

*IWWG - International Waste Working Group  
University of Padova  
Hamburg University of Technology*

## SARDINIA2009



*TWELFTH INTERNATIONAL  
WASTE MANAGEMENT  
AND LANDFILL SYMPOSIUM*

*5 - 9 OCTOBER 2009*

# SYMPOSIUM PROGRAMME

# SARDINIA 2009

*Twelfth International Waste Management and Landfill Symposium*

Dodicesimo Simposio Internazionale sulla Gestione dei Rifiuti e sullo Scarico Controllato

*5-9 October 2009*

*S. Margherita di Pula (Cagliari), Sardinia, Italy*

*Organised by / Organizzato da:*

IWWG - International Waste Working Group

*With the scientific support of / Con il supporto scientifico di:*

University of Padova, IMAGE Department (IT)

TUHH - Hamburg University of Science and Technology (DE)

*With the support of / Con la partecipazione di:*

European Commission

US-EPA, Environmental Protection Agency (US)

Regional Government of Veneto - Environmental Policy Department (IT)

Regional Government of Sardinia - Department of the Environment (IT)

*Promoted by / Promosso da:*

ADEME - Agence de l'Environnement et de la Maitrise de l'Energie, France

ANDIS - National Association of Sanitary Engineering, Italy

ATEGRUS - Technical Association for the Waste Management and the Environment, Spain

ATIA - Italian Association of Environmental and Sanitary Engineering

CIWM - Chartered Institution of Wastes Management, UK

Danish Environmental Protection Agency

ESA - Environmental Services Association, United Kingdom

IGS - International Geosynthetics Society

IWMSA - Institute of Waste Management South Africa

JSWME - Japan Society of Waste Management Experts

LSA - The Landfill Systems & Technology Research Association of Japan

WMAA - Waste Management Association of Australia



*Under the patronage*

*of the President of the Regional Sardinian Council*

Col patrocinio

della Presidente del Consiglio Regionale della Sardegna

## PRESENTATION

*Waste management strategies and technologies are currently undergoing rapid development. The Sardinia Symposia were established in order to make knowledge and experiences in this field readily available. The Symposia have become the Reference Forum, where leading experts meet and present their research activities and experiences and discuss new concepts and technologies. The Symposia have witnessed and contributed worldwide to the development of modern waste management strategies such as the integrated waste management hierarchy, recovery of energy and sustainable landfilling. The eleventh Symposium was held in October 2007 in the traditional venue of the Forte Village Complex at S.Margherita di Pula (Cagliari), with an attendance of approximately 1000 delegates from approx. 80 different countries.*

*The Symposium focuses on innovative aspects of Sustainable Waste Management, presenting new technologies, describing the state of the art and related case studies, discussing controversial subjects, sharing experiences among different countries and evaluating social and economical balances.*

*The Symposium includes oral presentations, poster sessions, specialized sessions and specific workshops. In accordance with a consolidated tradition, the Symposium will be opened by an introductory lecture not strictly linked to sanitary landfilling. The twelfth edition will be opened by the renowned economist Prof. Thomas C. Kinnaman with a lecture on "Waste and the Economy".*

## PRESENTAZIONE

Le strategie e le tecnologie per la gestione dei rifiuti sono in continua evoluzione a livello internazionale. I Simposi Sardinia sono stati istituiti con lo scopo di rendere facilmente disponibili le conoscenze e le esperienze nel campo della gestione dei rifiuti e dello scarico controllato. I Simposi sono divenuti il Forum di riferimento per gli esperti del settore e hanno testimoniato e contribuito allo sviluppo dei moderni concetti di gestione integrata dei rifiuti con recupero di materiali ed energia e di smaltimento sostenibile dei residui. L'undicesima edizione del Simposio si è svolta nell'ottobre 2007 e ha visto la partecipazione di circa 1000 delegati provenienti da 80 paesi diversi.

La dodicesima edizione sarà incentrata sulle innovazioni nella gestione dei rifiuti, con la presentazione di nuove tecnologie e casi di studio, con momenti di discussione sugli aspetti più controversi e di confronto di esperienze a livello internazionale.

Il Simposio è strutturato in presentazioni orali, presentazioni poster, sessioni specializzate e workshop. Secondo una tradizione ormai consolidata, il Simposio verrà inaugurato con una relazione di apertura non strettamente legata ai rifiuti. La dodicesima edizione verrà aperta dal Prof. Thomas C. Kinnaman, che terrà una lezione su "I rifiuti e l'economia".

## THE SYMPOSIUM STRUCTURE

*The Symposium is structured in two General Sessions (A and B), five Specialized Sessions and Workshop Sessions (C, D, E, F, and G) for a total of seven parallel tracks. Additionally, this year for the first time ever, an eighth session will be held entirely in Italian to facilitate participation by local experts and administrators.*

*General Sessions A and B are usually attended by a considerable number of delegates and contributions within these sessions (20 minutes) are presented following a strict schedule, in order to enable delegates to plan participations adequately. Twenty minutes are devoted to discussion.*

*Topics discussed during Sessions A and B will be examined in greater detail during Specialized Parallel Sessions and Workshop Sessions. In Specialized Sessions shorter lectures (15 minutes each) are scheduled. Session G and part of Session F are dedicated to Workshops and are primarily addressed to experts on the specific topics. Introductory presentations are included in order to open discussion on more controversial aspects.*

*A final report will be presented during the Closing Session of the Symposium.*

## LA STRUTTURA DEL SIMPOSIO

Il Simposio è strutturato in due Sessioni Generali (A e B), cinque Sessioni Specializzate e Sessioni Workshop (C, D, E, F e G) per un totale di sette sessioni parallele in lingua inglese. In questa edizione è inoltre in programma una ottava sessione interamente in italiano introdotta per facilitare la partecipazione di esperti e operatori locali.

Le Sessioni Generali A e B vedono tradizionalmente la partecipazione di un gran numero di delegati; le relazioni presentate all'interno di tali sessioni avranno durata di venti minuti secondo un programma preciso e alla conclusione delle presentazioni saranno riservati 20 minuti alla discussione.

Gli argomenti discussi durante le sessioni A e B troveranno approfondimento nelle Sessioni Specializzate e nei Workshop. Nelle Sessioni Specializzate sono previste relazioni più brevi (15 minuti) e più spazio è dedicato alla discussione. I Workshop, svolti nella sessione G e parte della sessione F, sono prioritariamente rivolti ad esperti del settore specifico e sono strutturati allo scopo di stimolare il dibattito dopo una o più relazioni introduttive.

Durante la Sessione di Chiusura gli aspetti di maggior interesse emersi durante il Simposio saranno presentati con brevi relazioni dei presidenti delle sessioni.

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**DAILY PROGRAMME  
Monday October 5th - Morning**

**8:30 - 13:00**

*Registration / Registrazione*

**OPENING SESSION / SESSIONE DI APERTURA**

*Central Hall / Sala Centrale*

*Chairman / Presidente: R. Cossu (IT)*

**9:00 - 10:00**

*Welcome address / Saluti di benvenuto*

**Opening Lecture / Relazione di apertura**

**10:00 - 10:50**

*T.C. Kinnaman (US)*

*Waste and the economy*

**10:50 - 11:20**

*Coffee Break / Pausa*

**Introductory presentations / Relazioni introduttive:**

**11:20 - 11:50**

*J. Diaz del Castillo (ES)*

*The EU Landfill Directive: 10 years on*

**11:50 - 12:20**

*J. Bogner (US)*

*Waste management and global climate change*

**12:20 - 13:00**

*Discussion / Discussione*

SESSION A1 - Central Hall

### **Waste Management Strategies**

*Chairman: R. Stegmann (DE)*

**15:30 - 15:50**

*B. Bilitewski (DE)*

Safety assessment of consumer goods of recovered material in the perspective of circular economy at global scale - a new challenge

**15:50 - 16:10**

*M. Herczeg and A. Reichel (DK)*

Effectiveness of municipal waste management policies in Europe

**16:10 - 16:30**

*M. Yamada, K. Kawai, T. Ishigaki and M. Osako (JP)*

Waste stream diagram and transition of waste management in the world

**16:30 - 16:50**

*S. Tunesi and Y. Rydén (GB)*

Comprehensive assessment of WM strategies in England: the North London waste authority case

**16:50 - 17:10** Discussion

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION A2 - Central Hall

### **Support tools in waste management decisions (I)**

*Chairman: C. Visvanathan (TH)*

**18:00 - 18:20**

*A. Morrissey, D. Murphy and G. Foley (IE)*

The use of decision support tools in managing waste management decisions

**18:20 - 18:40**

*D. Tonini, S. Manfredi and T.H. Christensen (DK)*

Landfilling of individual waste fractions: contribution to the environmental impacts in a life cycle perspective

**18:40 - 19:00**

*T. Ekvall, A. Björklund, O. Eriksson, M.L. Söderman, G. Östblom, M. Sjöström, Å. Stenmarck and J.O. Sundqvist (SE)*

Modelling to assess policy instruments

**19:00 - 19:20**

*S. Vaughan-Jones, S. Chackiath and A. Street (GB)*

Risk sharing in waste management projects

**19:20 - 19:40** Discussion

SESSION B1 - Panorama Hall

### **Landfill regulation issues**

*Chairman: L. Butti (IT)*

**15:30 - 15:50**

*O. Hjelmar and J.G. Hansen (DK)*

Implementation of the EU testing requirements for characterisation of waste for landfilling

**15:50 - 16:10**

*A. Budka, C. Bloquet, D. Presse and T. Gisbert (FR)*

The new landfill management ways in development in relation with the evolution of the legislative and economical context

**16:10 - 16:30**

*C. Scheutz, P. Kjeldsen, C. Trolle and H. Scharff (DK)*

The Danish method for emission reporting to PRTR from waste disposal sites

**16:30 - 16:50**

*V. Bretti, F. Belfiore, M. Dragan and G. Borgonovo (IT)*

A GIS application for environmental and operational data management in landfill sites

**16:50 - 17:10** Discussion

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION B2 - Panorama Hall

### **Sustainable landfilling**

*Chairman: R. Cossu (IT)*

**18:00 - 18:20**

*V. Vigneron, A. Budka, E. Jimenez, H. Hermkes, A. Rospars, B. Jean and P. Belbeze (FR)*

Bioreactor landfill: a sustainable waste treatment process

**18:20 - 18:40**

*G. Feuillade, A. Parodi and E. Redon (FR)*

Relation between organic matter Properties in leachate and biogas production from MSW landfilling

**18:40 - 19:00**

*W. Van Vossen, K.U. Heyer and H. Woelders (NL)*

Feasibility study of sustainable emission reduction at the existing landfills Wieringermeer and Kragge in the Netherlands: processes in the waste body and design and costs of enhancing measures (infiltration/aeration)

**19:00 - 19:20**

*C. Coubert, M. LHuillier, C. Couturier, V. Fairy and S. Lecoq (FR)*

Bioreactor and biogas recovery: a sustainable landfill concept for municipal waste in the Tarn Department (France)

**19:20 - 19:40** Discussion

SESSION C1 - Chiesa Room **15:30-17:10**

### **Management of special waste (I)**

*Chairman: F. Lombardi (IT)*

*D. Banemann, H. Lindorfer and M. Nelles (DE)*

Treatment pathways of different agricultural and industrial organic by-products

*K. Sakaguchi-Söder and J. Jäger (DE)*

A new tool to assess the efficiency of biological, chemical, or thermal treatment system for waste with chlorinated compounds

*R. Leduc and C. Belabid (CA)*

Biosolids conditioning and dewatering for MSW landfilling: a comparison between a synthetic and a biopolymer

*G. Valentini, F. Braca, M. Calderisi, A. Cecchi, L. Cursi, E. Marconi, R. Morreale, S. Lena and R. Rocchi (IT)*

A statistical multivariate approach for the control of waste fluxes at a waste stabilisation plant

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION C2 - Chiesa Room **18:00-19:40**

### **Construction and demolition waste**

*Chairman: M. Yamada (JP)*

*K.R.A. Nunes and L. Schebek (DE)*

C&D waste in Rio de Janeiro city: experiences with new Brazilian legislation and standards

*N. Stirmer, D. Bjegovic and R. Roskovic (HR)*

Pilot project for construction and demolition waste recycling in Croatia

*E. Birlé, D. Heyer and M. Boso (DE)*

Earth works with contaminated soils and recycled materials of low permeability: principles of construction and large scale field test

*S.P. Fucale, T.C.R. Silva, R.A. De Medeiros Junior, A.D. Gusmão and S.R.M. Ferreira (BR)*

Laboratory analysis on feasibility of using recycled civil construction waste aggregate for soil improvement in foundation works

SESSION D1- Naturista Room **15:30-17:10**

### **Landfill modelling**

*Chairman: A. Haarstrick (DE)*

*J.R. McDougall (GB)*

Waste heterogeneity; an obstacle to models?

*J. Lamborn (AU)*

Conversion of municipal solid waste fractions into model inputs

*T. Ricken, M. Robeck and R. Widmann (DE)*

A 3D finite element simulation of biological conversion processes in landfills using a multiphase model based on the theory of porous media

*V. Kruse, U. Kowalsky, D. Dinkler and S. Bente (DE)*

Coupling biodegradation models of varying complexity with transport processes in landfills

*R. Beaven (GB)*

A challenge to modellers to predict the performance of a landfill cell

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION D2- Naturista Room **18:00-19:40**

### **Use of waste materials in water treatment**

*Chairman: V. Belgiorno (IT)*

*F. Chazarenc, C. Barca, C. Gerente and Y. Andres (FR)*

The use of an industrial by-product (steel slag) as a reactive media to treat wastewater

*M. Aivalioti, N. Mavrikis and E. Gidarakos (GR)*

Municipal solid waste management and groundwater remediation - can there be a connection?

*V. Ribé, E. Nehrenheim, M. Odlare, S. Waara, L. Gustavsson and Å. Forsberg (SE)*

Using ecotoxicological tests in the development of a low-cost filtering system for landfill leachate

SESSION E1- Le Dune Room **15:30-17:10**

**Landfill gas oxidation in top cover**

*Chairman: C.F. Mahler (BR)*

*S. Bohn and J. Jager (DE)*

Microbial methane oxidation in landfill top covers- process study on an MBT landfill

*S. Dever, G. Swarbrick and R. Stuetz (AU)*

A simple carbon mass balance model for evaluating the field performance of a passive landfill gas biofilter

*C. Scheutz, A. Pedicone and P. Kjeldsen (DK)*

Evaluation of respiration based CO<sub>2</sub> emissions from compost landfill covers

*J. Gebert and A. Groengroef (DE)*

Role of soil gas diffusivity for the microbial oxidation of methane in landfill covers

*M. Gruyters, R. Widmann, T.C. Schmidt and M. Stephan (DE)*

Use of complementary research methods to evaluate the appropriateness of an interim coverage as a methane oxidation layer on a closed landfill

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION E2- Le Dune Room **18:00-19:40**

**Landfill gas emissions (I)**

*Chairman: P. Kjeldsen (DK)*

*O. Bour, I. Zdanévitch, M. Briand and L. Llinas (FR)*

Estimating methane emission and oxidation from two temporary covers on landfilled MBT treated waste

*P. Agamuthu and V. Navanani (MY)*

Bioremediation of landfill gas using bioreactor columns

*F. Straka, P. Lacek and M. Kunčarova (CZ)*

Landfill gas mitigation using biofilters

*I. Rachor, J. Streese-Kleeberg and J. Gebert (DE)*

Spatial and temporal variability of gas emissions from old landfills

*R.L.S. Izzo, V.P. Guedes, C.F. Tarazona, L.C. Almeida and C.F. Mahler (BR)*

New equipment for measuring gas flows in sanitary landfills

*J.L. Rose and C.F. Mahler (BR)*

Comparison of CH<sub>4</sub> oxidation rates in MSW compost, clay soil and a mixture of both

SESSION F1 - Edera Room **15:30-17:10**

**Design and long term performance of bottom liner**

*Chairman: S. Purdy (US)*

*B. Weiss, C. Tarnowski and S. Baldauf (DE)*

Evaluation of long-term behaviour of geosynthetics for a safe design and use of geosynthetic sealing systems on slopes

*J. Klompmaker (DE)*

Geosynthetics in landfill base lining systems

*G. Burkhardt, T.A. Egloffstein and A. Humeniuk (DE)*

Landfill liner systems - experiences in different countries and under different climatic conditions

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION F2 - Edera Room **18:00-19:40**

**Workshop: Landfill stability**

*Chairman: J.P. Gourc (FR)*

Stability of landfill (slope stability, cap settlement) is a recurring concern. Heterogeneity, wide granular distribution with coarse elements, large range of components and of the preparation before storage (shredding, PTMB,...) are typical characteristics of waste. Use of soil mechanical approach for design comes up against the difficulty of assessment of hydro-mechanical properties of waste as well from field tests as from laboratory tests. There is an actual need for a database related to the main properties of waste.

**Introductory lectures:**

*F. Kölsch and J. Bauer (DE)*

Static stability of landfills

*G. Ferreira Simões and M.A.N. Oliveira (BR)*

Preliminary application of debris flow concepts to municipal solid waste landfills

*G. Stoltz, K. Nousheen Arif, J.P. Gourc, F. Olivier and E. Redon (FR)*

Hydro-mechanical properties of MSW from laboratory tests following a deep drilling campaign

SESSION G1 - Gerani Room **15:30-17:10****Workshop: Food waste management***Chairman: P. Lechner (AT)*

Food is an essential part of our life as it covers physiological, social, cultural and psychological functions. The supply of food for human consumption implicates numerous research activities and considerable efforts in production, processing, distribution and trade. Indeed, food represents one of the most demanding products from a point of view of energy and resources. Moreover, food frequently features as a central theme in connection with ethics as well as social and environmental responsibility - as is the case with hunger, Fair Trade and organic food issues. Nevertheless a large quantity of still edible food is disposed of during all stages of production, distribution and usage. The majority is constituted by leftover food still suitable for human consumption. In addition to the social and ethical issues, considerable efforts are required in the correct handling of food residues in waste management. An unthinkable amount of edible food waste is landfilled worldwide and converted into methane. Thus, the high quality food produced in compliance with strict legal restrictions continues to contribute towards global climate change even at the end of life cycle.

**Introductory lecture:***F. Schneider and S. Lebersorger (AT)*

Households attitudes and behaviour towards wasting food - a case study

**17:10 - 17:40** Coffee Break**17:40 - 18:00** Poster discussionSESSION G2 - Gerani Room **18:00-19:40****IWWG Workshop:  
Industrial waste management***Chairman: E. Gidarakos (GR)*

The aim of this workshop is to explore, exhibit and debate the applied practices on industrial waste management, as they have been adopted by different countries of the world, with the view to determine the advantages, the limitations, as well as the applicability of each one. Industrial wastes represent a complex and demanding waste category that requires special attention and continuous study, in order to achieve the optimum management of each of their sub-category. Based on the existing experience, certain controversial issues have been raised, imposing the need for further research, assessment and evaluation. During this workshop, specialists from different backgrounds will be asked to overview and evaluate the existing picture on the field of industrial waste management. Hopefully, some useful conclusion for both scientists and practitioners will come out.

**Introductory lecture:***M. Cabiddu (IT)*

Underground waste disposal for coal by-products from power plant

SESSIONE italiana I1 - Sala Baldacchino **15:30-17:10****Ceneri e scorie da impianti di incenerimento***Presidente: M. Ragazzi**A. Dominijanni, G. Genon, P. Luciani, M. Maggiorotto, M. Manassero, F. Marchese, S. Puma, G.L. Soldi, M.C. Zanetti*

Smaltimento in discarica e riutilizzo di ceneri pesanti prodotte dall'incenerimento di combustibile derivato dai rifiuti e di rifiuti solidi urbani

*A. Poletti*

Stato dell'arte e prospettive di ricerca sulla gestione delle scorie di fondo dalla termovalorizzazione dei rifiuti

*R. Baciocchi, G. Costa, A. Poletti, R. Pomi*

Studio degli effetti della carbonatazione accelerata sul rilascio di metalli da ceneri di termovalorizzazione

*S. Rocca, E. Lategano, G. Costa, L. Galeotti, F. Lombardi*

Valutazione del possibile riutilizzo di scorie da termovalorizzazione di rifiuti: confronto tra due casi studio

*G. Cappai, S. Milia, A. Muntoni, M. Piredda*

Effetto della carbonatazione accelerata sulle scorie da termovalorizzazione dei RU e sulle singole frazioni granulometriche

**17:10 - 17:40** Pausa**17:40 - 18:00** Discussione posterSESSIONE italiana I2 - Sala Baldacchino **18:00 - 19:40****Produzione ed uso del CDR***Presidente: E. de Fraja Frangipane**U. Arena, L. Zaccariello, M.L. Mastellone*

Gassificazione a letto fluido di combustibili derivati da rifiuti

*R. Civita, G. Cornacchia, A. Donatelli, P. Iovane, M. Martino,**D.A. Matera, A. Russo*

Gassificazione di combustibile derivato da rifiuti (CDR) in un impianto pilota a tamburo rotante

*E.C. Rada, M. Ragazzi*

Criteri per valutare la fattibilità di un impianto su piccola scala per la bioessiccazione di rifiuti urbani finalizzata alla produzione di CDR per uso locale

*G. Caterina, E. Sartori, F. Giacomini*

Individuazione delle possibili destinazioni del CDR in ambito provinciale

SESSION A3 - Central Hall

### **Waste minimisation**

*Chairman: S. Thorneloe (US)*

**9:00 - 9:20**

*K. Strange, J. Cox, S. Giorgi, V. Sharp, D.C. Wilson and N. Blakey (GB)*

Investigating household waste prevention - A review of evidence

**9:20 - 9:40**

*T. Tasaki and H. Yamakawa (JP)*

A review of research approaches for waste prevention and reuse of waste

**9:40 - 10:00**

*M. Huber-Humer and P. Lechner (AT)*

Future visions: sustainable landfilling or a sustainable society without landfills?

