

VENICE 2026

11th INTERNATIONAL SYMPOSIUM ON
ENERGY FROM BIOMASS & WASTE
23-25 November 2026, Venice, Italy

SYMPOSIUM PROGRAMME

(Updated on 21.09.2026)



Programme at a glance

■ Thermal treatment
 ■ Biological treatment
 ■ Biofuels
 ■ Various
 ■ Energy Recovery & Circular Economy
 ■ Focus Session

Monday, 23 November 2026			
09:00 - 10:15	OPENING SESSION Chair: Raffaello Cossu, University of Padova (IT)		
10:45 - 12:00	FOCUS SESSION I		
12:15 - 13:30	SESSION A01 Combustion, Emissions and Process Efficiency	SESSION B01 Pretreatments and Feedstock Selection	SESSION C01 Life Cycle Thinking and Assessment
13:30 - 15:00	<i>Lunch break</i>		
15:00 - 16:15	SESSION A02 Optimization of Incineration Processes	SESSION B02 Modelling, Optimisation and Systems Analysis	SESSION C02 Workshop - Sustainable Electronics: Reuse, Recycling, and LCA I
16:45 - 18:00	SESSION A03 Advanced Gasification and Syngas Valorisation	SESSION B03 Anaerobic Processes: Efficiency and Optimization	SESSION C03 Workshop - Sustainable Electronics: Reuse, Recycling, and LCA II

Tuesday, 24 November 2026			
09:00 - 10:15	SESSION A04 Pyrolysis of Plastics and Composites	SESSION B04 Specific Biomass Management	SESSION C04 Workshop - Carbon, Nutrient, and Energy Recovery Pathways I
10:45 - 12:00	SESSION A05 Environmental Challenges of Waste-to-Energy	SESSION B05 Hydrogen Production and Valorisation	SESSION C05 Workshop - Carbon, Nutrient, and Energy Recovery Pathways II
12:15 - 13:30	SESSION A06 Biomass Thermal Conversion and Smouldering	SESSION B06 Perspectives of Biogas Utilisation	SESSION C06 Sustainable Aviation Fuels (SAFs)
13:30 - 15:00	<i>Lunch break</i>		
15:00 - 16:15	SESSION A07 Biofuels and Bioproducts Conversion Technologies	SESSION B07 Enhanced Energy Recovery from Biological Processes	SESSION C07 Workshop - IWWG Thermal Treatments Task Group Sandpit I
16:45 - 18:00	SESSION A08 Pathways and Perspectives for Biofuels and Bioproducts	SESSION B08 Education and Public Awareness in Waste-to-Energy	SESSION C08 Workshop - IWWG Thermal Treatments Task Group Sandpit II

Wednesday, 25 November 2026			
09:00 - 10:15	SESSION A09 Advanced Thermal Waste Valorisation	SESSION B09 Specific Circular Economy Streams	SESSION C09 Workshop - IEA Bioenergy Task 33: Biofuels and Biochemicals I
10:45 - 12:00	SESSION A10 Hydrothermal Processes	SESSION B10 Circular Valorisation of Industrial Waste Streams	SESSION C10 Workshop - IEA Bioenergy Task 33: Biofuels and Biochemicals II
12:15 - 13:30	SESSION A11 Biochar Production and Use	SESSION B11 Italian Session - Rifiuti e Salute: Presentazione Libro Chairs: R. Cossu, M. Ferrante	SESSION C11 National Case Studies
13:30 - 15:00	<i>Lunch break</i>		
15:00 - 16:15	SESSION A12 Carbon Capture and Utilisation	SESSION B12 Workshop - PFAS in Waste Streams: Challenges, Technologies, and Future Horizons	
16:45 - 18:00	FOCUS SESSION II		
18:00 - 18:30	CLOSING SESSION Chair: Raffaello Cossu, University of Padova (IT)		

Poster Session - From 23 to 25 November 2026	
09:00 - 18:30	SESSION PP POSTER PRESENTATIONS Available in digital format at all times throughout the conference.

SESSION A01 // 23rd November 2026 12:15 -13:30

COMBUSTION, EMISSIONS AND PROCESS EFFICIENCY

Chair / *Presidente*: TBD

D. Panepinto, M. Zanetti, P. Urso, V. Tedesco (IT)

Energy recovery, emission mitigation and resource efficiency in the expansion of a waste-to-energy facility

T. Turzynski, S. Polesek-Karczewska, P. Hercel, P. Baginski, A. Andrearczyk, D. Kardas (PL)

Development and thermodynamic optimization of a small-scale regenerative air Brayton cycle fueled by green methanol

S. Umegaki, Y. Kimoto, H. Harada, M. Takaoka (JP)

Effects of CO₂ concentration in municipal solid waste incineration on high-temperature corrosion of boiler heat transfer tubes

C. Dettori, G. Tilley ()

Boosting efficiency with antifouling treatment at WtE plants

SESSION A02 // 23rd November 2026 15:00 -16:15
OPTIMIZATION OF INCINERATION PROCESSES

Chair / *Presidente*: TDB

A. Gyorfi, A. Dolgosné Kovács, B.L. Alpek, Cs. Leitol (HU)

Effects of particle size fractionation on the main quality characteristics of RDF/SRF

F. Xu, L. Yin, D. Chen (CN)

Co-incineration of industrial organic waste in MSW incinerators: combustion performance analysis and dynamic furnace temperature prediction

M. Qiu, D. Chen (CN)

Performance and iron transformation of Fe-MgO-biochar catalyst in MSW volatile steam reforming: a laboratory-scale comparative study between fixed-bed and fluidized-bed reactors

M. Schnell, **K. Stark**, E. Peters, D. Wohter, P. Quicker (DE)

Decentralised sewage sludge incineration in a double whirl twin stage incinerator: pilot-scale demonstration, energy integration and resource recovery potential

