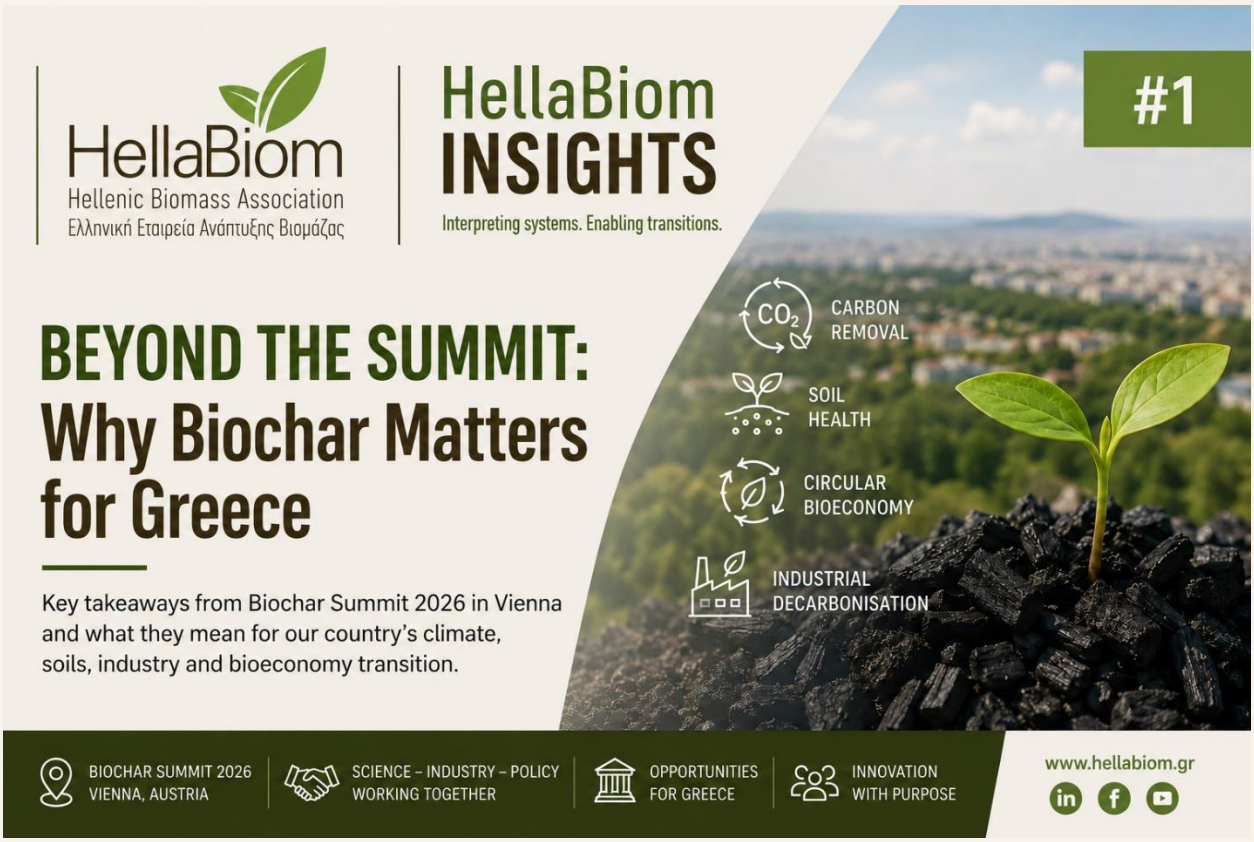
WHEN AN ECOSYSTEM COMES OF AGE

Lessons from Biochar Summit 2026 and why they matter for Greece



When an Ecosystem Comes of Age

Major technological transitions rarely happen because of a single breakthrough.

They happen when an ecosystem reaches the point where innovation is no longer discussed as an isolated achievement, but as part of a broader system capable of creating lasting value.

That moment is not always obvious. It is rarely announced. More often, it reveals itself through subtle changes in the nature of the conversation.

