

# **3<sup>rd</sup> MATER MEETING**

## **INNOVATION & TRENDS IN WASTE MANAGEMENT**

**May 22<sup>nd</sup>, 2017**

**Session 1: *STRATEGIES AND PERCEPTIONS ON WASTE MANAGEMENT***

**Stefano Consonni**, Dip. di Energia - Politecnico di Milano

**Session 2.1: *ECONOMIC REGULATION OF WASTE MANAGEMENT***

**Antonio Massarutto**, Università degli Studi di Udine

**Session 2.2: *CLOSING THE LOOP: POTENTIALITY AND CRITICAL ISSUES***

**Lucia Rigamonti**, DICA - Politecnico di Milano

**May 23<sup>rd</sup>, 2017**

**Session 3: *PROCESSES AND TECHNOLOGIES FOR ENERGY RECOVERY***

**Federico Viganò**, Dip. di Energia - Politecnico di Milano

**Session 4: *PROCESSES AND TECHNOLOGIES FOR MATERIAL RECOVERY***

**Mario Grosso**, DICA - Politecnico di Milano

**INFO & REGISTRATIONS**

**[www.mater.polimi.it](http://www.mater.polimi.it)**

**ORGANIZATION COMMITTEE:**



**mater@polimi.it**



**+39.0523.356886**



**MatER\_StudyCenter**



**@materresearch**

The event arises from the fundamental goal of MatER that is providing a thorough, objective representation of technologies and policies for **material and energy recovery from waste**, thereby contributing to move toward sustainable waste management. The Meeting aims at being an update on latest trends in **Sustainable Waste Management**, dealing with regulatory, strategic and technical-scientific aspects.

*The event is organized with the scientific support of **DICA (Department of Civil and Environmental Engineering)** and Energy Department of the **Politecnico di Milano**.*

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## **SCIENTIFIC COMMITTEE:**

### **SESSION CHAIRMEN**



**PROF. STEFANO CONSONNI**  
**Energy Dept. - Politecnico di Milano**

Chair of Session 1 **"Strategies and perceptions on waste management"**



**ENG. LUCIA RIGAMONTI**  
**DICA (Dept. of Civil and Environmental Engineering) - Politecnico di Milano**

Chair of Session 2 **"Closing the loop: potentialities and critical issues"**



**ENG. FEDERICO VIGANÒ**  
**Energy Dept. - Politecnico di Milano**

Chair of Session 3 **"Processes and technologies for energy recovery"**



**PROF. MARIO GROSSO**  
**DICA (Dept. of Civil and Environmental Engineering) - Politecnico di Milano**

Chair of Session 4 **"Processes and technologies for material recovery"**

### **OTHER MEMBERS**

- Umberto Arena, *Seconda Università degli Studi di Napoli*
- Thomas Fruergaard Astrup, *Technical University of Denmark (DK)*
- Giorgio Buonanno, *Università degli Studi di Cassino*
- Ennio Carnevale, *Università degli Studi di Firenze*
- Marco J. Castaldi, *The City College of New York City (US)*
- Stefano Cernuschi, *Politecnico di Milano*
- Raffaello Cossu, *Università degli Studi di Padova*
- Domenico Laforgia, *Università del Salento*
- Michele Giugliano, *Politecnico di Milano*
- Bettina Kamuk, *Ramboll Group (DK)*
- Ennio Macchi, *Politecnico di Milano*
- Antonio Massarutto, *Università degli Studi di Udine*
- Ange Nzihou, *École des mines d'Albi-Carmaux (FR)*
- Antonio Perdichizzi, *Università degli Studi di Bergamo*
- Alessandra Poletti, *Sapienza - Università di Roma*
- Peter Quicker, *RWTH Aachen University*
- Marco Ragazzi, *Università degli Studi di Trento*
- Piero Salatino, *Università degli Studi di Napoli*
- Fabio Tatano, *Università degli Studi di Urbino*
- Nicholas J. Themelis, *Columbia University (US)*
- Giuseppe Tipaldo, *Università degli Studi di Torino*
- Costas Velis, *University of Leeds (UK)*
- Gaspare Viviani, *Università degli Studi di Palermo*

