M.A. Al-Shaweesh, A. Al-Muhtaseb, J.A. Alhwarin (JO)*

Improve the rheological properties and compressive strength of self-compacting concrete incorporating finest limestone quarry and finest iron slag, Jordan

*S. Serranti, G. Capobianco, S. Malinconico, G. Bonifazi (IT)*

Micro X-ray fluorescence imaging coupled with chemometrics to detect and classify asbestos fibers in demolition waste

*S. Fucale, A. Farias, R. Volk (BR)*

Use of construction and demolition waste in paving project: a sustainable alternative



## SESSION D13 / PANORAMA HALL 2 / 15:30-17:10

### WORKSHOP: PLASTICS AND ENVIRONMENT

Chair / *Presidente*: Claire Gwinnett (UK)

Over the last ten years there has been an increased public awareness of the extent of plastic pollution and, in particular, microplastic pollution due to highly publicised studies and widespread media attention. Microplastics (defined as <5mm in size) have been found to be present in all environments, even remote locations, and have proven to have many adverse effects to biota that ingest them. The presence of microplastics in the environment and our food is no longer a surprise but now there is a need for global organisations, government bodies and scientists from a multitude of disciplines to work together to answer current key questions such as 'what is the true extent of this pollutant?' and 'how do we combat it at all levels? *Full appetizer available on the website*

#### Introductory lectures:

*A. Bartl, W. Ipsmiller, B. Piribauer, D. Koch, T. Laminger (AT)*

Microplastics in maritime systems, overview and methods for analysis

*S. Lenz, J. Mayerhofer, P. Rauscher, A. Rameder, E. Binner, M. Huber-Humer, G. Obersteiner (AT)*

Bioplastics in biowaste and Danube littering

*P. Zuccarello, G. Oliveri Conti, C. Favara, I. Nicolosi, C. Allagui, M. Banni, M. Maisano, M. Ferrante (IT)*

Microplastics <10µm in vegetables and fruit as unmanaged risk of the circular economy

**17:10 - 17:40** Coffee break + Poster discussion

## SESSION D14 / PANORAMA HALL 2 / 17:40-19:20

### PLASTIC WASTE - NEW PRODUCTS

Chair / *Presidente*: Francesco Di Maria (IT)

*T.O. Mbuya, A. Evangelou, G.O. Rading, I. Williams, J.I.R. Blake, P.A.S. Reed (KE)*

On plastic waste based composite materials for applications in construction

*V. Ž. Bogataj, P. Fajs, C. Peñalva, M. Omahen, M. Čop, A. Henttonen (SI)*

Utilization of recycled polypropylene, cellulose and newsprint fibers for production of green composites

*B. Silva, A. Marques, A. Vilela, H. Martins, A. Mota, A. Ribeiro, J. Araújo, M.C. Paiva, J.P. Nunes, S. Castro, J. Amaro, S. Santos, P. Gaiato, J. Carvalho (PT)*

New circularity approach of mixed plastics in the development of eco-sustainable railway sleepers

*K. Qian, X. Yang, W. Li (CN)*

Valorization of municipal solid wastes to activated carbon and their catalytic performance in production of jet fuel range hydrocarbons from waste plastics

# THURSDAY OCTOBER 3

## AFTERNOON

### SESSION E13 / EX CHIESA HALL / 15:30-17:10

#### WORKSHOP: BIOREFINERIES

Chair / *Presidente*: William Clarke (AU)

The concept of biorefinery has evolved over time from traditional bioferineries towards waste biorefineries, with the environmental and economic sustainability as the main objectives. Biorefinery schemes could consist of an anaerobic process performed in two stages, with the first one managed in order to recover  $H_2+CO_2$  from fermentation, besides the  $CH_4+CO_2$  mixture produced in the second stage... *Full appetizer available on the website*

#### Introductory lectures:

*I. Atamaniuk, H. Boysen, N. Wieczorek, N. Politaeva, I. Smiatskaia, K. Kuchta (DE)*

Two-stage fermentative biohydrogen and biomethane production from lipid-extracted chlorophyta microalgae

*J. Kannengiesser, A. Campitelli, A. Vogt, I. Steinberg, J. Jager, L. Schebek (DE)*      Combination of different treatment methods for biological waste and agricultural residues to generate bio-based products

*F. Asunis, M.R. Boni, A.P. Brundu, G. Cappai, A. Carucci, F.G. Cocco, G. De Gioannis, M. Isipato, S. Milia, A. Muntoni, A. Poletini, R. Pomi, A. Rossi, D. Spiga (IT)*

Three-step process for hydrogen and PHA production from sheep cheese whey

**17:10 - 17:40**    Coffee break + Poster discussion

### SESSION E14 / EX CHIESA HALL / 17:40-19:20

#### WORKSHOP: BIOLOGICAL TREATMENT OF ANIMAL WASTE

Chair / *Presidente*: Evangelos Gidaracos (GR)

Animal waste consists of solid and liquid excreta derived from animal catabolism, often containing impurities of other organic residues, such as hay, twigs and more others. However, these organic, nutrient-rich substrates, also contain pathogenic microorganisms. Thus, the systematic disposal of untreated animal waste to the environment can cause pollution and human health problems. It is known that livestock industries generate large amounts of animal waste that require proper management. Therefore, the challenge for modern industries of this sector is the sustainable management of the above-mentioned stream of waste. In this context, combining waste stabilization with recovery and utilization of nutrients consists a viable option for avoiding environmental problems and saving natural resources. Is anaerobic digestion a valuable and effective tool for this purpose?

#### Introductory lectures:

*I. Moukazis, K. Tsokanis, F.- M. Pelleri, E. Gidaracos (GR)*

Valorization of animal waste and by-products via anaerobic digestion process

*F.S. Erkuş, Ş. Sayın (TR)*

Performance of sequential anaerobic/aerobic co-digestion of waste activated sludge and cattle manure

## SESSION F13 / NATURISTA HALL / 15:30-17:10

### LEACHATE TREATMENT II

Chair / *Presidente*: Stuart Dever (AU)

*T. Robinson (UK)*

Removal of dissolved methane from landfill leachates in engineered wetlands

*G. Mwangi, A. Mayabi, A. Tanaka, G. Lubaale (KE)*

Biological treatment of landfill leachate using organic waste biochar in tropical countries

*L. Zhang, X. Wang, D. Yue, H. Jiang, Y. Wang, Z. Fan (CN)*

Effect of submerged combustion evaporation on Cd complexation potential of leachate humic substance

*B. Reimers, W. Woodenberg, Sershen, C. Trois (ZA)*

A multidisciplinary investigation of constructed wetlands for the treatment of landfill leachate: where environmental engineering, microbiology and botany meet

**17:10 - 17:40** Coffee break + Poster discussion

## SESSION F14 / NATURISTA HALL / 17:40-19:20

### WORKSHOP: IWWG TASK GROUP LANDFILL AERATION - OPTIMAL PERFORMANCES AND FAKE AERATION

Chair / *Presidente*: Marco Ritzkowski (DE)

Published data on landfill aeration projects suggest that the passive aeration concept is increasing by number. This concept has the advantage that the required infrastructure (thus the investment costs) are relatively low since the piping system can be design as a single-line (only negative pressure) and no second blower unit is required. Moreover, benefits may be generated by energy recovery from the extracted landfill gas. But what is often disregarded is the relatively slow stabilisation effect and operational challenges in cases where the landfilled wastes are fully water saturated or even leachate tables are present on the landfill liner.