SESSION A03 // 23rd November 2026 16:45 -18:00

ADVANCED GASIFICATION AND SYNGAS VALORISATION

Chair / *Presidente*: TBD

L. Lombardi, C. Boccia, A. Maragkaki, E. Maragkaki, G. Daskalakis, T. Kamperidis, R. Muñoz, M.R. Rodero, A. Lazari, S. Saxioni, K. Karakitsou, E. Georgakopoulou, G. Polychroniou, D. Tamvakis, V. Lolou, A. Papamavrou, T. Lolos, C. Tsompanidis, T. Manios (IT)

Integrated gasification and biological biomethanation for enhanced carbon recovery from organic waste: the life-W2B concept

M. Chiocchini, S. Piazzzi, F. Patuzzi, M. Baratieri (IT)

A review on hydrochar gasification for the valorisation of waste biomass feedstocks

C. Masala, D. Fenu, G. Calì (IT)

Waste-to-hydrogen from non-recyclable plastic waste via gasification: conceptual scale-up and techno-economic assessment

N. Cerone, F. Zimbardi, L. Contuzzi, G. Zito, U. Calice, C. Florio, G. Santilli, M. Carnevale, C. Ragone, V. Valerio, A. Villone (IT)

Valorisation of lignocellulosic waste via pilot-scale two-stage catalytic tar cracking for clean syngas production

F. Parrillo, F. Ardolino, G. Calì, A. Pettinau, C. Masala, U. Arena (IT)

Oxygen–steam gasification for Waste-to-X syngas production in a pilot-scale fluidized bed reactor with integrated catalytic hot syngas cleaning

SESSION A04 // 24th November 2026 09:00 -10:15

PYROLYSIS OF PLASTICS AND COMPOSITES

Chair / *Presidente*: TBD

M. Zhang, S. Liu, R. Li, Z. Hu, X. Wang (CN)

Continuous rotary kiln pyrolysis of retired wind turbine blades: temperature effects on product characteristics and recycled glass fiber quality

S. Chen, R. Feng, Y. Hu, Y. Feng (CN)

Pyrolysis valorization of end-of-life wind turbine blades in China: recycling facility planning and pilot-scale rotary kiln validation

M. Zhang, R. Li, S. Liu, R. Ruan, X. Wang (CN)

Pyrolysis of plastic waste and its co-pyrolysis with cotton fabric: temperature dependent product evolution and safety implications for deflagration control

D. Sorino, S. Cordiner, F. Lombardi ()

Toward feedstock-flexible mixed plastic pyrolysis: A data-driven modeling approach based on universal differential equations (UDE)

A. Tokuhara, S. Kosai, S. Kashiwakura, E. Yamasue, H. Sakaki, S. Yoneda ()

Life cycle assessment of a decentralized energy recovery system for waste polyester fibers via microwave pyrolysis

SESSION A05 // 24th November 2026 10:45 -12:00
ENVIRONMENTAL CHALLENGES OF WASTE-TO-ENERGY
Chair / *Presidente*: TBD

T. Shishida, *A. Yonezawa, R. Zhang, H. Harada, M. Takaoka (JP)*

Effect of CO₂-rich atmosphere on formation of dioxins under O₂/CO₂ combustion of municipal solid waste

S. Andersson (*SE*)

WtE fly ash detoxification and zinc recovery

I. Verginelli, G. Costa, L. Acampora, A. Bruni, S. Scotti, S. Malvezzi, C. Mensi (IT)

Analyzing the environmental compatibility of the use of products from the advanced treatment of APC residues from waste to energy plants through a risk-based procedure

R. Esposito, *F. De Antoni, I. Dameno, R. Ripamonti ()*

Evolution of emission performance and emerging operational challenges in the implementation of the BAT conclusions for waste incineration in Lombardy

SESSION A06 // 24th November 2026 12:15 -13:30
BIOMASS THERMAL CONVERSION AND SMOULDERING

Chair / *Presidente*: TBD

T.L. Rashwan, F. Khodaparastan, P. Renforth, C. Switzer, J.L. Torero, K.J. Dobson (GB)

Exploring smouldering-based systems for carbon-negative waste treatment

F. Khodaparastan, J. Bowen, A. Fraser-McDonald, C. Switzer, J.L. Torero, L. Kinsman, M.A.B. Zanoni, T.L. Rashwan (GB)

Oxygen dynamics in the smouldering reaction zone: experimental measurements and analytical modelling

V. Gollnisch, E. Pienihäkkinen, M. Hechmi Aissaoui, T. Ohra-aho, J. Sirviö, T. Khazraie, L. Sandstrom, A. Dufour (FR)

Fast pyrolysis of biomasses in a microfluidized bed : effect of biomass pretreatments on bio-oil quality

R. Li, M. Zhang, Y. Yang, K. Gao, Z. Hu, G. Dai, X. Wang (CN)

Comparative evaluation of torrefaction temperatures for different biomass: fuel upgrading and grinding characteristics

J. Kluska, K. Matej-Lukowicz, N. Nawrot, J.D. da Silva Fonseca, A. Szymkiewicz, E. Wojciechowska (PL)

Chicken manure carbonization – energy balance and sorption characteristic of biochar

SESSION A07 // 24th November 2026 15:00 -16:15

BIOFUELS AND BIOPRODUCTS CONVERSION TECHNOLOGIES

Chair / *Presidente*: TBD

B. Ndaba-Vatsha (ZA)

Nano-assisted pretreatment of biomass for bioethanol production

T. Rabalao, B. Ndaba, B. Vatsha (ZA)

Mechanosynthesised iron oxide nanoparticles for biobutanol production

D. Behera, J. Shaji, S. Lekshmi, D. Shee, S. Banerjee, P. Chatterjee (IN)

Modified in-situ transesterification of microalgae for engineered alkane production: decarboxylation-driven process-controlled alkane production

S.M. Sadrameli, T. Ramezani (OM)

Advancing circular and sustainable petrochemicals: renewable naphtha production from linseed oil methyl esters

L. Christwinarso, W. De Jong (NL)

Power-to-X: a techno-economic analysis of commercial bio-oil gasification and electrolytic hydrogen into light olefins in the Netherlands