**10:00 - 10:20**

*E. Finney and R. Cracknell (GB)*

Towards zero waste: a waste strategy for Wales

**10:20 - 10:40** Discussion

**10:40 - 11:10** Coffee Break

SESSION A4 - Central Hall

### **Waste generation and characterisation**

*Chairman: M. Nelles (DE)*

**11:10 - 11:30**

*P. Beigl and S. Lebersorger (AT)*

Forecasting municipal solid waste generation for urban and rural regions

**11:30 - 11:50**

*J. Parfitt and E. Bridgwater (GB)*

A review of municipal waste compositional data in the United Kingdom and the development of a new approach to national estimates

**11:50 - 12:10**

*R. Glanz and F. Schneider (AT)*

Causes of food waste generation in households

**12:10 - 12:30**

*K. Böhm (Meissl), E. Smidt and P. Lechner (AT)*

Waste characterization by means of infrared spectroscopy

**12:30 - 12:50** Discussion

SESSION B3 - Panorama Hall

### **Mechanical and hydraulic behaviour of waste**

*Chairman: D. Cazzuffi (IT)*

**9:00 - 9:20**

*S. Elagroudy, M. Abdel-Razik, M. Abd El-Azeem, F. Ghobrial and*

*M. Warith (EG)*

Effect of biological degradation on settlement of bioreactor landfills

**9:20 - 9:40**

*J.P. Gourc, M. Staub, M. Conte, H. Benbelkacem, R. Bayard and*

*E. Redon (FR)*

A biomechanical model to predict long-term secondary settlements of MSW - validation on large-scale trials

**9:40 - 10:00**

*H.J. Kim, D. Endo, M. Sato, T. Matsuo and T. Matsuto (JP)*

Estimation of water flow in a closed landfill by tracer test in gas vents and the change in leachate quality

**10:00 - 10:20**

*A.A. Siddiqui, D.J. Richards and W. Powrie (IN)*

A preliminary analysis of mechanically biologically treated waste: biodegradation and settlement behaviour

**10:20 - 10:40** Discussion

**10:40 - 11:10** Coffee Break

SESSION B4 - Panorama Hall

### **Landfill bottom liners**

*Chairman: J.P. Gourc (FR)*

**11:10 - 11:30**

*I. Djeran-Maigre, A.R. Razakamanantsoa, G. Banast and G. Didier (FR)*

Formulation methodology for bentonite and polymer treated soil used as hydraulic barrier

**11:30 - 11:50**

*S.F. Eldridge, J.J. Eldridge and A.P. Kortegast (NZ)*

Steep wall liner system design

**11:50 - 12:10**

*H. Aurinko and K. Kujala (FI)*

Contaminant transport in landfill bottom layer

**12:10 - 12:30**

*A. Ferrari, I. Pradella and P.P.F. Gouveia (BR)*

The study of three mineral barrier options for a sanitary landfill liner system

**12:30 - 12:50** Discussion

SESSION C3 - Chiesa Room **9:00-10:40**  
**Support tools in waste management decisions (II)**  
*Chairman: T. Ekvall (SE)*

*G. Barberio, P. Buttol and S. Scalbi (IT)*  
Life cycle assessment for waste valorization: a comparative analysis

*R. Galvez-Cloutier and R. Rodriguez (CA)*  
Using a multicriteria aid decision method “expert choice” to assess the best solid waste management plan for Zapotlan, Mexico

*A. Santamaria and F.G.A. Vagliasindi (IT)*  
Holistic solid waste management: a necessary paradigm to identify sustainable solutions

*F. Pantaleoni, A. Bonoli and M. Bergonzoni (IT)*  
The life cycle assessment of the production of sound-insulating panels

*A.M. Gatti, S. Montanari and F. Capitani (IT)*  
Traceability method to assess the environmental risk of a pollution source

**10:40 - 11:10** Coffee Break

SESSION C4 - Chiesa Room **11:10-12:50**  
**Waste strategies: case studies**  
*Chairman: S. Tunesi (GB)*

*C. Caramiello, L. Fabbri, M. Marzi and F. Tatano (IT)*  
Interaction “Tourism - MSW”: elaborations for the relevant case-study “Adriatic Riviera” (Province of Rimini, Italy)

*J.A. Bonander and P. Garbarino (US)*  
Productive franchising agreements between local governments and private ownership garbage/recycling companies benefit communities

*C.D.H. Wilson, I.D. Williams and S. Kemp (GB)*  
Compliance with water legislation in waste management facilities: experiences from UK small and medium-sized enterprises

*C. Niwagaba, U. Bagampaddle, H. Kalibbala, R. Kulabako, J. Kinobe, M. Ottaviani and R. Pomi (UG)*  
A pilot-scale study on the assessment of domestic organic waste processing in Kampala - Uganda

*A. Anić Vučinić and M. Zebić (HR)*  
Municipal solid waste management in the Republic of Croatia

*M.A. Moqsud, Q.S. Bushra, S. Hayashi and M.H. Rahman (JP)*  
Composting barrel for sustainable organic waste management in Bangladesh

SESSION D3 - Naturista Room **9:00-10:40**  
**Leachate generation and quality**  
*Chairman: H.D. Robinson (GB)*

*L. Rodriguez Ruiz, V.Y. Hoang, H. Jupsin and J.L. Vassel (BE)*  
A typology of leachates based on data from hundreds of sanitary landfills

*L. Badoil, D. Benanou and J.C. Tabet (FR)*  
Fractionation of waste landfill leachate organic matter for a deep characterization using high resolute mass spectrometry

*M. Rafizul, M. Alamgir, E. Kraft and G. Haedrich (BD)*  
Characterization of leachate generated from municipal solid waste in sanitary landfill lysimeter

*H. Modin, M. van Praagh and K.M. Persson (SE)*  
A modern landfill - experiences from Fläskebo landfill, Sweden

*A. Ilyas, M. Persson and M. van Praagh (SE)*  
Measurement of moisture content of waste materials with frequency domain reflectometry (FDR)

**10:40 - 11:10** Coffee Break

SESSION D4 - Naturista Room **11:10-12:50**  
**Leachate groundwater contamination**  
*Chairman: P. Kjeldsen (DK)*

*K. Haarstad, T. Mælhum and E. Bloem (NO)*  
Tracers in solid waste leachate

*T. Van Nooten, H. Sterckx, L. Diels, P. Verkaeren, L. Horckmans, D. Diricx and L. Bastiaens (BE)*  
Demonstration of a pilot-scale multibarrier for the semipassive in-situ treatment of landfill leachate contamination

*K.J. Tuttle and S.M. Hordnes (NO)*  
Design of a shorefront permeable reactive barrier for treatment of landfill leachate

*W.J. Van Vossen, F. Olie, H. Peperkamp and D.T. Folmer (NL)*  
New and practical approach for sustainable emission reduction of closed landfills based on natural biochemical processes: results of a full scale bioreactor project at the landfill “Vlagheide” in Schijndel (NL)

SESSION E3 - Le Dune Room  
**Landfill gas emissions (II)**

9:00 - 10:40

*Chairman: J. Streese-Kleeberg (DE)*

*A. Babilotte, R. Green, G. Hater, T. Watermolen and B. Staley (FR)*  
 Field intercomparison of methods to measure fugitive methane emissions

*A. Corti, L. Lombardi, G. Cenni, I. Pecorini and L. Burberi (IT)*  
 Experimental estimation of the residual landfill gas production from aerobically biostabilised organic fraction of municipal solid waste

*M.P. Fedorov, A.N. Chusov and V.I. Maslikov (RU)*  
 Model of environmental risk assessment of atmospheric air pollution by toxic gases emission from MSW landfills.

*F. Atabi, S.A.N. Harati and N. Qanbari Sagharlu (IR)*  
 Calculation of CH<sub>4</sub> and CO<sub>2</sub> emission rate in Kahrizak landfill site through LandGem mathematical model

*A. Corti, L. Lombardi and I. Pecorini (IT)*  
 Management conditions and diffused gas emission monitoring correlation in four non-hazardous waste landfills

10:40 - 11:10 Coffee Break

SESSION E4 - Le Dune Room

11:10-12:50

**Landfill gas emissions measurements**

*Chairman: J. Gebert (DE)*

*A. Kheffi, C. Collart, D. D'or, O. Bour, M. Garcia and V. Salpeteur (BE)*  
 Methodology developments for measuring biogas emissions from landfill surface

*J. Streese-Kleeberg, I. Rachor and R. Stegmann (DE)*  
 In-situ measurement of methane oxidation activity in landfill covers by gas push-pull tests

*H. Scharff and A. Hensen (NL)*  
 Further development of a cheap and simple methane emission measurement method

*T. Laurila, J.P. Tuovinen, J. Hatakka, M. Aurela, A. Lohila, T. Lamminpää, M. Etuala, A. Sjöberg, N. Honkala, M. Helkearo and I. Sundholm (FI)*  
 Methane and carbon dioxide emissions from a twelve-year-old landfill observed by a micrometeorological method and simulated by the IPCC first order decay method

*B. Capaccioni, C. Caramiello, G. Corigliano, S. De Rosa and F. Tatàno (IT)*  
 Accumulation chamber measurements of biogas fluxes: experimental indications from four years' application to a sanitary landfill in Marche Region (Italy)

SESSION F3 - Edera Room

9:00-10:40

**Workshop:  
 Siloxanes and corrosion problems in landfill gas**

*Chairman: M. Crest (FR)*

Different biogas conversion routes in operation and under development have specific requirements for biogas quality to ensure optimum efficiency and equipment life. One of the major problematic compounds in biogas is siloxanes. The origin and degradation processes leading to presence of siloxanes in LFG remain to be established and identification of treatment required is still lacking. Moreover, the detection and quantification of siloxanes remains uncertain, with discrepancies on optimal sampling procedure, sample preparation and analytical technique.

**Introductory lectures:**

*M. Crest, C. Chottier, P. Camacho, A. Ohannessian, V. Chatain and P. Germain (FR)*  
 Comparison of two analytical methods to quantify volatile organo silicon compounds (VOSiC) contents in landfill biogas

*A. Narros, M.I. Del Peso, G. Mele, M. Vinot, E. Fernández and M.E. Rodríguez (ES)*

Determination of siloxanes in landfill gas by adsorption on Tenax tubes and TD-GC-MS

*S. Mattersteig, L. Brunn, M. Friese and B. Bilitewski (DE)*  
 Organosilicon compounds in the exhaust gas of biological-mechanical treatment plants

10:40 - 11:10 Coffee Break

SESSION F4 - Edera Room

11:10-12:50

**Workshop: Health issues in waste management**

*Chairman: R. Cossu (IT)*

Waste management facilities play a central role in modern society in guaranteeing a correct, safe disposal of waste. Considerable emphasis is placed on technical, economical and social issues, in addition to sustainability in modern waste management strategies. Despite the latter, high concern may be manifested by citizens, political parties and associations. The aim of the workshop is to stimulate discussion on aspects of health-related and other controversial issues of modern waste management facilities.

**Introductory lectures:**

*ST. Kontogianni and A. Karagiannidis (GR)*  
 Assessing occupational health and safety factors in Hellenic waste management facilities

*S. Montanari and A.M. Gatti (IT)*  
 Prototypal procedure to assess the nanopathological risk caused by waste incineration

*A. Narros, M.M. Fuente, B. Collazos, M. Vinot, E. Fernández, R. Borge and M.E. Rodríguez (ES)*  
 In situ determination of VOC uptake-rates from MSW composting facilities

*D. Papadopoulos, A. Katsoulis, G. Bouboukas, O. Galenianou, G. Hantzoz, O. Skiadi and E. Stamatopoulou (GR)*  
 The operation experience of the medical waste incinerator of Attica region

SESSION G3 - Gerani Room **9:00-10:40****IWWG Workshop: Leaching tests (I)***Chairman: H.A. van der Sloot (NL)*

Standardised characterization leaching tests, such as the pH dependence leaching test (CEN/TS14429/CEN/TS14997, ISO TS 21268-4, EPA method 1313), the percolation test (CEN/TS14405, ISO/TS 21268-3, EPA method 1314) and the tank leach test (CEN/PrEN 15863, EPA Method 1315) are being recognized more and more as the proper tools to assess release of substance from granular materials (waste, slag, soil, sludge, sediment, compost, aggregates) and monolithic products (such as cement stabilized waste and construction products containing alternative materials). Unlike single step methods, the more detailed information from characterization is most suitable for evaluating waste treatment processes, long term behaviour of waste, evaluation of release from aftercare and possible reuse of waste in beneficial applications.

**Introductory lectures:***M. Van Praagh and K.M. Persson (SE)*

Sustainable waste management in the EU with some experience from Sweden

*S. Heuss-Asbichler, A. Heindl and D. Sager (DE)*

The effect of salt concentration in pore solutions of MSWI residues on the stability of ettringite and Friedel's salt

*S. Thorneloe, D. Kosson, G. Helms and A. Garrabrants (US)*

Improved leaching test methods for environmental assessment of coal ash and recycled materials used in construction

*O. Hjelmar (DK)*

Application of the column leaching test for characterisation of waste for landfilling or utilisation

*K. Lewin, J. Turrell, A. Godley, J. Frederickson, N. Blakey**and J. Gronow (GB)*

Characterisation of treated wastes - headlines and more questions

**10:40 - 11:10** Coffee BreakSESSION G4 - Gerani Room **11:10-12:50****IWWG Workshop: Leaching tests (II)***Chairman: H.A. van der Sloot (NL)*

In Session G4 the debate on leaching tests started in the previous Session G3 will be continued in order to draw conclusions to be presented in the Closing Session of the Symposium

SESSIONE Italiana I3 - Sala Baldacchino **09:00-10:40****Riqualificazione delle discariche (I)***Presidente: A. Magrini**E. Cossu, A. Artuso, M. Cannas*

Riqualificazione ambientale e funzionale della discarica di Scala Erre, Sassari

*G. Delbarba, S. Mazzata*

Un vigneto sulla discarica. Esperienza di un recupero ambientale in Franciacorta (BS)

*A. Segalini, M. Bergonzoni, E. Kekridou*

Ripristino ambientale e adeguamento della discarica per rifiuti solidi urbani di Keramoti (GR) alla normativa della comunità europea

*A. Levorato, A. Atzori, A. Moretto, M. Dal Prà*

Riqualificazione della ex discarica per rifiuti mediante realizzazione di un parco fotovoltaico: verifica delle caratteristiche del terreno e valutazione di impatto ambientale

*P. Simone, L. Nettuno, C. Zaninelli, M. Vercesi*

Progettazione partecipata dei bambini sull'area della discarica Vergomasco a Odolo, in Provincia di Brescia

*M. Montebelli, S. Di Nauta*

Terre e rocce da scavo in Italia: rifiuti o risorse? Evoluzione del quadro normativo nazionale e regionale, problematiche applicative e criteri di gestione

*A. Angeloni, A. Bavestrelli*

Bonifica e recupero ambientale dell'area mineraria di Baccu Locci nei territori dei comuni di Villaputzu e San Vito - Provincia di Cagliari

**10.40-11.10** PausaSESSIONE Italiana I4 - Sala Baldacchino **11:10-12:50****Riqualificazione delle discariche (II)***Presidente: A. Magrini*

Nella Sessione I4 si continuerà il dibattito sulla riqualificazione delle discariche iniziato nella Sessione precedente.

### SESSION A5 - Central Hall

#### **Waste collection: “Pay as you throw” principle**

*Chairman: I.D. Williams (GB)*

**15:30 - 15:50**

*S. Suzuki, A. Tachifuji and Y. Matsufuji (JP)*

Household behavior on combustible waste set-outs under “door-to-door” collection method with “pay-as-you-throw” system

**15:50 - 16:10**

*G. Delbarba and S. Mazzata (IT)*

COGEME management and global selective waste collection. A quality of life project for the territory

**16:10 - 16:30**

*A. Malamakis, A. Karagiannidis and G. Perkoulidis (GR)*

Simulation and assessment of alternative pay-as-you-throw scenarios aiming at maximizing municipal waste diversion by the resulting direct promotion of minimization and recovery schemes

**16:30 - 16:50**

*R. Gamberini, L. Galloni, B. Rimini, F. Beltrami and M. Ori (IT)*

Evaluation and comparison of waste collection services

**16:50 - 17:10** Discussion

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

### SESSION A6 - Central Hall

#### **Waste source segregation**

*Chairman: K. Strange (GB)*

**18:00 - 18:20**

*M. Ragazzi and E.C. Rada (IT)*

How high efficiency selective collection affects the management of residual MSW

**18:20 - 18:40**

*A. Bernstad, J. la Cour Jansen and H. Aspegren (SE)*

Local strategies for an efficient management of solid household waste - The full scale Augustenborg

**18:40 - 19:00**

*I.D. Williams and A. Culleton (GB)*

Manchester recycling for all: increasing participation in recycling by offering choice and alternatives to low recycling communities

**19:00 - 19:20**

*A. Bernstad, J. la Cour Jansen and H. Aspegren (SE)*

Influence of information strategies on waste recycling behavior - Evaluation of a full scale experiment

**19:20 - 19:40** Discussion

### SESSION B5 - Panorama Hall

#### **Leachate drainage**

*Chairman: A. Lagerkvist (SE)*

**15:30 - 15:50**

*H.G. Ramke (DE)*

Lechate collection systems in bottom liner systems

**15:50 - 16:10**

*J.M. Nash and M. Thom (AU)*

Recycled and natural crushed stone aggregate as an alternative leachate collection and drainage layer for solid waste landfills in NSW, Australia

**16:10 - 16:30**

*A. Hudson, R. Beaven, K. Knox and W. Powrie (GB)*

Investigation of the clogging of landfill tyre drainage layers

**16:30 - 16:50**

*F. Olivier, L. Oxarango, V. Mugnier, A.J. Tinet and M.A. Marcoux (FR)*

Estimating the drawdown of leachate in a saturated landfill: 3D modeling based on field pumping tests

**16:50 - 17:10** Discussion

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

### SESSION B6 - Panorama Hall

#### **Leachate recirculation**

*Chairman: K. Knox (GB)*

**18:00 - 18:20**

*J.C. Gourry, B. Chevrier, D. Guyonnet, S. Moreau and M. Lemunier (FR)*

Improving landfill leachate reinjection design by 3-D electrical resistivity tomography

**18:20 - 18:40**

*B.D. Ranzi, A.B. Castilhos Junior, E. D'Almeida Duarte and J. Tavares (BR)*

Evaporation phenomenon as a sustainable solution for landfill leachate treatment

**18:40 - 19:00**

*S. Moreau, B. Chevrier, F. Saidi, G. Buton and J.M. Bouye (FR)*

Using fiber optic to measure waste mass temperature: application to evaluate leachate recirculation network in landfill bioreactor

**19:00 - 19:20**

*P. S. Calabrò, S. Orsi, E. Gentili and C. Meoni (IT)*

The effect of recirculation of concentrated leachate: the case study of “Il Fossetto” landfill

**19:20 - 19:40** Discussion

SESSION C5 - Chiesa Room **15:30-17:10****Waste data base and material flow***Chairman: T. Matsuto (JP)**K. Blumenthal, C. Heidorn and W. Kloek (LU)*

The environmental data centre on waste

*K. Gaska and A. Generowicz (PL)*

Modeling of the integrated waste management systems using graph-oriented data structures

*K. Ishii, T. Furuichi, N. Tanikawa and K. Nakamura (JP)*

Study of nitrogen cycle related to waste biomass utilization by numerical simulations

*A. Cardoso and B. Mendes (PT)*

The Extended Producer Responsibility in waste streams - Portuguese approach

**17:10 - 17:40** Coffee Break**17:40 - 18:00** Poster discussionSESSION C6 - Chiesa Room **18:00-19:40****International waste management policy***Chairman: L.F. Díaz (US)**I. González, M. Rodriguez, D. Hernandez and A. Macht (MX)*

The modernization of waste management legislation in the State of Mexico, Mexico

*K. Kawai, M. Osako and M. Yamada (JP)*

Proposal for the evaluation indicators of municipal solid waste management in Southeast Asia

*M. Meissner, C. Pladerer and M. Koblmüller (AT)*

Waste management as a key issue for the sustainable European football championship UEFA Euro 2008™ in Austria and Switzerland

*G. Eörsi-Tóta, I. Tóth and G. Kiss (HU)*

Incineration versus landfill, technical, economic, and environmental comparison based on Hungarian experience

SESSION D5 - Naturista Room **15:30-17:10****Different landfill concepts***Chairman: J.Y. Kim (KR)**R. Thiel and T. Pilch (US)*

Case history of small community evaluation to long-haul waste vs manage a small landfill

*T. Chassagnac, I. Zdanevitch and O. Bour (FR)*

The 'sustainable confinement' concept, a management tool for polluted sites: case study at Fitiuu, French Polynesia

*E. Barnard and R. Fanni (ZA)*

Expansion of the Rooipoort landfill site - easy design?