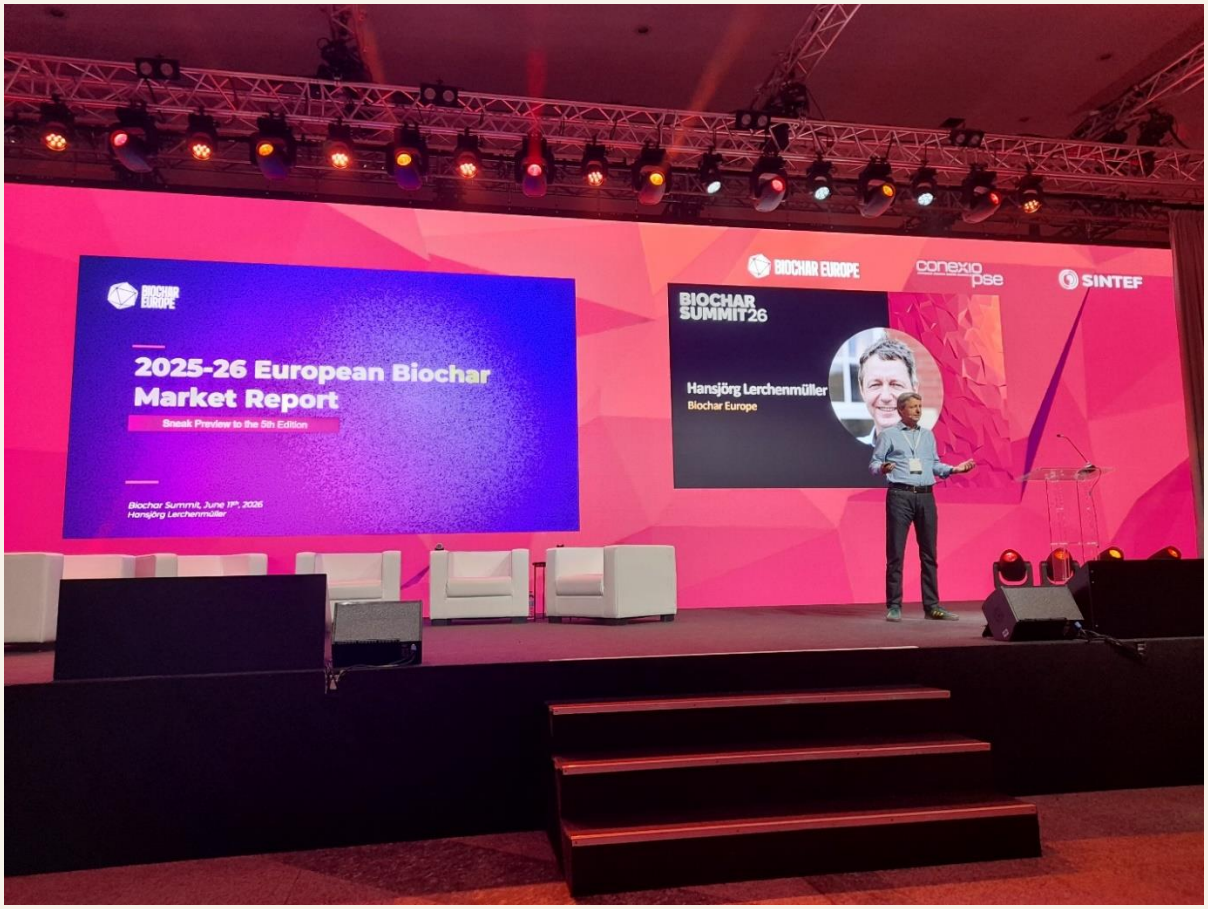
Questions gradually shift. Instead of asking whether a technology works, stakeholders begin asking how it can be implemented at scale.

Scientific excellence remains essential, yet attention increasingly turns towards reliable biomass supply chains, investment confidence, industrial integration, certification, public policy and long-term collaboration.

The conversation is no longer about technology alone. It is about the ecosystem required for technology to succeed.

This was perhaps the most significant message emerging from **Biochar Summit 2026**, held in **Vienna** between **9 and 12 June 2026** under the theme **"From Innovation to Integration: Scaling Biochar to Climate Relevance."** The event combined a Focus Day dedicated to innovation in the built environment, a two-day Main Conference and three Field Tours showcasing biochar applications at industrial scale. Together, these four days provided a comprehensive view of how scientific innovation, industrial deployment and stakeholder collaboration are progressively shaping Europe's biochar ecosystem.