During the workshop this and other existing methodologies for landfill aeration will be discussed in view of workshop title, namely how to ensure quality performance and sufficient results of landfill aeration projects?

After the methodical issues have been discussed, the workshop will focus on benchmarks in connection with landfill aeration. Here, the focus is on the technical implementation and the discussion shall come up with indications on how to optimize future aeration projects.

#### Introductory lectures:

*M. Huber-Humer (AT)*

Benchmarking of landfill aeration projects

*M. Ritzkowski (DE)*

Objectives and appropriate technical implementation of landfill aeration projects

*M. Ritzkowski, K. Kuchta (DE)*

Temperature dependency of metabolic processes during landfill aeration

# THURSDAY OCTOBER 3 AFTERNOON



## SESSION G13 / IN ITALIANO / HELL'S KITCHEN / 15:30-17:10

### **CIRS - COMITATO INTERDISCIPLINARE RIFIUTI E SALUTE: LA COMUNICAZIONE NELLA GESTIONE DEI RIFIUTI**

Chair / *Presidente*: Eleonora Perotto (IT)

Questo workshop è espressione delle attività del CIRS-Comitato Interdisciplinare su Rifiuti e Salute. Il modo in cui questa tematica è percepita dalla gente dipende sostanzialmente oltre che dalla qualità degli impianti e della gestione dei rifiuti anche dalla qualità della comunicazione nella sua accezione più vasta ed articolata: correttezza e semplicità delle informazioni tecniche e scientifiche, coinvolgimento, partecipazione, trasparenza, presa di coscienza, ascolto del territorio, etc. Tutto ciò implica che il rapporto tra i diversi interessati (amministratori, gestori, tecnici, cittadini, operatori dei mass-media) non deve essere unidirezionale ma deve fare parte di un sistema "informativo" con carattere strutturale e non essere un mero strumento di convincimento per un'acritica acquisizione del consenso.

**Interverranno:** *Giornalisti di alcune importanti testate, addetti dell'Ufficio Comunicazione di qualificate Società del settore, Componenti del Tavolo Tematico "Comunicazione del CIRS"*

**17:10 - 17:40** Coffee break + Poster discussion

## SESSION G14 / IN ITALIANO / HELL'S KITCHEN / 17:40-19:20

### **CIRS - RESOCONTO ATTIVITA'**

Chairs / *Presidenti*: Raffaello Cossu, Margherita Ferrante (IT)

Il CIRS-Comitato Interdisciplinare Rifiuti e Salute, è un gruppo di lavoro, non istituzionale, espressione della società civile, aperto all'attività volontaria di esperti qualificati in diversi campi disciplinari e professionali, nato per ovviare alla carenza di un'informazione scientifica integrata e di un dialogo tra le diverse esperienze in tema di rifiuti e salute. Obiettivo finale, dopo un confronto sugli studi e le esperienze consolidate, è quello di arrivare alla redazione di un documento condiviso che per differenti tipologie dei rifiuti e tecnologie di gestione faccia il punto sullo stato delle conoscenze e tracci proposte sostenibili che possano costituire una base di razionale riferimento per la popolazione e per il mondo politico. Il CIRS è stato promosso dal Tavolo di Roma, piattaforma di riflessione sulla gestione dei rifiuti che riunisce uomini politici di diverso schieramento partitico, ambientalisti, ingegneri ambientali, medici, giornalisti, avvocati, magistrati, economisti, tutti non portatori di interessi di parte. Il CIRS è stato presentato e ha avviato i suoi lavori nel gennaio 2019, in una riunione a Roma presso l'Aula Gruppi di Montecitorio, dove sono intervenuti appoggiando l'iniziativa la Vice-Presidente del Parlamento, On. Mara Carfagna, il Ministro dell'Ambiente, Gen. Sergio Costa, i parlamentari Onn. Daniele Belotti (Lega), Chiara Braga (PD), Paolo Russo (Forza Italia), Alberto Zolezzi (M5S) e il Dott. Antonio Cianciullo, Giornalista.

I lavori del Comitato sono coordinati dal prof. Raffaello Cossu, già Ordinario di Gestione dei Rifiuti solidi presso l'Università di Padova e dalla prof. Margherita Ferrante, Ordinario di Igiene, Università di Catania. Il Comitato si riunisce indicativamente ogni due mesi, per un paio di giorni a cavallo del fine settimana, suddividendo la sua attività in diversi tavoli tematici, con momenti plenari di discussione e di sintesi. Le spese vive di partecipazione sono a carico di ogni singolo partecipante. Il workshop servirà a fare il punto sullo stato della discussione in atto offrendo al dibattito con partecipanti quanto fin qui prodotto.

## SESSION H13 / BALDACCHINO ROOM / 15:30-17:10

### WORKSHOP: WEEE - CIRCULAR ECONOMY OPPORTUNITIES

Chair / *Presidente*: Pascal Leroy (BE)

Waste electrical and electronic equipment (WEEE) is one of the fastest growing waste streams in the EU; it is estimated that 12 million tonnes will be generated in 2020. The improvement of WEEE prevention, collection and recovery is essential to creating circular economies and enhancing resource efficiency. This will require new approaches in the design, manufacturing, use and end of life treatment of electrical and electronic equipment. C-SERVEES is a project funded under the H2020 Program (2018-2022) that aims to boost circular economic business models in the EEE sector. The business models will be developed through wide consultation with relevant stakeholders and their viability will be tested through demonstrations involving four target products: washing machines, printers, televisions and access link monitoring equipment used in telecoms... *Full appetizer available on the website.*

#### Introductory lectures:

*E. Moliner (ES)*: Introduction to C-SERVEES - The landscape and opportunities for developing the circular economy in the EEE sector

