

Program

Biochar: Production, Characterization and Applications

August 20-25, 2017
Hotel Calissano
Alba, Italy

Conference Co-Chairs:

Franco Berruti
Western University, London, Canada

Ondrej Masek
University of Edinburgh, Edinburgh, UK

Raffaella Ocone
Heriot-Watt University, Edinburgh, UK



Engineering Conferences International
32 Broadway, Suite 314 - New York, NY 10004, USA
Phone: 1 - 212 - 514 - 6760, Fax: 1 - 212 - 514 - 6030
www.engconfintl.org – info@engconfintl.org

Hotel Calissano
Via Pola 8
12051, Alba (Cuneo)
Italy
Tel: +39-0173-364855

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Sunday, August 20, 2017

16:00 – 18:00	Registration
17:00 – 18:00	Organizing Committee Meeting
18:00 – 19:30	Welcome Reception
20:00 – 21:30	Dinner

NOTES

- *Technical and poster sessions will be in Luigi Calissano.*
- *All speakers should also bring a poster presentation of their talk that will be displayed the same day as the talk.*
- *Audiotaping, videotaping and photography of presentations are all prohibited.*
- *Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).*
- *Speakers – Please leave at least 3 minutes for questions. Extended discussion will take place at the poster session*
- *Please do not smoke at any conference functions.*
- *Turn your cellular telephones to vibrate or off during technical sessions.*

Monday, August 21, 2017

- 07:30 – 08:30 Breakfast
- 08:30 – 08:45 Welcome and Conference Overview
- 08:45 – 09:20 **PLENARY**
Biochar: From ligno-cellulosic materials to engineered products for environmental services
Manuel Garcia-Perez, Washington State University, USA
- 09:20 – 09:40 **Thermocatalytic-Reforming (TCR®) and TCR®-biochar properties**
Markus Heberlein, Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT, Germany
- 09:40 – 10:00 **Autothermal biochar production and characterization at pilot scale**
Andrea M. Rizzo, RE-CORD, Italy
- 10:00 – 10:20 **Woody and agricultural biomass diversity in torrefaction: A complete study in solid conversion and volatiles formation on TGA-GCMS**
María González Martínez, CEA Grenoble, LGC - INP Toulouse, France
- 10:20 – 10:50 Coffee Break
- 10:50 – 11:10 **Production and characterization of slow pyrolysis biochar from lignin-rich digested stillage from 2nd generation bioethanol production**
Frederik Ronse, Ghent University, Belgium
- 11:10 – 11:30 **A three-stage thermochemical conversion process for the production of biochar**
Alessandro Scova, Sea Marconi Technologies, Italy
- 11:30 – 11:50 **Biochar from microwave pyrolysis of selected feedstocks**
Muhammad Afzal, University of New Brunswick, Canada
- 11:50 – 12:10 **Biochar production through slow pyrolysis of different biomass materials: Seeking the best operating conditions**
Joan J. Manyá, University of Zaragoza, Spain
- 12:10 – 12:30 **Investigation of innovative and conventional pyrolysis of ligneous and herbaceous biomasses for biochar production**
Silvia Fiore, Politecnico di Torino, Italy
- 12:30 – 12:50 **Pyrolysis of residues from well-established biochemical processes for the production of biochar**
Devon Barry, ICFAR, The University of Western Ontario, Canada
- 12:50 – 13:10 **Biochar production through hydrothermal carbonization: Energy efficiency and cost analysis of an industrial-scale plant**
Fabio Merzari, Università di Trento, Italy
- 13:10 – 14:10 Lunch
- 14:10 – 17:00 Networking/*ad hoc* sessions
- 17:00 – 17:20 Afternoon Refreshments

Monday, August 21, 2017 (continued)

- 17:20 – 17:40 **Production of activated carbon from barley biochar precursor**
Javier Pallares Ranz, University of Zaragoza\CIRCE Research Institute, Spain
- 17:40 – 18:00 **Activation and mild oxidation of vacuum pyrolysis biochar**
Serge Kaliaguine, Université Laval, Canada
- 18:00 – 18:20 **Modeling of radical structures in biochar using DFT calculations**
Anna Trubetskaya, Umeå University, Sweden
- 18:20 – 18:40 **BiocharFX: Production with carbonFX technology, characterization and applications in potting soil related to plant production**
Sébastien Lange, Biopterre, Canada
- 18:40 – 19:00 **Biochar production and application in the Intermountain West**
Darren McAvoy, Utah State University, USA
- 19:00 – 19:20 **Biochar: Product development in remote regions from mixed residues**
Kelly Hawboldt - Memorial University, Canada and Stephanie MacQuarrie - Cape Breton University, Canada
- 19:30 – 21:00 Dinner
- 21:00 – 22:30 Poster Session with Social Hour