## MatER Meeting 2017 - May 22<sup>nd</sup> & 23<sup>rd</sup>

# INNOVATION AND TRENDS IN WASTE MANAGEMENT

**SESSION CHAIRMEN:** S. Consonni, L. Rigamonti, A. Massarutto, F. Viganò, M. Grosso

**Piacenza Campus - Politecnico di Milano: Aula A, via Scalabrini 76, Piacenza, Italy**

### May 22<sup>nd</sup> 2017

#### 8:15 Participants Registration

#### Session 1: Strategies and perceptions on waste management

- 9:15 Welcoming Addresses & Introduction
- 9:30 An underestimated technology for Renewable Energy and Climate Control
- 09:55 Waste logistics optimisation: from collection of MSW to treatment and disposal flow management
- 10:20 Circular Economy Principles and Waste Management System of Brescia
- 10:45 **Coffee break - Poster Session**
- 11:15 Lung cancer risk assessment at receptor site of an incinerator plant in Italy
- 11:40 KEYNOTE LECTURE: To maximise EfW delivery, simple public acceptance of EfW isn't good enough
- 12:10 Discussion & Questions
- 12:30 **Lunch**

#### Chair: S. Consonni

S. Consonni - MatER/Politecnico di Milano  
N.J. Themelis - Columbia University, USA  
M. Pozzi - Optit Srl, Cesena  
M.L. Venuta - Cattolica University  
  
M. Scungio - University of Cassino and Southern Lazio  
Paul Davison - Proteus Environmental Communications, Oxford, UK

#### Session 2.1: Economic regulation of waste management

- 14:00 Guests Presentation & Round Table Introduction
- 14:15 Rates regulation of access to the waste treatment plants: an overview
- 14:25 **Round Table Discussion:** AGCM (Italian Competition Authority) - UTILITALIA - ATERSIR Emilia Romagna - HERAMBIENTE

#### Chair: A. Massarutto

A. Massarutto - Un. degli studi di Udine  
A. Moretto - Ente di Bacino Padova 2  
C. Benassi - C. Desogus (AGCM), A. Spaziani (UTILITALIA), V. Belladonna (ATERSIR Emilia Romagna), F. Brandolini (HERAMBIENTE)  
Gian Luca Galletti - Ministro dell'Ambiente e della Tutela del Territorio e del Mare

#### 15:25 Closure by the Italian Minister of the Environment

#### 15:45 Coffee break - Poster Session

#### Session 2.2: Closing the loop: potentiality and critical issues

- 16:15 KEYNOTE LECTURE: Complex value optimization for resource recovery: A novel analytical framework and tool for circular economy
- 16:45 Environmental impacts of the different schemes for the management of municipal waste in Galicia
- 17:10 A Methodology To Estimate Benefits From WEEE Recycling - Ecodom Case Study
- 17:35 Discussion & First day closing

#### Chair: L. Rigamonti

Costas Velis - University of Leeds, UK  
M.T. Moreira - Un. of Santiago de Compostela, Spain  
L. Campadello - Ecodom, Saronno  
5-10 min

#### 19:15 Meeting Point @ Piazza della Cittadella - Main entrance of Palazzo Farnese

#### 19:45 Guercino Exhibition & Palazzo Farnese main galleries GUIDED TOUR

#### 20:45 Aperitivo & GALA DINNER @ Palazzo Farnese, Piacenza

### May 23<sup>rd</sup> 2017

#### Session 3: Processes and technologies for energy recovery

- 9:30 KEYNOTE LECTURE
- 10:00 Wood combustion ash for the upgrading of biogas from anaerobic digestion
- 10:25 Anaerobic digestion laboratory test to evaluate the efficiency of biogas production from biowaste
- 10:50 Mass Balance And Economic Performance Of A Green Waste Composting Plant - Case Study Of Rodengo Saiano Plant
- 11:15 **Coffee break - Poster Session**
- 11:45 Technical Assessment Of Gasification Technologies In The Usa
- 12:10 Modeling gasification of waste-derived fuels in a rotary kiln converter operated with oxygen staging
- 12:35 Discussion & Questions
- 12:45 **Lunch**