*M. Scotto and L. Conti (IT)*

The use of a quarry as a landfill by the use of soil reinforced structures

*F. Moraci, N. Moraci, P.S. Calabrò and R. Lisi (IT)*

A complex evaluation procedure: the case study of the "Pace" landfill, Messina (Italy)

**17:10 - 17:40** Coffee Break**17:40 - 18:00** Poster discussionSESSION D6 - Naturista Room **18:00-19:40****Landfill risks detection and assessment***Chairman: R. Parker (AU)**M. Thom, F. MacGregor and J.M. Nash (AU)*

Comparative risk in landfill design and operation

*E. Davoli, M. Palmiotto, E. Fattore, V. Paiano, G. Celeste, R. Fanelli, A.N. Rossi, M. Il Grande, M. Giorgi, B. Burgio, G. Schembre and P.A. Tuttolomondo (IT)*

Integrated risk assessment of waste management: results from a two year follow-up of a municipal solid waste landfill

*N. Hoekstra, P. Kruiver, H. Kers, W. Van Vossen, H. Woelders and H. Oonk (NL)*

Throwing light into black boxes: using new characterization tools for risk assessment of abandoned landfills

*A. Schueler and C. Mahler (BR)*

Evaluation system for rating urban solid waste disposal sites for remediation and reuse

*P. Sander and C. Nielsen (SE)*

Hydrogeological investigations of a large abandoned landfill in Göteborg, Sweden

*M. Mohr and R. M. Rosendal (DK)*

Electronic reporting and information system for Danish landfills (ERISDA)

SESSION E5 - Le Dune Room 15:30-17:10

**Landfill gas emissions control**

*Chairman: P. He (CN)*

*R. Parker and J. Mackenzie (AU)*

Use of statutory environmental auditing to improve landfill performance

*M. Leppänen and J. Sarkkila (FI)*

Quality control of recycling materials used in landfill structures

*J. Rinkinen, J. Sikiö, J. Forsman, M. Uusihakala and R. Pammo (FI)*

Maintenance facilities at the Ämmässuo new bioreactor landfill

*M.R. Islam, M. Alamgir, W. Bidlingmaier, W. Stepniemski, E. Kraft, G. Haedrich and I.M. Rafizul (BD)*

Design and construction of pilot scale sanitary landfill in Bangladesh

17:10 - 17:40 Coffee Break

17:40 - 18:00 Poster discussion

SESSION E6 - Le Dune Room 18:00-19:40

**Odour control in waste management**

*Chairman: A. Bockreis (DE)*

*T. Zarra, V. Belgiorno and V. Naddeo (IT)*

New developments in odours impact assessment and control in waste management

*A. Segalini, M. Bergonzoni and M. Bottai (IT)*

Yield optimisation of a biofilter applied to an urban waste primary treatment plant through in situ olfactometric measurement and analysis

*E. Kapetanios, L. Panogeorgos and D. Malamis (GR)*

Design of a chemical scrubbing deodorizing unit for the treatment of air emissions resulting from a full-scale composting plant

*M. Schlegelmilch, K. Kleeberg, J. Streese-Kleeberg and R. Stegmann (DE)*

Evaluation of odour reduction in a multi-step waste gas treatment system

*B. Culos, S. Rivilli, R. Snidar, L. Capelli, S. Sironi and A. Trovarelli (IT)*

The application of electronic noses in the evaluation of efficiency of neutralizing products for odour abatement in landfills

*V. Decottignies, A. Bruchet and I. Mel Suffet (FR)*

Landfill odour wheel: a new approach to characterize odour emissions at landfill sites

SESSION F5 - Edera Room 15:30-17:10

**Workshop:  
Geophysical methods for landfill monitoring**

*Chairman: H. Rosqvist (SE)*

The use of geophysical investigation techniques is an established practice for environmental applications and particularly interesting for landfill monitoring. The development geophysical imaging techniques at landfills have three major areas of interest: mapping for identification and delineation of groundwater contamination, mapping of internal physical structures in landfills, and investigations of internal processes including monitoring of moisture, temperature, and landfill gas.

**Introductory lectures:**

*H. Rosqvist, V. Leroux, T. Dahlin, M. Svensson, M. Lindsjö, C-H. Månsson and S. Johansson (SE)*

An evaluation of the potential of the geoelectrical resistivity method for mapping gas migration in landfills

*C. Nielsen and P. Sander (SE)*

Geological mapping and geophysical investigations - optimising monitoring programs for active and abandoned landfills

*M. Lanoe, J.C. Goumand, M. Guerbois and P. Belbeze (FR)*

Localisation and characterisation of underground fires in landfills using geophysics methods

17:10 - 17:40 Coffee Break

17:40 - 18:00 Poster discussion

SESSION F6 - Edera Room 18:00-19:40

**Workshop: Bottom liner design and performance**

*Chairman: W. Powrie (GB)*

Bottom liners have become more sophisticated as the reliance placed upon them by environmental legislation has increased. Following presentation of the introductory papers, suggested discussion topics for the workshop include the rationale for multi-layer systems; interactions between the layers; appropriate materials for each layer; and the interaction between the liner, drainage system and the waste itself.

**Introductory lectures:**

*S. Purdy and G. Van Dorst (US)*

Modified containment system design and construction to accept power plant filter cake at the California street landfill, Redlands, California, USA

*D. Guyonnet, D. Cazaux, H. Vigier-Gailhanou and B. Chevrier (FR)*

Effect of cation exchange on hydraulic conductivity in a sand-bentonite-polymer mixture

SESSION G5 - Gerani Room **15:30-17:10****IWWG Workshop: Sustainable landfilling (I)***Chairman: H. Scharff (NL)*

The Workshop will propose four elements relevant for a definition of sustainable landfill. A sustainable landfill is a landfill that: 1) reaches functional stability (based on site-specific physical, chemical, and biological characteristics of the waste mass, leachate, or landfill gas) such that the undisturbed contents do not pose a threat to human health and the environment; 2) during the process towards functional stability no unacceptable emissions should occur; 3) the stable situation should be reached in approximately one generation (30-50 years); and 4) The funding for completion of aftercare and minimal (custodial) care beyond completion has been secured and allows for responsible and beneficial end use of the site. The workshop aims to get consent on a shared definition of sustainable landfill. An attempt will be made to translate this into an outline for a protocol for the completion procedure. The definition and the protocol will clarify which criteria for ending aftercare are needed. In addition to current condition also potential developments and future changes need to be addressed. Tools to assess compliance with criteria will be discussed.

**Introductory lecture:***J.W.F. Morris and H. Scharff (NL)*

Critical elements in defining landfill sustainability and completion criteria

**17:10 - 17:40** Coffee Break**17:40 - 18:00** Poster discussionSESSION G6 - Gerani Room **18:00-19:40****IWWG Workshop: Sustainable landfilling (II)***Chairman: H. Scharff (NL)*

In Session G6 the debate on sustainable landfilling started in the previous Session G5 will be continued in order to draw conclusions to be presented in the Closing Session of the Symposium

SESSIONE Italiana I5 - Sala Baldacchino **15:30-17:10****Classificazione e gestione dei rifiuti pericolosi. Il caso del car fluff***Presidente: L. Butti**L. Butti*

Classificazione e gestione dei rifiuti pericolosi. Il caso del car fluff

*S. Fiore, B. Ruffino, M.C. Zanetti*

Processi di trattamento per la valorizzazione di autoveicoli a fine vita

*R. Cossu, T. Lai*

Pretrattamento dei residui da rottamazione degli autoveicoli

**17:10 - 17:40** Pausa**17:40 - 18:00** Discussione posterSESSIONE Italiana I6 - Sala Baldacchino **18.00 - 19.40****Recupero e valorizzazione dei rifiuti***Presidente: R. Pomi**G. Longhi*

La gestione avanzata dei rifiuti di imballaggio come valorizzazione dell'ambiente e del mercato

*F. Valerio*

Impatti ambientali dei sistemi di gestione dei materiali post consumo: rassegna bibliografica

*M. Ragazzi, E.C. Rada*

Come la raccolta differenziata ad alta efficienza influenza la gestione dei rifiuti urbani residui

*G. Delbarba, S. Mazzata*

Cogeme Gestioni e la raccolta differenziata globale. Un progetto per la qualità della vita del territorio

*D. Scamardella, G. Ponzini*

Il sistema di regolazione del ciclo integrato dei rifiuti: la tariffa e il caso Quadrifoglio S.p.A.

*A. Canovai, P. Pula, A. Eleuteri*

Ottimizzazione del ciclo energetico in impianti di compostaggio in Sardegna

*A. Canovai, M. Musio, A. Pau*

Impianto di compost di qualità della frazione organica dei rifiuti solidi urbani proveniente da raccolta differenziata e dagli scarti lignocellulosici di Serramanna

SESSION A7 - Central Hall

### **Composting**

*Chairman: C.F. Mahler (BR)*

**9:00 - 9:20**

*K. Esteve, A. Tremier, M. Launay and P. Dabert (FR)*

Comprehensive study of solid waste aerobic biodegradation kinetics: coupling of specific chemical analysis

**9:20 - 9:40**

*N.M. Sunar, D.I. Stewart, E.I. Stentiford and L.A Fletcher (GB)*

A rapid molecular approach to determine the occurrence of pathogen indicators in compost

**9:40 - 10:00**

*R. Mohee and H. Rughoonundum (MU)*

Study on composting of digested centrifuged waste sludge for land application

**10:00 - 10:20**

*C.P. Mihalopoulos, M.D. Loizidou, K.J. Haralambous and E. Kapetanios (GR)*

Simulation model of home scale aerobic processes & designing a home scale bioreactor

**10:20 - 10:40** Discussion

**10:40 - 11:10** Coffee Break

SESSION A8 - Central Hall

### **Waste pretreatment (MBT, RDF production)**

*Chairman: R. Stegmann (DE)*

**11:10 - 11:30**

*A. Le Bozec, D. Robin and M.E. Mollaret (FR)*

Biodegradable waste: economic assessment of collection - biological treatment options

**11:30 - 11:50**

*R. Vazquez and A. Cabeças (PT)*

Comparison of investments and operating costs of anaerobic digestion and composting plants

**11:50 - 12:10**

*E.C. Rada and M. Ragazzi (IT)*

Criteria for assessing the viability of a small scale MSW bio-drying plant aimed to RDF production for local use

**12:10 - 12:30**

*S. Scotti (IT)*

MBT as equalization process before further waste treatments

**12:30 - 12:50** Discussion

SESSION B7 - Panorama Hall

### **Leachate treatment**

*Chairman: K.M. Persson (SE)*

**9:00 - 9:20**

*H. Robinson and R. Formby (GB)*

The use of pilot-scale trials in the design of on-site leachate treatment plants

**9:20 - 9:40**

*E. Wojciechowska, M. Gajewska, S. Waara, H. Obarska-Pempkowiak, P. Kowalik, A. Albuquerque and P. Randerson (PL)*

Treatment of landfill leachate by constructed wetlands

**9:40 - 10:00**

*J. la Cour Jansen, A. Andersson and K. Jönsson (SE)*

Reduction of COD and specific refractory substances from leachate at Sysav Spillepeng

**10:00 - 10:20**

*A. Spagni, S. Marsili-Libelli and M.C. Lavagnolo (IT)*

Nitrogen and COD removal optimisation from leachate generated in old MSW landfills

**10:20 - 10:40** Discussion

**10:40 - 11:10** Coffee Break

SESSION B8 - Panorama Hall

### **Landfill gas management**

*Chairman: M. Ritzkowski (DE)*

**11:10 - 11:30**

*P. Wens and U. Pannizzo (BE)*

The value of 3-D modelling in biogas valorisation projects

**11:30 - 11:50**

*J. Jacobs (NL)*

Cryogenic landfill gas upgrading in The Netherlands

**11:50 - 12:10**

*M. Héroux, D. Millette and C. Guy (CA)*

Behaviour of a landfill gas collection system at the city of Montreal landfill site

**12:10 - 12:30**

*E. Imre, K.L. Kovács, Z. Bagi, N. Ács, R.K. Perei, I. Bartha, P.Q. Trang and G. Telekes (HU)*

Biotechnological methods to increase landfill gas production

**12:30 - 12:50** Discussion

SESSION C7 - Chiesa Room **9:00-10:40****Waste transportation***Chairman: B.A. Díaz-Fernández (ES)**A. Segalini, M. Bergonzoni and G. Cervotti (IT)*

Advanced innovative systems for optimization of the service of collection, transportation and disposal of solid urban waste

*J. Coetzee and C.J. Hall (ZA)*

Design and implementation of an integrated waste management facilities in a developing country: waste transfer incorporating waste minimisation practices, City of Cape Town, South Africa

*I. Markidis, F. Tsagas, N. Grigoropoulos, I. Tsakmakis and D. Dermatas (GR)*Cost and CO<sub>2</sub> emissions of the waste transportation network in the region of Eastern Macedonia-Thrace in Greece*E. Schmied, R. Linzner, G. Obersteiner, S. Scherhauser, T. Teichert and B. Kopacek (AT)*

Informal waste collection activities and transboundary shipment of wastes in and to Central and Eastern European Countries (CEE)

**10:40 - 11:10** Coffee BreakSESSION C8 - Chiesa Room **11:10-12:50****Healthcare waste management***Chairman: S. Mahmik (AT)**G. Obersteiner, S. Scherhauser and P. Lechner (AT)*

Composition of non hazardous medical waste and possible influence on waste management strategies

*M. Zamorano, E. Insa and R. López (ES)*

Medical waste legislation in Spain

*J.A. Ferreira, D.M. Bila, A.C.S. Braga and D.N.G. Veiga (BR)*

Chemical medical waste management in small municipalities in Brazil

SESSION D7 - Naturista Room **9:00-10:40****Enhancement of biological processes in landfilling***Chairman: K.-U. Heyer (DE)**A. Boulanger, G. Ait Baddi, A. Alcuta, A. Mansour, M. Bouix and T. Bouchez (FR)*

Comparing the effect of different waste preparation methods to enhance municipal solid waste methanisation kinetics and yield

*R. Bayard, H. Benbelkacem, Y. Zhang and R. Gourdon (FR)*

Impact of leachate injection modes on landfill gas production

*A. Budka, D. Aniel and E. Stoppioni (FR)*

Leachate reinjection, LFG production. Correlation and environmental balance for traditional and bioreactor landfill: results after five management years from a real case study

*M. Staub, J.P. Gourc, G. Stoltz and A.A. Mansour (FR)*

Bio-hydro-mechanical behaviour of MSW in large-scale compression cells

**10:40 - 11:10** Coffee BreakSESSION D8 - Naturista Room **11:10-12:50****Special waste and codisposal landfilling***Chairman: F. Straka (CZ)**G.L. Soldi, C. Mastretta, M. Demaio and P. Luciani (IT)*

Biologic monitoring at hazardous waste landfill in Northern Italy

*A. Boulanger, G. Ait Baddi, A. Alcuta, A. Mansour, M. Bouix and T. Bouchez (FR)*

Codisposal of bottom ashes with municipal solid wastes: an unexpected effect on methanogenesis

*C. Visvanathan and N.H. Yin (TH)*

Lysimeter study on co-disposal of e-waste with municipal solid waste

*D. Sager and S. Heuss-Assbichler (AT)*

Effects of the landfill setup on long-term discharge of pollutants from mineral residues

SESSION E7 - Le Dune Room **9:00-10:40**

**Landfill settlement**

*Chairman: R.P. Beaven (GB)*

*S. Bente, U. Kowalsky, D. Dinkler and V. Kruse (DE)*

Modelling long term settlements of MSW landfills

*G.F. Simões and C.A.A. Catapreta (BR)*

Settlement monitoring at Belo Horizonte sanitary landfill, Brazil

*S. Nagaoka, K. Sato, S. Yamada, Y. Nabeshima, T. Hachimura,*

*T. Miyahara, M. Buma and H. Suzuki (JP)*

One-dimensional settling behaviour of wastes in static water assuming coastal landfill

*A.G.H.P. Van Elk and L.S. Mañas (BR)*

Evaluation of the settlement of the Valdemingómez landfill using compressibility models

*N. Shariatmadari, S.L. Machado, A. Noorzad, M. Karimpour-Fard and A. Mansouri (IR)*

Loading rate evaluation on the mechanical behavior of saturated MSW materials

*N. Shariatmadari, A. Mansouri, M. Zarrabi and M. Karimpour-Fard (IR)*

Effect of waste compaction in landfill settlement- a case study in Iran

**10:40 - 11:10** Coffee Break

SESSION E8 - Le Dune Room **11:10-12:50**

**Hydraulic behaviour of waste in landfills**

*Chairman: D. Guyonnet (FR)*

*A. Hudson, R. Beaven and W. Powrie (GB)*

Assessment of vertical and horizontal hydraulic conductivities of household waste in a large scale compression cell

*K. Zardava, W. Powrie and J. White (GB)*

The determination of the moisture retention characteristics of waste materials using vertical drainage experiments

*T. Wohlhuter, T. Gisbert, N. Busquet, A. Budka and C. Bloquet (FR)*

The intrinsic stock of leachate: a simple tool for assessment and its evaluation on real size landfill sites

*N. Woodman, T. Rees-White, R. Beaven and A. Hudson (GB)*

Refining experimental method for fluid flow experiments on MSW wastes in a large-scale uniaxial compression cell

SESSION F7 - Edera Room **9:00-10:40**

**Workshop: Waste minimisation**

*Chairman: F.G.A. Vagliasindi (IT)*

Minimization is viewed as the first step of a modern waste management strategy. Minimization of the amount of waste produced by a society or avoidance of waste produced by a consumer or producer is an apparently evident part of a waste management strategy, although not constituting an easy issue to deal with and manage. Waste minimization implies a significant participation by the public, producers, and by politicians. Products should be developed whilst bearing in mind that sooner or later they will become waste, for example, packaging plays an important role in the transportation, handling and maintenance of products, but soon becomes waste. The aim of the workshop is to highlight the possibility of implementing effective waste minimization strategies, to discuss case studies and experiences and to establish the state of the art of this issue.

**Introductory lectures:**

*A.S. Haner and A. Bartl (AT)*

Waste minimization through recycling of apparel

*P.T. Magubane (ZA)*

The effect and impact of waste minimisation on a society “recycling is beneficial to us all”

**10:40 - 11:10** Coffee Break

SESSION F8 - Edera Room **11:10-12:50**

**Workshop: Waste management and land planning**

*Chairman: I.D. Williams (GB)*

Waste management facilities are often large-scale plants having a strong impact on the town planning of cities and municipalities. These plants should be located as close as possible to the location of waste and wastewater producers, cities, towns or communities in order to minimize transportation costs. The workshop will focus on the issues, possibilities, experiences and new developments related to the design of new, or expansion of already existing waste management and treatment facilities and their impact on town planning of cities, town and areas landscape.

**Introductory lecture:**

*A. Magrini and L.B. Elabras Veiga (BR)*

Eco industrial park development in Rio de Janeiro metropolitan area, Brazil: a solution for RJ State industrial park settlement re-design?