SESSION A08 // 24th November 2026 16:45 -18:00

PATHWAYS AND PERSPECTIVES FOR BIOFUELS AND BIOPRODUCTS

Chair / *Presidente*: TBD

A. Giuliano, P.P. Polverino, N. Pierro, A. Rinaldi, A. Ricca, P. Garzone, M.T. Petrone, I. De Bari ()

Comparing liquid biofuels and developing a decision-support tool for sustainable mobility

J. Ding, Y. Xin, X. Liu, **L. Sun**, H. Zhong (US)

Food–energy trade-offs in vegetable oil systems: waste reduction and land-sparing pathways for climate-resilient supply

A. Kaminsky, A. Golberg, M. Gozin, Y. Anker (IL)

Futurewise – Innovative solutions for Waste-to-Energy conversion and supply chain enablement for the generation of renewable fuels and value-added products

B.A. Simmons (US)

Conversion of mixed waste feedstocks in the North San Joaquin Valley into advanced biofuels and bioproducts

M. Romero, A. Arato ()

Comparative techno-economic assessment of power-to-methanol and power-to-liquids from biogenic and unavoidable industrial CO₂ sources

SESSION A09 // 25th November 2026 09:00 -10:15
ADVANCED THERMAL WASTE VALORISATION

Chair / *Presidente*: TBD

L. Lombardi, C. Boccia (IT)

Solar drying as an enabling technology for energy-positive sewage sludge pyrolysis

N. Labaky, A. Dahdouh, C. El Irani, V. Gollnisch, M. Eternot, L. Vilcocq, P. Arnoux, A. Dufour, Y. Le Brech (FR)

From emissions to resources: temperature optimization for CO₂-based lignin recovery from kraft black liquor and subsequent valorization via pyrolysis

H. Liu, Y. Feng, D. Chen, J. Han, J. Gu, H. Yuan (CN)

Pretreatment-regulated carbothermal reduction and water leaching for selective lithium recovery from spent lithium-ion batteries

Y. Qiu, A. Zhang, Y. Feng, D. Chen (CN)

Tuning waste-tire-derived carbon anodes for sodium-ion batteries by CO₂/N₂ pyrolysis atmosphere

M. Li, D. Chen (CN)

Carbon-Incorporated NiFe/MgAl₂O₄ catalysts for simultaneous tar elimination and CH₄ reforming in Municipal Solid Waste volatiles

SESSION A10 // 25th November 2026 10:45 -12:00

HYDROTHERMAL PROCESSES

Chair / *Presidente*: TBD

A. Di Lisi, *F. Patuzzi, S. Piazzzi, M. Baratieri (IT)*

Pretreatment of Feedstock to Enhance Hydrothermal Liquefaction Conversion Process: A Review

Y. Ryckmans, *E. Bustillo, J. Van den Auweele (BE)*

Industrial hydrothermal carbonization of heterogeneous refuse compost: lessons learned from industrial test

Q.T. Hisani, A.S. Bano, F. Almomani ()

Hydrothermal liquefaction of native Arabian Gulf microalgae for biocrude production: process optimization and characterization

I. Saatçi, *S. Yaman ()*

Simulation and process analysis of two-stage hydrothermal liquefaction of Spirulina for bio-oil production

SESSION A11 // 25th November 2026 12:15 -13:30

BIOCHAR PRODUCTION AND USE

Chair / *Presidente*: TBD

N. Cerone, *F. Zimbardi, L. Contuzzi, G. Zito, C. Florio, U. Calice (IT)*

Environmental impacts and climate benefits of energy-integrated biochar systems from agricultural residues

U. Schmieder, *A. Pollex, S. Bothe (DE)*

Turning agricultural residues into certified carbon sinks: operational implementation of a decentralized biochar system in Ethiopia

R. Visser, *N. Vonk, J. Visser (NL)*

Carbon-neutral concrete: biochar as carbon storage in products

J. Park, **S.-J. Kim** (KR)

Recovery of valuable metals from stainless steelmaking dust using kenaf biochar as a low-carbon reducing agent

SESSION A12 // 25th November 2026 15:00 -16:15

CARBON CAPTURE AND UTILISATION

Chair / *Presidente*: TBD

M. Schranzer (NL)

Security of supply and decarbonisation through bioenergy: CHP contracting and CO₂ utilisation in practice

D. Dong, G. Shin, S. Kim, Z. Tan, J. W. Lee ()

Evaluation of ionic liquid potential for selective absorption of carbon dioxide from biogas

A. Masi, G. Costa, F. Lombardi, N. Nmiri, L.C. Pasquier, I. Tebiche (IT)

Analysis of the products of an amine-based indirect carbonation treatment of steel slag aimed at residue valorisation and CO₂ storage

SESSION B01 // 23rd November 2026 12:15 -13:30
PRETREATMENTS AND FEEDSTOCK SELECTION

Chair / *Presidente*: TBD

A. Fahlén Hammar, L. Andreas, J. Kumpiene (SE)

Choosing the right blend: multi-objective optimization of co-digestion

S. Hirakawa, Y. Kaizu, K. Furuhashi (JP)

Stabilizing high-nitrogen anaerobic digestion of chicken manure by pH control: implications for fertilizer substitution and transport burden

A. Omanakuttan, K. Benyounis, **J. Stokes** (IE)

Pretreatment effects on the anaerobic digestion of grass for biogas production

Md.T. Islam, A. Huda, S. Ahmed (BD)

From waste to cooking fuel: biogas recovery from faecal sludge treatment systems in Rohingya Refugee Camps, Bangladesh

SESSION B02 // 23rd November 2026 15:00 -16:15
MODELLING, OPTIMISATION AND SYSTEMS ANALYSIS
Chair / *Presidente*: TBD

Y. Ge, J. Tao, Z. Wang, L. Mu, W. Guo, Y. Shi, Z. Cheng, B. Yan, H. Su, G. Chen (CN)

Optimization of Gompertz model with machine learning towards applicable and accurate simulation of anaerobic digestion