#### Chair: F. Viganò

Franz Neubacher - UVP GmbH, Vienna, Austria  
L. Lombardi - Niccolò Cusano University, Roma  
M. Soldano - CRPA, Research Centre on Animal Production, Reggio Emilia  
A. Carrara, E. Vitto - Linea Energia SpA  
  
M. Castaldi - The City College of New York, USA  
C. Tregambi - University of Napoli Federico II

#### Session 4: Processes and technologies for material recovery

- 14:30 KEYNOTE LECTURE: Thermo-Recycling - Implementing a new recycling strategy
- 15:00 Sludge from mining and processing stone: strategies to improve resource efficiency and promote recycling according to the pillars of the European Commission
- 15:25 Challenges in carbon-fiber disposal and recycling
- 15:50 **Coffee break - Poster Session**
- 16:20 Future challenges for the Italian biowaste recycling sector
- 16:45 Glass waste<sup>3</sup> recovery: new technologies for corks and plastic separation
- 17:10 The reuse of solid residues from mass-burning and fluidized-bed reactors for concrete production
- 17:35 Final Discussion & Meeting Closing

#### Chair: M. Grosso

Daniel Böni - KEZO WtE plant Director, Hinwil, CH  
R. Bellopede - Politecnico di Torino  
M. Limburg - RWTH Aachen University, Germany  
  
A. Confalonieri - CIC, Monza Brianza  
G. Zanotti - Politecnico di Torino  
A. Abbà - University of Pavia  
5-10 min

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**Info & REGISTRATION  
details at the website:  
[www.mater.polimi.it](http://www.mater.polimi.it)**

## POSTER SESSIONS

The allocation of the abstracts submitted was undertaken by the Organizing Committee according to their scientific quality, innovation and relevance of the subject, together with the need to preserve a balance of topics within the 4 Sessions.

Some works will be illustrated during the Oral Sessions and the rest will be presented **in 4 Poster Sessions, distributed among the 2 days, that will take place during the coffee breaks of 30 minutes each.**

The works that have been selected as Posters have been divided as well according to the affinity to the topics of each session, but they will be shown and will remain available during the 2 days of the Meeting, independently from the scheduling of each session.

| SESSION<br>Topic | 13 POSTER Presentations   |  |
|------------------|---|--|
| S.1              | Environmental Sustainability Of Food Waste Management Strategies At Regional Level<br>Ruolo Della Respirometria Applicata Ai Rifiuti Secondo La Prospettiva Della Economia Circolare In Unione Europea<br>Optimization of waste collection systems: development and application of a decision model   | G. Feijoo - University of Santiago de Compostela, Spain<br>M. Ragazzi - University of Trento<br>C. Magrini - University of Bologna   |
| S.2              | Techno-Economic Assessment Of The Municipal Solid Waste Management System In The Context Of The Circular Economy: The Case Study Of Brescia, Italy<br>Diversion Of Municipal Solid Waste From Landfills: Recycling And Waste-To-Energy Facilities<br>Characterization And Evaluation Of The Generation And Separate Collection Of Restaurant Waste: A Case Study In Central Italy       | L. Manili - A2A Ambiente S.p.A., Brescia<br>M. Castaldi - The City College of New York, USA<br>F. Tatàno - University of Urbino "Carlo Bo"   |
| S.3              | Combustion Optimisation On Moving Grates<br>Combustion Grate As Completion Of Existing Rotary Kiln Wte Plants<br>Sludge disposal: what alternatives to agriculture<br>The Bio2energy Project: Bioenergy, Biofuels And Bioproducts From Municipal Solid Waste And Sewage Sludge<br>Life cycle assessment analysis of biomass lignocellulosic of s.a.ba.r. s.p.a.: from waste to resource | D. Zibrat - Technikgruppe, Austria<br>M. Carollo - Forni Engineering srl, Milano<br>T. Vollmeier - TBF + Partner AG Consulting Engineers, CH<br>I. Pecorini - University of Florence<br>R. Spinelli - University of Modena and Reggio Emilia |
| S.4              | Magaldi Ecobelt® WA - Dry Waste Bottom Ash Handling System<br>Stabilization of MSWI fly ash through a combined separation-immobilization method using sodium carbonate  | D. Ricci - Magaldi Power S.p.A., Salerno<br>E. Atanes - Universidad Politécnica de Madrid, Spain   |