SESSION G7 - Gerani Room 9:00-10:40

**IWWG Workshop: Bottom ash management**

*Chairman: A. Poletini (IT)*

Of waste incinerator residues, bottom ashes are those generated in the largest amounts and are at the same time the residues with technical qualities most suited for utilization. However, due to the strict regulatory criteria established by several European and non-European countries for utilization of waste materials, bottom ash does not always comply with the imposed quality characteristics. From a technical and environmental point of view, it is therefore essential to optimize bottom ash processing and management in order to gain the full benefits available from possible utilization. The workshop aims to present the findings from research studies on treatment and utilization of incinerator bottom ash, to highlight common experiences gained in individual studies, and to suggest appropriate management strategies for bottom ashes. The discussion will be open to identifying the alternatives available to pursue sustainable management solutions for incinerator bottom ash in the future.

**Introductory lecture:**

*A. Poletini (IT)*

State of the knowledge and research needs in bottom ash management

SESSION G8 - Gerani Room 11:10-12:50

**Workshop: Co-benefit CDM**

*Chairman: Y. Matsufuji (JP)*

In addition to the reduction of GHSs (Global greenhouse gases), Clean Development Mechanism, CDM, which is one of the provisions for achieving the reduction target of Kyoto protocol, is greatly expected to bring the benefit of the possible sustainable development and the technology transfer in the developing countries. In the developing countries, CDM project will help the reduction of GHGs and sustainable development, which is called co-benefit. In this workshop, co-benefit CDM project with GHGs reduction and protection of the environment from the waste sector will be focused and discussed.

**Introductory lectures:**

*M. Kato and J. Morizane (JP)*

Co-benefits approach to climate change mitigation and waste management

*M. Tsubaki, S. Ueno and Y. Tsuji (JP)*

The CDM methodology for reduction of greenhouse gas emissions from landfill sites by semi-aerobic landfill system

*S. Rotter, O.C. Dewi, W. Maaskant and M.A. Siebel (NL)*

Reducing GHG-emissions in the waste sector - CDM or recycling?

*C. Lee, J. Bogner, J. Van Horne and L. Van Hook (US)*

Carbon markets for landfill gas and waste sector projects: current status and post-2012 opportunities

*S.F. Eldridge, J.M. Simpson and A.P. Kortegast (NZ)*

Potential for clean development mechanism and voluntary emission reduction projects within the waste sector in the South Pacific Nations

SESSIONE Italiana I7 - Sala Baldacchino 09:00-10:40

**Bonifica delle vecchie discariche (I)**

*Presidente: R. Raga*

*R. Cossu, R. Raga, V. Salieri, A. Dal Maso, M. Zanella*

Test preliminari per l'aerazione in situ di una discarica in zona di montagna in Italia settentrionale

*A. Dal Maso, M. Zanella*

Principi e risultati delle esperienze in Italia dell'aerazione in situ delle discariche

*R. Cossu, M.C. Lavagnolo, R. Raga*

Teoria e pratica del landfill mining: casi di studio e prospettive

*R. Cossu, O. Del Greco, A. Godio, C. Oggeri*

Indagini integrate di una discarica di RSU per un progetto di landfill mining: rilievi geofisici, geotecnici e idraulici

**10.40-11.10** Pausa

SESSIONE Italiana I8 - Sala Baldacchino 11:10-12:50

**Bonifica delle vecchie discariche (II)**

*Presidente: R. Raga*

Nella Sessione I8 si continuerà il dibattito sulla bonifica delle vecchie discariche iniziato nella Sessione precedente.

SESSION A9 - Central Hall

### **Anaerobic digestion**

*Chairman: W.P. Clarke (AU)*

**15:30 - 15:50**

*F. Kirchmeyer, G. Anzengruber and R. Tulnik (AT)*

Anaerobic digestion - waste management to generate energy and an organic fertilizer without producing waste for later generations

**15:50 - 16:10**

*T. Haupt and E. Kraft (DE)*

Fundamentals of solid state fermentation using renewable resources in batch operation

**16:10 - 16:30**

*J. Grossin-Debattista, X. Qu, M. Sassi, J. Epissard, A. Guenne, V. Vavilin, M. Lemunier, H. Budzinski, P.J. He, T. Bouchez and L. Mazeas (FR)*

Elucidation of metabolic pathways during municipal solid waste anaerobic digestion using methane stable carbon isotope composition and fluorescent in situ hybridization

**16:30 - 16:50**

*S. Pommier, A. Mañas Llamas and X. Lefebvre (FR)*

Impact of shredding of the MSW paper/cardboard fraction on its anaerobic biodegradability

**16:50 - 17:10** Discussion

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION A10 - Central Hall

### **Biological Hydrogen production**

*Chairman: A. Muntoni (IT)*

**18:00 - 18:20**

*K. Bru, C. Joulian, I. Ignatiadis, D. Guyonnet and M.C. Dictor (FR)*

Optimisation of the biohydrogen production from the organic fraction of domestic wastes

**18:20 - 18:40**

*H.B. Ding and J.Y. Wang (SG)*

A novel three-phase anaerobic digestion system (3PADS) for co-production of H<sub>2</sub> and CH<sub>4</sub> from organic solid wastes

**18:40 - 19:00**

*L. Rechtenbach and R. Stegmann (DE)*

Combined bio-hydrogen and methane production

**19:00 - 19:20**

*M.C. Lavagnolo, L. Alibardi, R. Cossu and L. Danieli (IT)*

Hydrogen and methane production from the organic fraction of MSW in a double phase lab scale plant

**19:20 - 19:40** Discussion

SESSION B9 - Panorama Hall

### **Landfill top cover**

*Chairman: J.Y. Kim (KR)*

**15:30 - 15:50**

*J.P. Gourc, O. Ple and P. Villard (FR)*

Preliminary discrete modelling of landfills clay barrier

**15:50 - 16:10**

*A. Groengroeft, J. Gebert, K. Berger and S. Melchior (DE)*

Optimisation of landfill cover properties with regard to water balance and methane oxidation

**16:10 - 16:30**

*K. Venkatraman and N. Ashwath (AU)*

Phytocapping - can it reduce percolation of water into buried waste?

**16:30 - 16:50**

*I. Travar, L. Andreas, S. Lidelöw, G. Tham and A. Lagerkvist (SE)*

Development of drainage water quality from landfill covers built with ashes and sewage sludge

**16:50 - 17:10** Discussion

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION B10 - Panorama Hall

### **Methane oxidation in biocover**

*Chairman: C. Scheutz (DK)*

**18:00 - 18:20**

*M. Huber-Humer and P. Lechner (AT)*

Biocover construction and monitoring - implementation criteria and processes

**18:20 - 18:40**

*P. Kjeldsen, C. Scheutz, J. Samuelsson, P.H. Petersen and*

*J.H.B. Jørgensen (DK)*

Establishing a biocover system for mitigating methane emissions from an old unlined landfill - baseline studies and biocover construction

*P. Kjeldsen, C. Scheutz, A.M. Fredenslund and G.B. Pedersen (DK)*

Mitigating methane emissions from landfills using biocovers - lessons learned and future challenges

**18:40 - 19:00**

*J. Gebert, I. Rachor and L. Bodrossy (DE)*

Composition and activity of methane oxidizing communities in landfill covers

**19:00 - 19:20**

*J. Sun, S.T.S. Yuen, J. Bogner and D. Chen (AU)*

Phytocaps as biotic systems to mitigate landfill methane emissions: the A-ACAP investigation

**19:20 - 19:40** Discussion

SESSION C9 - Chiesa Room **15:30-17:10**  
**Mechanical treatment: compaction and shredding**  
*Chairman: K. Münnich (DE)*

*S. Lebersorger and P. Beigl (AT)*  
Determining the volume and bulk densities of individual waste categories

*W. Hogland, A. Lönnermark, M. Marques and H. Persson (SE)*  
Storage of organic materials, solid waste and biofuels - risks for fires and fire fighting

*F. Tsagas, I. Markidis, I. Tsakmakis, N. Grigoropoulos and D. Dermatas (GR)*  
Review of available technologies for volume reduction and interim storage of MSW: implications for full-scale application in Greece

*O. Hjelmar (DK)*  
Shredder waste characteristics and management options

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION C10 - Chiesa Room **18:00-19:40**  
**RDF quality**  
*Chairman: H. Albers (DE)*

*V.S. Rotter, A. Lehmann, T. Marzi, E. Möhle, G. Hoffmann and D. Schingnitz (DE)*  
Characterisation of RDF- parameters, problems, new strategies

*D. Pico and A. Bartl (AT)*  
Characteristics of composite materials in thermal waste treatment

*A.J. Wandrasz and A.Z. Wandrasz (PL)*  
Research of organic substances for possible use in renewable energy source applications

*F. Claesson, E. Wikström Blomqvist, A. Johansson, B.J. Skrifvars and B.Å. Andersson (SE)*  
Annual variation in elemental, dioxin and PCB content within Swedish waste fuels - results from two plants

*G. Hoffmann, D. Schingnitz, C. Wunsch, M. J. Gehring and B. Bilitewski (DE)*  
RDF from Chinese residual waste - compound, characteristic, capacities of recovery and quality requirements

*A. Garg, I.M. Mishra and S. Chand (IN)*  
Study of thermal behaviour of pulp and paper mill sludge using thermo-gravimetric analysis

SESSION D9 - Naturista Room **15:30-17:10**  
**Combined treatment of leachates of different origin**  
*Chairman: M. van Praagh (SE)*

*T. Lolos, C. Tsompanidis, G. Lolos, G. Tavoularis and C. Raptis (GR)*  
A combined leachate and industrial type of effluents treatment plant: the case of the wastewater treatment plant at Marathounta landfill site in Cyprus

*J.A. Ferreira, C.F. Mannarino, D.M. Bila and E. Ritter (BR)*  
Ecotoxicological tests for assessment of combined treatment of urban solid waste leachate in a sewage treatment plant

*A. Mishra, B. R. Yadav and A. Garg (IN)*  
Treatment of leachate using wet oxidation process - an experimental study

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION D10 - Naturista Room **18:00-19:40**  
**Leachate treatment: constructed wetlands and aerobic lagooning**  
*Chairman: H.D. Robinson (GB)*

*V. Krishna Murthy, D. Raj Manandhar and Y. Shanker Kasaju (IN)*  
Estimation of landfill leachate from a lysimeter of a pilot scale and feasibility of treatment by constructed wetland technology

*T. Bramryd, M. Johansson, T. Nielsen, G. Tham, G. Renman, B-E. Bengtsson, S. Stiernström and M. Breitholtz (SE)*  
Treatment of landfill leachates in a combined wetland and forest irrigation system for increased biomass production - a part of the strategy to regard landfills as a carbon sink

*R.H.R. Costa, H. Fernandes, A. Viancelli, C.L. Martins and A.B. Castilhos Jr (BR)*  
Evaluation of phytoplanktonic and microbial dynamics in an aerobic pond treating landfill leachate

*R.H.R. Costa, C.L. Martins, T.D.S. Pereira, H. Fernandes and A.B. Castilhos Jr (BR)*  
Performance evaluation and nitrogen balance of a ponds treatment system treating landfill leachate

SESSION E9 - Le Dune Room 15:30-17:10

**Waste electric electronic equipment**

*Chairman: G. Obersteiner (AT)*

*L. González-Torre and B. A. Díaz-Fernández(ES)*

The generation of waste electrical and electronic equipment (WEEE) in the household: the Spanish case study

*F. Ongondo, I.D. Williams and S. Keynes (GB)*

Estimating the impact of the “digital switchover” on disposal of WEEE at household waste recycling centres in Hampshire, UK: a case study

*I.A. Istrate, E.C. Rada, A. Badea, T. Apostol, G. Andreottola and M. Ragazzi (RO)*

Management of waste electric and electronic equipment in Romania

*G. Martinho, J. Santos, C. Godinho and R. Gomes (PT)*

Household batteries and WEEE: a case study in Portugal

17:10 - 17:40 Coffee Break

17:40 - 18:00 Poster discussion

SESSION E10 - Le Dune Room 18:00-19:40

**Geomechanical properties of MBT waste**

*Chairman: W. Powrie (GB)*

*K. Velkushanova, D. Caicedo, D. Richards and W. Powrie (GB)*

A detailed characterisation of an MBT waste

*K. Münnich, J. Bauer and K. Fricke (DE)*

Determination of water balance parameters for MBT waste material

*J. Bauer, K. Münnich and K. Fricke (DE)*

Response of MBT residues in large scale triaxial compression tests

*J.L. Rose, R.L.S. Izzo and C.F. Mahler (BR)*

Effect of MSW compost-soil mixtures in compaction and permeability tests

SESSION F9 - Edera Room 15:30-17:10

**Workshop: Landfill gas utilisation**

*Chairman: T. Branryd (SE)*

Biogas extraction from landfills and bioreactor cells is an important way of getting valuable bio-energy from residual solid wastes. Biogas/landfill gas is an important source for heat and electricity production, but also to an increasing extent for the production of motor fuel. The technique of extracting biogas from landfills and bioreactor cells has also many climatic and environmental advantages compared to other types of energy production as biogas is a non-fossil fuel, the stabilized organic fraction left in the landfill/bioreactor cell creates an important carbon sink, increased demand for biogas will lead to more economic resources to improve efficient biogas extraction techniques which will decrease the risk for diffuse emissions from landfills, optimized biogas production from landfills/bioreactor cells can easily be linked to nutrient extraction through the leachates.

*H.V. Latsios, O.A. Bereketidou, N.D. Charisiou and M.A. Goula (GR)*

Energy potential assessment of the biogas produced by an urban waste landfill in Northern Greece

*T. Parker, P. Pointer, S. Conry and I. Morrish (GB)*

Using incinerator ash to remove hydrogen sulphide from landfill gas

*E. Nikoli and E. Voudrias (GR)*

Using biogas for energy production: comparison between anaerobic digestion and landfilling

17:10 - 17:40 Coffee Break

17:40 - 18:00 Poster discussion

SESSION F10 - Edera Room 18:00-19:40

**End-of-Life Vehicles**

*Chairman: W. Hogland (SE)*

*G. Tavoularis, T. Lolos, G. Lolos, C. Jordan, K. Moustakas, V. Inglezakis and M. Loizidou (GR)*

Management of the end-of-life vehicles stream in Romania

*S. Fiore, B. Ruffino and M.C. Zanetti (IT)*

Treatment processes for the valorization of end of life vehicles (ELVs) residues

*A. Bartl (AT)*

An innovative concept for fiber recovery from shredder light fraction

*F. Pantaleoni, A. Bonoli and M. Bergonzoni (IT)*

The life cycle analysis of end of life tyres for the production of asphalt

*N. Ahmed, H. Wenzel and J.B. Hansen (DK)*

Feasibility of resources recovery from shredder waste

SESSION G9 - Gerani Room 15:30-17:10

**Workshop: Waste management and global climate change**

*Chairman: J. Bogner (US)*

Although the waste sector is a small contributor to global anthropogenic greenhouse gas emissions (<3%), there are a wide range of mature waste management technologies which can positively contribute to greenhouse gas mitigation at low cost. Thus the waste sector is a small part of the “problem” but can be a larger part of the “solution.” This workshop will focus on greenhouse gas emissions and mitigation with particular focus on evolving methodologies and results.

**Introductory lectures:**

*T. Astrup (DK)*

Estimating contents of biogenic and fossil carbon in Municipal Solid Waste

*D. Schingnitz, G. Hoffmann, C. Wunsch and B. Bilitewski (DE)*

Waste-economical climate-protection-potential in the EU 27

*E. Smidt, J. Tintner, K. Böhm (Meissl) and P. Lechner (AT)*

Carbon sequestration by waste management strategies - a survey of experimental and analytical approaches

*M. Rodríguez Salinas, D. Méndez Bellamy, P. Heredia Cantillana,*

*S. Rüd and A. Macht (US)*

Climate change and waste management training through GIRE SOL network: working locally and thinking globally

17:10 - 17:40 Coffee Break

17:40 - 18:00 Poster discussion

SESSION G10 - Gerani Room 18:00-19:40

**IWWG Workshop: Legislation and waste**

*Chairman: L. Butti (IT)*

The workshop is organised by the newly established L.a.W. (Legislation and Waste) Task Group and is structured as a dialogue between regulators, lawyers and judges. The workshop aims to coordinate studies and research on the most recent international trends in waste regulation and policies. A second focus will be on identification of the best legal procedures adopted internationally to implement the approval of efficient waste management plants, addressing issues posed by N.I.M.B.Y. (Not in My Back Yard) and B.A.N.A.N.A. (Build Absolutely Nothing and Never Again) syndromes.

**Introductory lectures:**

*J. Gronow, M. Forbes Pirie, C. Grose, K. Galley, R. Slack and*

*N. Voulvoulis (GB)*

Household hazardous waste - what we have learned and what we need to know

*L. Butti and V. Zatra (IT)*

Contaminated sites regulation in Italy and in the United States

SESSIONE Italiana I9- Sala Baldacchino 15:30-17:10

**Workshop: BIOH<sub>2</sub>POWER. Dai rifiuti ai combustibili gassosi rinnovabili per i veicoli del futuro (I)**

*Presidente: D. Fino*

Il progetto BioH<sub>2</sub>Power ha lo scopo di studiare la fattibilità di un impianto per la produzione simultanea di energia elettrica, metano e idrogeno a partire da biogas prodotto in discarica. Precisamente, ha lo scopo di valutare la fattibilità di un'unità di potenza (250 kW) basato un fuel processor accoppiato (FP) ad una Molten Carbonate Fuel Cell (MCFC) per la produzione di metano ed idrogeno, utilizzato per una stazione di distribuzione in grado di rifornire 20-100 veicoli al giorno.

**Presentazioni introduttive:**

*D. Mescia, C. Mollea, R. Conti*

BioH<sub>2</sub>Power WP1: specifiche del biogas e valutazione delle potenziali fonti di produzione

*S.P. Hernandez, D. Mescia, M. Cugino, N. Russo, D. Fino*

BioH<sub>2</sub>Power WP2: desolfurazione e dealogenazione

*A. Marigo, S. Tonini, G. Galli, L. Grimoizzi*

BioH<sub>2</sub>Power WP3: reforming, purificazione dell'idrogeno e selezione impiantistica di riferimento

*R. Bertone, F. Federici, F. Coletti, L. Sala*

BioH<sub>2</sub>Power WP4: tests ad hoc per l'esercizio di un sistema ibrido MCFC con produzione di idrogeno

*D. Anfossi, L. Mortarini, S. Trini Castelli, A. Carpignano, F. Ganci*

BioH<sub>2</sub>Power WP5: studio dell'affidabilità e sicurezza dell'impianto di produzione di H<sub>2</sub> da biogas di discarica

*A. Carpignano, S. Fiorot, A. Graizzaro, U.A. Icardi, M. Mazzucato,*

*F. Nicolini, V. Verda*

BioH<sub>2</sub>Power WP6: life cycle analysis, impatti ambientali e socio-economici

17.10-17.40 Pausa

17.40-18.00 Discussione Poster

SESSIONE Italiana I10- Sala Baldacchino 18:00-19:40

**Workshop: BIOH<sub>2</sub>POWER. Dai rifiuti ai combustibili gassosi rinnovabili per i veicoli del futuro (II)**

*Presidente: D. Fino*

Nella Sessione I10 si continuerà il dibattito su BIOH<sub>2</sub>POWER iniziato nella Sessione precedente.

SESSION A11 - Central Hall

### **Thermal treatment (I)**

*Chairman: T. Astrup (DK)*

**9:00 - 9:20**

*H. Albers, S. Wolff, A. Schmidt, T. Brinkmann and H. Lambrecht (DE)*

Combination of optimization and material flow analysis methods for optimum operating conditions Reid thermal waste treatment facilities

**9:20 - 9:40**

*H.-G. Ramke, D. Blöbse, H.-J. Lehmann and J. Fettig (DE)*

Hydrothermal carbonization of organic waste

**9:40 - 10:00**

*M. Hoffmann, C. Wünsch, J. Jäger and B. Bilitewski (DE)*

CO<sub>2</sub>-prevention at waste incineration by improvement of energy efficiency and a credit of CO<sub>2</sub>-emission reduction by recovering of metal fraction from slag - an evaluation in Germany

**10:00 - 10:20**

*C. Cord'Homme and E. Gartner (FR)*

Energy from waste plants: technology developments on the combustion system (CDR treatment, enriched air combustion...)

