



BBioNets

Boosting the adoption  
of Bio-Based Technologies

# Cross-Fertilisation Meetings

Bio-Based Practices on Farms & Forests

## Accelerating “Bio-Based Practices on Farms and Forests”

### Key Takeaways

#### CFM No4 “Woody Biomass Utilisation”

12 February 2026 | Online | 11:00 CET

**Main author:** *Francesco Basset* - [Council for Agricultural Research and Agricultural Economics Analysis – Department of Policies and Bioeconomy \(Italy\)](#)

**Contributors:** *Iakovos Delioglani, Ephy Kouzi, Dafni Delioglani* – [FOCUS STC \(Greece\)](#)

The fourth cross-fertilisation meeting on Woody Biomass Utilisation explored how different actors across Europe are improving the mobilisation, monitoring and valorisation of forest biomass and residues - from high-value materials to energy applications.

In Ireland, the University of Limerick presented lignin-based materials that can replace fossil-derived polymers and the PAN precursor used in conventional carbon fibre, with pilot-scale processing and life-cycle assessment indicating strong reductions in cost and energy demand.

Agresta cooperative from Spain showcased ForestMapia, a national-scale platform combining National Forest Inventory and LiDAR data with remote-sensing updates and a natural-language assistant (Gaia) to support biomass availability assessment, mechanizability / profitability screening and applications such as forest fire risk mapping.

From the Czech Republic, the SME ProPelety illustrated modular pelletising lines enabling local conversion of wood and agricultural residues into pellets for fuel and other uses, highlighting tangible savings while stressing the need for stable policy and realistic emissions standards.

Finally, the Magnifica Comunità di Fiemme from Italy shared a community-based forest ownership model and its approach to handling and valorising residues, from heating uses to niche bioproducts and soil improvers. Overall, the discussion emphasised matching feedstock quality to end-use requirements, reducing logistics bottlenecks, and strengthening collaboration across the value chain.

**Overall, the discussion highlighted that there is a shared and well-defined pathway for the valorisation of woody biomass, moving from monitoring biomass availability to the uptake of innovative technologies that deliver high value-added products/energy, and finally to governance models and the valorisation of by-products through certifications and stakeholder networks.**



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## Plastics' Natural Rival: Lignin-based Materials and Carbon Fibres

**Presenter:** *Maurice Collins* - Professor, [University of Limerick](#) (Ireland)

- **Lignin as a Renewable Polymer Platform:** lignin, a major component of woody biomass, is positioned as a 'natural rival' to fossil plastics, enabling circular and bio-based material pathways while valorising forestry side-streams.
- **From Lignin Blends to Carbon Fibres and Functional Materials:** the group develops lignin-based formulations (including polymer blends) that can be spun into precursor fibres and carbonised into carbon fibre, while also enabling porous structures for membranes and energy-related applications (e.g., supercapacitors).
- **Pilot-Scale Processing and Life-Cycle Perspective:** a pilot line demonstrates end-to-end fibre production and carbonisation; life-cycle assessment highlighted around 50% reductions in cost and energy compared with conventional approaches. In discussion, the need to link feedstock selection to end-use requirements and to valorise residues (rather than leaving them unmanaged) emerged as key enabling factors.

### *Woody Biomass Utilisation — Discussion points extracted from Irish case*

- End-use driven decision-making: the best balance between energy use and higher-value materials depends on the target application (stiffness, flexibility, performance). You start from product requirements and work backwards to the right feedstock, extraction route, and processing steps.
- Feedstock variability is a key criterion: not all woody biomass, or lignin, is the same. Species, wood age (juvenile vs mature), origin, and extraction method strongly affect composition and purity (e.g., sulphur-free, high-purity lignin for structural applications), which determines suitability for specific uses.
- Valorisation depends on process fit and enabling tools: "effective utilisation" means matching material properties to appropriate technologies (melt spinning vs wet spinning, agro hydrogels, fibres/composites). Digital tools/AI can help speed up screening and selection of the best biomass-to-product pathways