M. Occhinegro, I. Bortone, L. Alibardi, F. Todaro, M. Notarnicola (IT)

From mechanistic to symbolic modelling in anaerobic processes

E. Ngobeni, C. Trois (ZA)

Evaluation of organic waste collection pathways for waste-to-energy production in national fresh produce markets

X. Wang, B. Yan, S. Zhou, Y. Ge, Z. Wang, X. Lu, G. Chen (CN)

Coupling carbon conversion with nutrient circularity mitigates environmental trade-offs in crop-livestock waste valorization

A.-M. Tuomala, M. Eronen (FI)

Renewable energy nodes for climate change mitigation using food processing residues

SESSION B03 // 23rd November 2026 16:45 -18:00

ANAEROBIC PROCESSES: EFFICIENCY AND OPTIMISATION

Chair / *Presidente*: TBD

E. Lee, P. Sokunthea, J. Shin, K.J. Min, K.Y. Park (KR)

Process stability of food waste leachate anaerobic digestion against fog shock loading through sludge recirculation

S. Nilsson Pålédal, E Nordell, J. Moestedt (SE)

Lessons learned from more than 25 years of laboratory- and full-scale anaerobic digestion of industrial by-products and food waste: the role of iron chloride and trace elements in process stability

H.J. Shin, Y.B. Seo, Y.M. Yoon (KR)

Effects of Water Potential Induced by Na⁺, K⁺, Mg²⁺ and Ca²⁺ on Anaerobic Methane Production and Microbial Community Characteristics

SESSION B04 / / 24th November 2026 09:00 -10:15

SPECIFIC BIOMASS MANAGEMENT

Chair / *Presidente*: TBD

D. Mulu, M. Mekuyie, C. Trois, A. Dell'Orto (ZA)

Climate change resilience of smallholder farmers through food waste valorization into biofertilizer: a circular approach

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

From BSF exuviae to Chitosan: a sustainability perspective

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

Unlocking the potential of insect biomass waste: Chitin and Chitosan valorisation in the circular bioeconomy

B.L. Short, C. Palazón, C. Garrido Pérez, J.A. Perales Vargas-Machuca, M.D. Macías-Sánchez, J. Ruiz (ES)

Winery wastewater valorisation through microalgae: nutrient removal and biomass production

SESSION B05 // 24th November 2026 10:45 -12:00
HYDROGEN PRODUCTION AND VALORISATION

Chair / *Presidente*: TBD

K.L. Mascarenhas, S.T. Coelho, J. Romano Meneghini ()

From wastewater to sustainable hydrogen: social acceptance and communication challenges for the energy transition

A. Gutierrez-Gomez, V. Garcilasso, M. dos Santos, K. Mascarenhas, J. Meneghini, S. Coelho ()

Pathways for hydrogen production from municipal solid waste: potential assessment in Sao Paulo State, Brazil

A. Trinca, A. Giuliano, P. Garzone, R. Albergo, A. Caporusso, E. Viola, I. De Bari ()

Green hydrogen-assisted glycerol valorization for advanced biofuels

A. Hasni, H. Ahmed, S.M. Raza, U.A. Siddiqui, M. Junaid ()

Breaking the grey hydrogen lock-in: in-situ exergy-machine learning for dynamic SMR-PSA decarbonization and blue & green hydrogen transition

SESSION B06 // 24th November 2026 12:15 -13:30

PERSPECTIVES OF BIOGAS UTILISATION

Chair / *Presidente*: TBD

I. Ålund ()

Is biogas as green as we think? Methane leaks, LDAR campaigns and the carbon footprint of the biogas value chain

K. Kawai (JP)

Biomethane potential to substitute for grid-supplied gas in Japan in 2050

T.E. Rasimphi ()

Sustainability of decentralized renewable energy systems in rural Africa: adoption, and post-adoption trajectories of biogas

A. Dell'Orto, E. Ngobeni, C. Trois (ZA)

An investigation into the prospective environmental and economic benefits of integrated biohydrogen and biomethane production from municipal organic waste in South Africa: insights from Cape Town and Durban

SESSION B07 // 24th November 2026 15:00 -16:15

ENHANCED ENERGY RECOVERY FROM BIOLOGICAL PROCESSES

Chair / *Presidente*: TBD

M. Holden (GB)

From declining landfill asset to renewable energy hub: the potential role of ex-situ biomethanation in future landfill gas management

I. Rahmouni, J. Wiechert, A. Nassour, M. Nelles (DE)

Comparative assessment of innovative technologies for low-calorific landfill gas (LOCAGAS) utilization.

Md.T. Islam, A. Huda, S. Ahmed (BD)

From phytoremediation biomass to electricity: a circular resource recovery approach for faecal sludge treatment plants

C. Trois, G. Gaogane, A. Dell'Orto, P. Sekoai ()

Otimising biohydrogen production from slaughterhouse waste via biochar-assisted dark fermentation

SESSION B08 // 24th November 2026 16:45 -18:00
EDUCATION AND PUBLIC AWARENESS IN WASTE-TO-ENERGY
Chair / *Presidente*: TBD

G. De Feo (IT)

Waste-to-energy and systems thinking: the Greenopoli pedagogical approach

I. Grinfelde, V. Grybauskiene, J. Pilecka-Ulcugaceva (LV)

Education for sustainable development as a tool for building future competences in biomass, waste to energy and circular economy sectors

G. De Feo, G. Marmora, A.A. Paruolo, A. Grosso (IT)

The hidden role of waste-to-energy: a counterfactual assessment of the Acerra plant in Southern Italy

SESSION B09 // 25th November 2026 09:00 -10:15

SPECIFIC CIRCULAR ECONOMY STREAMS

Chair / *Presidente*: TBD

A. Bartl, N. Depope (AT)

Integrated biorefinery concept for blended textile waste: from enzymatic hydrolysis to ethanol and methanol production

R. Visser (NL)

Carbon-fibers from cotton-rich post-consumer textile waste: Upcycling as an economically viable recycling option?