*B. Kopacek (AT)*: A new Circular Economy Business Model, created within the C-SERVEES project

*P. Carminati (CH)*: Circular Economy in practice at Lexmark

*P. Leroy (BE)*: Results from our survey on opportunities and barriers to Circular Economy

**17:10 - 17:40** Coffee break + Poster discussion

## SESSION H14 / BALDACCHINO ROOM / 17:40-19:20

### WORKSHOP: CIRCULAR ECONOMY READINESS. ADDRESSING BARRIERS IN PREPARATION FOR THE CIRCULAR ECONOMY

Chairs / *Presidenti*: Rachel Dunk, Carly Fletcher (UK)

In this workshop session delegates will explore the concept of Circular Economy Readiness and its application to the waste and resource management sector. Circular Economy Readiness is based on the similar concept of Carbon Capture Readiness, which aims to prepare the power sector for the future implementation of Carbon Capture and Storage (CCS). For example, planning requirements for new fossil-fuel combustion plants within the EU include provisions such that carbon capture technology can be retrofitted in the future. This allows the immediate need for additional capacity to be met whilst addressing the risk of lock-in. This can be compared to the barriers that affect progressive waste management, where the immediate need for increased sanitary disposal may be viewed as more pressing than the need for fully circular waste management practices... *Full appetizer available on the website.*

#### Introductory lecture:

*R. Dunk, C. Fletcher (UK)*: Introducing the concept of circular economy readiness and outcomes of the SUM2018 Workshop

# THURSDAY OCTOBER 3

## SOCIAL EVENT



### SARDINIA'S GOT TALENT / PIAZZA MARIA LUIGIA

**H. 22:00**

Following the huge success of the 2015 edition, "Sardinia's Got Talent" returns, an entertaining evening during which Symposium delegates and staff, accompanied by a band, take their place on stage to show off their talents. An unmissable opportunity to have fun and become an artiste... at least for one night!

If you can sing, play an instrument or dance and would like to take part in the show, please contact the Organising Secretariat at the Registration desk by Thursday morning (rehearsals will be held on Thursday afternoon).

The audience present in the Piazza will pick the winner by voting for the best performance on their smartphones. Following the prize giving, the evening will continue with live music and dancing. The dancing team of the Technical University of Crete will perform during the Sardinia's Got Talent.

*Dopo lo straordinario successo dello spettacolo del 2015, torna il "Sardinia's Got Talent" divertentissima serata in cui i partecipanti e lo staff del Simposio, accompagnati da una band di supporto, saliranno sul palco per mostrare i propri talenti.*

*Un'occasione imperdibile per divertirti e sentirti un vero artista... almeno per una notte!*

*Se sapete cantare, suonare uno strumento, ballare e volete esibirvi durante lo spettacolo, contattate la Segreteria Organizzativa al banco registrazioni entro giovedì mattina. Il pubblico in Piazza decreterà il vincitore votando la miglior performance attraverso gli smartphone.*

*Dopo la premiazione, la serata continua con balli e musica dal vivo.*

*Durante lo spettacolo è prevista un'esibizione di danze tradizionali greche degli studenti della scuola di ballo della Technical University di Creta.*



DAY 5 / FRIDAY  
OCTOBER 4

# FRIDAY OCTOBER 4

## MORNING

### SESSION A15 / CENTRAL HALL / 9:00-10:40

#### LCA IN WASTE MANAGEMENT

Chair / *Presidente*: Thomas Astrup (DK)

*T.H. Christensen, A. Damgaard, A. Boldrin, T.F. Astrup, V. Bisinella (DK)*

The future role of LCA modelling in integrated waste management

*E. Spadavecchia, A. Damgaard, V. Bisinella (DK)*

Life cycle assessment of the management of industrial textile waste in Northern Italy: factors influencing sustainability

*V. Takou, V. Bisinella, A. Damgaard, T. F. Astrup (DK)*

Material flow analysis and life cycle assessment of Danish household waste – Factors of importance

*L.G. Jakobsen, M.M. Steingrimsdottir, L. Shen, H.M. Junginger, C. Moretti, I. Vural Gursel, J. Petrik, L. Hoejbye, L.C. Dreyer, A.S. Olesen, L. Hamelin (DK)*

End-of-life perspectives of life cycle assessment of biogenic plastic in Europe - Case study on cups

**10:40 - 11:10** Coffee break

### SESSION A16 / CENTRAL HALL / 11:10-12:50

#### ENVIRONMENTAL IMPACT OF WASTE MANAGEMENT FACILITIES

Chair / *Presidente*:

*Z. Duan, P. Kjeldsen, C. Scheutz (DK)*

Validation of the tracer dispersion method for quantifying VOC emissions from waste management facilities - A controlled release test

*R. Arias, N. Salas Seoane, S. Sironi (ES)*

Citizen science for odour impact assessment considering the real perception of the receptors: the case of Barcelona

*F. Di Maria, F. Sisani (IT)*

Assessment of the environmental impact of the waste management policy. An Italian case study

*G.Y. Bian, I.H. Mel Suffet (US)*

Monitoring of landfill nuisance odors at an off-site, odor-impacted location using an “odor patrol” panel



## **SESSION B15 / CENTRAL HALL 2 / 9:00-10:40**

### **END OF LIFE TEXTILES MANAGEMENT**

Chair / *Presidente*: Pierre Hennebert (FR)

*W. Ipsmiller, E. Ipsmiller, A. Bartl (AT)*

Dead white men's clothes: a comprehensive synopsis of end-of-life textiles management and global economic implications

*C. Scheutz, N. Nørup, K. Pihl, A. Damgaard (DK)*

Assessment method to quantify amount and quality of textiles discarded in Danish household waste

*W. Ipsmiller, B. Piribauer, S. Vecchiato, G. Ruppert, A. Bartl, G. Gübitz (AT)*

Contributing to a circular economy by an advanced method for the complete recycling of special technical textiles

*A. Damgaard, N. Nørup, K. Pihl, C. Scheutz (DK)*

Replacement rate for textiles in a circular economy - A case of three African countries

**10:40 - 11:10** Coffee break

## **SESSION B16 / CENTRAL HALL 2 / 11:10-12:50**

### **END OF LIFE TEXTILES - RECYCLING AND ENVIRONMENTAL IMPACT**

Chair / *Presidente*: Peter Kjeldsen (DK)

*C. Scheutz, N. Nørup, K. Pihl, A. Damgaard (DK)*

Textile sorting facilities - Material flow analysis and the importance of quality criterias

*B. Piribauer, W. Ipsmiller, B. Steinacker, T. Laminger, D. Koch, A. Bartl (AT)*

Simulation of natural degradation of cellulosic fibres with cellulase bioreactors

*B. Piribauer, U. Jenull-Halver, W. Ipsmiller, T. Laminger, D. Koch, A. Bartl (AT)*

TEX2MAT - Next level textile recycling with biocatalysts

*P. Hennebert (FR)*

Literature evidence on the brominated flame retardant content in plastics of construction, of textiles/furnitures and of non-food packaging: should they be sorted before recycling?

