

BeonNAT delivers a Blueprint for turning Europe's marginal lands into engines of the bio-economy

- BeonNAT validated 8 bio-based products from underutilized biomass, including bioplastics, essential oils, and biochar.
- Marginal lands proved viable, with field trials showing environmental benefits like soil carbon increase and water retention.
- Strong European outreach, with key presentations at CONAMA and EUBCE, and final results shared in Almería and Bragança.

Madrid, Spain. 27 June, 2025 - After five years of research, field trials and pilot-scale manufacturing, the BeonNAT consortium has completed its Horizon 2020–BBI JU mission and demonstrated that Europe's degraded and abandoned lands can supply premium biomass for a new generation of sustainable products. Launched in July 2020, the project set out to cultivate under-utilized tree and shrub species on low-productivity soils, convert that biomass through cascading biorefinery routes, and validate eight high-value product lines. Today, the partners confirm that every major milestone defined in the Grant Agreement has been met or surpassed.

Over seventy hectares of demonstration plots in Spain, Germany and Romania now host species such as *Ulmus pumila* (Siberian elm), *Betula pendula*, *Cistus ladanifer* and *Rosmarinus officinalis*. Detailed root-system studies completed this spring show that Siberian elm not only thrives on semi-arid soils but also increases organic carbon and improves water infiltration, evidence that marginal-land forestry can deliver tangible ecosystem benefits. Biomass harvested from these sites has fed pilot plants that produced essential oils, botanical extracts, poly-lactic-acid bioplastics, biochar, activated carbon, absorbents, pulp and particleboard. Market analyses reveal strong demand in the cosmetics, packaging and pet-care sectors.

The final year of the project had many different highlight moments. At the eighth General Assembly in Bragança, partners showcased interim techno-economic data and agreed exploitation pathways for each value chain. The workshop "Cultivating Marginal Lands: Sustainable Solutions for New Opportunities," held in May 2025 at the PSA facilities in Almería, gathered policy-makers, farmers and investors to discuss Common Agricultural Policy incentives and business models. A month later, the ninth and closing General Assembly took place, combining laboratory tours at the Solar Platform and field visits to El Jarpil's Siberian-elm plantations, where participants witnessed live harvesting and on-site pyrolysis.

With technical proof of concept now complete, the consortium will focus on transferring its eight validated value chains into commercial practice. Priority actions include: signing supply agreements with landowners on additional marginal sites, scaling pilot operations to pre-industrial capacity, and engaging downstream users in the cosmetics, packaging, pet-care and soil-improvement sectors. Parallel work will continue on policy dialogue and regional investment frameworks to help replicate the BeonNAT model across other low-productivity areas of Europe.

BeonNAT's scientific and industrial outreach has spanned the continent. At CONAMA 2024 in Madrid the project's bioproducts were presented as new perspectives for Spain's climate-neutral economy. Earlier this year, oral and visual comparisons of BeonNAT value chains versus conventional forestry were delivered at EUBCE 2025 in Valencia, demonstrating land-use

efficiencies up to forty per cent higher than traditional timber. Across its lifetime the consortium has produced more than twenty peer-reviewed publications and issued four project newsletters, six species factsheets, two didactic infographics and a suite of market briefs, all freely available on the project website.

About BeonNAT

The BeonNAT project is a groundbreaking initiative aimed at transforming marginal lands in Europe into sources of sustainable biomass. By developing eight new bio-based products and materials, BeonNAT addresses climate change, enhances resource efficiency and fosters rural growth within the circular bio-economy. The project has received funding from the Bio-Based Industries Joint Undertaking (BBI JU) under the European Union's Horizon 2020 research and innovation programme (Grant Agreement No 887917).

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