N. Depope, F. Quartinello, J. Egan, A. Bartl, C.B. Schimper (AT)

Restex: closing the loop in textile waste recycling

A. Boscolo, L. Placentino, M. Placentino (IT)

Industrial sorting techniques for the detection and separation of end-of-waste plastic products: from polymers to phthalates and additives

SESSION B10 // 25th November 2026 10:45 -12:00

CIRCULAR VALORISATION OF INDUSTRIAL WASTE STREAMS

Chair / *Presidente*: TBD

A.K. Avornyo, S.W. Hasan, F. Banat, C.V. Chrysikopoulos (QA)

In-situ CaCO₃-templated structuring of low-cost graphene oxide-kaolin ceramic membranes for predictable fouling control in oily wastewater filtration

G. Trancone, M. Race, G. Policastro, **M. Fabbricino** (IT)

Circular integration of dark fermentation and mineral waste valorization: calcium leaching from construction and demolition waste using bio-based effluents

S. Soltanian, S.A. Salaudeen, A. Dutta ()

Reductive depolymerization of waste polyethylene into branched paraffins over recyclable Pt/WO_x/USY for tuneable gas-liquid product balance

G. Dalla Santa, M. Noro, **G. Giacomello**, A. Maghssudipour, E. Buoso (IT)

From waste heat and road pavements to local district heating: an integrated technical, socio-economic and regulatory framework for urban energy transition

SESSION B11 // 25th November 2026 12:15 -13:30

RIFIUTI E SALUTE: PRESENTAZIONE LIBRO

Chair / *Presidente*: TBD

Italian Session - Maggiori dettagli disponibili a breve.

SESSION B12 // 25th November 2026 15:00 -16:15

WORKSHOP - PFAS IN WASTE STREAMS: CHALLENGES, TECHNOLOGIES, AND FUTURE HORIZONS

Chair / *Presidente*: F. Khodaparastan (UK)

Per- and polyfluoroalkyl substances (PFAS) have been key synthetic compounds used in many consumer and safety-critical products and – from food wrappers to fire-fighting foams. Thousands of unique compounds are now under the PFAS classification. PFAS contamination is insidious as current understanding now shows that pollution from these compounds poses severe environmental risks. Due to PFAS' toxicity, persistency, and mobility – small concentrations can transport widely in the environment and bioaccumulate in the food chain to adversely impact human and ecosystem health. There are now many treatment methods available that aim to capture PFAS to limit its mobility in the environment. As an example, activated carbon and ion exchange resins are commonly used to remove PFAS from drinking water. From another perspective, critical anesthetic gases such as isoflurane, desflurane, and sevoflurane have been widely used in medical applications; these gases are trapped in activated carbon after use for disposal. The used activated carbon and ion exchange resins, as well as other PFAS-contaminated materials (e.g., municipal solid wastes, sewage sludge, and hazardous wastes), necessitate active treatment.

Thermal treatment methods have shown strong promise in destroying PFAS at the appropriate conditions (e.g., peak temperatures and residence times). However, there are many research gaps regarding PFAS destruction in these thermal systems, and even small concentrations of untreated PFAS leftover from incomplete or partial destruction can pose long-lasting and challenging environmental risks for future generations. These PFAS treatment knowledge gaps must be solved to reliably ensure full PFAS destruction in thermal waste treatment systems. Furthermore, treatment method selection is shaped not only by technical effectiveness but also by regulatory frameworks, liability structures, and the application of the polluter-pays principle. This workshop integrates technical and policy perspectives to explore how institutional frameworks influence PFAS treatment choices.

T. Rashwan, F. Khodaparastan, F. Fredriksson, R. Aro, L. Yeung, M. Johansson (GB)

Exploring challenges and future directions associated with PFAS-contaminated waste in thermal treatment systems

M. Zanetti, G. Campo, D. Panepinto, M. Ravina, B. Ruffino, G. Zanzi (IT)

PFAS management in municipal sewage sludge: environmental monitoring and full-scale assessment of thermal oxidation in a fluidized bed furnace

SESSION C01 // 23rd November 2026 12:15 -13:30

LIFE CYCLE THINKING AND ASSESSMENT

Chair / *Presidente*: TBD

H. Schindler, L. Merfort, V. Lenz, S. Majer, D. Thrän (DE)

Policies for sustainable forest bioenergy in the EU: the Renewable Energy Directive, the role of carbon pricing and implications for wood-cascading in the bioeconomy

F. Ardolino, F. Parrillo, M. Monaco, U. Arena (IT)

Environmental assessment of energy and material recovery strategies for infectious healthcare waste

Y. Abera, C. Trois (ZA)

The WROSE model as an evidence-based decision-support tool for sustainable waste management planning and policy in South Africa

M. Pasetto, **G. Giacomello**, F. Tabarin, R. Camicata, M. Zaghet, B. Bora, M. Jamshidi (IT)

Environmental assessment of asphalt mixtures containing recycled shingle production waste: a circular economy approach

SESSION C02 // 23rd November 2026 15:00 -16:15

WORKSHOP - SUSTAINABLE ELECTRONICS: REUSE, RECYCLING, AND LCA I

Chair / *Presidente*: K. Owusu-Sekyere (DE)

Waste Electrical and Electronic Equipment (WEEE), or e-waste, is one of the world's fastest-growing waste streams, driven by rapid digital transformation and technological innovation. However, a large share of globally generated e-waste never enters formal collection and recycling systems and poses environmental burdens at the end of its life. Even when it is collected, current recycling technologies often fail to recover many valuable and critical raw materials, particularly those in complex microelectronic components, resulting in losses to slags or other residual waste streams. At the same time, the manufacturing of new electronic devices, especially microelectronic components, is globally rising and highly resource- and energy-intensive, contributing to climate change, resource depletion, and water scarcity.

This workshop explores how principles of early-stage sustainability decisions for emerging electronics can contribute to resource efficiency and climate change mitigation by shifting the focus from end-of-life approaches toward predictive circular design strategies. We will investigate how sustainability can be systematically embedded across device architecture, and component design to enable recycling, less resource use and higher levels of circularity throughout the electronics value chain.