**10:20 - 10:40** Discussion

**10:40 - 11:10** Coffee Break

SESSION A12 - Central Hall

### **Bottom ash stabilisation and utilisation**

*Chairman: A. Poletti (IT)*

**11:10 - 11:30**

*H. Bjurström, R. Herbert, C. Ribbing and G. Tham (SE)*

Using ash in a sustainable society, Swedish R&D programme 2002-2008

**11:30 - 11:50**

*B.D. Azevedo, C. Cardoso, R. Azevedo and I.C. Azevedo (BR)*

The challenge of solid waste management in slums

**11:50 - 12:10**

*E. Brännvall, L. Andreas, S. Diener, G. Tham and A. Lagerkvist (SE)*

Influence of accelerated ageing on acid neutralization capacity and mineralogical transformations in refuse-derived-fuel fly ashes

**12:10 - 12:30**

*S. Rocca, E. Lategano, G. Costa, L. Galeotti and F. Lombardi (IT)*

The reuse potential of waste incineration bottom ash: a comparative experimental study

**12:30 - 12:50** Discussion

SESSION B11 - Panorama Hall

### **Landfill aerobisation (I)**

*Chairman: Y. Matsufuji (JP)*

**9:00 - 9:20**

*K.U. Heyer, K. Hupe, A. Koop and R. Stegmann (DE)*

Aerobic in situ stabilization - a new part in the German landfill ordinance

**9:20 - 9:40**

*B. Beatty, E. Benda, M. Jadeja, S. Lee and A. Mohamed (CA)*

Canada's 30 year old aerobic landfill

**9:40 - 10:00**

*M. Ritzkowski, K.-U. Heyer and R. Stegmann (DE)*

Practical application of landfill aeration in Germany

**10:00 - 10:20**

*P.P. Huber, M. Huber-Humer and P. Lechner (AT)*

Effect of different aeration rates on nitrous oxide emissions

**10:20 - 10:40** Discussion

**10:40 - 11:10** Coffee Break

SESSION B12 - Panorama Hall

### **Methane emissions from landfills**

*Chairman: T.H. Christensen (DK)*

**11:10 - 11:30**

*M. Jorgensen, J. Joseph and L. Reid (AU)*

Challenges in measuring landfill cap emissions - the Australian experience

**11:30 - 11:50**

*K. Spokas, J. Bogner, J. Chanton and G. Franco (US)*

Developing a new field-validated methodology for landfill methane emissions in California

**11:50 - 12:10**

*S. Donovan, T. Bateson, J. Gronow and N. Voulvoulis (GB)*

Modeling the greenhouse gas emissions of biologically pretreated waste in landfill

**12:10 - 12:30**

*J. Jacobs, J.G. Cuperus, J.J. Steketee and M. Kraakman (NL)*

Validation study Dutch national methane emission model

**12:30 - 12:50** Discussion

SESSION C11 - Chiesa Room **9:00-10:40**

**Anaerobic digestion processes**

*Chairman: G. Rettenberger (DE)*

*J. Povinelli, M.E. Dillenburg and G.D.B. Souto (BR)*

Recovery of inhibited anaerobic digesters by the use of anaerobic packed bed reactors

*N. Fischer, I.I. Knappik and A. Haarstrick (DE)*

Influence of pH and acid buffering capacity on anaerobic degradation processes in municipal solid waste

*M. Horttanainen, M. Luoranen, A. Niskanen and J. Havukainen (FI)*

On the criteria of treatment method selection for biodegradable waste between combustion and anaerobic digestion

*R. Waltenberger, T. Proell, A. Schumerguber, R. Grossfurtner, R. Braun and R. Kirchmayr (AT)*

Biogas from waste material as key technology for energy self-sufficient slaughterhouses

*J. Alexeeva-Steiniger, T. Haupt and J. Londong (DE)*

Nutrient recovery from digestates of agricultural biogas plants - a contribution of economic operation

*A. Morán, A. Lobato, S. Guerra and X. Gómez (ES)*

Improvement in anaerobic digestion by glycerine supplementation

**10:40 - 11:10** Coffee Break

SESSION C12 - Chiesa Room **11:10-12:50**

**Anaerobic co-digestion**

*Chairman: J. Lamborn (AU)*

*E. Trulli and I. Mancini (IT)*

Assay for planning anaerobic codigestion of municipal sludge and biodegradable waste

*M. Molena, R. Goeschl and M. Smilkova (AT)*

Anaerobic thermophilic semi-dry process behavior by having as feedstock respectively source separated organic waste and MSW organic fraction

*L. Lombardi, A. Corti, C. Lubello and S. Caffaz (IT)*

Anaerobic co-digestion of source selected organic fraction of municipal solid waste and waste water treatment plant sludge

*P.K. Pratapchandran and V. Gandhiraj (IN)*

Co-digestion of the organic fraction of municipal solid waste with distillery effluent for enhanced methane generation

*D.G. Ohandja, R. Kimber, J. Gronow and N. Voulvoulis (GB)*

The environmental impact of anaerobic co-digestion of commercial food waste and sewage sludge

SESSION D11 - Naturista Room **9:00-10:40**

**Leachate treatment: case studies**

*Chairman: L.J. Strachan (ZA)*

*H.D. Robinson, S. Farrow, M.S. Carville, L. Gibbs, J. Roberts and D. Jones (GB)*

Operation of the UK's largest leachate treatment plant 6 years of experience at Arpley landfill

*K. Jönsson, A. Andersson, E. Heander and J. la Cour Jansen (SE)*

Laboratory and pilot scale experiments for design of a leachate treatment facility at Sysav Spillepeng

*G. Martinho, J. Santos, A. Brandão and M. Nunes (PT)*

Leachate management at Municipal Solid Waste landfills in Portugal

*S. Speer, P. Champagne and B. Anderson (CA)*

Pretreatment study for an integrated naturalized landfill leachate treatment system to preserve fish habitat

*Y. Wang, M. Pelkonen and J. Kaila (FI)*

Implementation of on-site pre-treatment process for landfill leachate management: a cost-savings estimation case study

**10:40 - 11:10** Coffee Break

SESSION D12 - Naturista Room **11:10-12:50**

**Landfill aerobisation (II)**

*Chairman: R. Raga (IT)*

*O. Hirata, Y. Matsufuji, A. Tachifuji, R. Yanase and S. Suzuki (JP)*

Biodegradation process and mass balance of different landfill types using large scale lysimeter - the substrate utilization of bacteria in leachate by semiaerobic landfill

*O. Gamperling, K. Böhm (Meiss) and E. Smidt (AT)*

Efficiency control of landfill in-situ aeration based on leachate characterisation

*J. Fellner, D. Laner and P.H. Brunner (AT)*

Impact of aeration on the long term behavior of nitrogen in MSW landfills

*Y. Xue, J. Liu, D. Yue, Y. Zhang, R. Li and Y.F. Nie (CN)*

Laboratory-scale aerobic landfill bioreactor study: acceleration of stabilization by controlling moisture content and oxygen concentration within landfilled waste

*A. Nikolaou, A. Giannis and E. Gidarakos (GR)*

Sequential aerobic-anaerobic treatment of municipal solid waste in a bioreactor landfill

SESSION E11 - Le Dune Room 9:00-10:40

**Landfill top covers: design and performance**

*Chairman: S. Purdy (US)*

*T. Hillebregeit (NL)*

Life time expectancy of end capping constructions on SWDS, based on long-term field soil temperature measurements and Dutch climate change model

*K. Berger, S. Melchior, V. Sokollek, B. Steinert and B. Vielhaber (DE)*

Water balance and effectiveness of landfill cover systems: 20 years measurements at the landfill Hamburg-Georgswerder

*A. Martínez and J. Cabré (ES)*

Veneer stability analysis in capping systems

*G. Mondelli, F.J.P. Oliveira, T.N. Silva and C.V.S. Benjamim (BR)*

A cap system design proposal for a Brazilian sanitary landfill

**10:40 - 11:10** Coffee Break

SESSION E12 - Le Dune Room 11:10-12:50

**Landfill top covers: behaviour of different construction materials**

*Chairman: R. Parker (AU)*

*R.L.S. Izzo, C.F. Mahler, J. Bauer and K. Münnich (BR)*

Test results of a capillary barrier made of MBT waste

*K. Berger, A. Groengroeft and C. Harms (DE)*

Water balance and effectiveness of a landfill cover with layers of dredged materials: the Hamburg-Francop case

*J. Klompmaier and G. Heerten (DE)*

State of geosynthetic clay liner (GCL) approval for landfill capping sealing systems in Germany

*A. Dominijanni, G. Genon, P. Luciani, M. Maggiorotto, M. Manassero, F. Marchese, S. Puma, G.L. Soldi and M.C. Zanetti (IT)*

Landfilling and reuse of bottom ashes from refuse derived fuel and municipal solid waste incineration

SESSION F11 - Edera Room 9:00-10:40

**Recycling of waste plastics and fibers**

*Chairman: T. Matsuto (JP)*

*Z. Foltynowicz and R. Kaps (PL)*

Plastic waste management in Poland - state of the art and future perspectives

*E. Montoneri, V. Boffa, D.G. Perrone, L. Garlasco, M. Ghezzi and P. Savarino (IT)*

Recycling lignocellulosic waste organic matter to the chemical industry and developing bio-based products for chemical technologies.

**10:40 - 11:10** Coffee Break

SESSION F12 - Edera Room 11:10-12:50

**Landfilling in developing countries**

*Chairman: C. Visuanathan (TH)*

*F.J. Maciel and J.F. Jucá (BR)*

Bioenergy from a municipal solid waste landfill in Brazil

*J.G. Paul, M. Buquiran and E. Libradilla (PH)*

Experiences with the establishment and operation of a waste management and recycling center in Bais city, Negros Oriental, Philippines

*K.U. Heyer, K. Hupe and R. Stegmann (DE)*

Long-term landfill emissions and monitoring in the aftercare

*R. Damiecki and J. Bilong (DE)*

Landfill gas management at a sanitary landfill in extreme tropical conditions, Kuching, Sarawak, Malaysia

*G. Rettenberger (DE)*

Recovery of landfill gas under the conditions of landfills in developing countries

*S.K. Sankoh, E.T. Ndomahina, A.B. Karim, J.A.S. Redwood-Sawyer and R.A. Wadsworth (GB)*

Urban solid waste management in Freetown, Sierra Leone: an environmental and social framework study

SESSION G11 - Gerani Room 9:00-10:40

**IWWG Workshop: Landfill modelling**

*Chairman: A. Haarstrick (DE)*

It is widely recognised that numerical modelling could play a powerful role in solving future landfill problems. These include the construction of bioreactor landfills, the monitoring and risk assessment of conventional landfills that are either in the operating or post-completion state, and the prediction and control of the long-term emissions behaviour. During the workshop the aims of the new IWWG Landfill Modelling Task Group (LMTG) will be presented and discussed. Further discussions will concern the objectives of the LMTG and the purpose and priorities in modelling landfill processes. By focussing on current developments and challenges in the fields of sustainable landfilling and landfill emission behaviour, with reference to National waste policies the new Task Group will sharpen its scope and objectives, and develop ideas for future activities and cooperation with other Task Groups.

**Introductory lectures:**

*A. Haarstrick, J. White, R. Beaven and K. Münnich (DE)*  
Landfill modelling taskgroup LMTG - challenge and scope

*A. López, N. Cobo, M. Cuartas and A. Lobo (ES)*  
Estimating the future emissions of an old landfill by simulation

**10:40 - 11:10** Coffee Break

SESSION G12 - Gerani Room 11:10-12:50

**Workshop: Leachate recirculation**

*Chairman: S.A. Reyes (AR)*

It was not until relatively recently that leachate recirculation has been identified as a powerful means of speeding up organic fraction degradation and biogas generation within landfills waste mass. In other words leachate recirculation helps to develop full scale bioreactor landfills shortening their contaminant life-span. However, a careful moisture balance is needed in order to maintain the waste mass free of stagnant water or submerged conditions. Keeping moisture within an efficient range is key to establish a sustainable and balanced degradation process. Moreover, leachate regular flow within the waste mass promotes bacteria transport, its efficient distribution and availability of the carbonic fraction. The discussion will focus on key issues learned for full scale implementation.

**Introductory lecture:**

*S.A. Reyes, S. Fernández, A. Martínez, R. Moratto, A. Juanpataoro and M. Darqui (AR)*

Pilot scale application of air depletion and leachate recirculation on a landfill sited at Southeastern Argentina

SESSIONE Italiana I11 - Sala Baldacchino 09:00-10:40

**LCA-Analisi del ciclo di vita. Casi di studio (I)**

*Presidente: S. Tunesi*

*G. Magatti, M. Camatini*

Valutazione del ciclo di trasformazione dei rifiuti in energia tramite metodologia life cycle assessment (LCA): il sistema ITS - intelligent transfer station

*F. Pantaleoni, A. Bonoli, M. Bergonzoni*

Analisi del ciclo di vita dei pneumatici fuori uso per la produzione di asfalto

*M. Gallo, C. Cattaneo, A. Del Borghi*

Life cycle assessment (LCA) come strumento di supporto alle decisioni per la gestione dei rifiuti: analisi di casi di studio sul territorio italiano

*G. Barberio, P. Buttol, S. Scalbi*

Valutazione del ciclo di vita (LCA) per la valorizzazione dei rifiuti: analisi comparative

*G. Calabrò, P.S. Calabrò, F. Nucera, E. Tigano*

Analisi ambientale del progetto di una nuova lattina di alluminio per bevande

*F. Pantaleoni, A. Bonoli, M. Bergonzoni*

Analisi del ciclo di vita della produzione dei pannelli fonoassorbenti

**10.40-11.10** Pausa

SESSIONE Italiana I12 - Sala Baldacchino 11:10-12:50

**LCA-Analisi del ciclo di vita. Casi di studio (II)**

*Presidente: S. Tunesi*

Nella Sessione I12 si continuerà il dibattito sui casi di studio di analisi del ciclo di vita iniziato nella Sessione precedente.



SESSION A13 - Central Hall

### **Waste management strategies in developing countries**

*Chairman: L.F. Díaz (US)*

**15:30 - 15:50**

*R. Couth and C. Trois (GB)*

Comparison of waste management activities across Africa with respect to carbon emissions

**15:50 - 16:10**

*M. Rodríguez, A. Von Bertrab, D. Hernández and A. Macht (US)*

Public-private partnerships as a means to consolidate integrated solid waste management initiatives in tourism destinations: the case of the Mexican Caribbean.

**16:10 - 16:30**

*R. Musleh, Z. Samhan and S. Rishmawi (PS)*

Strategic planning in a fragile setting and unstable conditions: the Palestinian strategic planning experience in solid waste management

**16:30 - 16:50**

*G. Hädrich, W. Bidlingmaier and E. Kraft (DE)*

Limited resources - evaluation wanted; procedure supporting creation of landfill concepts

**16:50 - 17:10** Discussion

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION A14 - Central Hall

### **Appropriate solutions in developing countries (I)**

*Chairman: C. Zurbrügg (CH)*

**18:00 - 18:20**

*C.J. Liebenberg (ZA)*

Waste management in developing countries: what are appropriate solutions?

**18:20 - 18:40**

*A.P.P. Timóco, I.C.D. Azevedo, R. Azevedo and E.A.G. Marques (BR)*

Separation and composting plant in small cities of Zona da Mata, Minas Gerais, Brazil

**18:40 - 19:00**

*Y. Bousselmi, W. Pfaff-Simoneit and K.-H. Striegel (DE)*

Establishment of a National Hazardous Waste Management System in Tunisia

**19:00 - 19:20**

*P. Novella (ZA)*

Waste to energy - Is this appropriate for Cape Town, a developing African city?

**19:20 - 19:40**

Discussion

SESSION B13 - Panorama Hall

### **Risk assessment at landfills**

*Chairman: O. Hjelmar (DK)*

**15:30 - 15:50**

*A. Van Zomeren, H. Scharff and H. van der Sloot (NL)*

Environmental risk assessment for determination of long-term emissions of landfills

**15:50 - 16:10**

*S. Silvestri, A. Viezzoli, A. Edsen, E. Auken and M. Giada (IT)*

The use of remote and proximal sensing for the identification of contaminated landfill sites

**16:10 - 16:30**

*H. Rosqvist, C. Sparrenbom, M. Lindsjö, E. Wadstein and E. Åkerlund (SE)*

Site specific risk assessment at landfills: Swedish condition for modelling

**16:30 - 16:50**

*L. Reid (AU)*

Alternative rehabilitation approach for small rural landfills

**16:50 - 17:10** Discussion

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION B14 - Panorama Hall

### **Landfill afteruse (II)**

*Chairman: E. Kapetanios (GR)*

**18:00 - 18:20**

*J. Tintner, E. Smidt, R. Kramer and P. Lechner (AT)*

Decisions on after use concepts of sanitary landfills

**18:20 - 18:40**

*D. Pereboom, J.G. Knoeff, R. Thijsen and G. Meesters (NL)*

Commercial development on landfill Bavel

**18:40 - 19:00**

*F.J.P. Oliveira, C.V.S. Benjamim and G. Mondelli (BR)*

Example of a Brazilian sanitary landfill enlargement using 1v:1h slope

**19:00 - 19:20**

*G. Delbarba and S. Mazzata (IT)*

A vineyard on the landfill. Practicing ecological restoration in Franciacorta (Brescia, Italy)

**19:20 - 19:40** Discussion

SESSION C13 - Chiesa Room **15:30-17:10**  
**GHG emissions from biological treatment facilities**

Chairman: K. Spokas (US)

*J. Colón, E. Cadena, M. Pognani, A. Sánchez, A. Artola and X. Font (ES)*  
 Determination of emission factors in composting plants

*A. Niskanen, M. Horttanainen and V. Panapanaan (FI)*  
 Scenario-based energy and GHG emission balance estimation for alternative treatment options of biodegradable waste streams

*J.K. Andersen, A. Boldrin, T.H. Christensen and C. Scheutz (DK)*  
 Methods for quantification of GHG emissions from composting of garden waste

*A. Singh and J.D. Murphy (IE)*  
 Biomethane from animal waste and grass for clean vehicular biofuel in Ireland

*A. Pertl, P. Mostbauer and G. Obersteiner (AT)*  
 Climate relevance of upgrading and energy conversion of biogas

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION C14 - Chiesa Room **18:00-19:40**  
**Mechanical biological treatment before landfilling**

Chairman: E. Binner (AT)

*A Corti and L. Lombardi (IT)*  
 Anaerobic digestion of the organic fraction of MSW to boost energy recovery

*G. Rettenberger (DE)*  
 Improvement of the utilisation ratio of waste treatment plants and digestion towers through material separation with extrusion technology

*A. Parodi, G. Feuillade, S. Pommier and A.A. Mansour (FR)*  
 Municipal solid waste methanisation: organic matter fractionations from leaching tests

*Y. Zhang, D. Yue, J. Liu, Y. Xue, R. Li and Y. Nie (CN)*  
 Nitrogen flow during aerobic pretreatment of MSW prior to landfill

*M. Thom and Y. Zadik (AU)*  
 Water based treatment of municipal solid waste

*M. Pace, A. Poletini and R. Pomi (IT)*  
 Statistical analysis of size separation performance in a full-scale waste recovery facility

SESSION D13 - Naturista Room **15:30-17:10**  
**Leachate treatment: metals removal and toxicity reduction**

Chairman: J. la Cour Jansen (SE)

*J. Zagorc-Končan, A. Žgajnar Gotvajn and N. Čermila Zajc (SI)*  
 Reduction of municipal landfill leachate toxicity due to different treatment methods

*K.M. Persson, H. Modin, A. Andersson and M. Van Praagh (SE)*  
 Removing metals from leachate: when is sorption the solution?

