

## ***Program***

# ***Biochar IV: Production, Characterization and Applications***

**May 8-23, 2025  
Santa Marta,  
Colombia**

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**David Chiaramonti**, Politecnico di Torino and RE-CORD, Italy  
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**Previous Conferences in this Series**

**Biochar: Production, Characterization and Applications**

August 20-25, 2017

Alba, Italy

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**Biochar II: Production, Characterization and Applications**

September 15-20, 2019

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**Biochar III: Production, Characterization and Applications**

September 17-22, 2023

Tomar, Portugal

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## **Sunday, May 18, 2025**

16:30 – 18:00	Conference check in (Meeting room foyer)
18:00 – 19:00	Welcome reception with entertainment (Beach)
19:00 – 21:30	Dinner (Cayeye Restaurant)

### **NOTES**

- *Technical Sessions will be in the Tayrona Ballroom. Poster sessions will be in the Ballroom Foyer.*
- *Breakfasts and Lunches will be in the main restaurant (1525).*
- *Dinners will be in the Cayeye Beach Restaurant.*
- *The ECI office is the Sala Arhuaco.*
- *Audiotaping, videotaping and photography of presentations are prohibited.*
- *Speakers – Please have both your long and short presentations 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 May 19, 2025**

7:30am - 8:30am	Breakfast
8:30am – 8:45am	Opening Remarks
8:45am – 9:15am	<b>Keynote:</b> O131 - Dog or Tail: Carbon vs Nutrients in Biochar Systems Johannes Lehmann, Cornell University (USA)
9:15am – 9:30am	O146- Biochar Production and Characterisation by Pyrolysis of Oil Palm Biomass Heidi Teran Pradilla, University of Glasgow (UK)
9:30am – 9:45am	O190 - Novel biocher production technique in fluidized beds - First experiences in a large-scale unit Diana Carolina Guio Perez, Chalmers University of Technology (Sweden)
9:45am – 10:00am	O229 - Effect of heating rate and holding time on biochar features for carbon sequestration Paola Giudicianni, Institute of Sciences and Technologies for Sustainable Energy and Mobility (STEMS) – CNR (Italy)
10:00am – 10:15am	O143 - Effect of separation mechanism and position on char fractionation and characteristics in continuous hydrothermal liquefaction Maria Jose Rivas Arrieta, Aarhus University (Denmark)
10:15am -11:00am	Coffee Break
11:00am – 11:15am	O209 - High-temperature Pyrolysis of Contaminated Biomass: Case Study on Railway Ties Javier Ordonez-Loza, ICFAR, Western University (Canada)
11:15am – 11:30am	O207 - Influence of residence time and pyrolysis temperature on the physicochemical and textural properties of biochar and its potential for climate change mitigation Karen Bibiana Quiroga Salinas, Universidad Nacional de Colombia (Colombia)
11:30am – 11:45am	O191 - Production of biocarbon from untreated and leached birch, spruce and pine bark Liang Wang, SINTEF Energy Research (Norway)
11:45am – 12:00pm	O108 - Toward a Circular Bioeconomy: Advancing Sustainable Solutions with Engineered Biochar Payam Ghorbannezhad, Karlsruhe Institute of Technology (Germany)
12:00pm – 12:15pm	O128 - Investigation into the role of feedstock on the Carbonization of Transient Plastic Phase Biochar Robert Johnson, University of Hawaii (USA)
12:15pm – 12:30pm	O171 - Gasification Behaviour of Biochar in the Chemical Looping Process Marian Schmitt, Hamburg University of Technology (Germany)
12:30pm – 1:30pm	Lunch
1:30pm – 3:30pm	Networking / Free time
3:30pm – 4:00pm	Coffee Break