## ForestMapia: National-scale Biomass Monitoring and Decision Support

**Presenter:** *Jorge Olivar Ruiz* - [Agresta Cooperative](#) (Spain)

- **Agresta and ForestMapia:** Agresta presented ForestMapia as an evolution of its ForestMap platform, scaling from pilot areas to national coverage in Spain and delivering forest inventory outputs through an accessible web interface.
- **Decision Support for Biomass Mobilisation:** the platform combines National Forest Inventory plots with LiDAR (PNOA) and other datasets to estimate timber volume and convert it to available biomass, adding mechanisability (roads, terrain) and profitability screening to support 'go/no-go' decisions.
- **Monitoring, Risk Modules and Improved Usability:** Landsat-based change detection provides semester updates, while modules can address topics such as fire risk and carbon fluxes.





### Woody Biomass Utilisation — Discussion points extracted from Spain case

- Traditional field-based forest inventories are generally more accurate, but they take longer and are more expensive; the satellite/LiDAR + AI approach enables continuous monitoring with errors that vary strongly by forest type and species, ranging from about 2–3% in the best cases up to 10–15% in the worst cases (e.g., in more open forests).
- To make estimates more transparent and usable, the platform is moving from single “fixed” values to reporting accuracy levels and confidence ranges, starting with stand volume as the key variable and then extending the same approach to other variables.
- The Gaia language assistant improves accessibility for non-technical users (e.g., forest owners) by allowing natural-language questions and explanations of report outputs; the same data also supports broader use cases beyond biomass supply, such as forest fire risk mapping and decision support for regional authorities.

## Modular Pelletising Solutions for Residues and Agro-biomass

**Presenter:** *Vladimír Hájek* - [Properly](#) (Czech Republic)

- **What Properly offers and why pelletising is flexible:** Properly designs, supplies, and services mid-capacity modular pelletising lines that can process agri-biomass, woody biomass, and residues/waste into pellets suitable for fuel, bedding, fertiliser, or feed, depending on input quality (calorific value, nutritional value, absorbency) and consistent pre-processing/quality control.
- **Two real-world examples showing circular value and economics:** A Czech wood-products company started pelletising its own packaging residues, covering ~33% of its pellet demand, cutting pellet costs by ~57% versus buying, and saving about €56k/year with an ROI near 5 years; A municipal heating operator near Prague added a biomass boiler after gas-price shocks and began producing blended pellets (wood + hay/straw ~50/50) for winter heat, while producing animal-feed/bedding pellets in the off-season—improving fuel diversification and independence from gas.
- **Key takeaways on performance and constraints:** The talk stressed low electricity use per kg of pellets relative to delivered energy (process efficiency) and the idea of pellets as seasonal energy storage. Main constraints remain upfront investment, emissions compliance, and meeting regulatory/permit requirements.

### Woody Biomass Utilisation — Discussion points extracted from Polish case

- The discussion highlights that awareness and investment in biomass do not grow steadily but come in “waves” driven by policy signals. After a period of strong support, especially for energy uses, attention shifted toward other renewables, and regulatory uncertainty has led many actors to pause or delay new investments.
- It is clarified that the main perceived bottleneck is not CO<sub>2</sub> (treated as neutral for biomass in this context), but local pollutants and technical standards. Tighter limits for dust/particulates and NO<sub>x</sub>, together with evolving EcoDesign-type requirements that are sometimes seen as unrealistic, create uncertainty and reduce investor confidence. There is also a call for rules that are better tailored to context (e.g., urban vs rural) and developed with stronger technical input.
- Feedstock variability is raised as a practical challenge, especially when moving between agricultural and woody residues: differences in ash chemistry, chlorine and other inorganic constituents can affect combustion performance and cause fouling, slagging, or corrosion. The response stresses a focus on fuel/pellet quality and downstream compatibility, relying on end-user feedback to inform quality control and specifications.