A further challenge lies in the early stages of innovation, where environmental impacts are overlooked during the design and development of novel materials and electronic components. We are assessing how Life Cycle Assessment (LCA) and sustainability considerations from the beginning of innovation can help avoid unsustainable material development and design choices associated with energy-intensive and solvent-heavy production pathways and enable more sustainable technology development before commercialization.

The workshop presents research from the "Responsible Electronics in the Climate Change Era" (REC2) Cluster of Excellence at the TU Dresden and highlights innovative approaches to advancing circularity and sustainability in emerging electronics.

Participants will explore:

- 1) Integrating recycling into device design through predictive approaches that enable more sustainable electronics across their life cycle.
- 2) Developing circular economy frameworks for design-for-reuse, with a focus on future electronic material flows and component-level reuse.
- 3) Establishing reuse factors and materials libraries for emerging materials and micro- and nanoelectronics, supporting sustainability assessment and decision-making during early-stage technology development.

By connecting resource management, circular economy strategies, and sustainable electronics innovation, the workshop aims to foster interdisciplinary discussion on how responsible innovation can reduce environmental impacts while improving resource efficiency across the electronics value chain.

This session continues in the next one.

This session continues from the previous one.

Waste Electrical and Electronic Equipment (WEEE), or e-waste, is one of the world's fastest-growing waste streams, driven by rapid digital transformation and technological innovation. However, a large share of globally generated e-waste never enters formal collection and recycling systems and poses environmental burdens at the end of its life. Even when it is collected, current recycling technologies often fail to recover many valuable and critical raw materials, particularly those in complex microelectronic components, resulting in losses to slags or other residual waste streams. At the same time, the manufacturing of new electronic devices, especially microelectronic components, is globally rising and highly resource- and energy-intensive, contributing to climate change, resource depletion, and water scarcity.

This workshop explores how principles of early-stage sustainability decisions for emerging electronics can contribute to resource efficiency and climate change mitigation by shifting the focus from end-of-life approaches toward predictive circular design strategies. We will investigate how sustainability can be systematically embedded across device architecture, and component design to enable recycling, less resource use and higher levels of circularity throughout the electronics value chain.

A further challenge lies in the early stages of innovation, where environmental impacts are overlooked during the design and development of novel materials and electronic components. We are assessing how Life Cycle Assessment (LCA) and sustainability considerations from the beginning of innovation can help avoid unsustainable material development and design choices associated with energy-intensive and solvent-heavy production pathways and enable more sustainable technology development before commercialization.

The workshop presents research from the “Responsible Electronics in the Climate Change Era” (REC2) Cluster of Excellence at the TU Dresden and highlights innovative approaches to advancing circularity and sustainability in emerging electronics.

Participants will explore:

- 1) Integrating recycling into device design through predictive approaches that enable more sustainable electronics across their life cycle.
- 2) Developing circular economy frameworks for design-for-reuse, with a focus on future electronic material flows and component-level reuse.
- 3) Establishing reuse factors and materials libraries for emerging materials and micro- and nanoelectronics, supporting sustainability assessment and decision-making during early-stage technology development.

By connecting resource management, circular economy strategies, and sustainable electronics innovation, the workshop aims to foster interdisciplinary discussion on how responsible innovation can reduce environmental impacts while improving resource efficiency across the electronics value chain.

SESSION C04 // 24th November 2026 09:00 -10:15

WORKSHOP - CARBON, NUTRIENT, AND ENERGY RECOVERY PATHWAYS I

Chair / *Presidente*: A. Pollex (DE)

Biomass and waste conversion can generate more than energy: thermochemical processes such as pyrolysis provide biochar and heat energy, while a wide range of biomass and organic waste streams can be valorized for nutrient recovery and agricultural use. Biochar offers a particularly promising link between energy and material recovery, combining heat energy utilization options e.g. for district heating with carbon sequestration and use cases as soil amendment.

Biofertilizers are increasingly gaining attention as resilient bioeconomy approaches. Produced from locally available biomass residues, and organic waste streams, they can help to close nutrient cycles, reduce resource dependency, and restore soil fertility. In particular, they can counteract soil degradation caused by continuous nutrient extraction and declining soil organic carbon, while supporting integrated soil fertility management and food security.

When combined with biochar, the resulting biochar-based organic fertilizers can contribute to reduced soil acidification, limited nutrient leaching and enhanced long-term carbon sequestration. Carbon financing mechanisms that enable smallholder revenue-sharing, such as the Artisan C-Sink certification, can further improve economic viability in particular in the Global South.

The workshop will discuss challenges, enabling conditions, and successful implementation examples of integrated biomass- and waste-based resource recovery systems. It will explore how different biomass and waste streams, conversion technologies, and end-use pathways can be combined to maximize resource recovery and create locally appropriate circular systems.

This session continues in the next one.

SESSION C05 // 24th November 2026 10:45 -12:00

WORKSHOP - CARBON, NUTRIENT, AND ENERGY RECOVERY PATHWAYS II

Chair / *Presidente*: A. Pollex (DE)

This session continues from the previous one.

Biomass and waste conversion can generate more than energy: thermochemical processes such as pyrolysis provide biochar and heat energy, while a wide range of biomass and organic waste streams can be valorized for nutrient recovery and agricultural use. Biochar offers a particularly promising link between energy and material recovery, combining heat energy utilization options e.g. for district heating with carbon sequestration and use cases as soil amendment.