## **Monday May 19, 2025 (continued)**

- 4:00pm – 4:15pm O117 - Design of Auger Pyrolizer for biochar production through slow pyrolysis  
José-Daniel García, Universidad Nacional de Colombia Sede Medellin (Colombia)
- 4:15pm – 4:30pm O122 - Monolithic biochar as functional nanomaterial for sustainability  
Charles Jia, University of Toronto (Canada)
- 4:30pm – 4:45pm O178 - Continuous separation of biochar from a bubbling fluidized bed with solids crossflow  
Azka Rizwana Siddiqui, Chalmers University of Technology (Sweden)
- 4:45pm – 5:00pm O105 - First Principles and Neural Network-Driven Biochar Spectral Database: Raman, XPS, IR, and NMR  
Valentina Sierra Jimenez, Washington State University (USA)
- 5:00pm – 5:15pm O121 - Characterization of oil palm biomass, derived materials and applications  
Maria del Pilar Noriega, Daabon Group (Colombia)
- 5:15pm – 5:30pm O139 – Tailored biochar as peat substitute in soilless growth media  
Aidan mark Smith, Aarhus University, Denmark
- 5:30pm – 5:45pm Invited – The pilot plant works: let's commercialize!  
Stephanos Horvers, ITER Technologies-JCT, (Canada/Colombia)
- 5:45pm – 7:00pm Networking/Discussion/Free time
- 7:00pm – 8:30pm Dinner
- 8:30pm – 9:15pm **Short (3 minute) Poster Previews**
1. Synthesis engineered biochar from automotive paint sludge  
Payam Ghorbannezhad Sorkhkolaei, KIT, Germany
  2. Biochar Production, Application, and Education in Alaska, USA  
Darren McAvoy, Utah State University Forestry Extension, USA
  3. The Role of Biochar in the Circularity and Sustainability: Case Study of “Experimental Center El Remanso Ecer” in Choachi – Colombia  
Hector Rojas, Universidad Externado de Colombia, Colombia
  4. Application of Waste-Recycled Biochar to Mitigate Antimicrobial Resistance (AMR) in Animal Production in Norway and China  
Jihong Liu Clarke, Norwegian Institute of Bioeconomy Research (NIBIO), Norway
  5. RegioH2O - Implementing activated hydrochar in a water purification cascade of municipal wastewater for safe and multifunctional reuse  
Lisa Röver, DBFZ, Germany
  6. Perspectives of biochar and hydrochar production from biomass conversion  
Myriam Rojas, KIT, Germany
  7. Structural Evolution and Mechanical Properties of Pellet Char after Pyrolysis of Biomass Pellets with Different Densities  
Marian Schmitt, Hamburg University of Technology (Germany)
- 9:15pm – 10:30pm **Poster Session / Social Networking**

## Tuesday May 20, 2025

7:30am - 8:30am	Breakfast
8:30am – 9:00am	<b>Keynote:</b> O228 - Combining biochar and rock powder to increase the overall CDR-potential: Does it work? Results from the “PyMiCCS” project Claudia Kammann, Hochschule Geisenheim University (Germany)
9:00am – 9:15am	Invited - A Lucky Strike: How Biochar Found Me (and What We Do With That Gift) Martin Herrera, SIRIUS Regenerative (Colombia)
9:15am – 9:30am	O118 - Structural analysis of biochar derived from pruning residues gasification Iván Calderón-Gutiérrez, Universidad Nacional de Colombia Sede Medellín (Colombia)
9:30am – 9:45am	O110 - Products comparison of inert and oxidative slow pyrolysis of six different underused tree and shrub species cultivated in marginal land David Chiaramonti, RE-CORD (Renewable Energy Consortium for R&D) DENERG of the Polytechnic of Turin (Italy)
9:45am – 10:00am	O103 - Biochar modified asphalt - Capturing and storing CO <sub>2</sub> in roads Alexandru Let, Sustainability Asphalt Concrete Solutions PTY Ltd (Australia)
10:00am – 10:15am	O137 - Mechanochemical functionalization of Biochar for the production of new hydrophobic coatings Maria Rosaria Acocella, University of Salerno (Italy)
10:15am – 10:30am	O133 - Development of an organo-mineral fertilizer formulation derived from cocoa pod husks grown in the Arauca region Julieth Andrea Moreno Carrillo, University of Antioquia (Colombia)
10:30am -11:00am	Coffee Break
11:00am – 11:15am	O138 - Perspectives of Rice Husk Biochar for Obtaining Sustainable Construction Materials Diego Camargo-Trillos, TAYEA, Universidad Nacional de Colombia (Colombia)
11:15am – 11:30am	O111 - Novel green molecules and cancer: biochar enhances the anti-tumor effects of butyrate-glycerides in colorectal cancer Davide Casini, RE-CORD (Renewable Energy Consortium for R&D (Italy)
11:30am – 11:45am	O141 - Stability of biochar-supported catalysts during CO <sub>2</sub> methanation Alexandra Frainetti, ICFAR Western University (Canada)
11:45am – 12:30pm	Networking/Discussion/Free time
12:30pm – 1:30pm	Lunch
1:30pm – 3:30pm	Networking / Free time
3:30pm – 4:00pm	Coffee Break