## **MONDAY MAY, 22<sup>ND</sup> - EVENING PROGRAM**

- 19:15 Meeting point in the inner courtyard of **Palazzo Farnese** placed in Piazza della Cittadella 29, Piacenza.
- 19:45 Start of the guided tour of the **Guercino Exhibition** and the visit of some of the **Civic Museums' main galleries inside the palace** (Pinacoteca & Sala del Plastico)
- 20:45 Aperitivo & GALA Dinner at *Anticamera del Trono – Sala XII* of Palazzo Farnese
- 22:30 Musical entertainment

### **MUSICAL ENTERTAINMENT PROGRAM**

**Joseph Haydn**  
**(1732/1809)**

*DIE LONDONER TRIOS I in C major*  
*For two flutes and cello*  
*Allegro moderato, Andante, Finale Vivace*

**Georg Philipp Telemann**  
**(1681/1767)**

*QUARTETTO n. 5 TWV 43 in A minor*  
*For two flutes, cello and harpsichord*  
*Andante, Vivace, Presto, Allegro*

### **EXECUTORS: "AFFINITY OF SOULS"**

*Marina Sartini – Flute*  
*Emanuela Goi – Flute*  
*Maria Paola Busconi – Cello*  
*Silvia Sesenna – Harpsichord*

Affinity of Souls was born in 2010 and brings together artists associated with the passion for music especially in the Classico-Baroque period. Components find in the assembly the best expression of a group work by discovering that commitment needed to develop any creative project. The formation, composed by musicians graduated from the Conservatories of Milan, Piacenza and Mantua, is composed by a stable group of musicians to which are added other artists who accompanies and enrich the sound. Over the years they have collaborated with numerous chamber music and orchestral music formations. In addition to classical concerts, the ensemble organizes events in collaboration with actors and writers where the development of the musical part is based on a search for pieces of literature of the same era. On this occasion, the instrumental organ is composed of two flutes, cello and harpsichord.

<http://www.affinityofsouls.altervista.org>

## **PALAZZO FARNESE**

*Located in the northern part of the city, but separate from the inhabited area, it is still characterised by a sense of majestic severity. The palace was built in the 50ies and 60ies of the 16th century, upon will of the duchess Margaret of Austria, wife of Ottavio Farnese; it was located in the area of the Visconti Citadel, aiming to construct a stately residence for the dukes, which would have to symbolize the power of the Farnese family. The architect in charge of the project was Jacopo Barozzi, known as Vignola.*



## **WEDNESDAY MAY, 24<sup>TH</sup> - POST MEETING**

**FROM 9:00 TO 11:00 AM | TECHNICAL VISIT TO THE WASTE-TO-ENERGY PLANT  
OF IREN AMBIENTE SPA (STR. BORGOFORTE 22, PIACENZA)**