*A. Žgajnar Gotvajn, J. Zagorc-Končan and M. Cotman (SI)*  
 Comparison of different methods for removal of metals from landfill leachate

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION D14 - Naturista Room **18:00-19:40**  
**Leachate treatment: nitrogen removal**

Chairman: K. Jönsson (SE)

*L. Yokoyama, J.C. Campos, D.A.G. Moura, A.P.M. Costa and L. Cardillo (BR)*  
 Ammonia removal from landfill leachate by air stripping

*G.D.B. Souto and J. Povinelli (BR)*  
 Ammonia stripping from landfill leachate using packed towers

*V.Y. Hoang, J.L. Vassel and V.C. Le (BE)*  
 Application of data analysis and experimental planning method to study partial nitrification in treatment of ammonium in landfill leachate in Vietnam

*A.K.B. Amorim, B.O. Freitas and R.S. Bernardes (BR)*  
 Nitrogen removal from municipal solid waste leachate by nitrification-denitrification via nitrite in a sequencing batch reactor



## Thursday October 8th - Afternoon

SESSION E13 - Le Dune Room **15:30-17:10**

### **Thermal treatment (II)**

*Chairman: A. Polettini (IT)*

*J. Fellner, O. Cencic and H. Rechberger (AT)*

Cost effective determination of the share of renewable energy from waste-to-energy plants

*C. Wünsch, G. Hoffmann, S. Suttirat, D. Schingnitz, M. Gebring and B. Bilitewski (DE)*

Decentralised combustion in stationary fluidised bed combustion plants

*P. Viotti, R. Tamma, L. Lombardi and G. Mancini (IT)*

Novel and innovative thermal process for energy efficient and environmentally sound fluff disposal

*G. Tavares, Z. Zsigraiová and V. Semião (PT)*

A GIS-based siting of a MSW incineration plant

*A. Van Der Linden, L. Goovaerts and K. Vrancken (BE)*

The evaluation of best available techniques (BAT) for the combustion of biowaste for energy production - a practical tool for environmental policy on bioenergy

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION E14 - Le Dune Room **18:00-19:40**

### **Thermal treatment (III)**

*Chairman: B. Bilitewski (DE)*

*M. Münster and P. Meibom (DK)*

Importance of flexible use of waste for energy for the national energy system

*U. Arena, L. Zaccariello and M.L. Mastellone (IT)*

Fluidized bed gasification of packaging and refuse derived fuels

*M. Bernardo, N. Lapa, M. Gonçalves, R. Barbosa, B. Mendes, F. Pinto and I. Gulyurtlu (PT)*

Evaluation of the environmental hazard of char residues produced in the co-pyrolysis of different wastes: chemical and ecotoxicological characterization

*M.J. Murer, H. Spliethoff, M.A.J. Van Berlo, C.M.W. de Waal and O. Gohlke (DE)*

Comparison of energy efficiency indicators for energy-from-waste plants

## Thursday October 8th - Afternoon

SESSION F13 - Edera Room **15:30-17:10**

### **Landfill afteruse (I)**

*Chairman: P. Lechner (AT)*

*R. Cossu, T. Lai and R. Raga (IT)*

Final storage quality of a landfill in view of after use

*A.M. Llorens, P. Gourdain, G. Barina and J.P. Siblet (FR)*

Biodiversity integration and management on landfill sites: testing a new biodiversity quality index

*A. Bockreis and J. Jager (DE)*

Waste-economical reconstruction of old landfills

*T. Carvalho Santos (BR)*

“A DNA view on landscape and waste”: an urban morphology approach to what it is and to what its functional spatial patterns can be

*A. Bodenbagen, P. Hock, M. van Cleef and B. van Ouytsel (DE)*

Utilising an usable space: Solar (Photovoltaic) installations on working landfills

**17:10 - 17:40** Coffee Break

**17:40 - 18:00** Poster discussion

SESSION F14 - Edera Room **18:00-19:40**

### **IWWG Workshop: Methane emissions in landfills**

*Chairman: M. Huber-Humer (AT)*

This workshop is hosted by CLEAR (Consortium for Landfill Emissions Abatement Research), an IWWG-task group, which coordinates interdisciplinary research on the quantification and mitigation of landfill gas emissions, with the main focus on biological processes to reduce the release of methane and non-methane organic compounds into the atmosphere.

The main purpose of this workshop is to provide a panel for interactive group discussion, to exchange ideas, and to jointly consider and relate current results and findings as well as open research questions related to methane oxidation performance and emissions in landfill covers, biocovers and biofilters. Key-issues will be presented briefly, particularly in the form of specific questions, which shall help leading and stimulating discussion.

SESSION G13 - Gerani Room 15:30-17:10  
**DGGT (Landfill Technology Committee)**  
**Workshop: Design and construction of bottom liner and leachate collection systems. Appropriate solution for developing countries**

Chairman: H.-G. Ramke (DE)

The workshop is dedicated to experts from low and middle income countries and will be held by members of the German Technical Committee "Landfill Technology". The technical committee, established by German landfill technology experts with broad experience at home and abroad, prepares a toolkit "landfill technology" for landfill professionals like landfill designers, managers, and local authority administrative staff in developing and emerging countries, which is published in the internet. The technical committee tries to consider different socio-cultural, climatic, and economic circumstances for their proposals. In the first session typical problems of landfill lining, leachate collection, and landfill operation and proposals for appropriate solutions shall be discussed.

**Introductory lecture:**

H.G. Ramke (DE)

Objectives and activities of the technical committee "Landfill Technology"

17:10 - 17:40 Coffee Break

17:40 - 18:00 Poster discussion

SESSION G14 - Gerani Room 18:00-19:40  
**DGGT (Landfill Technology Committee)**

**Workshop: Landfill restoration, capping and monitoring. Useful experience for developing countries**

Chairman: H.-G. Ramke (DE)

The second session of the workshops organised by the Technical Committee "Landfill Technology" focuses on landfill rehabilitation and closure. An introductory lecture gives an overview of methods of landfill capping with particular emphasis on the water balance of cover systems. The discussion shall start with simple methods of landfill rehabilitation, can continue with examples of cost effective capping systems and might eventually cover aspects of landfill monitoring. Both DGGT-workshops shall support exchange of experience with successful solutions for landfill construction and operation under different socio-economic and climatic conditions. Colleagues from other countries will be invited to join the technical committee and to prepare contributions to the toolkit.

**Introductory lecture:**

K. Berger and S. Melchior (DE)

Landfill capping and water balance of cover systems

SESSIONE Italiana I13 - Sala Baldacchino 15:30-17:10  
**Salute e inceneritori (I)**

Presidente: R. Cossu

G. Angelucci, K. Bedin, W. Tirlor, M. Donegà

L'influenza dell'impianto di incenerimento dei rifiuti urbani di Bolzano sulla qualità dell'aria nella provincia di Bolzano

S. Montanari, A.M. Gatti

Procedimento prototipale per valutare il rischio nanopatologico provocato da inceneritori dei rifiuti

A.M. Gatti, S. Montanari, F. Capitani

Metodo di rintracciabilità per valutare il rischio ambientale di una fonte d'inquinamento

M. Federico, M. Pirani, N. Caranci

Incidenza dei tumori nella popolazione che risiede in prossimità dell'impianto per l'incenerimento dei rifiuti urbani di Modena

R.M. Cenci, L. Montanarella, L. Musmeci

Monitoraggio ambientale "olistico" attorno ai termovalorizzatori: come si dovrebbe operare

L. Stabile, G. Buonanno

Concentrazioni totali e distribuzioni dimensionali dell'aerosol in emissione e in prossimità di inceneritori

17.10-17.40 Pausa

17.40-18.00 Discussione Poster

SESSIONE Italiana I14 - Sala Baldacchino 18:00-19:40  
**Salute e inceneritori (II)**

Presidente: R. Cossu

Nella Sessione I14 si continuerà il dibattito su salute e inceneritori iniziato nella Sessione precedente.



## Friday October 9th - Morning

### SESSION A15 - Central Hall **Education and public involvement**

*Chairman: J. Lamborn (AU)*

**9:00 - 9:20**

*V. Femia and P. O'Connor (AU)*

Waste and recycling behaviours - do domestic or commercial recycling programmes raise awareness and cause best practice?

**9:20 - 9:40**

*L. Rosa, F. Santos, and A. Cabeças (PT)*

Waste management roadshow - a virtual journey

**9:40 - 10:00**

*I.D. Williams (GB)*

Experiences of co-operative research studies between Universities and Local Authorities

**10:00 - 10:20**

*P. Simone, L. Nettuno, C. Zaninelli and M. Vercesi (IT)*

Children participated design on Vergomasco landfill in Odolo, Brescia province

**10:20 - 10:40** Discussion

**10:40 - 11:10** Coffee Break

### SESSION A16 - Central Hall **Management of special waste (II)**

*Chairman: E. Gidarakos (GR)*

**11:10 - 11:30**

*P. Chanceler, C.E.M. Meskers, C. Hagelueken and V.S. Rotter (DE)*

Setting priorities for the end-of-life management of complex products

**11:30 - 11:50**

*A. Montero, Y. Tojo, T. Matsuo, T. Matsuto, M. Yamada, H. Asakura and Y. Ono (JP)*

Gypsum distribution in a mixed construction and demolition waste sorting process and its composition in residue

**11:50 - 12:10**

*S. Scherhauser and P. Beigl (AT)*

Recycling options of car parts and their environmental burdens

**12:10 - 12:30**

*S. Thorneloe, P. Lemieux, L. Miller and M. Rodgers (US)*

Update on U.S. EPA decision support tools for the management of disaster generated waste and debris

**12:30 - 12:50** Discussion

## Friday October 9th - Morning

### SESSION B15 - Panorama Hall **Environmental costs in landfilling**

*Chairman: J. Gronow (GB)*

**9:00 - 9:20**

*H. Scharff (NL)*

Environmental cost of landfill

**9:20 - 9:40**

*R. Mtibaa and J. Mery (FR)*

Temporal and spatial aspects of landfill externalities

**9:40 - 10:00**

*G. Longhi (IT)*

A new integrated approach for the control of the environmental costs of waste management and landfilling

**10:00 - 10:20**

*M. Thom and F. MacGregor (AU)*

The real costs of landfill design and operations

**10:20 - 10:40** Discussion

**10:40 - 11:10** Coffee Break

### SESSION B16 - Panorama Hall **Landfill mining**

*Chairman: G. Rettenberger (DE)*

**11:10 - 11:30**

*D. Geysen, P.T. Jones, K. Van Acker, S. Van Passel, M. Craps, J. Eyckmans, K. Vrancken, B. Laenen and P. Laevers (BE)*

Enhanced landfill mining - a future perspective for landfilling

**11:30 - 11:50**

*M. Hogland, B. Berg, W. Hogland and M. Marques (SE)*

Planning of, and economic constraints related to, a landfill mining project in Norway

**11:50 - 12:10**

*R. Cossu, O. Del Greco, A. Godio and C. Oggeri (IT)*

Integrated investigation of MSW for a landfill mining project: geophysical, geotechnical and hydraulic surveys

**12:10 - 12:30**

*R. Cossu, R. Raga, A. Dal Maso and M. Zanella (IT)*

Preliminary tests for the application of landfill in situ aeration in a mountain area in Northern Italy

**12:30 - 12:50** Discussion

SESSION C15 - Chiesa Room **9:00-10:40**  
**Mechanical biological treatment and composting technologies**

*Chairman: G. Cappai (IT)*

*J.L. Martel, N. Moretti, A. Budka and J.P. Harry (FR)*  
 From MBT to compost production: influence of the quality of MSW and mechanical pre-treatment on the quantity and quality of final compost

*I. Zdanevitch, O. Bour, L. Llinas and S. Lejal (FR)*  
 Comparison of polluting potentials of liquid emissions from MBT plants

*D. Komilis, D. Bandi, G. Kakaronis, G. Zouppouris and E. Voudrias (GR)*  
 The effect of household batteries on the heavy metal content of the organic fraction of municipal solid waste during active composting

*F. Andersen, M. Andersen, K. Bester, X. Chen, L. Clowes, B. Larsen, P. Pena-Martínez and T. G. Poulsen (DK)*  
 Fate of pharmaceuticals and personal care product (PCPs) by composting of biosolids

*M. Altınbaş, D.I. Cifci, E.B. Gencsoy, O.A. Arikan, I. Demir, L. Ozturk, S. Yildiz, T. Ciftci, İ. Cakmak and İ. Ozturk (TR)*  
 Co-composting of mixed municipal solid waste and waste activated sludge

**10:40 - 11:10** Coffee Break

SESSION C16 - Chiesa Room **11:10-12:50**  
**Mechanical biological treatment quality testing**

*Chairman: O. Hjelmar (DK)*

*S. Grilli, N. Faustini and A. Giordano (IT)*  
 Comparison between biological stability measurements under aerobic and anaerobic conditions of municipal solid waste organic fraction

*A. Sánchez, S. Ponsá, M. Pognani, J. Colón, E. Cadena, T. Gea, R. Barrena, A. Artola, X. Font, G. D'Imporzano and F. Adani (ES)*  
 Respiration indices to monitor biological treatment plants: results from several municipal plants

*C. Dumas, J. Lebegue, M. Torrijos, H. Carrère, J.P. Steyer and J.P. Delgènes (FR)*  
 Indicators of biodegradability during anaerobic digestion of solid wastes

*S. Chackiath and B. Couth (GB)*  
 Assessment of biodegradability reduction achieved at an MBT plant

*R. Weltens, G. Vanermen, K. Tirez, I. Nobels and J. Robbins (BE)*  
 DISCRISET phase 2: try-out of a set of fast screening tests for hazard assessment of complex waste materials (part 1: general toxicity)

SESSION D15 - Naturista Room **9:00-10:40**  
**Leachate treatment: non conventional and innovative processes**

*Chairman: G. Bortone (IT)*

*L. Yokoyama, F.V.F. Araujo, J.C. Campos, L.F.A. Freire and L.A.C. Teixeira (BR)*  
 Landfill leachate treatment with advanced oxidation process

*J. Denis, S. Logette, M. Coste and C. Del Piccolo (FR)*  
 Definition and test of optimized landfill leachate treatment line including thermal processes

*L.L. Damiano and J.R. Jambeck (US)*  
 Leachate treatment and electricity production in microbial fuel cells

*W. Hogland, M. Marques, F. Kaczala, S. Laohaprapanon, A. Strömblad, Å. Erlandsson, M. Nilsson, A. Peterson, C. Wiberg, H. Ingdahl and C. Persson (SE)*

Planning and communication for development of an integrated approach for industrial wastewater treatment system in the wood-industry sector - process water, leachate and stormwater

**10:40 - 11:10** Coffee Break

SESSION D16 - Naturista Room **11:10-12:50**  
**Landfill long term behaviour and aftercare**

*Chairman: K.-U. Heyer (DE)*

*D. Laner, J. Fellner and P.H. Brunner (AT)*  
 Quantitative criteria to terminate landfill aftercare - concepts and challenges

*I. Hébé, F. Olivier and E. Plottu (FR)*  
 Evaluation of the R&D program of the French Environmental Agency (ADEME) on sanitary landfills - review and focus on one of the top priorities: post-closure care

*E. Imre, P.Q. Trang, I. Laufer, M. Kovács, P. Nédli, T. Firgi and G. Telekes (HU)*  
 Inverse problem solution to predict long term behaviour of a landfill using short term data

*J.W.F. Morris, M. Crest, A. Åkerman, A. Budka, D. Presse, S. Hayward-Higham and M.A. Barlaz (FR)*  
 Application of the EPCC methodology to evaluate functional stability at closed MSW landfills in Europe

*I. Mancini, S. Masi, D. Caniani and R. Pandolfo (IT)*  
 Long term stabilization in a dry tomb landfill

*M.A. Marcoux, B. Jean, J.P. Gourc, D. Guyonnet, J.F. Ouwry and F. Olivier (FR)*  
 The importance of physico-hydro-mechanical parameters as indicators of MSW stabilisation and their impact on post-closure care and cap cover strategies

## Friday October 9th - Morning

SESSION E15 - Le Dune Room **9:00-10:40**

### **Thermal treatment of gas: case studies**

*Chairman: D. Chen (CN)*

*A. Karagiannidis, T. Kasampalis, N. Gkatsos, P. Samaras and St. Kontogianni (GR)*

Utilization of waste-derived fuels in Hellenic cement plants

*M. Straarup (MY)*

Experiences with development of a Malaysian incinerator

*G. Angelucci, K. Bedin, W. Tirlir and M. Donegà (IT)*

The influence of the Bolzano waste incineration plant and domestic heating on the air quality in the province of Bolzano

*C. Cord'Homme (FR)*

Selection of the best available techniques (BATs) for nitrogen oxides (NO<sub>x</sub>) treatment in different energy from waste plants around Paris

*E. Lategano, F. Lombardi, R. Gavasci and D. Desideri (IT)*

Optimization of the SNCR DENO<sub>x</sub> system of a healthcare waste incinerator: a case study

**10:40 - 11:10** Coffee Break

SESSION E16 - Le Dune Room **11:10-12:50**

### **Combustion residues stabilisation**

*Chairman: A. Lagerkvist (SE)*

*R. Baciocchi, G. Costa, A. Poletti and R. Pomi (IT)*

An insight into the effect of accelerated carbonation on metal release from incinerator ash

*D. Chen, Y. Hu, B. Zhou and J. Xie (CN)*

Hydrothermal treatment of MSWI fly ashes for their complete stabilization

*A. De Boom and M. Degrez (BE)*

Washing of different size-fractions from municipal solid waste incinerator fly ashes

*G. Cappai, S. Milia, A. Muntoni and M. Piredda (IT)*

Effect of accelerated carbonation on MSWI bottom ash and its particle size fractions

*D. Sager and S. Heuss-Assbichler (AT)*

The relevance of grain size fraction on solid phase development of MSWI bottom ash

## Friday October 9th - Morning

SESSION F15 - Edera Room **9:00-10:40**

### **Sustainable waste management and capacity building in developing countries**

*Chairman: C. Zurbrügg (CH)*

*J. Snyman and K. Vorster (ZA)*

Towards zero waste for the city of Tshwane metropolitan municipality

*G. Langergraber, F. Meinzinger, M. Lechner, G. de Bruijne, S. Sugden, C.B. Niwagaba, T.A. Kimaro, B.M. Mutua, K. Kassa, R. Komakech, S.N. Kimani, P. Kinyange and W. Ayele (AT)*

Implementation of sustainable sanitation in Eastern African cities - the ROSA approach

*L. Strachan and J. Pass (ZA)*

Where from and where to: 15 years of landfilling in South Africa

*M. Hoffmann, J. Jager and H. Lo (DE)*

Development for the implementation of an integrated waste management model and an education program in Depok, Indonesia

*R. Linzner, P. Beigl and F. Schneider (AT)*

Capacity development in waste management - needs and challenges illustrated in four case studies

*M. Tawfig, R. Couth, G. Pearson and L. Strachan (GB)*

Development of sustainable waste disposal in Sudan

**10:40 - 11:10** Coffee Break

SESSION F16 - Edera Room **11:10-12:50**

### **Appropriate solutions in developing countries (II)**

*Chairman: P.H. Novella (ZA)*

*C. McKinnon (ZA)*

South Africa's best practice methodology on refuse collection and cleaning in informal settlement areas

*Y. Voegeli, C. Lohri, G. Kassenga, U. Baier and C. Zurbrügg (CH)*

Technical and biological performance of the ARTI compact biogas plant for kitchen waste - case study from Tanzania

*S. Sivakumaran, P. Kuruparan and D.A. Mackeen (LK)*

Successive experience of solid waste collection in low income country (Sri Lanka case study)

*S. Diener, F.R. Gutiérrez, C. Zurbrügg and K. Tockner (CH)*

Are larvae of the black soldier fly - *Hermetia illucens* - a financially viable option for organic waste management in Costa Rica?

*I.C.D. Azevedo, R. Azevedo, A.A.P. Tinôco and E.A.G. Marques (BR)*

Scenario of MSW disposal in Zona da Mata, Minas Gerais, Brazil

*S. Elagroudy, T. Elkady, H. Sherif and F. Ghobrial (EG)*

Comparative cost-benefit analysis of different SWM scenarios in Basrah, Iraq

SESSION G15 - Gerani Room **9:00-10:40**  
**IWWG Workshop: In situ aeration in old landfills**  
*Chairman: M. Ritzkowski (DE)*

Landfill aeration has gained increased attention during recent years. This technology offers numerous advantages in terms of emissions reduction, shortening landfill aftercare and providing costs savings for the landfill operator. The method has been successfully applied to a number of landfills in Europe and the US. Other applications of landfill aeration exist with semi-aerobic landfills in Japan and Malaysia. Currently methodologies are under development in order to provide a sound basis for the incorporation of landfill aeration into the carbon trade mechanisms. Within the workshop the potential of landfill aeration will be demonstrated and discussed based on examples from European countries as well as the US. Challenges regarding operation, monitoring and definitions of completion will be addressed. The effectiveness of the semi-aerobic landfill approach will be another focus of the discussion.

**Introductory lectures:**

*M. Ritzkowski, K.-U. Heyer, K. Hupe and R. Stegmann (DE)*  
 Long term landfill aeration by means of a wind driven air venting and aeration system

*D. Nayagam, J. White, T. Rees-White, D. Holmes and K. Zardava (GB)*  
 Modelling study of field-scale aerobic treatment of waste using forced-air injection

**10:40 - 11:10** Coffee Break

SESSION G16 - Gerani Room **11:10-12:50**  
**IWWG Workshop: Research in biological production of Hydrogen**  
*Chairman: W.P. Clarke (AU)*

In biological hydrogen production, bio-resources are used to produce energy with sustainable environmental impacts. Double step digestion may represent the future for anaerobic processes with the production of both hydrogen and methane. The Workshop will establish the state of the art and advances made in research on biological hydrogen production.