Tuesday, August 22, 2017

- 07:30 – 08:30 Breakfast
- 08:30 – 09:05 **PLENARY**
Biochar characterization: Standard biochar and the Charchive
Ondrej Masek, University of Edinburgh, United Kingdom
- 09:05 – 09:25 **How to produce a potential high value bio-char from the worst invasive plant in Canada**
Chiara Barbiero, ICFAR, The University of Western Ontario, Canada
- 09:25 – 09:45 **Characterization of biochar pore structure with X-ray tomography**
Jari Hyväluoma, Natural Resources Institute Finland (Luke), Finland
- 09:45 – 10:05 **Novel bio-char characterization strategies and their use to study the chemical and morphological evolution of material derived from xylan, cellulose and lignin**
Manuel Garcia-Perez, Washington State University, USA
- 10:05 – 10:25 **Production of biochar and development of predictive methods for determining performance in value-added composite materials**
Douglas Matthew Cuthbertson, ICFAR, Western University, Canada
- 10:25 – 10:55 Coffee Break
- 10:55 – 11:15 **Off-gassing of charred pellets during storage**
Sudhagar Mani, University of Georgia, USA
- 11:15 – 11:35 **Changes in carbon structure distribution and nanostructure of functionalized biochars**
Elsa Weiss-Hortala, Rapsodee UMR CNRS, France
- 11:35 – 11:55 **Biochar from gasification in cultivated soils and riparian buffer zones: Chemical characterization**
Ivano Vassura, University of Bologna, Italy
- 11:55 – 12:15 **Biochar characterization and EU27 law harmonization: REFERTIL results**
Massimo Pugliese, University of Torino, Italy
- 12:15 – 12:35 **Hydrothermal carbonization of sewage sludge: Char characterization and reference to international legislations**
Fabio Merzari, University of Trento, Italy
- 12:35 – 12:55 **Hydrous pyrolysis of digestate as alternative to post composting in a biowaste anaerobic digestion facility**
Maria Laura Mastellone, Università della Campania Luigi Vanvitelli, Italy
- 13:00 – 14:00 Lunch
- 14:00 – 17:00 Networking / *ad hoc* sessions
- 17:00 – 17:20 Afternoon Refreshments
- 17:20 – 17:40 **Mobile organic compounds in biochar. Relationships with carbonization degree and bio-oil composition**
Daniele Fabbri, University of Bologna, Italy

Tuesday, August 22, 2017 (continued)

- 17:40 – 18:00 **Lab-scale pyrolysis and hydrothermal carbonization of biomass digestate: Characterization of solid products**
David Chiaramonti, RE-CORD/CREAR, University of Florence, Italy
- 18:00 – 18:20 **Physical properties of charred pellets after two months of storage**
Sudhagar Mani, University of Georgia, USA
- 18:20 – 18:40 **Analysis of product distribution and characteristics of bio-oil and bio-char from fast pyrolysis of date palm tree waste**
Yassir Makkawi, Department of Chemical Engineering, American University of Sharjah, United Arab Emirates
- 18:40 – 19:00 **Pyrolysis of cotton stalks and utilization of pyrolysis char for sustainable soil enhancement and carbon storage**
Sebastian Schaffer, University of Natural Resources and Life Sciences, Vienna, Austria
- 19:00 – 19:20 **Multi-technique characterization of biochar formation**
Anthony Dufour, CNRS Nancy, France
- 19:20 – 19:40 **Biochar quality management**
Fabian Stenzel, Fraunhofer UMSICHT, Institute Branch Sulzbach-Rosenberg, Germany
- 20:00 – 21:15 Dinner
- 21:15 – 22:30 Poster Session with Social Hour