## **Tuesday May 20, 2025 (continued)**

- 4:00pm – 4:15pm O219 - Biochar Based Geopolymer Composites: A New Approach for Sustainable Construction  
Alex Neves Junior, Federal University of Mato Grosso (Brazil)
- 4:15pm – 4:30pm O116 - Addition of Biochar to Anaerobic Digestion of Food Waste in a UASB Reactor to Enhance Biogas Production  
Michell Ortiz, Universidad Nacional de Colombia Sede Medellin (Colombia)
- 4:30pm – 4:45pm O120 - Effect of Physicochemical Characteristics Of Biochar Produced from Palm Kernel Shells and Pruning Residues On Anaerobic Digestion For Enhanced Biogas Production  
Juan Diego Otálora, Universidad Nacional de Colombia Sede Medellin (Colombia)
- 4:45pm – 5:00pm O153 - Activated biochar as a catalyst for methane pyrolysis to produce hydrogen  
Rhiana Palfy, ICFAR Western University (Canada)
- 5:00pm – 5:15pm O195 - Agronomic Application of Coffee Husk Biochar Increase Coffee Yield and the Farmers' Profit – a Summary of Field Conditions Trials  
Leonidas Carrijo Azevedo Melo, Federal University of Lavras (Brazil)
- 5:15pm – 5:30pm Stretch Break
- 5:30pm – 5:45pm O200 - Utilization of Biochar as bio- and regular heterogeneous support  
Jean-Michel Lavoie, Université de Sherbrooke (Canada)
- 5:45pm – 6:00pm O192 - Biochar in Polymeric Composite for Automotives: Influence on Thermomechanical, Microstructural, and Viscoelastic Properties  
Manuel Garcia-Perez, Washington State University (USA)
- 6:00pm – 6:15pm O216 - Biochar as Sustainable Filler for Recycled Polylactic Acid (PLA)  
Maria Rosaria Acocella, University of Salerno (Italy)
- 6:15pm – 6:30pm O220 - Linking Bacterial Adsorption to Local Biochar Morphology and Production Conditions by X-ray Nanotomography  
Meredith Barr, London South Bank University (UK)
- 7:00pm – 8:30pm Dinner
- 8:30pm – 9:15pm **Short (3 minute) Poster Previews**
1. Biochar: a strategic and integral component for the viability of biorefineries in Colombia  
Carlos M. Ceballos, Universidad de la Guajira, Colombia
  2. Production of ecological biochar from forest waste shells in Peru  
Dembert Chavez Yauri, BEI, Peru
  3. Structural Properties Characterization of Biochar Derived from Biomass-plastic Pyrolysis  
Silvio Ospina, Instituto de Capacitación e Investigación del Plástico y el Caucho, Colombia
  4. Characterization of liquid by-products from pyrolysis of birch, spruce and pine bark  
Bence Babinszki, HUN-REN Research Centre for Natural Sciences, Hungary

**Tuesday May 20, 2025** (continued)

9:15pm – 10:30pm      **Poster Session** / Social Networking

### **Wednesday May 21, 2025**

7:30am - 8:30am	Breakfast
8:30am – 9:00am	<b>Keynote:</b> O201 - New York State's climate-focused biochar policies: Opportunities, obstacles, and lessons for other jurisdictions Tristan Brown, SUNY College of Environmental Science & Forestry (USA)
9:00am – 9:15am	O225 - Torrefied palm kernel shell biochar as a promising material for hydrogen sulfur (H <sub>2</sub> S) adsorption Marlon Cordoba-Ramirez, University of La Guajira (Colombia)
9:15am – 9:30am	O215 - Biochar as biofertilizer for the cultivation of strawberries Silvia Fiore, Politecnico di Torino (Italy)
9:30am – 9:45am	O125 - Process integration between slow oxidative pyrolysis and anaerobic digestion to enhance biomethane production using the aqueous fraction of condensates David Chiaramonti, RE-CORD Renewable Energy Consortium for R&D, Florence; DENERG (Energy Dept.) of the Polytechnic of Turin (Italy)
9:45am – 10:00am	O231 - Advancing Sustainable Additive Manufacturing with Biochar-Enhanced Composites Ramona Fayazfar, Ontario Tech University (Canada)
10:00am – 10:15am	O130 - Pyrolysis and Hydrothermal Carbonization in Wetland Engineering: Carbon Sequestration, Phosphorus Recovery, and Structural Characterization of Willow-based Chars with X-ray Based Techniques Andrés Acosta, Aarhus University (Denmark)
10:15am – 10:30am	O167 - Hard to Abate? Our Solution for Defossilizing the Metallurgy Sector Using Biocoal and Green Hydrogen Viviana Negro, Politecnico di Torino (Italy)
10:30am -11:15am	Coffee Break
11:15am – 11:30am	O126 - Pre-sowing seeds imbibition with diluted wood vinegar from slow pyrolysis to promote germination under water stress David Casini, RE-CORD (Italy)
11:30am – 11:45am	O224 - An effective Biochar application for reducing nitrogen emissions from buffalo digestate storage tank Corinna Maria Grottola, Institute of Sciences and Technologies for Sustainable Energy and Mobility - C.N.R, Naples (Italy)
11:45am – 12:00pm	O161 - Biochar as a Multi-tasking Agent in Agricultural Mulch Films: from End-of-life Management to Processing Additive Yvan Hernandez, Cinterest Inc. (Colombia)
12:00pm – 12:15pm	O177 - A new controlled release fertilizer based on biochar Mauricio Flores, Unidad de Desarrollo Tecnológico de la Universidad de Concepcion (Chile)
12:15pm – 12:30pm	O175 - Optimizing dairy manure management with pyrolysis: a life cycle assessment approach Lucinda Li, Cornell University (USA)