**Introductory lectures:**

*L. Alibardi, L. Favaro, M.C. Lavagnolo, M. Basaglia, S. Casella and R. Cossu (IT)*  
 Microbiological analysis in batch test for hydrogen production

*G. Cappai, G. De Gioannis, G. Giordano, A. Muntoni, A. Polettini and R. Pomi (IT)*  
 Energy and material recovery through combined hydrogen-methane production and final composting of different solid and liquid waste (Hymec concept)

*M.R. Boni, S. Scaffoni and L. Tuccinardi (IT)*  
 Lab-scale tests in different operating conditions for the hydrogen and methane production from organic waste

**D. Fino (IT)**

BIOH<sub>2</sub>POWER: from waste to renewable gaseous fuels for current and future vehicles

SESSIONE Italiana I15 - Sala Baldacchino **09:00-10:40**  
**Impatto ambientale delle discariche**  
*Presidente: M.C. Zanetti*

*B. Capaccioni, C. Caramiello, G. Corigliano, S. De Rosa, F. Tatàno*  
 Misure di flusso di biogas con camera di accumulo: indicazioni sperimentali derivanti dall'esperienza quadriennale in una discarica controllata in Regione Marche

*A. Corti, L. Lombardi, I. Pecorini*  
 Riferimenti sulla procedura di misura con il metodo della camera di accumulo delle emissioni di gas da discarica attraverso campagne di misura sperimentali in situ

*F. Belfiore, V. Bretti, L. Frassinetti, F. Olivieri*  
 Analisi complessa della situazione ambientale di una discarica attiva

*E. Davoli, E. Fattore, M. Palmiotto, V. Paiano, G. Celeste, R. Fanelli, A.N. Rossi, M. Il Grande, M. Giorgi, B. Burgio, G. Schembre, P.A. Tuttolomondo*

Studio di risk assessment su una discarica di rifiuti solidi urbani: risultati da due anni di monitoraggio

*S. Silvestri, A. Viezzoli, A. Edsen, E. Auken, M. Giada*  
 L'uso del telerilevamento satellitare e da elicottero per l'identificazione di discariche abusive e siti contaminati

**10:40 - 11:10** Pausa

SESSIONE Italiana I16 - Sala Baldacchino **11:10-12:50**  
**Misura e controllo degli odori nella gestione dei rifiuti**  
*Presidente: F. Tatàno*

*B. Culos, S. Rivilli, R. Snidar, L. Capelli, S. Sironi, A. Trovarelli*  
 Valutazione dell'efficienza di un impianto per la neutralizzazione di odori in una discarica mediante applicazione di nasi elettronici

*T. Zarra, V. Belgiorno, V. Naddeo*  
 Nuovi sviluppi nella valutazione e controllo degli odori nella gestione dei rifiuti

*A. Segalini, M. Bergonzoni, M. Bottai*  
 Ottimizzazione del rendimento di un biofiltro applicato ad un impianto di trattamento preliminare di rifiuti urbani, mediante misure ed analisi olfattometriche in situ

## Friday October 9th - Afternoon

### CLOSING SESSION - Central Hall

*Chairmen: R. Cossu (IT) and R. Stegmann (DE)*

**15:30 – 16:30**

#### Reports on Workshop Sessions

Chairmen's reports on Workshop activity highlighting the controversial aspects, open questions and future developments arising from discussion

**16:30 – 18:30**

#### Table of Rome Thematic Talk

### “FOOD WASTE”

A Thematic Talk on “Food Waste” will be organised by the “Table of Rome” during the Closing Session of Sardinia 2009 Symposium.

The “Table of Rome” represents an independent debate group focusing on the sustainable management of solid wastes and resources. The group is made up of international experts from various fields (university professors, lawyers, representatives of environmental movements, journalists, economists, politicians, doctors, etc).

The group was formed in view of the impelling need manifested during the International Sardinia 2007 Symposium to promote a working group, an integrated multidisciplinary task group with the aim of investigating the sustainable integrated management of solid wastes and resources.

Significant amounts of food waste originate from the industrial production of food throughout the production line. In addition to discards from the production process, considerable amounts of edible foods are disposed of for different reasons. Composition analyses of household waste indicate that significant amounts of unconsumed foodstuffs are disposed of by private households. This “new” type of waste is regarded as a promising field for waste prevention, considering the relevant quantities and their rising trend.

The aim of the Thematic Talk is to stimulate discussion on the scientific aspects of food waste management and other related issues.

A panel of international experts from various fields, including university researchers, political representatives of the Italian Ministry for Food and Agriculture, and Retail chain stores will take part in the debate.

**21:00** Gala Dinner and Closure

The SARDINIA 2009 Award “A life for waste” will be delivered during the Dinner



**Poster discussion will take place in the Poster Hall in the presence of authors, every afternoon from 17:40 to 18:00**

### A: Waste characteristics

**A1** *A.C. Ribeiro, R. Azevedo, E.F. Rocha, I.C.D. Azevedo and A.S. Loreto (BR)*

Mechanical properties of municipal solid wastes

**A2** *N.M. Sunar, D.I. Stewart, E.I. Stentiford and L.A. Fletcher (GB)*

Enumeration of salmonella in compost material by a non-culture based method

**A3** *D. Setnikar, B. Belingar, S. Janežič and J. Kortnik (SI)*

Integrated monitoring of waste consolidation using laser scanning and DPPM method with mathematical correlation of both methods

**A4** *A.Z. Wandrasz, A.J. Wandrasz and J. Koziol (PL)*

Research of influence of bioadhesives on functional characteristics of coal-dust briquettes

**A5** *Y. Dote and T. Sekito (JP)*

Elution rate and composition of alkali from bottom ash

**A6** *K.K. Kleeberg, M. Schlegelmilch and J. Streese-Kleeberg (DE)*

Needle trap: a new method for chemical analysis of odorous substances

**A7** *A. Malamakis, A. Karagiannidis and L. Kouvaritakis (GR)*

Study on production patterns and characteristics of non-household, non-hazardous municipal wastes

### B: Recycling and reuse

**B1** *B. Mohammed and C.R. Cheeseman (GB)*

Converting treated oil drill cuttings into sandcrete construction products

**B2** *J.G. Paul, S. Lange, N. Ravena and E. Paredes (PH)*

Technical and socio-economic aspects of a 100-day material recovery test for the production of alternative fuels and raw materials (AFR) in Iloilo City, Philippines

**B3** *J.B. Hansen, O. Hjelmar, E.A. Hansen and A. Oberender (DK)*

Evaluation of environmental criteria for re-use of soil based on total content of contaminants

**B4** *G. Calabrò, P. S. Calabrò, F. Nucera and E. Tigano (IT)*

Environmental analysis of the design of a new soft drink aluminium can

**B5** *L. Mancini, M. Bergonzoni and G. Ruscitti (IT)*

Recovery and reuse of worm-out tires (PFU) for the realization of soundproof jet material useable in eco-constructions

**B6** *R. Ciccu, M. Ghiani, G. Mei, C. Tilocca and M. Figus (IT)*

Recovery of energetic materials from scrap electrodes of aluminium smelter

**B7** *M.N. Rojas-Valencia, C. E. Ríos and G. Urquiza (MX)*

Hydrometallurgic process for recovery and recycling of the components of alkaline and zinc-carbon batteries in Mexico

**B8** *S. Masi, I.M. Mancini, D. Caniani and E. Trulli (IT)*

Reuse of msw organic fraction and drinking water sludge in geo-environmental application

**B9** *S. Sarenbo and M. Svensén (SE)*

Wood ash agglomerates as roadside filling: influence on the near-road soil chemistry

### C: Waste management strategies

**C1** *S. Sivakumaran, P. Kuruparan and D.A. Mackeen (LK)*

Performance management tool of prevailing and proposed waste management system, Ampara Urban Council, Sri Lanka

**C2** *M. Rodríguez, D. Méndez, P. Heredia, D. Hernández and A. Macht (MX)*

Waste management strategic planning: a Mexico experience

**C3** *E. Kapetanios and A. Tzouvaras (GR)*

Development of an innovative model for the management of packaging materials that arise from a wide scale logistics of cosmetic products

**C4** *S. Kontogianni and A. Karagiannidis (GR)*

Investigation of hazardous household waste in a Hellenic municipality: preliminary results in view of contemporary management challenges

**C5** *T. Lolos, C. Tsompanidis, A. Mentzis, T. Buth, A. Bay and A. Panagouloupoulos (GR)*

Challenges and opportunities in providing technical assistance in the field of solid waste management in Romania

**C6** *A. Nassour, M. Nelles, M. Al-Jaar and A. Schüch (DE)*

Sustainable management of agricultural organic waste and by products in Jordan

**C7** *N. Hirayama, Y. Kawata, S. Suzuki and K. Harada (JP)*

Estimation procedure for potential quantity of tsunami debris on tsunami earthquake disasters

**C8** *G. Tavares, Z. Zsigraiová, V. Semião and M.G. Carvalho (PT)*

A GIS 3-D modelling of MSW collection with optimisation of fuel and labour costs

**C9** *M. Mancini, M. Bergonzoni and E. Bocciarelli (IT)*

Design and optimization of waste management services in mountain districts; the case of "Mountain Community of Taro and Ceno valleys"

## Posters session

**C10** *A.C.Lordsleem Júnior and S.P. Fucale (BR)*  
Quantitative assessment of waste management in Brazilian construction sites

**C11** *M. Mancini, M. Bergonzoni, F. Scaramozzino and L. Sabini (IT)*  
Integrated management of urban solid waste in the territory of Comunità Montana delle valli del Taro e Ceno: organizational-technical and economic aspects

**C12** *R. Garret Da Costa, J. Costa Da Silva, S.G.F. Leite and D. Dias De Carvalho (BR)*  
Rio de Janeiro municipality case: solid urban waste management with emphasis on the process of natural composting

**C13** *C. Llatas and R. Huete (ES)*  
Construction waste management in projects within the framework of the Spanish legislation

**C14** *H.A. Nájera, P. Vera, D. Escobar and M.N. Rojas-Valencia (MX)*  
Evaluation of the site in San Cristóbal de Las Casas, Chiapas, for the final disposal of solid residues, based on official Mexican standards

**C15** *A. Karagiannidis, T. Kasampalis, S. Groudev, T. Kerestedjan, M. Frincul and L. Fanfani (GR)*  
A novel decision support tool for the management of mineral and mining waste with emphasis on new EU member states

## D: Waste management technologies

**D1** *R. Sjöblom and G. Tham (SE)*  
Anthropogenic and natural analogues for the development over time of mixtures of wood-based ash and activated sewage sludge

**D2** *H. Benbelkacem, M. Staub, C. Kintzuger, C. Morra, J.-P. Gourc, J.-P. Laurent, L. Oxarango and R. Bayard (FR)*  
Results of moisture monitoring in two bioreactor cells using neutron scattering and time-domain reflectometry

**D3** *P.P. Falciglia and F.G.A. Vaghiasindi (IT)*  
Treatment of large volumes of industrial sludge: feasibility study and economic sustainability of a stabilization-solidification process

**D4** *C.P. Mihalopoulos, E. Kapetanios and D. Malamis (GR)*  
Multi-criteria evaluation of home composters

**D5** *F. Tsagas, I. Markidis, I. Tsakmakis, N. Grigoropoulos and D. Dermatas (GR)*  
Pilot case study of baling-wrapping for volume reduction and interim storage of MSW in Alexandroupolis, Greece

**D6** *E. Kapetanios, E. Diamantakis, D. Malamis and Ch. Kapetanidou (GR)*  
Development of a prototype model for the optimization of the design of mechanical separation plant for packaging materials

## Posters session

**D7** *M.L. Mancini, M. Bergonzoni, G. Gottardi and S. Oppimitti (IT)*  
Air biofiltering system management and removal efficiency of odour emissions from a preselection solid waste plant

**D8** *G.F. Simões and C.A.A. Catapreta (BR)*  
Waste compaction in Belo Horizonte landfill, Brazil

**D9** *T.A.P. Caldas (CA)*  
Environmental septic wastewater treatment system for primary treatment effluents

**D10** *M.F. Milazzo, R. Lisi and G. Maschio (IT)*  
Revamping of a municipal solid waste incinerator for the treatment of sanitary wastes

**D11** *E.B.A.V. Pacheco, E.C.R. Silva and E. Masanet (BR)*  
Study of technologies of scrap tire destinations in Brazil through environmental impact assessment

**D12** *D. Suetsugu, S. Hayashi, M. Azizul Moqsud, Y. Ushihara and Q.S. Bushra (JP)*  
Pioneering improvement technique of tidal mud in the Ariake Sea, Japan

**D13** *M. Rosato (ES)*  
AFADS organic water/solid waste depurator

**D14** *A. Karagiannidis, T. Kasampalis, P. Samaras, G. Perkoulidis and P. Ziogas (GR)*  
Estimation of sewage sludge production in Greece in the frame of integrated material and energy recovery

## E: Degradation processes

**E1** *M. Mellendorf, A. Watzinger, M. Huber-Humer and M.H. Gerzabek (AT)*  
Changes in microbial community composition and biomass during in-situ aeration of landfill materials in laboratory column experiments

**E2** *M. Patoni, N. Kalogerakis (GR)*  
Acclimatization of anaerobic cultures for methane production from electrochemically pretreated olive mill wastewater

**E3** *A. Morán, M.J. Cuetos, D. Blanco and X. Gómez (ES)*  
Anaerobic co-digestion poultry manure with sludge and food wastes

**E4** *S. Grilli, A. Dall'Ara, M. Caudatelli and N. Rappoli (IT)*  
Assessment of biostabilisation in municipal solid waste organic fraction: additive and time effects on laboratory scale test

**E5** *G. Cappai, A. Carucci, G. De Gioannis and A. Muntoni (IT)*  
Accelerated ageing of Waelz slag residue by combined carbonation and chemical stabilization

## F: Landfill design and technologies

**F1** *N. Ronkainen, K. Kujala and J. Saarela (FI)*

Use of industrial by-products in landfill cover

**F2** *K. Kudo, S. Usami, S. Imaizumi, I. Norimatsu and S. Matsuyama (JP)*

Experimental study on slow and fast deformation of bentonite mixed soil layer

**F3** *D. Malamis, S. Gozhdari, S. Malamis, E. Kapetanios and M. Loizidou (GR)*

Development of a landfill site selection decision tool

**F4** *A. Segalini, M. Bergonzoni and E. Kekridou (IT)*

Environmental restoration and adaptation in the legislation of the community of the landfill site for M.S.W. in Keramoti (GR)

**F5** *G. Zappini, G. Tomasoni and P. Cocca (IT)*

A forecasting model for waste being disposed of in landfills

**F6** *A.L. Martínez, G.F. Simões, A.L.G. Cortázar, R.S. Padilla, C.A.A. Catapreta and V.F.O. Morais (ES)*

Water balance of an experimental landfill using modulo

**F7** *E. Ritter, J.A. Ferreira, I.M. Barroso, T.F.L. Dos Santos and M.A. Ventura (BR)*

The final soil cover design using tropical soil from Brazil

**F8** *R.J. Villela, R.L.S. Izzo and C.F. Mabler (BR)*

Study of diversion in capillary barriers made of MBT waste

**F9** *F. Belfiore, V. Bretti, L. Frassinetti and F. Olivieri (IT)*

Integrated analysis of a complex environmental state at an active landfill site

**F10** *F. Ohno, I. Norimatsu, M. Hanashima and T. Furuichi (JP)*

Study on construction of large capacity closed system disposal facilities in Japan

**F11** *M. Kawaguchi, T. Furuichi, N. Tanikawa and K. Ishii (JP)*

Experimental studies on a self-restoring liner system that uses colloidal solution for landfill site

## G: Environmental aspects in waste management

**G1** *R. Couth and C. Trois (GB)*

Calculation of carbon emissions from waste management across Africa and potential for reduction

**G2** *K.R. Kwon, H.S. Cho and J.Y. Kim (KR)*

Two major issues on estimation of CERs potential in CDM landfill projects

**G3** *F. Gross, V. S. Rotter, Wisjuprpto and M. Siebel (DE)*

GHG reduction through integrated industrial waste management in palm oil production processes - Case study in Indonesia

**G4** *T. Ishigaki, Y. Furuta, K. Wang-Yao, K. Endo and M. Yamada (JP)*

Estimation of emission factors of greenhouse gas emission from waste landfills in Japan

**G5** *M.N. Rojas-Valencia, I. Oropeza and H. Najera (MX)*

The influence of solid urban waste on climate change

## H: Leachate and biogas emissions and management

**H1** *P.P. Cella Mazzariol, G.F. Galanzino, C. Ubbiali, D. Mainero, G.L. Soldi and E. Magnano (IT)*

Treatment of landfill biogas using the Geko® system

**H2** *A. Corti, L. Lombardi and I. Pecorini (IT)*

Reference procedure definition for accumulation chamber measurements of landfill cover emissions through field experimental campaigns

**H3** *A. Corti and L. Lombardi (IT)*

Comparison of different possibilities for biogas recovery: power production vs. up-grading

**H4** *B. Quant, S. Fudala-Książek, A. Łuczkiwicz K., E. Kulbat, K. Olan Czuk-Neyman, K. Jankowska and K. Czerwionka (PL)*

Landfill leachate treatment at the municipal wastewater treatment plants

**H5** *K. Sakaguchi-Söder and J. Jager (DE)*

Compound-specific stable chlorine isotope analyses on chlorinated organic compounds: A new tool for landfill leachate management

**H6** *K. Wangyao, M. Yamada, K. Endo, T. Ishigaki, T. Naruoka, S. Towprayoon and C. Chiemchaisri (JP)*

Estimation of methane generation rate constant for tropical landfills

**H7** *E. Ritter, J.A. Ferreira, I.C.R.P. Valadao and J.A.C. Pires (BR)*

The contamination profile on compacted soil foundation from two experimental cells in Rio das Ostras sanitary landfill, Brazil

**H8** *L. Yokoyama, J.C. Campos, F.B. Silva, B.R.P. Ferro, P.F. Schilling and L. Cardillo (BR)*

Treatment of landfill leachate by combined processes

**H9** *N. Tanikawa, T. Furuichi and K. Ishii (JP)*

Proposal for a convenient method for estimating methane emissions from landfilled waste using a closed system disposal facility and a portable open-path analyzer

**H10** *C.T. Zanotelli, L.M.A. Rodrigues, C.M. Orth and R.H.R. Costa (BR)*

Stabilization ponds for the treatment of industrial leachate

## Posters session

**H11** *T. Fukushige, A. Tanaka and Y. Matsufuji (JP)*  
Low cost and simple technology-type leachate treatment system for developing countries

**H12** *I. Norimatsu, N. Yamaguchi, S.- T. Park, K.H. Lee and K.H. Lee (JP)*  
Laboratory experiment based on in-situ landfill anaerobic-aerobic changeover control and water supplying for methane gas collection and waste stabilization

## I: Waste to energy

**I1** *R. Civita, G. Cornacchia, A. Donatelli, P. Iovane, M. Martino, D.A. Matera and A. Russo (IT)*  
Refuse derived fuel (RDF) gasification in a rotary drum experimental plant

**I2** *J.G. Paul, S. Lange, A.R.D. Romallosa (PH)*  
Results of a value adding test to produce alternative fuels and raw materials (AFR) for industrial purposes and for household energy supply with appropriate technologies

**I3** *A. Segalini, M. Bergonzoni and L. Canforini (IT)*  
Realization of a biomass installation in Borgo Casale (PR): planning, environmental, managerial, energetic and economic characteristics

**I4** *D. Barba, M. Prisciandaro and A. Salladini (IT)*  
The Gibbs free energy gradient method for RDF gasification modeling

**I5** *K. Ishii, T. Furuichi, N. Tanikawa and S. Watanabe (JP)*  
Development of energy supply systems in an industrial area linked with a biomass community

**I6** *A. Karagiannidis, G. Perikoulidis, A. Papageorgiou and S. Kalogirou (GR)*  
Integrated assessment of a candidate waste-to-energy plant in central Greece

**I7** *A. Karagiannidis, T. Kasampalis, A. Malamakis, G. Fontaras, K. Tegos and Z. Samaras (GR)*  
Assessing the sustainability of waste-derived biofuels in the transport sector in Greece

**I8** *N.J. Themelis, A. Bourka, G. Ypsilantis and A. Karagiannidis (US)*  
Energy and material recovery from municipal solid wastes on the island of Rhodes

## Posters session

## L: Contaminated soils and groundwater

**L1** *M.R. Boni, S. Scaffoni and L. Tuccinardi (IT)*  
Valorisation of inorganic waste for MTBE removal from contaminated groundwater

**L2** *L. Petrescu, E. Bilal and L.E. Iatan (RO)*  
A study of contaminated soils near a uranium mine, East Carpathians, Romania: metal distribution and partitioning of U, Th and some heavy metals with implications for vegetation uptake

**L3** *D. Nordmark, R. Rönkkö, J. Kumpiene, L. Andreas and A. Lagerkvist (SE)*  
Changes in leaching and chemical fractionation of arsenic, chromium and copper in soil after thermal treatment

**L4** *A. Dall'Ara, F. Ferri, V. Marroni, L. Billi and A. Bonoli (IT)*  
Low impact bioremediation technology: application in a restoration site

**L5** *A. Takahashi, T. Kameyama and S. Hoshina (JP)*  
Pre-treatment method in a bio-degradation system for removing polychlorinated dioxins from contaminated soil and sediments

**L6** *G. De Gioannis, A. Muntoni, D. Spiga and J.J.P. Zijlstra (IT)*  
Reuse of transformed red mud waste in electrokinetically aided reactive barriers for remediation of arsenate polluted low permeability soils

**L7** *G. De Gioannis, A. Muntoni, R. Peretti, A. Serci, D. Spiga and A. Zucca (IT)*  
Comparison of different approaches to treatment of residues resulting from contaminated sediments dredging



## **INSTRUCTIONS FOR CHAIRMEN & SPEAKERS ISTRUZIONI PER PRESIDENTI DI SESSIONE & RELATORI**

### **Instructions for Chairmen of Sessions**

On arrival at the Symposium venue Chairmen of oral sessions, specialised sessions and workshops are kindly requested to contact the Speakers' Room where curricula vitae of Speakers will be provided and any last-minute changes in the programme of the session to be chaired will be notified. Fifteen minutes prior to start of the sessions, Chairmen should report to the Conference Hall where the session will take place, to meet the Speakers. Chairmen are furthermore requested to ensure that all Speakers remain seated at the table throughout the entire session and that the timetable is strictly adhered to. This aspect is of extreme importance in order to allow Delegates to schedule their attendance in the parallel sessions.