**REGISTRATION IS REQUIRED**



**2** Waste-to-Energy lines

**11.7** MWeI of Net electric power

**44.4** MWth of total thermal capacity

**120,000** ton. of waste disposed per year



## PIACENZA CITY CENTER MAP WITH THE MATER17 MAIN POINTS OF INTEREST

## MatER17 Main Parkings

**P1 Urban Center Parking**

Stradone Farnese n°126

Max Daily Price: 3.00 €

**P2** Cavallerizza Parking

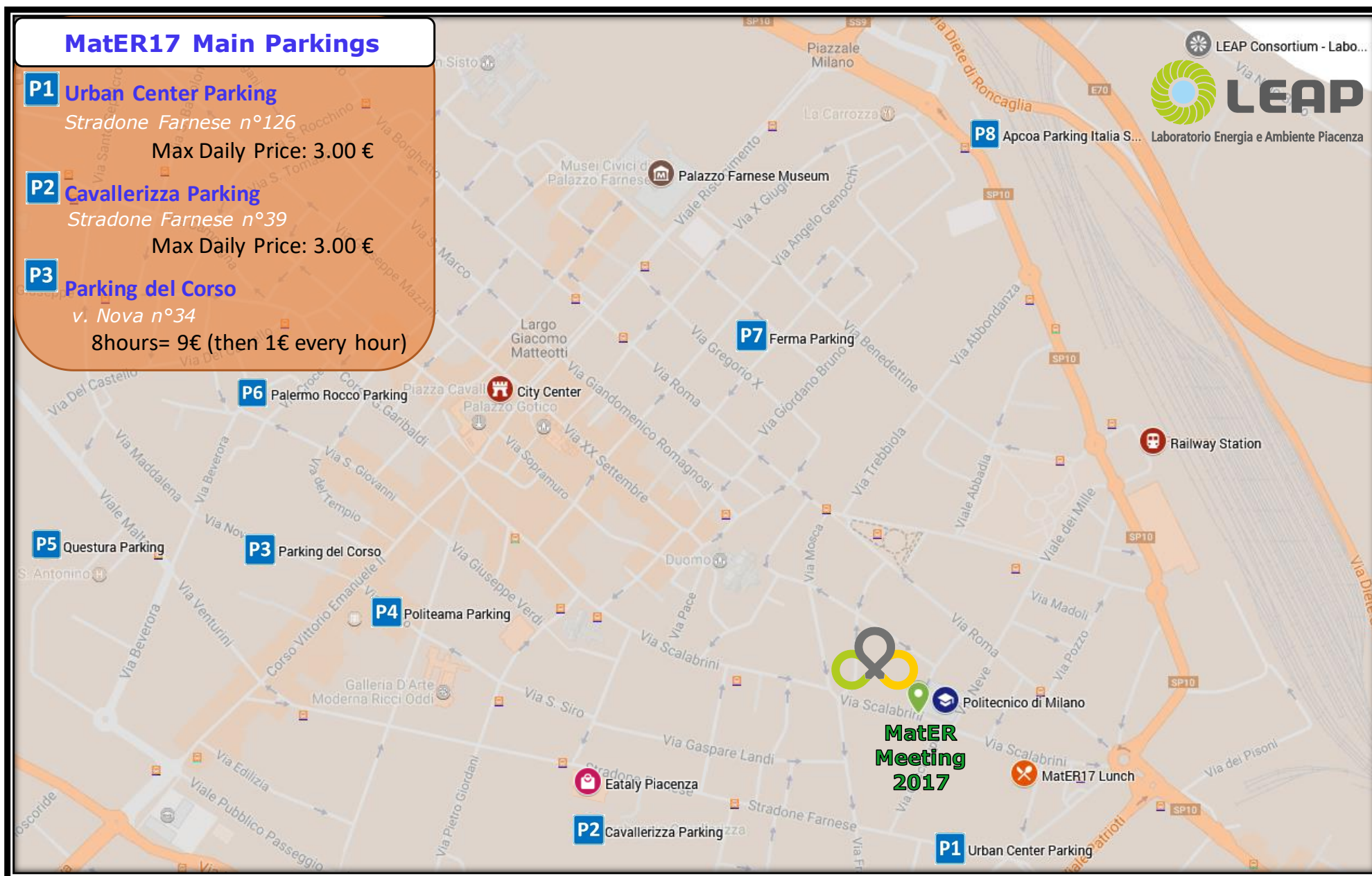
Stradone Farnese n°39

Max Daily Price: 3.00 €

**P3** Parking del Corso

v. Nova n°34

8hours= 9€ (then 1€ every hour)



## WHERE TO STAY IN PIACENZA

In order to facilitate your **accommodation** during the conference days, we have selected **four of the main hotels in Piacenza**, establishing with each one a special reduced rate exclusively for the MatER Meeting 2017.