## Magnifica Comunita di Fiemme: Community Forestry and Residue Valorisation

**Presenter:** *Eva Maria Trettel* - [Magnifica Comunita di Fiemme](#) (Italy)

- **A long-standing community-based forest owner manages 20,000 ha** (mostly spruce) through legally binding 20-year management plans, strong local stewardship (district rangers, nurseries, local contractors), and a clear goal of keeping value in the local economy.
- **Extreme events have created an urgent biomass-residue challenge:** a major windstorm (2018) followed by an ongoing bark beetle outbreak generated very large volumes of damaged timber and residues, made harder to mobilise/valorise by the area's remote Alpine logistics.
- **Residue valorisation follows a cascade:** mainly energy uses (sawdust to pellets, chips to district heating, firewood including a traditional "free collection" scheme), plus non-energy products (bark for mulching; small labs extracting aromas/resins for cosmetics and food) and an R&D pathway to turn residues into soil improvers for reforestation and climate resilience—within strict sustainability constraints (FSC/PEFC and other certifications, ESG/LCA).

### *Underutilisation of Wool — Discussion points extracted from Italy case*

- The main barriers to building and sustaining the community/network were geographic remoteness (far from industrial hubs and rail/logistics routes) and the resulting constraints on timber trade and collaboration.
- Social and cultural factors also mattered: a very close-knit community and a strong historical identity/heritage can make it harder to "open up" and connect with external actors and new experiences.
- In terms of transferability, the most replicable elements are the technical, long-established forest management approach and the use of certifications (FSC/PEFC), which can strengthen both market positioning and forest management practices.

[Download the presentations](#)

[Watch the recording](#)





## What are Cross-Fertilisation Meetings?

BBioNets' **Cross-Fertilisation Meetings** are essential events designed to connect the project's regional **Forest and Agriculture Networks (FANs)**. While each FAN addresses unique **regional realities and specific challenges**, there is significant common ground regarding biomass availability, exploitation potential, and shared needs. By networking across borders, the project aims to collectively increase the impact of local work significantly.







These meetings were designed to help participants:

- **Share Difficulties:** Exchange common challenges and concerns regarding the application and scaling of **Bio-Based Technologies (BBTs)**.
- **Discover Opportunities:** Outline new breakthroughs, emerging technologies, and potential market opportunities across regions.
- **Promote Knowledge:** Capture, validate, and widely promote practical knowledge created by national EIP-AGRI Operational Groups (OGs).
- **Forge Collaborations:** Facilitate bilateral and multilateral collaboration opportunities among FANs and OGs.

## The Six-Part Series: Topics and Schedule

1. **Innovations in Nutrient Recovery:** 11 December 2025
2. **Innovative Hemp Practices:** 15 January 2026
3. **Sustainable Sheep Wool Processing:** 29 January 2026
4. **Efficient Woody Biomass Utilisation:** 12 February 2026
5. **Circular Approaches in Olive Groves:** 26 February 2026
6. **Opportunities in Green Biorefineries:** 23 April 2026

### BBioNets Project Identity

Full Project Title	<b>BBioNets</b> – Creation and promotion of Forest and Agriculture Networks to boost Bio-Based Technologies adoption and Value Chain development (GA No 101133904)		
Start – end date	1/11/2023 – 31/10/2026 (36 months)		
Coordinator	Ms. Carmen Girón Domínguez, Munster Technological University <a href="mailto:carmen.dominguez@mtu.ie">carmen.dominguez@mtu.ie</a>		
Contact email	<a href="mailto:info@bbionets.eu">info@bbionets.eu</a>		
Consortium	         		
Social Media	<a href="https://www.facebook.com/bbionets.eu">/bbionets.eu</a>	<a href="https://www.linkedin.com/company/bbionets-eu">/bbionets-eu</a>	<a href="https://twitter.com/bbionets_eu">@bbionets_eu</a>
	<a href="https://bbionets-eu.bsky.social">@bbionets-eu.bsky.social</a>	<a href="https://www.instagram.com/bbionets_eu">@bbionets_eu</a>	<a href="https://www.youtube.com/@BBioNetsEU">@BBioNetsEU</a>