Wednesday, August 23, 2017

- 07:30 – 08:30 Breakfast
- 08:30 – 09:05 **PLENARY**
Which policy for biochar deployment in Southern EU? An integrated approach is possible
David Chiaramonti, RE-CORD/CREAR, University of Florence, Italy
- 09:05 – 09:25 **Biochar for remediating contaminated soils: Outdoor experiments in Wales, UK**
F. Alayne Street-Perrott, Swansea University, United Kingdom
- 09:25 – 09:45 **Monolithic biochar as electrode in supercapacitor**
Charles Q. Jia, University of Toronto, Canada
- 09:45 – 10:05 **Biochar for pollutant removal from aqueous solutions**
Raffaella Ocone, Heriot-Watt University, United Kingdom
- 10:05 – 10:25 **Biochar and ash amendment effects on mine reclamation in the boreal forest**
Jillian M.H. Bieser, University of Toronto, Canada
- 10:25 – 10:55 Coffee Break
- 10:55 – 11:15 **Agronomic benefits and detriments of using biochar**
Carlo Grignani, University of Turin, Italy
- 11:15 – 11:35 **Evaluating the potential of biochar for reducing bioavailable heavy metal fractions in polluted soil**
Rosa Soria Penafiel, University of Sheffield, United Kingdom
- 11:35 – 11:55 **Carbon sequestration using bio-refinery residues**
Ondrej Masek, University of Edinburgh, United Kingdom
- 11:55 – 12:15 **Biochar addition in the anaerobic digestion of the organic fraction of municipal solid waste for biogas production**
Paola Giudicianni, CNR-IRC, Italy
- 12:15 – 12:35 **Evaluation of the environmental benefits of biochar addition into concrete-based composites**
Mauro Giorcelli, Politecnico di Torino, Italy
- 12:35 – 12:55 **The role of bio-char as an agro-environmental tool: Formation mechanism and potential for control water release, bacterial retention and greenhouse gas emissions**
Manuel Garcia-Perez, Washington State University, USA
- 13:00 – 14:00 Lunch
- 14:00 – 17:00 Networking/*ad hoc* sessions
- 17:00 – 17:20 Afternoon Refreshments
- 17:20 – 17:40 **Developing biosensors as monitoring tools to assess the performance of biochar amended contaminated soil**
Bastian Saputra, University of Sheffield, United Kingdom

Wednesday, August 23, 2017 (continued)

- 17:40 – 18:00 **Bio char as cheap and environmental friendly filler able to improve polymer mechanical properties**
Alberto Tagliaferro, Politecnico di Torino, Italy
- 18:00 – 18:20 **A novel solution for utilizing liquid fractions from slow pyrolysis and hydrothermal carbonization - Acidification of animal slurry**
Kimmo Rasa, Natural Resources Institute Finland, Finland
- 18:20 – 18:40 **Biochar-ammonium phosphate as an uncoated-slow release fertilizer in sandy soil**
Haytham Elsharkawi, CLAC - Agricultural Research Center (ARC), Egypt
- 18:40 – 19:00 **Microwave characterization and shielding properties of biochar based polymers and cements**
Patrizia Savi, Politecnico di Torino, Italy
- 19:00 – 20:15 **International Biochar Initiative (IBI) Webinar: Past, present and future of IBI and the biochar industry**
Tom Miles, T.R. Miles Technical Consultants, USA and Kathleen Draper, Ithaca Institute for Carbon Intelligence, USA
- 20:15 – 21:30 Dinner
- 21:30 – 22:45 Poster Session with Social Hour

Thursday, August 24, 2017

- 07:30 – 08:30 Breakfast
- 08:30 – 08:50 **The effects of biochar as a soil amendment on soil quality and plant growth**
Ok-Youn Yu, Appalachian State University, USA
- 08:50 – 09:10 **Adsorption of Ammonium (NH₄⁺) Ions onto various Vietnamese biomass residue-derived biochars (wood, rice husk and bamboo)**
Hien Nguyen, University of Birmingham, United Kingdom
- 09:10 – 09:30 **Effect of biochar addition on carbon dioxide and nitrous oxide emissions from a temperate agricultural soil**
Maren Oelbermann, University of Waterloo, Canada
- 09:30 – 09:50 **Arsenic removal from drinking water by means of low cost biochars derived from miscanthus and coconut shell**
Silvia Fiore, Politecnico di Torino, Italy
- 09:50 – 10:10 **Characteristic studies on the waste biomass-based biochars produced by fast pyrolysis**
Ajay K. Dalai, University of Saskatchewan, Canada
- 10:10 – 10:30 **The influence of biochar on soil characteristics in a temperate agroecosystem**
Maren Oelbermann, University of Waterloo, Canada
- 10:30 – 11:00 Coffee Break
- 11:00 – 11:20 **Can biochar link forest restoration with commercial agriculture?**
Kristin Trippe - Oregon State University, USA
- 11:20 – 11:40 **Thermal evolution of biochar and its physicochemical properties during hydrothermal gasification**
Ajay Dalai, University of Saskatchewan, Canada
- 11:40 – 12:00 **Pyrolytic temperature evaluation of macauba biochar for uranium adsorption from aqueous solutions**
Ondrej Masek - University of Edinburgh, United Kingdom
- 12:00 – 13:00 Lunch
- 13:00 – 18:30 Excursion by bus: Visit to the Castle of Grinzane Cavour and museum (<http://www.castellogrinzane.com/en/homepage>); the town of Barolo with the Castle and the wine museum (<http://www.cellartours.com/italy/italian-cities/barolo.html>); the Castle of Guarene (<http://www.castellodiguarene.com/>) site of the conference banquet.
- 20:00 – 22:30 Banquet at the Castle of Guarene