Although the Summit showcased cutting-edge research, industrial applications and policy developments, its greatest value lay elsewhere. It demonstrated that the European biochar community is steadily moving beyond technological validation towards ecosystem development. The discussion is no longer centred on whether biochar has a future. Increasingly, it focuses on how that future can be built.



From Innovation to Systems Thinking

One of the recurring themes throughout the Summit was that meaningful innovation increasingly emerges through collaboration across disciplines, institutions and sectors.

An example of this collaborative approach was the Industry Talk poster **"Biochar as a Tool for Soil Health, Biodiversity and Climate Resilience in Urban Parks in Athens"**, jointly developed by **HellaBiom**, **Prof. Dimitris Kalderis** (Hellenic Mediterranean University) and **Prof. Dionysis Gasparatos** (Agricultural University of Athens).

The proposal explored a concept that is both practical and highly replicable.

Urban pruning residues are typically regarded as waste requiring collection and disposal. Viewed through the perspective of the circular bioeconomy, however, they become a valuable local resource capable of generating multiple environmental benefits. Through thermochemical conversion, these biomass streams can be transformed into biochar and subsequently returned to urban soils, improving soil health, enhancing biodiversity, increasing water retention, strengthening climate resilience and contributing to long-term carbon sequestration.

The technical concept itself is important. What makes it particularly relevant is the system behind it. Its successful implementation depends not only on technology, but also on cooperation between municipalities, researchers, local authorities, practitioners and citizens. Innovation, in other words, becomes meaningful only when it is embedded within relationships capable of transforming scientific knowledge into practical action.

This is precisely the type of systems thinking that will increasingly define the future of Europe's bioeconomy.

Islands of Reliability

If the conference sessions illustrated the direction of travel, the industrial visits demonstrated what implementation already looks like.

The visit to **PurEnergy Holding GmbH** in Gänserndorf offered a compelling example of how decentralised biochar production can become an integral part of regional energy and biomass systems. Built on **SYNCRAFT's** technology, the facility converts sustainably sourced woody biomass into multiple outputs, including biochar, renewable electricity and bioheat supplied to the local district heating network.

The technological solution is undoubtedly impressive. The organisational model behind it is even more instructive.

Facilities such as PurEnergy succeed not simply because they produce biochar efficiently, but because they operate within mature systems characterised by reliable forest management, predictable biomass mobilisation, stable demand for renewable heat and electricity, and established markets for biochar.

Seen from this perspective, these facilities become far more than production plants. They become **islands of reliability** within regional bioeconomy ecosystems.

They provide dependable outlets for forest residues, stable renewable energy generation and long-term carbon management, while simultaneously strengthening regional resilience through local value creation.

For countries such as Greece, where biomass resources are abundant but geographically dispersed, this observation carries particular significance. The long-term success of decentralised biochar facilities will depend as much on the quality of the surrounding ecosystem as on the efficiency of the technology itself.

Photo: PurEnergy Holding GmbH Reverse Power Plant in Gänserndorf

Industrial Awe

The subsequent visit to **Holcim's Zementwerk Mannersdorf**, Austria's largest cement plant, offered a very different yet equally valuable perspective.

Standing before industrial systems operating at such scale inevitably evokes what might best be described as **industrial awe**.

The immense rotary kilns, towering silos and highly integrated production lines challenge our intuitive understanding of industrial processes. They reveal not only engineering excellence, but also the cumulative knowledge and continuous technological evolution that underpin modern heavy industry.

Yet beyond this initial sense of scale lies an even more important lesson. Industrial decarbonisation is no longer a theoretical aspiration. It is already taking place.

With alternative fuels replacing more than ninety percent of conventional fossil fuel demand and extensive use of secondary raw materials derived from industrial by-products and construction waste, Mannersdorf demonstrates how one of Europe's most energy-intensive sectors is progressively transforming its production model.