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SESSION C06 // 24th November 2026 12:15 -13:30

SUSTAINABLE AVIATION FUELS (SAFS)

Chair / *Presidente*: TBD

*A. Saeed, M.A. Qyyum, A. Riaz, S. Al-Saadi, F. Al-Jahwari, **A.H. Al-Muhtaseb** (OM)*

Decision-oriented benchmarking of sustainable aviation fuel pathways: harmonized cost, boundary-aware carbon intensity, and deployment readiness

***M.A. Rasheed**, M. Materazzi (GB)*

Techno-economic and environmental assessment of various sustainable aviation fuel production pathways from waste and biomass with system integrations

***I. Gökalp** ()*

Zero-emission sustainable aviation fuel (SAF) production from high-moisture organic waste

SESSION C07 // 24th November 2026 15:00 -16:15

WORKSHOP - IWWG THERMAL TREATMENTS TASK GROUP SANDPIT I

Chair / *Presidente*: L. Lombardi (IT)

A modern integrated solid waste management system should maximize resource recovery, given that, in a life-cycle approach, energy or fuel/chemicals recovery from waste allows decreasing consumption of fossil fuels and overall emissions from all current conversion systems. Advanced thermal treatment systems can contribute to these goals, and among them, gasification stands out as a particularly promising approach, enabling efficient energy and material recovery, while other emerging technologies offer complementary opportunities to enhance performance and sustainability. Despite these potentials, significant challenges remain across commercial/economic, policy/regulatory, technological, and environmental/sustainability dimensions. This “sandpit” style workshop will bring together researchers, industry experts, and stakeholders to explore these advanced thermal treatment approaches, analyse challenges and lessons from recent project successes and failures. The aim is to collaboratively produce a summary report and distilled document that highlights the current state of advanced thermal waste treatment and identifies key future trends.

This session continues in the next one.

SESSION C08 // 24th November 2026 16:45 -18:00

WORKSHOP - IWWG THERMAL TREATMENTS TASK GROUP SANDPIT II

Chair / *Presidente*: L. Lombardi (IT)

This session continues from the previous one.

A modern integrated solid waste management system should maximize resource recovery, given that, in a life-cycle approach, energy or fuel/chemicals recovery from waste allows decreasing consumption of fossil fuels and overall emissions from all current conversion systems. Advanced thermal treatment systems can contribute to these goals, and among them, gasification stands out as a particularly promising approach, enabling efficient energy and material recovery, while other emerging technologies offer complementary opportunities to enhance performance and sustainability. Despite these potentials, significant challenges remain across commercial/economic, policy/regulatory, technological, and environmental/sustainability dimensions. This “sandpit” style workshop will bring together researchers, industry experts, and stakeholders to explore these advanced thermal treatment approaches, analyse challenges and lessons from recent project successes and failures. The aim is to collaboratively produce a summary report and distilled document that highlights the current state of advanced thermal waste treatment and identifies key future trends.

The workshop will explore the potential of gasification as a pathway for producing biofuels and biochemicals from biomass and other renewable carbon-containing feedstocks. It will cover gasification technologies, syngas production and conditioning, and downstream catalytic and biochemical conversion routes to fuels, chemicals and other bio-based products.

Particular attention will be given to technological development, feedstock flexibility, process integration, sustainability and the potential contribution of gasification-based pathways to the defossilisation of the transport, energy and chemical sectors. The workshop will also provide an opportunity to discuss current challenges, research needs and opportunities for further collaboration.

Agenda - Part 1:

- *Jitka Hrbek, BOKU University (AT)*
IEA Bioenergy Task 33 – overview and activities in thermochemical gasification of biomass and waste
- *Joakim Lundgren, Luleå University of Technology (SE)*
Biomass to biofuels or negative emissions
- *Berend Vreugdenhil, TNO (NL)*
TNOs Perspective on SAF production
- *Donatella Barisano, ENEA (IT)*
Production of H₂-rich syngas from the gasification of biomass and biogenic fraction of waste: in-bed implementations in a BFB reactor

This session continues in the next one.

This session continues from the previous one.

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Particular attention will be given to technological development, feedstock flexibility, process integration, sustainability and the potential contribution of gasification-based pathways to the defossilisation of the transport, energy and chemical sectors. The workshop will also provide an opportunity to discuss current challenges, research needs and opportunities for further collaboration.

Agenda - Part 2:

- *Sabine Fleck, KIT - Karlsruhe Institute for Technology (DE)*
Influence of process conditions on the conversion of plastic waste based pyrolysis oil under entrained flow conditions
- *Beibei Yan, TJU (CN)*
Anaerobic fermentation integrated gasification process and high-efficiency tar removal technology towards green methanol synthesis
- *Umberto Pasqual Laverdura, ENEA (IT)*
Feedstock flexibility and process integration in sorption-enhanced gasification: from winery waste to methanol and power

SESSION C11 // 25th November 2026 12:15 -13:30

NATIONAL CASE STUDIES

Chair / *Presidente*: TBD

C. Trois, Y. Abera, M. Coetzee, A. Dell'Orto, M. Mariani, C. Nell, F. Schenck ()

Assessing the renewable energy and carbon reduction potential of vine waste valorisation in the South African wine industry using the WROSE model

E. Ali, S. Narra, J.B Oti (DE)

Does taxing pollution reduce biogenic methane emissions from the waste sector? Quasi-experimental evidence from Ghana's Sanitation and Pollution Levy

E.M.S. Guerreiro, A.F. Simões (BR)

Municipal solid waste management in Brazil: structural barriers to energy recovery and governance challenges

E.M.S. Guerreiro, E.S. Braga (BR)

Integrating waste management into environmental planning for oil spill contingency: lessons from major Brazilian oil spill events

S. Sadi, A. Leila, Y. Kehila ()

Landscape on landfill a second nature rediscovered

Poster presentations will be displayed **in digital format** in a dedicated hall throughout the conference, with opportunities to discuss them with the authors, depending on their availability.