*A. Damgaard, N. Nørup, K. Pihl, C. Scheutz (DK)*

Environmental impact of improving the fate of textile waste

# FRIDAY OCTOBER 4

## MORNING

### SESSION C15 / PANORAMA HALL / 9:00-10:40

#### WORKSHOP: FOOD WASTE PREVENTION

Chair / *Presidente*: Gudrun Obersteiner (AT)

Considering the fact that one third of all food in the world is lost or wasted (FAO, 2011), it is indispensable to reduce food waste (FW) and to increase resource efficiency. Food waste reduction is already manifested in a range of policy documents and actions around the world. The ambitious target of the Sustainable Development Goals, which is also followed by the EU circular economy package, is to halve per capita global food waste at retail and consumer levels by 2030 and a further reduction of food waste along the rest of the supply chain.

A range of initiatives and measures are already implemented and will further expand in near future due to politic pressure not only in the member states of the EU, but also beyond. However, a robust methodology on food waste quantification is often lacking, but is also necessary to evaluate the success of reduction measures. The workshop includes short introductory presentations followed by interactive discussion on two specific topics: i) definition and quantification of food waste and ii) prevention and reduction measures and its monitoring. This will look into the differences (e.g. cultural, methodical), challenges (e.g. implementation in practice) and opportunities (e.g. impacts on environment, economy and society) in food waste quantification and monitoring, and shall help to foster knowledge for the fight against food waste.

#### Introductory lectures:

*K. Watanabe (JP)*

Food waste definitions and categories - Differences between countries

*S. Scherhauser (AT)*

Possibilities of food waste quantification - Strength and weakness of different methods

*G. Obersteiner (AT)*

Measures on food waste prevention and reduction - Examples in practice

**10:40 - 11:10** Coffee break

### SESSION C16 / PANORAMA HALL / 11:10-12:50

#### WORKSHOP: FOOD WASTE - SOCIAL ASPECTS

Chair / *Presidente*: Gudrun Obersteiner (AT)

*S. Luck, G. Obersteiner (AT)*

Development and evaluation of school materials on food waste prevention in Austrian tourism schools

*K. Watanabe, T. Okayama, G. Obersteiner, J. Riegler, S. Luck (JP)*

Factors affecting attitudes and behaviour on food waste - An international comparative study

## SESSION D15 / PANORAMA HALL 2 / 9:00-10:40

### WORKSHOP: SOCIAL ASPECTS OF ENVIRONMENTAL ISSUES

Chairs/ *Presidente*: Rainer Stegmann (DE)

Without acceptance, support and participation of society it may be difficult or even impossible to realise environmental projects.

During this workshop we want to discuss different aspects, as there are education of social aspects for students with different background, presenting also some visual results from an actual course. In addition we will talk about responsibility of society in avoiding and solving environmental pollution and discuss the Nimby problem. As an example where participation of people is highly needed the plastic in the sea problematic will be discussed.

#### Introductory lectures:

*R. Stegmann (DE)*: Social and environmental issues as a curriculum for all University disciplines

*M. Ritzkowski (DE)*: Societies' responsibility for our environment - Example of plastic waste

*G. de Feo, S. de Gisi (IT)*: Is it a NiMBY or WhyMBY case of locally unwanted land use?

**10:40 - 11:10** Coffee break

## SESSION D16 / PANORAMA HALL 2 / 11:10-12:50

### WORKSHOP: WASTE AND HEALTH

Chair / *Presidente*: Margherita Ferrante (IT)

Current waste management and disposal activities, although perfectly designed and managed, cause the emission of a large number of compounds, in many cases emerging substances in small amounts and at such low concentrations that they are sometimes neglected. Unfortunately, this drawback of state-of-the-art technologies is expected to endure despite the increasing use of recycling, which is known to cause uncontrolled emissions of compounds of concern present in the products to be recycled. There is lack of evidence of health effects in populations living by waste management plants; studies are available but adequate individual exposure information and data on potential other causes for specific health issues are often missing. The attitude of populations towards waste management facilities is still affected by the Nimby syndrome; demagoguery is producing a generic refusal of any kind of waste management plant by populations still believing in idealistic 100% recycling with no emissions. How to address these issues in a scientific way? How to produce reliable data on the health effects of the different waste management activities and on the measures needed to prevent or minimize them?

#### Introductory lectures:

*J. Zayed, B. Bakhiyi, S. Gravel, F. Labrèche (CA)*: Global health issues and challenges related to e-waste management

*T.L. Gladding (UK)*: Health and safety and waste management in the UK

*I.M. Rafizul, P. K. Mahanta, M. Alamgir (BD)*: Assessment of the potential health risk of a waste disposal site in Khulna of Bangladesh

*T. S. Zikhathile, H. I. Atagana (ZA)*: Assessment on management practices and knowledge of community health workers on health care risk waste

# FRIDAY OCTOBER 4

## MORNING

### SESSION E15 / EX CHIESA HALL / 9:00-10:40

#### WORKSHOP: BIOLOGICAL DEGRADATION OF BIOPLASTICS

Chair / *Presidente*: Maria Cristina Lavagnolo (IT)

Many countries recently defined a target for the reduction, within a specific time range, of the single-use plastic items. Biodegradable bioplastic is considered one of the substitute material, due to its cleaner production chain and the possibility to be composted and biodegraded.

Both aerobic (composting) and anaerobic full scale treatment plants are facing different critical issues that need to be discussed to find the proper solutions.

What really happen to bioplastics in a composting plant? Is composting a proper treatment? What methodologies can be used to understand the effectiveness of bioplastic degradation? Is bioplastic a good substitute of conventional polyethylene for food waste collection bags?

During the workshop, the participants will try to clarify some controversial aspects providing a scientific support to the current debate.

