

# Summary of the Integration of Thermal, Thermochemical, and Biological Conversion Technologies Workshop hosted by EBNet's Biochars for Pollution Prevention WG

On 25-26 February 2025, the EBNet Biochar working group led by Dr Meredith Barr hosted a workshop co-funded by [EBNet](#) and [BBNet](#) to explore how thermal, thermochemical, and biological conversion technologies may be integrated to improve environmental and economic outcomes of waste and biomass valorisation processes. This is a broad topic of growing interest, for which the workshop successfully identified priority areas.



Workshop participants at the networking dinner

## Workshop Content

The two-day workshop consisted of three conference-style sessions, each with an introduction by an expert chair, three to four invited talks, and a consensus building activity following a “Café Delphi” format, in which open discussion functioned as the first round of the Delphi process, to identify consensus pathways subsequently ranked by participants according to perceived potential impacts and TRLs.

The 3 session topics were:

- 1. Biological pretreatment of thermal and thermochemical feedstocks**, chaired by Prof Jhuma Sadhukhan (University of Surrey, EBNet Co-I, Process Integration and Sustainability Assessment WG lead)
- 2. Biochar for microbiome engineering**, chaired by Dr Mark Gronnow (Biorenewables Development Centre Process Development Unit leader, BBNet board member)
- 3. Thermal and thermochemical technologies in anaerobic digestion and fermentation**, chaired by Dr Andy Ross (University of Leeds, Institute for Chemical Technology)



Dr Meredith Barr (left), Marc Buttmann of TerraNova Energy (centre), and Prof Ondrej Masek of the UKBRC (right)

The workshop also included a networking dinner on the first night to encourage collaboration-building and concluded with an industry panel discussion used to gather data on existing progress, feasibility, and industrial interest in the different pathways discussed throughout the workshop. The industry panel included representatives from Unyte Group, Inspro, and Colorifix, with additional industry representation among speakers and delegates including Severn Trent, TerraNova Energy, Yorfuel, Anaero Technology, Mono Carbon, ICMEA UK, and Straw Innovations.



Dr Tony Gutierrez (left) and the industry panel (right)—Jamie Bartley (left), Richard Small (centre), Chidinma Angela Tennison-Omovoh (right)—chaired by Dr Meredith Barr

## Preliminary Results

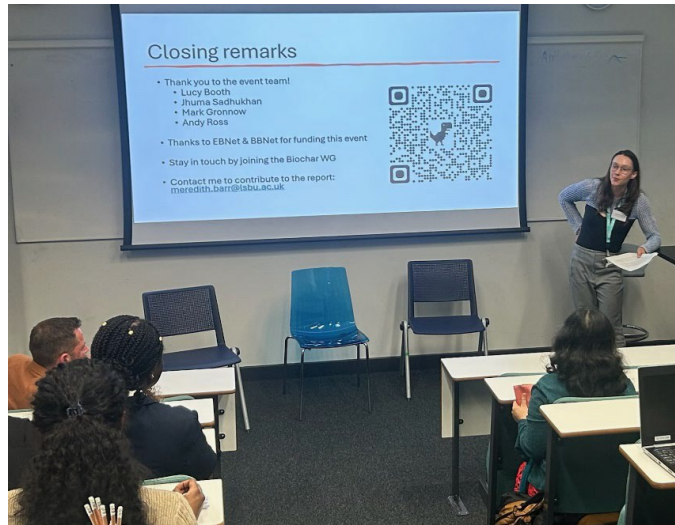
The consensus pathways identified in each session, and highlights of the associated survey results are detailed below. Consensus was built from the contributions of 52 workshop participants, including the host, 16 invited chairs, speakers, and panellists, and 35 competitively-selected delegates whose expertise was judged relevant to the workshop scope.

Session	Consensus Pathways	Survey Highlights
1	Anaerobic digestate hydrothermal carbonisation	Largest market disruption
	Fermentation residue hydrothermal carbonisation	
	Anaerobic digestate pyrolysis	Largest market size, ecological benefits, and waste valorisation potential; highest TRL
2	Enzymatic hydrolysate advanced thermal conversion	
	Contaminated soil bioremediation	Greatest ecological benefits
	Wastewater treatment (including biofiltration)	Largest market size and market disruption
3	Anaerobic digestion	Greatest waste valorisation potential; highest TRL
	Agricultural soil microbiome amelioration	
	Hydrothermal pretreatment for anaerobic digestion	Largest market size and waste valorisation potential; highest TRL
3	Digestate thermal conversion	
	Syngas fermentation	Largest market disruption
	Bio/hydro-char in anaerobic digesters and fermenters	Greatest ecological benefits

The industry panel identified overwhelming interest from both industry and academic participants in feeding into the regulatory environment for waste valorisation processes, as well as a desire for more straightforward opportunities for knowledge exchange and research co-production between the two sectors.

## Feedback

Thus far, 100% of participants have rated the workshop 5/5 for overall experience and for their likeliness to attend future EBNet and/or BBNNet events. Highlights include:



Dr Meredith Barr's closing remarks with link to join the biochar WG

*"...an excellent and fruitful exchange of inter-sector views across academia and industry. I hope it broadens in scope and becomes a regular event that can only help the sector grow."*  
-Richard Small, Managing Director and Founder at InsPro

*"...such an interesting range of speakers, covering such diverse subject matter whilst bringing academic and industry minds together to identify and discuss the challenges and opportunities in this exciting field of development."* -Samuel Dilcock, Director at YorFuel

## Future Plans

A report detailing the scope of this field including identified priority areas for research funding, enterprise investment, and regulatory focus will be published in 2025. This will include full analyses of the consensus activities and detailed conclusions of the industry panel discussion. This report will be used to engage funding bodies and policymakers in discussions about the future of integrated conversion technologies.

This workshop identified a strong demand for further events on the topic, especially those focusing on industry engagement, regulatory impact, and enterprise opportunities.

### Dr Meredith Barr

Lecturer in Chemical & Energy Engineering  
School of Engineering and Design  
College of Technology and Environment  
London South Bank University, London, SE1 0AA, UK  
[meredith.barr@lsbu.ac.uk](mailto:meredith.barr@lsbu.ac.uk)

*On behalf of the workshop participants*

**Environmental Biotechnology Network** [www.ebnet.ac.uk](http://www.ebnet.ac.uk)

**Biomass Biorefinery Network** [www.bbnet-nibb.co.uk](http://www.bbnet-nibb.co.uk)