### **Istruzioni per i Presidenti di sessione**

I Presidenti delle sessioni orali, specializzate e workshop al loro arrivo presso la sede del Simposio sono gentilmente pregati di contattare la Sala Relatori affinché vengano forniti loro i curricula vitae dei relatori e vengano comunicate eventuali modifiche al programma della sessione che dovranno presiedere. Quindici minuti prima dell'inizio delle rispettive sessioni i Presidenti si presenteranno presso la sala dove si svolge la sessione per prendere contatto con i Relatori. I Presidenti di sessione sono inoltre pregati di adoperarsi affinché nessuno dei Relatori abbandoni la sala prima della conclusione della sessione e che venga rispettata la tempistica prevista. Quest'ultimo aspetto è di particolare importanza al fine di consentire ai Partecipanti di seguire le relazioni di loro interesse nelle sessioni parallele.

### **Information for Speakers**

- Speakers should contact the Chairman 15 minutes prior to start of Session in which their paper is to be presented. The meeting will take place in the Conference Hall where the Session will take place.

- Speakers should be present at the Conference Table from start of the Session and remain for the entire duration.

- The time available for each presentation is 20 minutes in session A and B, 15 minutes in specialized session and 10 in workshop sessions. Chairmen will ensure that times are strictly adhered to - the following equipment will be available for Presentations:

- beamer
- In the Speakers' Room the following equipment will be provided:
- scissors, stapler, glue and general stationery
- copier
- back up computer and printer.
- The duty member in the Speakers' Room is on hand for all requirements.

- A PC is available for Speakers' use; priority will be given on the basis of session timetable. The computer in the Speakers' Room may not be used to prepare presentations, but only to make small changes or for final checking.

- Speakers who have not sent their powerpoint presentation to the Organising Secretariat prior to the conference are kindly requested to contact the Speakers' Room no later than during the Session prior to that in which their own communication is scheduled (should their communication be scheduled in the morning sessions, the deadline is the evening Session the day before). Should the powerpoint presentation not have been sent in advance and technical problems arise during the presentation, no additional time will be available.

- During the presentation commercial advertising should be avoided.  
- Mention of affiliations or company name should be very discreet. As time allowed for communication expires, do not under any circumstances accelerate in order to finish the entire presentation but pass directly to the conclusions.

- The poster session will be held in the external foyer of the main conference hall (see the map). Authors of posters should contact the Staff Members as soon as possible in order to place the posters on the panels. Please do not mount posters without Staff authorization.

- In preparing your poster please avoid any commercial advertising.  
- Mention in the poster of affiliations or company name should be very discreet.



## Informazioni per i Relatori

- I Relatori che devono presentare la loro relazione devono contattare il Presidente della sessione di interesse almeno 15 minuti prima dell'inizio della stessa nella Sala Conferenze.
- Gli Autori dovranno essere presenti al tavolo della conferenza dall'inizio della sessione e rimanervi per tutta la durata della stessa.
- Il tempo a disposizione per ciascuna presentazione è di 20 minuti per le sessioni A e B, 15 minuti per le sessioni specializzate, 10 minuti per i workshop. Il Presidente di sessione provvederà affinché tale limite sia strettamente osservato.
- Per la presentazione orale i Relatori avranno a disposizione:
  - Video-proiettore
- La Sala Relatori sarà a disposizione dei Relatori che potranno disporre di:
  - forbici, pinzatrici, colla ed altra cancelleria
  - fotocopiatrice
  - computer di riserva e stampante
- Nella Sala Relatori sarà sempre presente un incaricato dell'organizzazione per fornire eventuale assistenza (lingue parlate: inglese ed italiano).
- Il computer è a disposizione dei relatori con precedenza che rispetta gli orari della sessione di presentazione. Non sarà possibile utilizzare il computer della sala relatori per preparare le relazioni, ma solo per apportare piccole modifiche e per un controllo finale.
- Nella presentazione va assolutamente evitata qualsiasi forma di pubblicità.
- La presenza del vostro ente o ditta di appartenenza deve essere molto discreta. Durante la comunicazione orale, nel caso stia per terminare il tempo a disposizione, non accelerare per esporre il resto della relazione ma passare direttamente alle conclusioni.
- La sessione poster si terrà nel foyer esterno dalla sala Congressi (vedi mappa). Gli Autori dovranno quanto prima recarsi alla sala poster per procedere all'affissione del poster stesso coadiuvati dal Personale dell'Organizzazione. Si raccomanda di non procedere all'affissione del poster senza l'autorizzazione del Personale preposto.
- Nella preparazione dei poster va assolutamente evitata qualsiasi forma di pubblicità.
- La presenza nei poster del vostro ente o ditta di appartenenza deve essere molto discreta.

## USEFUL INFORMATION INFORMAZIONI UTILI

### Official Languages / Lingue Ufficiali

*The working language of the Symposium is English. This year, for the first time, a session will be held entirely in Italian to facilitate participation by local experts and administrators.*

La lingua ufficiale del Simposio è l'inglese. Quest'anno, per la prima volta, è in programma una sessione in italiano per facilitare la partecipazione di esperti e operatori locali.

### Symposium staff / Personale dell'organizzazione

*EuroWaste Personnel is on hand should you need assistance. They are easily recognisable and will be wearing a "staff" badge. Furthermore, a team of Hostesses and Stewards will be pleased to assist you and do their best to ensure that your participation in the Symposium is gratifying.*

Il Personale della EuroWaste, riconoscibile dal badge con la scritta "staff", è a vostra disposizione per ogni necessità. Inoltre, un gruppo di Hostess è disponibile per assistervi durante tutto il corso del Simposio.

### What's included in your registration / Che cosa è incluso nella vostra registrazione

*Full Delegate and Students' Fees / Quota Partecipanti e quota Studenti*

- participation in Symposium sessions
- CD-ROM and conference materials
- coffee breaks
- Gala Dinner (supplement to evening meal)
- n.b. Cost required to attend the Sardinian Dinner is not included
- partecipazione alle sessioni del Simposio
- CD-ROM e materiale congressuale
- coffee breaks
- Cena di Gala (come supplemento alla quota della pensione alberghiera)
- la quota di iscrizione non comprende il costo richiesto per prendere parte alla cena sarda

*All Delegates, including students, not resident at Forte Village Resort are required to pay the difference between the supplement for half board and full board for the Gala Dinner at the registration desk.*

I partecipanti al Simposio, compresi gli studenti, non residenti nel complesso alberghiero del Forte Village Resort, sono tenuti a pagare per la cena di gala la differenza tra il supplemento della mezza pensione e la pensione completa, presso il banco registrazioni.

## **Name badges / Badge nominativi**

*Badges distributed with the congress material received on registration are strictly personal: they represent the only valid document for admission to the Congress Hall and must be visible at all times. Entrance to conference hall may be refused to Delegates who cannot show their badge. Delegates may be required to provide proof of identity during on-the-spot checks.*

I badge, che verranno consegnati contestualmente al resto del materiale all'atto dell'iscrizione, sono strettamente personali e rappresentano l'unico documento valido per l'ingresso alle sale di svolgimento dei lavori. L'ingresso ai lavori potrà essere negato a chiunque non mostri il badge al personale preposto al controllo. Oltre al badge i Delegati saranno tenuti a mostrare, dietro eventuale richiesta del personale di controllo, un documento di identità.

## **Registration / Registrazioni**

*The Registration desk will be open in the Conference Center Hall on Sunday October 4th 2009, from 16.00 – 19.00, Monday October 5th 2009, from 08.00 – 13.00 and from 14.30 – 15.30. Late registration can be carried out on Tuesday, October 6th 2009, from 09.00 – 10.00.*

La registrazione al Simposio potrà essere effettuata al banco di segreteria presso la hall del Centro Congressi domenica 4 ottobre dalle 16.00 alle 19.00 e lunedì 5 ottobre dalle 08.00 alle 13.00 e dalle 14.30 alle 15.30. La registrazione sarà inoltre possibile la mattina di martedì 6 ottobre dalle 09.00 alle 10.00.

## **Accommodation**

*All prices quoted by Forte Village Resort are per person per day. On a halfboard basis, meals included are breakfast and evening dinner. For the evening of the Gala Dinner, the Organizers will be pleased to cover the necessary supplement to the price paid for evening dinner. Accompanying persons wishing to attend the Gala Dinner should book at the Conference Secretariat; in this case, the supplement will be payable directly to Forte Village Resort.*

## **Sistemazione alberghiera**

Tutti i prezzi imposti dal Forte Village Resort sono da intendersi per persona al giorno con sistemazione in mezza pensione. La mezza pensione include la colazione e la cena. Il supplemento richiesto per partecipare alla Cena di Gala è incluso nella quota di registrazione. Gli accompagnatori che desiderano partecipare alla Cena di Gala devono registrarsi presso la Segreteria Organizzativa del Simposio e il supplemento verrà regolato direttamente dal partecipante con il Forte Village Resort.

## **HOTEL FACILITIES / SERVIZI ALBERGHIERI**

### **Sport & Entertainment / Sport ed Intrattenimenti**

*The Forte Resort Complex is situated on the southwestern coast of Sardinia about 39 kms south of the capital, Cagliari. For recreation there is a superb stretch of private beach, 11 floodlit tennis courts, five swimming pools, a sauna and gymnasium, horse riding, basketball, volleyball, table tennis, mini golf, trampolines and much more. The Water Sports Centre offers wind surfing, sailing, scuba diving, water-skiing, rowing boats, catamaran and paragliding. Disco dancing until the small hours in the modern Forte Resort Discotheque.*

Il Complesso Alberghiero Forte Village si trova sulla costa sud-occidentale della Sardegna a circa 39 km di distanza da Cagliari. Gli ospiti potranno seguire corsi ed avere lezioni nelle diverse discipline sportive. Il costo del soggiorno comprende l'uso delle attrezzature sportive (tennis, squash con illuminazione artificiale) ad esclusione del noleggio biciclette, sport nautici, equitazione, lezioni e i servizi delle Terme del Parco. Alla sera è possibile ballare fino a tardi presso la discoteca del Villaggio.

### **The "Terme del Parco" wellness centre / Le Terme del Parco**

*We heartily recommend a visit to the marvellous Terme del Parco wellness centre. Here you can relax in a secluded oasis dotted with heated swimming pools with artificial waterfalls, hydromassage and wave-makers. Moreover you may work-out in a fully-equipped gym or regain top form in a sauna, Turkish bath or in the beauty centre and massage rooms. Special cost for Sardinia 2009 delegates: 65 Euro.*

Consigliamo vivamente una visita alle Terme del Parco. In un'atmosfera di assoluto relax potrete usufruire dei servizi idroterapici di piscine termali con cascate ed onde artificiali ed idromassaggio. Inoltre, per chi desidera rimettersi in forma, è disponibile una palestra completa con sauna, bagno turco, sala massaggi e centro estetico. Prezzo speciale per il Simposio Sardinia 2009: 65 Euro.

### **Guest card / Carta Ospiti**

*The Forte Village Guest Card, similar to a credit card, will be requested by hotel staff on access to restaurants, bar etc.. Clients will not be admitted to restaurants without this card. Cards should be obtained from the Travel Agency Desk in the Foyer of the Conference Centre before the evening meal on the day of arrival.*

La Carta Ospiti del Forte Village, simile ad una carta di credito, deve essere esibita al personale del complesso alberghiero all'ingresso di ristoranti, bar ecc... L'accesso verrà negato ai clienti sprovvisti di questa carta. La Carta Ospiti potrà essere ritirata al banco della Agenzia di Viaggi nel Foyer del Centro Congressi prima del pasto serale del giorno di arrivo.

### **Credit Cards and Cheques / Carte di Credito e Assegni**

*The following credit cards are accepted: Mastercard, American Express, Diners Club, Carte Blanche and Visa. Travellers Cheques can be cashed by the Front Desk Cashier or at the Hotel Castello Desk; personal cheques are not accepted.*

L'Hotel accetta le seguenti carte di credito: Mastercard, American Express, Diners Club, Bancomat e Visa. I Travellers Cheques potranno essere cambiati al banco di registrazione del Forte Village e all'Hotel Castello, ma non saranno accettati assegni bancari personali.

### **Restaurants / Ristoranti**

- Bar Oasis / Cavaliere (*open for breakfast / aperto per colazione*)
  - Pizzeria (*open at lunchtime / aperto per pranzo*) *Meals consumed at lunch time should be paid for separately (see "Useful Information")*
- I pasti consumati per pranzo dovranno essere pagati separatamente (vedere "Informazioni utili").
- Pineta and/or Colosseo (*open for dinner / aperto per cena*)

*Dinner will be served in the Pineta Restaurant, weather permitting. If weather is bad the Colosseo Restaurant will be used.*

La cena sarà servita al ristorante Pineta, solo in caso di brutto tempo al ristorante Colosseo.

### **Meal functions / Pasti**

*All Delegates residing at Forte Village Resort are accommodated on a half-board basis (breakfast and evening dinner included). Delegates resident at Forte Village Resort, who wish to obtain a buffet lunch in the hotel restaurants may do so but will be required to pay an extra 30,00 Euro per person per day. For delegates not resident at Forte Village Resort, the extra cost is 38,00 Euro per person per day. For those who do not wish to consume a full lunch, several snack bars and the pizzeria will be open in the hotel complex (see "Hotel Facilities"). Under no circumstances, with the exception of Tuesday 6th October for delegates who attend the Sardinian Dinner, will it be possible to exchange dinner for lunch; meals included in your package and not consumed will not be reimbursed.*

Per i partecipanti che alloggiano nel complesso Forte Village Resort è prevista una sistemazione di mezza pensione (includere prima colazione e cena). I partecipanti, residenti al Forte Village Resort, che desiderassero pranzare nei ristoranti del complesso alberghiero lo potranno fare ad un costo di 30,00 Euro. Per i partecipanti non residenti il costo dei pasti è di EURO 38,00 a persona. Per coloro che non intendono usufruire dei ristoranti, nel complesso alberghiero sono presenti alcuni snack bar e la pizzeria (vedere la parte relativa ai "Servizi Alberghieri"). In nessun caso per i partecipanti sarà possibile effettuare scambi fra pranzo e cena, ad eccezione di coloro che prenderanno parte alla Cena Sarda di martedì 6 Ottobre e solo per quel giorno; inoltre i pasti inclusi nel pacchetto alberghiero acquistato e non consumati non potranno essere rimborsati.

### **Getting around / Come muoversi nel villaggio**

*Information boards will be posted in the lobby of the Congress Hall illustrating each day's events. A map of the village will be provided on arrival in Forte Village Resort. Further copies may be obtained from the Hotel Reception.*

Un cartello informativo sarà sempre esposto nella zona di accesso alla Sala Centrale dove verranno segnalati gli eventi della giornata. All'arrivo al villaggio verrà consegnata una mappa dello stesso; altre copie potranno essere ottenute presso la Reception dell'Hotel.

### **Official Travel Agent / Agenzia di viaggi**

*The Official Travel Agent is available for assistance:*

F.A. Travel Srl

Via S. Tommaso d'Aquino 18,

09134 – Cagliari, Italy

Tel: +39.070.554195

Fax: +39.070.513451

Email: [landfill@fatravel.it](mailto:landfill@fatravel.it)



## SOCIAL EVENTS / EVENTI SOCIALI

*After eight hours of Symposium attendance it is time to enjoy the company of colleagues and friends, to relax and enjoy the entertainment. Details of social events organized are illustrated below. Some of these need to be booked due to the limited number of places available. In such cases, bookings should be received strictly by fixed dates and times. We recommend early booking.*

Dopo otto ore al giorno di lavoro congressuale è tempo di godere della compagnia di colleghi ed amici e di rilassarsi con un po' di svago! Come riportato qui di seguito sono state programmate diverse manifestazioni sociali. Per alcune di queste, a causa del numero limitato di posti disponibili, è necessaria la prenotazione entro i termini appresso indicati. Vi raccomandiamo di prenotare al più presto.

*Monday 5th*      *Karaoke Evening*  
Lunedì 5      Serata Karaoke

*Tuesday 6th*      *Sardinian Dinner*  
Martedì 6      Cena Sarda

*Wednesday 7th*      *International Soccer Match*  
Mercoledì 7      Partita Internazionale di Calcio

*Thursday 8th*      *Sardinia's Got Talent*  
Giovedì 8

*Friday 9th*      *Gala Dinner and Closure of Symposium*  
Venerdì 9      Cena di Gala e Chiusura del Simposio

*During the Gala dinner Awards will be given for the best papers in different areas. As for the past editions the Sardinia Symposium Award "A Life for Waste" will be presented in order to congratulate an outstanding personality in the field of Waste Management. The Award winner will be indicated by a Jury of International Experts.*

Durante la Cena di Gala verranno consegnati i premi per i migliori lavori presentati nelle diverse aree tecnico-scientifiche. Come per le scorse edizioni, il premio speciale "A Life for Waste" verrà consegnato per celebrare una personalità che si è distinta nel settore della gestione dei rifiuti. Il premio verrà assegnato da una giuria di esperti internazionali.

## SARDINIA SYMPOSIUM AWARD "A LIFE FOR WASTE" PREMIO SIMPOSIO SARDINIA "UNA VITA PER I RIFIUTI"

*In 1999, the International Advisory Board for the Sardinia Symposium set up an award "A Life for Waste", to be presented biennially to individuals who have made an outstanding contribution to advances in international waste management.*

*The recipient of the sixth edition of the Award, to be delivered during the Symposium Gala Dinner, for his significant and fundamental contributions to the science and practice of wastes management, is Rainer Stegmann. The award is represented by a sculpted silver statue by the renowned Sardinian artist Antonello Pillittu. The award will be delivered during the Gala Dinner on Friday evening, 9 October, h. 21.00.*

Il Comitato Scientifico Internazionale del Simposio Sardinia ha istituito il Premio "Una Vita per i rifiuti" da consegnare ogni due anni, e rivolto ad una personalità scientifica di alto livello che abbia nel corso della sua attività scientifica dato un particolare contributo all'avanzamento del livello tecnico e scientifico della gestione dei rifiuti solidi. Il sesto di questi Premi verrà consegnato durante il Sardinia 2009 ed è stato destinato al Professore Rainer Stegmann per il suo fondamentale contributo tecnico e scientifico alla gestione dei rifiuti solidi. Il Premio è costituito da una fusione in argento del famoso scultore sardo Antonello Pillittu. Il Premio verrà consegnato nel corso di una Cerimonia che si svolgerà durante la Cena di Gala, Venerdì, 9 Ottobre, alle ore 21.00.

## HALL OF HONOUR "A LIFE FOR WASTE" ALBO D'ORO DEL PREMIO "UNA VITA PER I RIFIUTI"

1999 – Masataka HANASHIMA

2001 – Eugenio DE FRAJA FRANGIPANE

2003 – Robert HAM

2005 – John PACEY

2007 – Grahame FARQUHAR



Sar-dinia

Reparata Eueria

Sar

Frisan

Bosi

Corneto

Valeria

Iessa

Cagliari

Sarula destructa

Girapola

Maltera

Area Santa

Tolar

Torre

Bossa

Oseo

Nova

Sassari

Rosan

Argelar

Napoli

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SARDINIA 2009

*[www.sardiniasymposium.it](http://www.sardiniasymposium.it)*