#### **Introductory lectures:**

*G. Dolci, M. Grosso, A. Catenacci, F. Malpei, R. Fancello (IT)*

Evaluation of the performances of paper and bioplastic bags in the management of food waste

*F. Ruggero, E. Carretti, T. Lotti, C. Lubello, R. Gori (IT)*

A synergic approach using different methodologies to monitor bioplastic film degradation during composting

**10:40 - 11:10** Coffee break

### SESSION E16 / EX CHIESA HALL / 11:10-12:50

#### WORKSHOP: LONG TERM BEHAVIOUR OF LANDFILL BARRIERS

Chair / *Presidente*: Daniele Cazzuffi (IT)

The Workshop will present some key issues to solve the problems, usually encountered in modern landfills, related to the need of increasing the volume of wastes to be stored in an already authorized plant and also to guarantee a satisfactory performance of the natural and/or synthetic materials used as barrier systems. In particular, some aspects related to the design and the construction of geosynthetic-reinforced structures to increase the landfill volume will be outlined, together with the presentation of some relevant recent European case-histories on such applications. *Full appetizer available on the website*

#### **Introductory lectures:**

*D. Cazzuffi, P. Recalcati (IT)*: Landfills volume increase with reinforced soil embankments: basic theory and case studies

*M. Regadio, J.A. Black, S. F. Thornton (UK)*: Comparison of different natural clays for their application as landfill liners

*Q. Wang, Q.Y. Xu, J.H. Ko (CN)*: Clogging characteristics of geotextiles in simulated bottom ash co-disposed landfill conditions

## **SESSION F15 / NATURISTA HALL / 9:00-10:40**

### **WORKSHOP: THE SCIENCE OF LANDFILL COMPLETION**

Chair / *Presidente*: Robert Gregory (UK)

Landfill surrender is regulated under very different regimes globally and even in different EU countries. While landfill is the default method of waste disposal in many countries, it can have long-lasting impacts which require management. As we move away from landfilling as the primary route for waste disposal, the science of landfill is no longer a priority in many countries. Do we just treat landfill as a subset of contaminated land, or do we use our existing knowledge to help bring these sites back into beneficial use with appropriate environmental management, that avoids long term financial and institutional management? This workshop seeks to get key researchers and influencers together to discuss the impacts of landfill processes on landfill surrender so that a policy agnostic, scientifically sound basis for landfill surrender might be developed.

#### **Introductory lectures:**

*R. Gregory (UK)*

The impact of LFG on landfill completion

*H. Robinson (UK)*

The impact of leachate on landfill completion

*O. Hjelmar (DK)*

The impact of groundwater protection on landfill completion criteria

*P. Kjeldsen (DK)*

The risk of low cellulose industrial waste landfills on landfill emissions

**10:40 - 11:10** Coffee break

## **SESSION F16 / NATURISTA HALL / 11:10-12:50**

### **SOLID WASTE MANAGEMENT IN EMERGENCIES**

Chair / *Presidente*: Roberto Raga (IT)

*M. Asari (JP)*

Preparation for disaster waste management in Japan and Pacific countries

*M.H. Park, J.Y. Kim (KR)*

Limitation of deterministic regression on flood waste quantity estimation in South Korea

*A. Messori, S. Suzuki, O. Hirata, A. Tanaka, R. Raga (IT)*

Disaster waste management, analysis and comparison of L' Aquila (Italy), Emilia (Italy) and Kumamoto (Japan) earthquake case studies

*M. Alamgir (BD)*

Challenges to combat environmental degradation due to Rohingya influx in Bangladesh

# FRIDAY OCTOBER 4 MORNING



## **SESSION G15 / IN ITALIANO / HELL'S KITCHEN / 9:00-10:40**

### **CIRIS - METODOLOGIA E AFFIDABILITÀ DEI DATI IGIENICO SANITARI**

Chair / *Presidente*: Margherita Ferrante (IT)

Per ridurre l'impatto dei rifiuti e promuovere l'uso efficiente delle risorse è importante diminuire i quantitativi di rifiuti prodotti, promuovere i rifiuti come risorsa e innescare uno smaltimento dei rifiuti sicuro. Tutto ciò non potrà essere realizzato senza prima avere chiari quali siano gli effetti dei vari tipi di trattamento sull'ambiente e sulla salute. Proprio per questo la sessione è dedicata alla comprensione dei dati sanitari e delle metodologie corrette per la produzione di dati attendibili e per la determinazione del nesso di causa effetto per la valutazione degli impatti ambientali e sanitari.

#### **Relazione introduttiva:**

*M. Vinceti (IT)*

Rifiuti, ambiente e salute umana: metodologie di raccolta e analisi dei dati

*E. Beccaloni (IT)*

Valutazioni sanitarie nel riutilizzo dei fanghi di depurazione

*F. Di Maria (IT)*

L'effetto della Normativa sull'evoluzione delle tecnologie di riduzione degli inquinati dall'incenerimento dei rifiuti

**10:40 - 11:10** Coffee break

## **SESSION G16 / IN ITALIANO / HELL'S KITCHEN / 11:10-12:50**

### **WORKSHOP: LA GESTIONE DEI RIFIUTI NEI GRANDI EVENTI SPORTIVI**

Chair / *Presidente*: Alberto Pivato (IT)

I grandi eventi sportivi, tra cui la prossima olimpiade invernale a Cortina, non sono solamente un'occasione - spesso unica - per esprimere i valori dello sport, né sono solamente un grande momento aggregativo e mediatico che consente di rendere visibile il proprio territorio, ma rappresentano anche una sfida impegnativa nella gestione dei rifiuti, sia liquidi che solidi, in un'ottica di sostenibilità ambientale dell'evento.

In questo workshop si discuterà dei seguenti argomenti:

- Vincoli ambientali e paesaggistici da analizzare per la realizzazione di specifici impianti (mobili o stabili) per la gestione dei rifiuti;
- Decentralizzazione o centralizzazione dei servizi;
- Modalità di attivazione di servizi straordinari di raccolta rifiuti;
- Nuove tecnologie sostenibili per la gestione dei rifiuti nei villaggi olimpici;
- Pianificazione territoriale ed urbanistica dei villaggi olimpici: aspetti architettonici nell'organizzazione della gestione dei rifiuti
- Comunicazione ed educazione come strategie per sensibilizzare il comportamento del pubblico, degli atleti e della popolazione residente in prossimità degli impianti verso una gestione più sostenibile dei rifiuti;
- Casi di studio di esperienze riuscite.

## SESSION H15 / BALDACCHINO ROOM / 9:00-10:40

### WORKSHOP: MEDICAL WASTE MANAGEMENT

Chair / *Presidente*: Tony L. Gladding (UK)

Medical waste is a growing waste stream, as healthcare services develops and the population grows there is a significant amount of hazardous material which needs to be managed in the correct manner. This workshop investigates the types of waste generated by medical establishments, and the current routes of disposal, including some of the latest technologies to not only safely dispose of that material but to obtain value from it.