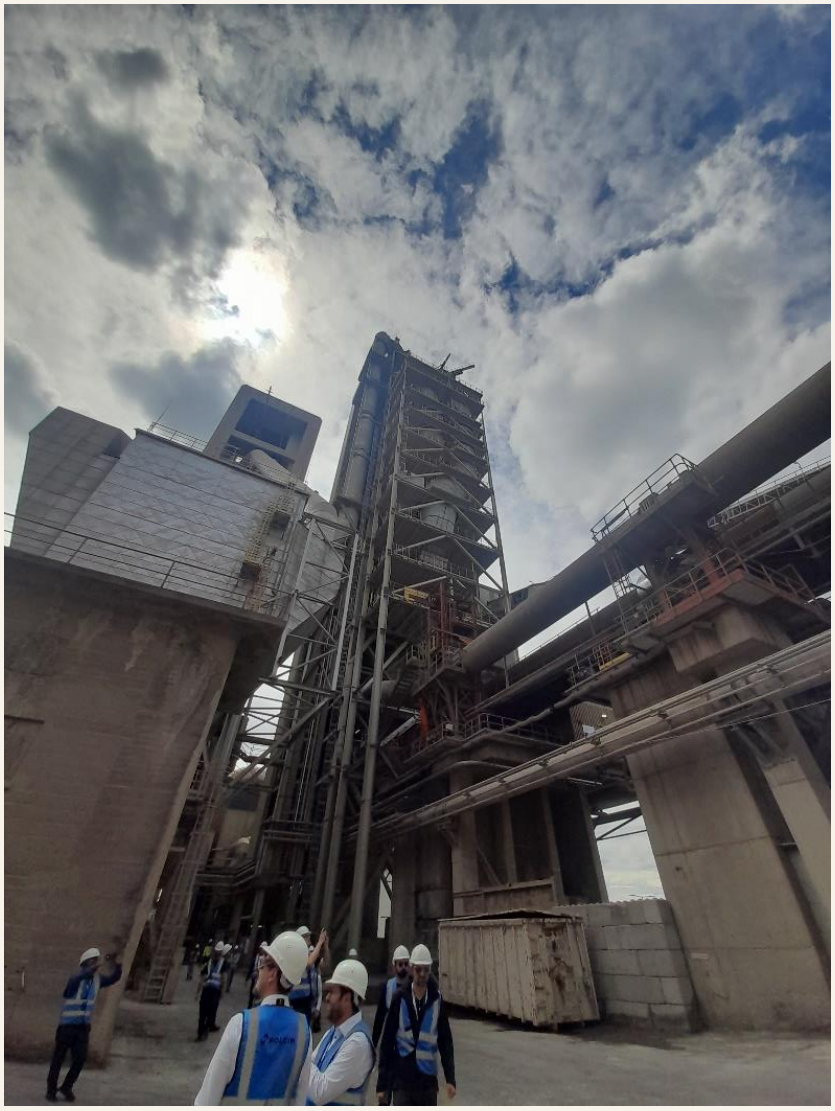


Photo: Holcim's Zementwerk Mannersdorf

At first glance, PurEnergy and Holcim appear to represent entirely different industrial realities. In practice, they illustrate complementary parts of the same transition.

One demonstrates how sustainably managed biomass can generate renewable carbon, renewable energy and long-term carbon removals.

The other illustrates how heavy industry is progressively integrating circular carbon solutions into its own pathway towards climate neutrality.

Neither represents the complete solution. Together, however, they reveal what the transition increasingly looks like: Not isolated technologies but complementary systems.