**Wednesday May 21, 2025 (continued)**

12:30pm – 1:30pm	Lunch
1:30pm – 3:30pm	Networking / Free time
3:30pm – 4:00pm	Coffee Break
4:00pm – 4:15pm	O188 - Electrical and Thermal Conductivity Enhancement of Epoxy Resin-Based Composites with Biochar Fillers for Self-Heating Applications Mauro Giorcelli, Politecnico di Torino (Italy)
4:15pm – 4:30pm	O210 - Impact of Biochar Physical Properties on Adsorption Mechanisms for the Removal of Aromatic Aqueous Contaminants in Water Franco Berruti, ICFAR Western University (Canada)
4:30pm – 4:45pm	O193 - Phosphoric Acid-treated Biochar in Sustainable Cementitious Material: Enhancing Pavement Durability, Carbon Sequestration, and Environmental Performance Manuel Garcia-Perez, Washington State University (USA)
4:45pm – 5:00pm	O196 - Evaluation of the effect of Lewis and Bronsted acid sites dispersed on a carbon-based catalyst derived from palm oil empty fruit bunch on the conversion of glucose to 5-Hydroxymethylfurfural (5-HMF) Carolina Mejía Salazar, Universidad de Antioquia (Colombia)
5:00pm – 5:15pm	O102 - Influence of acid-catalyzed dehydration and pressure on woody biomass carbonization: Exploring carbon yield, heteroatom functionalities, and biochar atomistic structure Valentina Sierra, Washington State University (USA)
5:15pm – 5:30pm	O124 - The Sirius Approach-merging Proprietary Pyrolysis Innovation, Ai, and Microbial Alchemy to Accelerate the Advent of Regenerative Agriculture Martin Herrera, SIRIUS Regenerative (Colombia)
5:30pm – 6:30pm	<b>Poster Session</b>
6:45pm	Meet in lobby for buses
7:00pm	Departure (via bus) for Santa Marta Club
7:30pm – 10:15pm	Conference Banquet at Santa Marta Club ( <b><i>Sponsored by Daabon Group</i></b> )