#### Introductory lectures:

*Y. Hu, Y. Tian, D. Chen, J. Zhong, H. Zhang (CN)*

Medical waste management in China: a case study of the Yangtze River economic belt

*V.E. Messerle, A.B. Ustimenko, Z. Jankoski, R.V. Baimuldin (KZ)*

Numerical modeling of biomedical waste plasma processing in various gasifying agents

**10:40 - 11:10** Coffee break

## SESSION H16 / BALDACCHINO ROOM / 11:10-12:50

### WORKSHOP: X-RAY FLUORESCENCE FOR WASTE CHARACTERIZATION

Chair / *Presidente*: Florian Part (AT)

This workshop aims to introduce handheld X-ray Fluorescence (hXRF) instruments, as a tool for rapid analyses for solid waste characterisation. hXRF is a non-destructive and portable method for determining the elemental composition of diverse solid wastes - theoretically, it works for all elements with an atomic number > 8. This method allows to measure relatively large sample sizes in-situ and consequently allows to study the heterogeneity of diverse waste streams. The elemental composition of heterogeneous waste is an important parameter to make a decision on its further treatment. It can tell if a material contains valuable components suitable for recycling or if the sample is contaminated and must undergo a specific treatment before disposal. On the contrary to hXRF, standard lab equipment is located in laboratories. Consequently, samples have to be taken on-site, transferred to a lab and need to be prepared (e.g. using microwave-assisted digestion) prior to being analysed, for instance, via ICP-OES or GC-MS. Hence, days pass before an evaluation report is available to make a final decision on how to adequately treat a certain material charge... *Full appetizer available on the website*

#### Introductory lectures:

*C. Zafiu, A. Jandric, F. Part (AT)*: Applicability of portable X-ray fluorescence devices for waste characterisation: challenges and opportunities

*C. Zafiu (AT)*: Principles, limitations and available hXRF devices

*F. Part (AT)*: Application study on sewage sludge ashes

*A. Jandric (AT)*: Application study on plastics

# FRIDAY OCTOBER 4

## AFTERNOON

### CLOSING SESSION / CENTRAL HALL / 15:30-17:30

#### ROUND TABLE: WASTE AND HEALTH

Chair / *Presidente*: Rainer Stegmann (DE)

A modern waste management is primarily addressed to solve the health issues associated to an improper and informal waste management. But release of emissions from waste collection, treatment and disposal, including recycling, are often worrying for potential health impacts. While possible occurrence of serious adverse effects when toxic waste are involved have been documented there is lack of evidence of health effects in populations living nearby municipal solid waste (MSW) management plants. Nevertheless there is in several countries a public opinion strongly adversing different kind of MSW treatment solutions. This is also the result of a lack of knowledge sharing and discussion between the different involved disciplines. Consequently the scientific communities miss to provide robust information on these issues leaving so far the communication to informal organizations and groups, which often spread emotional and uncontrolled news which might give raise to prejudices and scaremongering.

This Round Table will try to focus on some questions: What is the state of art with the scientific research? How to better involve the scientific community in communicating to the public opinion? How to cooperate among the different disciplines involved in the waste and health issues?

#### Invited speakers:

Muhammed Alamgir, *Khulna University of Engineering & Technology (BD)*

Jim Bridges, *University of Surrey (UK)*

Willam Clarke, *University of Queensland (AU)*

Raffaello Cossu, *University of Padova (IT)*

Margherita Ferrante, *University of Catania (IT)*

Evangelos Gidaracos, *Technical University of Crete (GR)*

Tony Gladding, *Open University (UK)*

Paolo Russo, *Italian Parliament (IT)*

Rainer Stegmann, *Technical University of Hamburg (DE)*

Marco Vinceti, *University of Modena-Reggio Emilia (IT)*

### CLOSING SESSION / CENTRAL HALL / 17:15-19:30

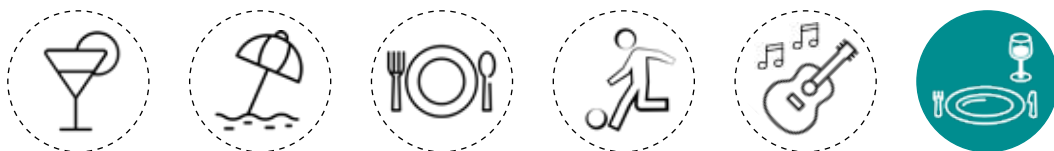
#### FAREWELL CEREMONY FOR RETIRING: PROF. EVANGELOS GIDARAKOS

Prof. Evangelos Gidaracos is retiring this September from the Technical University of Crete (Greece) after 18 years of teaching and researching at the School of Environmental Engineering. Among others, within this period he managed to create strong bonds between his institute and IWWG, through the organization of a biannual international conference on Industrial and Hazardous Waste Management on Crete and his position as a Board Member, TG Leader, TG Leaders Chair and future President. Join the farewell ceremony for his retirement, organized by colleagues and partners who had the honor to work with him and are willing to reveal his work and personality.



# FRIDAY OCTOBER 4

## SOCIAL EVENT



### **GALA DINNER / WHITE HALL FORTE VILLAGE** **CENA DI GALA / SALA BIANCA FORTE VILLAGE** **H. 21:00**

To celebrate the closure of the conference week all delegates are invited to a formal dinner in the elegant Sala Bianca at Forte Village, next to the Oasis swimming pool. Entrance to the Gala Dinner is by invitation only - these should be collected from the Secretariat starting from Wednesday 2nd October. The cost of the Gala Dinner is included in the registration fee for Symposium participants. Tickets for non-delegates should be purchased from the Secretariat. During the dinner the 2019 "Life for Waste" Award will be officially presented, and best paper awards delivered to the winners of the different categories. Dark suit would be appreciated. Live music will accompany the evening.

*Nella serata di venerdì, a conclusione dei lavori, è tradizione ormai consolidata che i partecipanti siano invitati a prendere parte alla Cena di Gala che si svolge nell'elegante Sala Bianca del Forte Village.*

*Il costo della Cena di Gala è incluso nella quota di iscrizione al Simposio. I partecipanti potranno ritirare il proprio invito rivolgendosi allo staff presente al banco registrazioni del Simposio a partire da mercoledì 2 ottobre. Presso il banco registrazioni saranno inoltre in vendita biglietti per eventuali accompagnatori non iscritti al Simposio.*

*Durante la cena sarà consegnato il premio "Una vita per i rifiuti" e saranno, inoltre, annunciati i vincitori dei premi per i lavori migliori presentati durante il Simposio.*



# POSTER SESSIONS

## SESSIONI POSTER

Poster presentations will be accessible to Symposium delegates at all times. Poster discussion will take place in the presence of authors in the afternoon from Monday to Thursday from 17:10 to 17:40.