E.J. Cho, H. Park, H.-J. Bae (KR)

Integrated Valorization of Waste Paper in a Sustainable Biorefinery Platform

D. Ciolkosz, J. Ali, M. Steiman, M. Hile (US)

Farm Scale Testing of Biochar in Digesters

B. Doria, C. Pastore, V. Locaputo, M. Lacalamita, E. Mesto, F. Raganati, A. Marzocchella, L. di Bitonto (IT)

Cu-TiO₂/LHLs photocatalyst from sewage sludge for solar hydrogen production and wastewater remediation

S. Frienberg, A. Paterson, J. Pilecka-Ulcugaceva, I. Grinfelde (LV)

Forecasts of waste volume and flow dynamics in Latvia in the context of EU waste management policy

D. Mulu, M. Mekuyie, C. Trois (ZA)

Exploring organic municipal waste valorization through Black Soldier Fly larvae and assessing the nutritional quality of the produced larvae for animal feed

F. Gramigni, L. Armilli, A. Bosetti, D. Cucchetti, A. Poletto, I. Rapone, V. Rodighiero, T. Pasini (IT)

Experimental study of dark fermentation using deoiled cakes as feedstock

J. Grave, J. Pilecka-Ulcugaceva, I. Grinfelde (LV)

PFOS and PFOA behaviour in two contrasting river basins of Latvia: seasonal dynamics and environmental controls

T. Hatagami, Y. Kaizu, K. Furuhashi (JP)

Environmental and agricultural benefits of field application of gasification biochar as a fertilizer

M.H.T. Huynh, S. Jang, H.-J. Bae (KR)

Feedstock-dependent enhancement of lignocellulosic saccharification by a GH10 Xylanase-secreting *Trichoderma reesei* enzyme system

T. Kawaguchi, Y. Nishiyama, S. Kosai, S. Kashiwakura, E. Yamasue (JP)

Life cycle resource use of Biomass- and Waste-Derived SAF in Japan toward 2030

S.Y. Kim, J.S. Nam, Y.M. Yoon, C.H. Kim (KR)

Effects of various biomass-derived biochars on methane production kinetics and anaerobic digestion performance of food wastewater

J.M. Choi, C.Y. Lee (KR)

Anaerobic co-digestion of pig manure and food waste leachate: performance, operational stability, and the hydrogenotrophic-to-acetoclastic ratio as a complementary indicator

A. Magdziarz, A. Mlonak-Medralska, M. Granollers Mesa, M. Sajdak, C. Quan, N. Gao, J. Wang (PL)

Marine plastic pollution: a global threat to life below water and human well-being

A. Guzzini, M. Pellegrini, J. Suzzi (IT)

From Waste-To-Energy to Waste-To-X: a new circular approach to convert municipal solid waste into liquid CO₂, water and computing power for IT infrastructures

J. Pilecka-Ulcugaceva, I. Grinfelde (LV)

Using urban snow as a passive environmental monitoring tool to identify potential household waste burning emissions: a case study from Jelgava, Latvia

W. Rasaq, J. Vasco, A. Bialowiec, T. Causer, S. Opalinski, D. DeVallance, L. Nunes, D. Ciolkosz (US)

Development of a BioSTEAM-based process model for biochar production from lignocellulosic biomass: preliminary mass, energy, and economic assessment

A.P. Ribeiro, M. Piñero, A.T. Brandão (PT)

Mechanophotocatalysis With Porphyrins: Solid-State Degradation Of Solid Pollutants

Y.B. Seo, H.J. Shin, Y.M. Yoon (KR)

Effects of Water Potential Reduction Induced by Cations (Na⁺, K⁺, Mg²⁺, and Ca²⁺) on Anaerobic Digestion Performance across Different Inocula

J. Shin, K.J. Min, E. Lee, K.Y. Park (KR)

Ammonia recovery from anaerobic digestate using integrated electrochemical treatment and membrane contactor

H. Watanabe, S. Kashiwakura, S. Kosai, K. Kashimura, T. Miyata, E. Yamasue (JP)

Quantitative analysis of hydrogen production from CFRP waste via hercynite-catalyzed microwave pyrolysis

F. Zimbardi, U. Calice, N. Cerone, V. Valerio (IT)

Electrochemical remediation of lignocellulosic waste for low-energy green hydrogen generation

M.C. Oliveira, I.R.F.S. Alves, E.P. Santiago, C.M.S. Cassar, I.D. Bassin, N.B.C. Santos, C. Sambusiti, J.P. Bassin (BR)

Food waste composition governs the shape, not only the magnitude, of methane conversion in co-digestion with green waste

M.C. Oliveira, I.R.F.S. Alves, E.P. Santiago, I.D. Bassin, N.B.C. Santos, C. Sambusiti, J.P. Bassin (BR)

Beyond conventional stability thresholds: alkalinity as an early-warning indicator in a food and green waste co-digester

J.C. Mendonça, F.M.S. Silva, J.P. Bassin, M.L.E. Gutarra, I.D. Bassin (BR)

Comparison of enzymatic pretreatment and direct enzyme addition for anaerobic co-digestion of waste activated sludge and food waste

A.S. Bano, F. Almomani ()

Comparative analysis of biomethane production in mono and co-anaerobic digestion using lab-scale digester

K. Loubar, N. Akkouche ()

Experimental valorization of plastic-pyrolysis gas in a spark-ignition engine within a cogeneration concept

P. Jadeja, S. Jha ()

Eutrobot: an autonomous unmanned surface vehicle integrating real time environmental sensing, AI assisted algal detection, and phytoremediation for scalable freshwater purification

N. Pierro, A. Giuliano, E. Viola, I. De Bari ()

From the biomass atlas to an advanced decision-support system: mapping residual and waste biomass and interoperable architecture for territorial energy planning in Italy

K. Kawaguchi, S. Kashiwakura, K. Kashimura, T. Miyata, S. Kosai, E. Yamasue ()

Effect of structural characteristics on hydrogen generation behaviour through kinetic analysis in the microwave-assisted pyrolysis for plastic recycling

G.P.V. Heidelmann, C.P. Pereira, J.P. Bassin, C.S. Guimarães, **I.D. Bassin** (BR)

Thermo-alkaline pretreatment of green waste for enhanced methane production

I.R.F.S. Alves, M.C. Oliveira, E.P. Santiago, I.D. Bassin, A.C. Coelho, H.L. Silva, N.B.C. Santos, C. Sambusiti, J.P. Bassin (BR)

Food waste and green waste co-digestion: effects on process stability and methane production