## **Thursday May 22, 2025**

7:30am - 8:30am	Breakfast
8:30am – 9:00am	<b>Keynote:</b> O165 - Synergistic Integration of Biochar with Advanced Carbon Dioxide Removal Technologies: A Comprehensive Approach to Climate Change Mitigation Ondrej Masek, University of Edinburgh (UK)
9:00am – 9:15am	O147 - Accurate Molecular Models of Biochar Materials for Environmental Applications Valentina Erastova, University of Edinburgh (UK)
9:15am – 9:30am	O198 - Exploring Cellulose Pyrolysis Mechanisms and Biochar Formation Through Reactive Molecular Dynamics and DIP FT-ICR MS Valentina Sierra, Washington State University (USA)
9:30am – 9:45am	O155 - Molecular-level insights into CO <sub>2</sub> adsorption by micropores in wood-derived biochars Audrey Ngambia, University of Edinburgh (UK)
9:45am – 10:00am	O119 - Hybrid polygeneration scheme (pyrolysis, gasification and biological) for producing biochar and biogas from organic waste Farid Chejne, Universidad Nacional de Colombia Sede Medellin (Colombia)
10:00am – 10:15am	O160 - Urban wood waste biochar for Canadian street trees: early field results and prospects for climate benefits Sean C. Thomas, University of Toronto (Canada)
10:15am – 10:30am	O179 - Empowering smallholder farmers communities with biochar: a case study on soil fertility improvement through ELSA gasification stove in Burundi Lucia Brusegan, International Biochar Initiative (Italy)
10:30am -11:00am	Coffee Break
11:00am – 11:15am	O187 - Novel Biochar Production Technique in Fluidized Beds - Techno-economic Analysis of a Large-scale Reactor System Diana Carolina Guio-Perez, BioShare AB (Sweden)
11:15am – 11:30am:	O221 - Techno-economic evaluation of ORC coupled self-sustaining mobile pyrolysis units for production of biochar, liquid and gaseous fuels in remote locations Murlidhar Gupta, Canmet ENERGY/Natural Resources Canada (Canada)
11:30am – 11:45am	O169 - Biochar, a Disruptive Role in Sustainable Biofuels and Carbon Removals: Policy Opportunities and Challenges David Chiaramonti, Politecnico di Torino and RE-CORD (Italy)
11:45am – 12:00pm	O174 - Circular Economy in Agriculture: Biochar as a Sustainable Solution for Waste Valorization and Carbon Storage Cristina Segura, Unidad de Desarrollo Tecnológico de la Universidad de Concepcion (Chile)
12:00pm – 12:15pm	O156 - Coffee Biochar a Carbon Removal Program Santiago Martinez, Biodiversal (Colombia)
12:30pm – 1:30pm	Lunch

**Thursday May 22, 2025 (continued)**

1:45pm – 5:45pm      **Excursion – City tour of Santa Marta**

7:00pm – 8:30pm      Dinner

8:30pm – 9:30pm      **Short (3 minute) Poster Previews**

1. Integrated Biofilm-Biochar System: A Novel Biochar Application in Circular Environmental Solutions  
Jiacheng Sun, The University of Edinburgh, UK
2. Pyrolysis of microalgae under N<sub>2</sub> and CO<sub>2</sub> atmosphere  
Liang Wang, SINTEF Energy Research, Norway
3. Synergies Between BECCS Waste Management and Biochar Carbon Sequestration Potential: Increased Economic Benefit and Climate Change Mitigation  
Jiacheng Sun, The University of Edinburgh, UK
4. Sewage sludge valorization by pyrolysis in a fluidized bed reactor - Biochar production and potential agricultural use  
Andres Pardo, Universidad Nacional de Colombia Sede Bogota, Colombia
5. Invertebrate community responses to biochar addition in enriched Amazonian secondary forests  
Pedro Ríos Guayasamín, University of Toronto, Canada
6. Production of biochar from the pyrolysis of mushroom substrate  
Stephanos Horvers, ICFAR, Western University, Canada
7. Biochar adsorption of caffeine and subsequent desorption using solvents and supercritical CO<sub>2</sub>  
Silvia Fiore, Politecnico di Torino, Italy
8. The Adsorption of Pharmaceuticals in Wastewater by Biochar: Diclofenac as Example  
Yi Zhang, University of Edinburgh, UK
9. Influence of temperature and pyrolysis medium on biochar properties and ammonium ion adsorption  
Corinna M. Grottola, Institute of Sciences and Technologies for Sustainable Energy and Mobility (STEMS) of the National Research Council (CNR), Italy

9:30pm – 10:45pm      **Poster Session / Social Networking**

**Friday May 23, 2025**

7:30am – 9:00am      Breakfast

Departures

**Additional Poster Presentations – Presented on Thursday, May 22**

- 1. Coffee Husk Biochar Enhances Nitrogen Use Efficiency and Soil Functionality under Reduced n Fertilization in Coffea Arabica Systems**  
Thiago Costa Viana, Federal University of Lavras, Brazil
- 2. Study of the effect of gas outlet location and bed heights on product distribution and biochar properties in a biomass pyrolysis pilot plant**  
César Gracia, Universidad de Zaragoza, Spain
- 3. Continuous gas phase ammonia adsorption on rice husk biochar**  
Alejandro Lete, Universidad de Zaragoza, Spain
- 4. Co-stabilization of Residues with the Addition of Biochar**  
Cristina Muñoz, Universidad de Concepción, Chile
- 5. Adsorption of ammoniacal nitrogen and phosphates by biochar produced from palm oil shell: Effects of production conditions**  
David Munar, Cenipalma, Colombia