*Le presentazioni poster saranno sempre accessibili ai partecipanti al Simposio. La discussione dei poster avverrà alla presenza degli autori dal lunedì, al giovedì pomeriggio dalle 17:10 alle 17:40.*

### A. GENERAL ASPECTS

**A01** / J.E.S., Santos, A.G.H.P. Van Elk, J.A Ferreira (BR)

Challenges for the implementation of the national solid waste policy in Brazilian municipalities, case study of São Gonçalo, Rio de Janeiro

**A02** / V. Nevrlý, R. Šomplák, V. Smejkalová (CZ)

Saving of ghg by modifying schedule of waste collection routes

**A03** / R.S. Magalhães, S.R. Teixeira, G.T.A. Santos, L.F. Santos, N.F.G. Silva, A.E. Souza (BR)

Characterization of spent foundry sand in development of glass-ceramic

**A04** / C. Hoysall, B.S. Jai Prakash (IN)

Froths, fires and fights over sustainability of Bellandur Lake - A case for intensive environmental detectivism

**A05** / I. Dudar, O. Yavorovska (UA)

Method of efficient allocation of facilities of the municipal solid waste system on the city plan

**A06** / A.L.F.M. Conde, J. Tonnera Jr, J.C. Campos, B.R. Quintaes (BR)

Physical characterization of the urban solid waste generated in different cities of Rio de Janeiro State, Brazil

**A07** / P. Berenjkar, Y. Y. Li, Q. Yuan (CA)

A review of the application of system dynamics method on waste management practices

### B. RECYCLING

**B01** / A. Mikelionienė, D. Vaičiukynienė, A. Augonis, E. Ivanauskas, J. Mockienė, V. Sasnauskas (LT)

The use of zeolitic waste with ammonium ions in cement systems

**B02** / L.F. Santos, S.R. Teixeira, R.S. Magalhães, G.T.A. Santos, S.S. Barreto, A.E. Souza (BR)

Characterization and reutilization of spent foundry sand in the production of rectangular concrete blocks for interlocked pavement

**B03** / J. Li, S. Yoshi, S. Riya, A. Terada, M. Hosomi (JP)

Zero-valent iron addition and dry magnetic separation for the treatment of geogenic arsenic-contaminated excavated sedimentary rocks in Japan: a case study

**B04** / M. Sarkkinen, K. Kujala, S. Gehör (FI)

Enhanced binder efficiency through waste based composites applied for road stabilization

**B05** / *V. Ocheretnyj, S. Sevastianov, O. Yavorovska (UA)*

Perspective use of thermal insulation materials from waste for high rise building

**B06** / *M.P. Maniscalco, D. Ticali, R. Volpe, A. Messineo (IT)*

Effect of CO<sub>2</sub> activation parameters on the electrosorption capacity of biomass-derived electrodes in CDI applications

**B07** / *F. Zimmermann, M. Lecler, F. Clerc, J. Grosjean (FR)*

Assessing and reducing chemical risk in weee recycling sectors in France

**B08** / *M. Rouskova, S. Sabata, O. Solcova, J. Hanika (CZ)*

Recycling of bio-elements from waste chicken feather

**B09** / *M. Regadio, J.A. Black, S.F. Thornton (UK)*

High attenuation recycling materials as landfill liners: the HARM project

**B10** / *V. Starostina, A. Kurina, E. Zelinskaya, N. Tolmacheva, A. Garashchenko (RU)*

The use of ash-and-slag waste as raw materials for the production of environmentally friendly building materials

**B11** / *G. M. P. Kumara, A. Matsuno, T. T. V. Nga, N. H. Giang, K. Kawamoto (JP)*

Simultaneous removal of Pb(II) and Cd(II) from binary and multi-metals solutions using autoclaved aerated concrete and steel slag grains as low-cost adsorbents

**B12** / *A. Oumarou Amadou, G. P. De Gaudenzi, G. C. Marcheselli, M. Piredda, A. Serpe (IT)*

A new sustainable approach in recovering cobalt from "hard metal" production by-products

**B13** / *P. Reddy, N. Mahdjoub, C. Trois (ZA)*

The use of municipal waste in the construction of smart pavements as a waste diversion strategy

## C. BIOLOGICAL TREATMENT

**C01** / *É. Dumont, S. Lagadec, N. Guingand, L. Loyon, A. Amrane, V. Couroussé, C. Gardin, A. Couvert (FR)*

Control of biotrickling filters treating NH<sub>3</sub> emissions from animal houses using electrical conductivity measurement

**C02** / *Y. Smyatskaya, N. Politaeva, A. Chusov, I. Atamaniuk, A. Kosheleva (RU)*

Utilization of microalgae residues as sorbents for removal of heavy metals from (industrial) wastewater

**C03** / *E.O. Silva, C.F. Mannarino, F.V. Correia, E.M. Saggio (BR)*

Waste poultry litter contaminated to antibiotics and their toxicity on earthworms *Eisenia andrei*

**C04** / *L.M.R. Gaspar, C.T. Inácio, B.R. Quintaes, H.L. Silva, A.A.C. Peres (BR)*

Management and quality tools applied to agribusiness waste management

**C05** / *I. Wojnowska-Baryła, D. Kulikowska, K. Bernat (PL)*

Biodegradability and compostability of biobased products

# POSTER SESSIONS

## SESSIONI POSTER

**C06** / *D.R. Lapen, N. Gottschall, M. Edwards, I. Khan, E. Craiovan, S.K. Frey (CA)*

Using drinking water treatment plant sludge in woodchip bioreactors to reduce nitrogen, phosphorus, pathogens, and veterinary antibiotics in agricultural drainage

**C07** / *É. Dumont, S. Lagadec, N. Guingand, L. Loyon, A. Amrane, V. Couroussé, C. Gardin, A. Couvert (FR)*

Nitrogen mass balance of a biotrickling filter treating NH<sub>3</sub> emissions from pig house

**C08** / *J. Rusin, K. Chamradova (CZ)*

Dry anaerobic digestion of biowaste from maintenance of urban greenery in novel rotary bioreactor

**C09** / *K. Chamradova, J. Rusin (CZ)*

Aerobic fermentation of grass cuttings in a rotary bioreactor

**C10** / *K. Bernat, I. Wojnowska-Baryła, A. Cydzik-Kwiatkowska, M. Zielińska, M. Zaborowska (PL)*

Valorisation of leachate from stabilization of organic fraction of municipal solid waste

