***Preliminary Program (April 3, 2025)***

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

**May 18-23, 2025**

**Santa Marta,**

**Colombia**

**Conference Co-Chairs:**

**Franco Berruti**, ICFAR, Western University, Canada  
**David Chiaramonti,** Politecnico di Torino and RE-CORD, Italy

**Farid Chejne Janna**, Universidad Nacional de Colombia, sede Medellín, Colombia

**Johannes Lehmann**, Cornell University, USA

**A beach with people swimming in the water

AI-generated content may be incorrect.**

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**Engineering Conferences International**

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**Sunday, May 18, 2025**

16:00 – 18:00 Registration

18:00 – 19:30 Welcome reception

19:30 – 22:00 Dinner

Guest Presentation: Martin Herrera, SIRIUS Regenerative (Colombia)

# NOTES

* Audiotaping, videotaping and photography of presentations are 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 May 19, 2025**

7:30am - 8:30am: BREAKFAST

8:30am – 9:00am: KEYNOTE: O217 - Unlocking biochar’s global potential: trends, drivers, and market dynamics. Suzanne Allaire, GECA Environmental (Canada).

9:00am – 9:15am: O131 - Dog or Tail: Carbon vs Nutrients in Biochar Systems, Johannes Lehmann, Cornell University (USA).

9:15am – 9:30am: O149 - Biocarbon production in fluidized beds: Evolution of particle physical properties during biomass conversion. Eduardo Arango-Durango, Luleå University of Technology (Sweden).

9:30am – 9:45am: O146 - Biochar Production and Characterisation by Pyrolysis of Oil Palm Biomass. Heidi Teran Pradilla, University of Glasgow (UK).

9:45am – 10:00am: O190 - Novel biochar production technique in fluidized beds - First experiences in a large-scale unit. Diana Carolina Guio Perez, Chalmers University of Technology (Sweden).

10:00am – 10:15am: 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).

10:15am – 10:30am: O143 - Effect of separation mechanism and position on char fractionation and characteristics in continuous hydrothermal liquefaction. Maria Jose Rivas Arrieta, Aarhus University (Denmark).

10:30am -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 - Enhancement of engineered biochar functionality through co-pyrolysis of municipal wastes over metal-adopted catalysts. 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

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: STRETCH BREAK

5:30pm – 5:45pm: O162 - About the elemental composition of biochars: a comparison of different analytical methods, Marilyne Farhat, CNRS-University of Lorraine (France)

5:45pm – 6:00pm: O172 - Structural Evolution and Mechanical Properties of Pellet Char after Pyrolysis of Biomass Pellets with Different Densities. Marian Schmitt, Hamburg University of Technology (Germany).

6:00pm – 6:15pm: O180 - Physicochemical characterization of biochar products from brazilian agricultural

residues. , Matheus AntÃ´nio da Silva, Embrapa Meio Ambiente (Brazil)

6:15pm – 6:30pm: O168 - Enhanced Forced Draft Retort System for Sustainable Biochar Production from Biomass, Senthilmurugan Subbiah, IIT Guwahati (India)

7:00pm – 8:45pm: DINNER

8:45pm – 9:45pm: SHORT (3 MIN) 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. Advanced studies in the thermochemical conversion of residual biomass for a sustainable energy transition with a focus on the production of biochar, Diego M. Yepes Maya, Federal University of ItajubÃ¡, Brazil
4. Biochar enhances the sorption, degradation of fluridone and main metabolite in soil: Insights into biodegradation potential and remediation mechanism, Chi Wu, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, China
5. The Role of Biochar in the Circularity and Sustainbility: Case Study of “Experimental Center El Remanso Ecer” in Choachi – Colombia, Hector Rojas, Universidad Externado de Colombia, Colombia
6. 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
7. RegioH2O - Implementing activated hydrochar in a water purification cascade of municipal wastewater for safe and multifunctional reuse, Lisa Röver, DBFZ, Germany
8. Perspectives of biochar and hydrochar production from biomass conversion, Myriam Rojas, KIT, Germany
9. Thermal drying treatment as an alternative for improving biochar production, Diego Mauricio Yepes Maya, Federal University of Itajubá, Brazil

9:45pm – 11:00pm: POSTER SESSION AND SOCIAL/NETWORKING

**Tuesday May 20, 2025**

7:30am - 8:30am: BREAKFAST

8:30am – 9:00am: KEYNOTE: 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: O137 - Mechanochemical functionalization of Biochar for the production of new hydrophobic coatings. Maria Rosaria Acocella, University of Salerno (Italy).

9:15am – 9:30am: O118 - Structural analysis of biochar derived from pruning residues gasification. Iván Calderón-Gutiérrez, Universidad Nacional de Colombia Sede Medellin (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 CO2 in roads. Alexandru Let, Sustainability Asphalt Concrete Solutions PTY Ltd (Australia).

10:00am – 10:15am: O127 - Biochar and vegetation effects on discharge water quality from organic-substrate green roofs. Wenxi Liao, University of Toronto (Canada).

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: O139 - Tailored biochar as peat substitute in soilless growth media. Andrej Saner, Aarhus University (Denmark).

11:30am – 11:45am: O141 - Stability of biochar-supported catalysts during CO2 methanation. Alexandra Frainetti, ICFAR Western University (Canada).

11:45am – 12:00pm: O142 - Use of biochar in the treatment of wastewater derived from the palm oil industry. Ainhoa Rubio-Clemente, University of Antioquia (Colombia).

12:00pm – 12:15pm: 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).