Friday, August 25, 2017

- 07:30 – 08:30 Breakfast
- 08:30 – 09:05 **PLENARY**
Overview of biochar for electrochemistry applications
Capucine Dupont, CEA – Grenoble, France
- 09:05 – 09:25 **Evaluation of the long-term effects of pre-conditioned biochar on soil organic carbon in temperate soils using the Century Soil Organic Matter model**
Maren Oelbermann, University of Waterloo, Canada
- 09:25 – 09:45 **Developing a method of accounting for the material use of biomass/biochar and its positive side benefits within the company carbon footprint: A case study at Hochschule Geisenheim University**
Georg Ardissonne, Hochschule Geisenheim University, Germany
- 09:45 – 10:05 **Biochar economics and the competition for feedstock**
Jude Huggan, IBiolC, United Kingdom
- 10:05 – 10:25 **Life cycle assessment of biochar production from southern pine**
Sudhagar Mani, University of Georgia, USA
- 10:25 – 10:45 **Behavioral factors affecting the adoption of biochar of farmers in Canada**
Maren Oelbermann, University of Waterloo, Canada
- 10:45 – 11:05 **NewCarbon innovation for sustainable agriculture, soil remediation and water / effluent purification**
Kristin Trippe - Oregon State University, USA
- 11:05 – 11:25 **Biochars from various biomass types as anodes for sodium-ion batteries**
Capucine Dupont, CEA, France
- 11:25 – 12:30 Coffee Break and Poster Session for Thursday and Friday
- 12:30 Lunch and Departure

Poster Presentations

- 1. Biofuel production via dry and wet torrefaction of agro-industrial waste: A comparative study**
Fabio Merzari, University of Trento, Italy
- 2. Three-dimensional rendering of biochar surfaces from their FESEM images**
Mauro Giorcelli, Politecnico di torino, DISAT, Italy
- 3. Production, characterization and application of activated biochar from wood residues**
Flavia Lega Braghiroli, Technology Center for Industrial Waste (CTRI); Research Forest Institute (RFI), University of Québec in Abitibi-Témiscamingue (UQAT), Canada
- 4. Analysis of total organic carbon in soil-biochar systems**
Daniele Fabbri, University of Bologna, Italy
- 5. Microwave characterization and shielding properties of biochar based polymers and cements**
Mauro Giorcelli, Politecnico di Torino, Italy
- 6. Adsorption isotherm determination and heavy metal removal by acid-washed softwood biochar**
Raisa Tjarinto, The University of Sheffield, United Kingdom
- 7. Biochar for gas sensors devices**
Mauro Giorcelli, Politecnico di Torino, Italy
- 8. Modifying effect of biochar by mixing it with digestate**
Helena Dvořáčková, Mendel University in Brno, Czech Republic
- 9. Effect of sulfuric acid pre-treatment on the pyrolysis of sewage sludge**
Nadia Ruiz-Gomez, University of Zaragoza, Spain
- 10. Preparation of biochar and activated carbon from cocoa pod husk by using microwave as ammonium carrier in urea-based fertilizer**
Fisal Ahmad, Malaysian Cocoa Board, Malaysia
- 11. The use of a sustainable biochar compost for stabilizing and revegetating metal-mine tailings heaps**
Alayne Street-Perrott, Swansea University, United Kingdom
- 12. Characterization of biochar from Peko Pe gasifier cookstoves**
Henrik Kofoed Nielsen, University of Agder, Norway
- 13. Biochar: Soil amendment for the future of tree survival?**
Emma Amber Schaffert, University of Reading, Bartlett Tree Expert Co Ltd, United Kingdom
- 14. Solar assisted pyrolysis for biochar production**
Paola Giudicianni, Istituto di Ricerche sulla Combustione – CNR, Italy
- 15. Perspectives in the use of biochars as low-cost CO₂ adsorbents**
Paola Giudicianni, Istituto di Ricerche sulla Combustione – CNR, Italy
- 16. Biochar fracture resistance**
Anthony Dufour, CNRS Nancy, France