**C11** / *K. Bernat, M. Zielinńska, A. Cydzik-Kwiatkowska, I. Wojnowska-Baryła, P. Tomalska (PL)*

Co-fermentation of crude glycerol and leachate from stabilization of organic fraction of municipal solid waste

### D. THERMAL TREATMENT

**D01** / *A. Kielė, D. Vaičiukynienė, A. Kantautas, D. Nizevičienė, V. Bocullo, R. Bistrickaitė (LT)*

Alkali activated biomass bottom ash and zeolitic waste

**D02** / *E. Hroncová, J. Ladomerský (SK)*

Two stage process of unused pentosan raw material transformation to 2-furaldehyde and biochar

**D03** / *B. Grycova, A. Pryszcz, V. Blahuskova, P. Lestinsky (CZ)*

Waste incineration products stabilizing with regard to legislative requirements

**D04** / *V. Blahuskova, J. Vlcek, M. Topinkova (CZ)*

Evaluation of solid residues after incineration of waste

### E. LANDFILLING

**E01** / *A. M. Costa, M. R. S. Valentim, L.F. Silva, S.D.A. Daflon, B.R. Quintaes, J.C. Campos (BR)*

Ecotoxicological evaluation of the contamination potential of leachate from Brazilian landfills: comparison between closed and active landfill

**E02** / *K. Ishii, T. Furuichi (JP)*

A simple box model for watering control in closed system disposal facilities

**E03** / *L. Liu, X. Zhang, Y. Tian, Y. Wan (CN)*

Degradation phase and stabilization evaluation in long term aeration in an old landfill

**E04** / R. De Almeida, F.A. Oroski, J.C. Campos (BR)

Techno-economic assessment of the nanofiltration in the treatment of landfill leachate

**E05** / S. Junior, C. Mannarino, E. Saggiaro, F. Correia (BR)

Ecotoxicological evaluations of landfill leachate on *Eisenia andrei*

**E06** / G. Gomes, A.S. Argolo, C.F. Mannarino, D.M. Bila (BR)

Estrogenic activity in dissolved and particulated phase from landfill leachate

**E07** / C. Neculau, F. Nguyen, D. Caterina, I. I. Manrique and the RAWFILL team (BE)

Innovative landfill characterization - Oriented landfill mining

**E08** / A.F.C. Klink, A.G.H.P. Van Elk, J.C. Silva (BR)

Monitoring and prediction the long-term settlement in Nova Iguaçu sanitary landfill, Rio de Janeiro, Brazil

**E09** / G.D.C. Anjos, R.S. Chalegre, D.M. Bila, J.C. Campos (BR)

Evaluation of landfill leachate treatment using activated sludge with addition of powdered activated carbon and zeolite

**E10** / J.C. Campos, V.A. Ferreira, A.M. Costa, J.M.S. Couto (BR)

Evaluation of the reduction of landfill leachate ecotoxicity after adsorption with activated carbon as pre and post-treatment to biological process

**E11** / Y. Matsufuji, S. Hoshino, T. Mito, A. Tachifuji (JP)

Rehabilitation of landfill site by "Fukuoka method" in Addis Ababa, Ethiopia

**E12** / K. Berger, S. Melchior (DE)

Soil temperatures in landfill cover systems – Measurement results from Hamburg, Germany

**E13** / T.S.M.M. Kamiji, F.J.P. De Oliveira (BR)

Evaluation of operational and safety aspects of Brazilian sanitary landfills

**E14** / D. Rakic, I. Basaric, J. Jankovic, T. Djuric (RS)

The importance of geotechnical investigations for the construction of transfer station "Prelici" on landfill in Cacak - Serbia

**E15** / S. Melgaço, V.P.R. Batista, D.M. Bila, E. Ritter (BR)

Sorption of organic and inorganic leachate contaminants by soil

**E16** / G. Feuillade-Cathalifaud, V. Pallier, E. Redon (FR)

Evaluation of the impact of leachate recirculation on the emission of pollutant from fresh and old wastes: pilot-scale study

## F. INDUSTRIAL WASTE AND CONTAMINATED SITES

**F01** / B. Ebin, M. Petranikova, D. Klinar, M. Kosir, P. Angelopoulos, K. Grossman, R. Geurts, M. Halilovic, P. Davris (SE)

Detoxification and recovery of spent pot linings (SPL) from aluminum production

**F02** / M. F. Godoy León, G. A. Blengini, J. Dewulf (BE)

Data collection and data quality assessment for cobalt

# POSTER SESSIONS

## SESSIONI POSTER

**F03** / *S. Saetta, F. Di Maria, V. Caldarelli, S. Tapola (IT)*

Improve the use of natural resources: inorganic binders in iron and steel foundries - Case of the Green Foundry LIFE project

**F04** / *S.B. Zueva, I. Birloaga, F. Ferella, E.V. Baturina, V. Corradini, F. Veglio (RU)*

Mitigation of fluorine-containing waste resulting from chemical vapour deposition used in manufacturing of silicon solar cells

**F05** / *I. De Michelis, S.B. Zueva, V. Corradini, V. Innocenzi, N.M. Ippolito, M. Prisciandaro (RU)*

Effect of high concentration of tetramethyl ammonium hydroxide on the biological kinetic of sewage sludge

**F06** / *A. G. Ramu, G. Muthuraman, I.-S. Moon (KR)*

Homogeneous electron mediators for ambient temperature degradation of gaseous chlorobenzene by electroscrubbing

**F07** / *M. Lecler, F. Zimmermann, E. Silvente (FR)*

Improving the work environment in the fluorescent lamp recycling sector by optimizing mercury elimination

**F08** / *G. Ascensão, F. Faleschini, J. Vleugels, H. Rahier, M. Marchi, M. Segata, Y. Pontikes (IT)*

The effect of polypropylene glycols on the properties of Fe-rich alkali activated materials

**F09** / *F. Kastanek, Y. Maletserova, H. Snajdaufova, O. Solcova (CZ)*

Removal of hazardous substances from soils and underground water in field conditions

**F10** / *Y. Maletserova, K. Demnerova, F. Kastanek, O. Solcova (CZ)*

Biodegradation of phenol adsorbed on soil

**F11** / *M.L. Franchi, F. Franceschini, R. Petrini, R. Giannecchini, A. Staiano (IT)*

Arsenic contamination in domestic wells in the Southern Versilia (Tuscany): investigation and hypothesis on origin and causes

**F12** / *W. Wan, Y. Xing, W. Chen (CN)*

A manganese-oxidizing bacterial consortium presenting good performance of dye decolorization and heavy metal ion adsorption biological treatment