When Communities Become Ecosystems

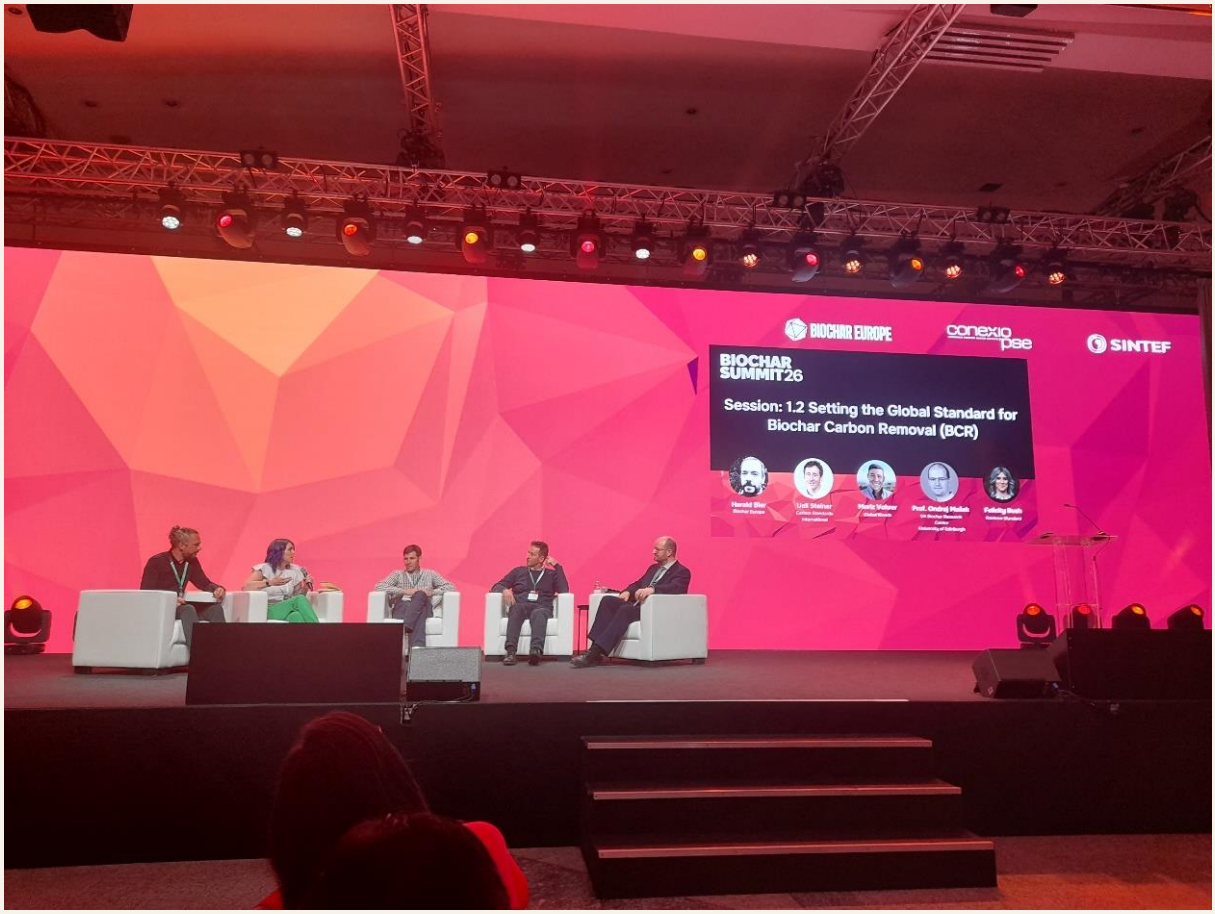
Some of the Summit's most meaningful outcomes were not necessarily presented from the main stage. They emerged through conversations, new relationships and a growing willingness among organisations across Europe to work more closely together in strengthening the biochar ecosystem.

Such developments rarely receive much attention. Yet, they often represent an important stage in the evolution of emerging sectors. Because technologies may create markets, but communities create ecosystems.

An ecosystem reaches maturity when its stakeholders begin building trusted relationships, developing shared understanding and investing collectively in long-term collaboration. This process cannot be measured through production capacity alone. It is reflected equally in the quality of dialogue, the willingness to cooperate and the emergence of institutions capable of connecting different parts of the value chain.

Organisations such as **HellaBiom** can contribute to this process by facilitating dialogue, encouraging collaboration and helping different stakeholders develop a common understanding of both emerging opportunities and systemic challenges.

Ultimately, resilient ecosystems are built not only on innovation, but also on trust.



Why This Matters for Greece

For Greece, the implications extend well beyond biochar itself.