Below you can find the main info of each Hotel. Please visit the dedicated page in the Meeting website at this [LINK](#) for the procedure to follow in order to benefit of the discount stipulated.

Where indicated, you can use the dedicated **booking code**, otherwise you simply need to contact the hotel and specify that your reservation is related to the **MatER Meeting 2017**.

All rates you will find are intended per room & per night, including VAT.

### **[CLICK HERE TO SEE THE MATER MEETING 2017 HOTEL MAP](#)**



#### [GRANDE ALBERGO ROMA](#)

**BOOKING CODE:** *"MATER17"* – 15% Discount on daily rate

**Address:** *Via Cittadella 14, 29121 Piacenza PC*

**Phone:** 0523.323201

**Email:** [info@grandealbergoroma.it](mailto:info@grandealbergoroma.it)



#### [HOTEL OVEST](#)

**BOOKING CODE:** *"32718"* - Lower fixed price until availability

**Address:** *Via Primo Maggio 82, 29121 Piacenza PC*

**Phone:** 0523. 712222

**Email:** [info@hotelovest.it](mailto:info@hotelovest.it)



#### [BEST WESTERN PARK HOTEL](#)

**DIRECT CONTACT:** *Reduced rates with locked price until May 7<sup>th</sup>*

**Address:** *Str. Val Nure 7, 29122 Piacenza PC*

**Phone:** 0523. 712600

**Email:** [info@parkhotelpiacenza.it](mailto:info@parkhotelpiacenza.it)



#### [HOTEL CITY](#)

**DIRECT CONTACT:** *Reduced rates with locked price until availability*

**Address:** *Via Emilia Parmense 54, 29100 Piacenza PC*

**Phone:** 0523. 579752

**Email:** [info@hotelcitypc.it](mailto:info@hotelcitypc.it)



## OUR MISSION:

The MatER Study Center aims at establishing a sound scientific bases for the many issues related to recovery from waste, without being influenced by any ideological or political consideration, independently of the expectations of any interest group. The ultimate goal is to give a rigorous scientific definition of the technologies and the policies which can be adopted for **material and energy recovery**, contributing to identify the most effective options for **sustainable, economically viable waste management practices**. This goal is pursued through the following actions:

- Identifying and analysing best available technologies for the recovery of material and energy from waste.
- Establishing links and collaborations between academic institutions, public and private organisations, business operators and technology providers.
- Promoting and undertaking studies and researches concerning material and energy recovery from waste.
- Organizing courses and events (conferences, seminars, workshops) to promote and divulge accurate scientific information.
- Monitoring the evolution of processes, technologies and practices for the recovery of material and energy from waste.
- Reviewing and promoting the improvement of legislation on waste management, recovery from waste and waste treatment.

## OUR PARTNERS:



MatER is a member of the **Global Waste-to-Energy Research and Technology Council (GWC)**, an international network of research centres which carry out activities concerning the sustainable management of waste. The network includes the representatives of the **Waste-to-Energy Research and Technology Council (WTER)**, founded in 2002 by Earth Engineering Center (EEC) of Columbia University, and of its sisters' organizations nowadays operative in several other nations.



## **ORGANIZATION COMMITTEE**



### **MatER Study Center**

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## **ADMINISTRATIVE SECRETARIAT**



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**PLEASE VISIT THE DEDICATED MATER MEETING 2017 WEBSITE FOR ALL  
THE NEWS & UPDATES ABOUT THE CONFERENCE:**

**[www.easychair.org/smart-program/MatER-2017/index.html](http://www.easychair.org/smart-program/MatER-2017/index.html)**