12:30pm – 1:30pm: LUNCH

1:30pm – 3:30pm: NETWORKING/FREE TIME

3:30pm – 4:00pm: COFFEE BREAK

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, Universite’ de Sherbrooke (Canada).

5:45pm – 6:00pm: O192 - Biochar in Polymeric Composite for Automotives: Influence on Thermomechanical, Microstructural, and Viscoelastic Properties. Mohammad Mezbah Ul Hoque, 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 – 8:45pm: DINNER

8:45pm – 9:45pm: SHORT (3 MIN) POSTER PREVIEWS

1. The virtuous circle of biochar: how a by-product became a material of interest!, Audrey Villot, IMT Atlantique, France
2. Evaluation of modified granular coconut shell biochar as a sustainable additive in biogas, Jose’ Eduardo Cruz Magdaleno, UNAM-Facultad de Qui­mica, Mexico
3. Activated carbon from chontaduro seeds: a sustainable solution for water treatment in rural areas in Colombia, Luis Angel, Universidad de los Andes, Colombia
4. Biochar: a strategic and integral component for the viability of biorefineries in Colombia, Carlos M. Ceballos, Universidad de la Guajira, Colombia
5. The Multifaceted Benefits of Biochar: Soil Remediation, Crop Enhancement, and Carbon Sequestration, Hailong Wang, Foshan University, China
6. The potential of biochar of citrus production waste in Argentina, Mariano Salerno, ACDI, Argentina
7. Produccion de biocarbon ecologico a partir de cascaras de residuos forestales en Peru, Dembert Chavez Yauri, BEI, Peru
8. Structural Properties Characterization of Biochar Derived from Biomass-plastic Pyrolysis, Silvio Ospina, Instituto de Capacitación e Investigación del Plástico y el Caucho, Colombia
9. Characterization of liquid by-products from pyrolysis of birch, spruce and pine bark, Bence Babinszki, HUN-REN Research Centre for Natural Sciences, Hungary

9:45pm – 11:00pm: POSTER SESSION AND SOCIAL/NETWORKING

**Wednesday May 21, 2025**

7:30am - 8:30am: BREAKFAST

8:30am – 9:00am: KEYNOTE: 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 (H2S) 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 -11:00am COFFEE BREAK

11:00am – 11:15am: O222 - Novel Biocomposites Based on Bio-based Pet Modified with Bio-char from Food Waste (Mollusc Shells, Eggshells and Coffee Grounds). Stanislaw Kuciel, Cracow University of Technology (Poland).

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 Tecnologico 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).

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. Mohammad Mezbah Ul Hoque, Washington State University (USA).

4:45pm – 5:00pm: O183 - Co-pyrolysis and pyrolysis of municipal sewage sludge, rice husk, and pruning residues: A comparative study through their physicochemical and biological characterization. Luz Maria Landa, Universidad de Guanajuato (Mexico).

5:00pm – 5:15pm: 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).

5:15pm – 5:30pm: O102 - Influence of acid-catalyzed dehydration and pressure on woody biomass carbonization: Exploring carbon yield, heteroatom functionalities, and biochar atomistic structure. Manuel Garcia-Perez, Washington State University (USA).

5:30pm – 5:45pm: O124 - The Sirius Approach-merging Proprietary Pyrolysis Innovation, Ai, and Microbial Alchemy to Accelerate the Advent of Regenerative Agriculture. Martin Herrera, SIRIUS Regenerative (Colombia).

5:45pm – 6:45pm: POSTER SESSION

7:00pm: Departure for Santa Marta Club

7:30pm – 10:30pm BANQUET @ SANTA MARTA CLUB (*Sponsored by Daabon Group*)

**Thursday May 22, 2025**

7:30am - 8:30am: BREAKFAST

8:30am – 9:00am: KEYNOTE: O115 - An update on the Expansion of the Biochar Atlas; A nationwide tool for biochar users. Kristin Trippe, USDA Agricultural Research Service (USA).

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 CO2 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, CanmetENERGY/Natural Resources Canada (Canada).

11:30am – 11:45am: O165 - Synergistic Integration of Biochar with Advanced Carbon Dioxide Removal Technologies: A Comprehensive Approach to Climate Change Mitigation, Ondrej Masek, University of Edinburgh (UK).

11:45am – 12:00pm: O169 - Biochar, a Disruptive Role in Sustainable Biofuels and Carbon Removals: Policy Opportunities and Challenges. David Chiaramonti, Politecnico di Torino and RE-CORD (Italy).

12:00pm – 12:15pm: O174 - Circular Economy in Agriculture: Biochar as a Sustainable Solution for Waste Valorization and Carbon Storage, Cristina Segura, Unidad de Desarrollo Tecnologico de la Universidad de Concepcion (Chile).

12:15pm – 12:30pm: O156 - Coffee Biochar a Carbon Removal Program. Santiago Martinez, Biodiversal (Colombia).

12:30pm – 1:30pm: LUNCH

1:30pm – 5:45pm: EXCURSION to Santa Marta

6:00pm – 7:00pm: SHORT (3 MIN) POSTER PREVIEWS (12 presentations + 2 min breaks)

7:00pm – 8:45pm: DINNER

8:45pm – 9:30pm: SHORT (3 MIN) 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\n2\n and CO\n2\n 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, Silvia Fiore, Politecnico di Torino, Italy
7. Biochar adsorption of caffeine and subsequent desorption using solvents and supercritical CO2, 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 – 9:45pm: CLOSING REMARKS

9:45pm – 11:00pm: POSTER SESSION AND SOCIAL/NETWORKING

**Friday May 23, 2025**

7:30am – 9:00am: BREAKFAST

Departures