The country possesses abundant agricultural and forestry biomass resources, internationally recognised scientific expertise and increasing awareness of the need to strengthen climate resilience.

The technologies already exist. So does the scientific knowledge. What remains under development is the ecosystem capable of bringing these elements together:

- Reliable biomass mobilisation.
- Long-term partnerships.
- Municipal engagement.
- Industrial participation.
- Investment confidence.
- Trusted certification.
- Efficient logistics.
- Public policy alignment.

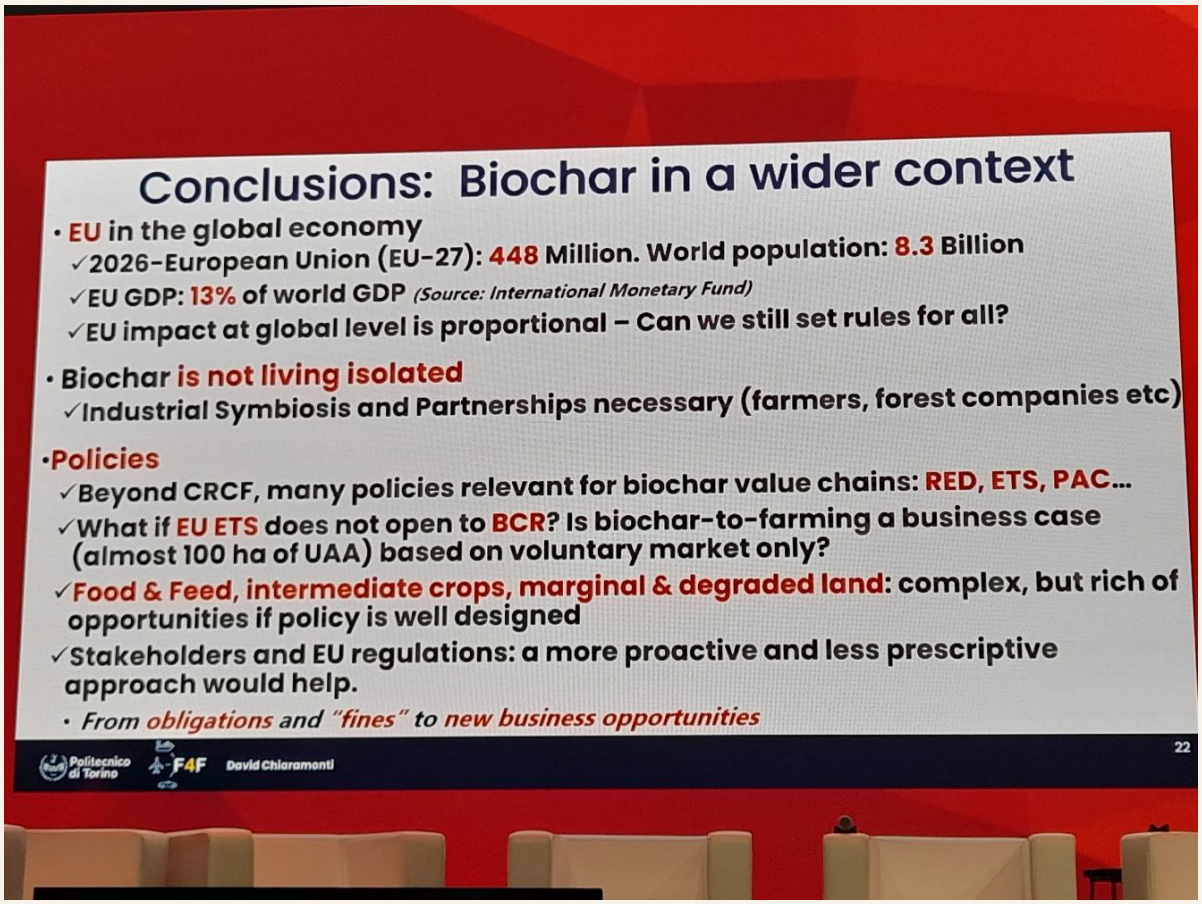
Each of these components may appear independent. In reality, they are deeply interconnected. Only when they evolve together can innovation move beyond demonstration projects and become part of the everyday economy.

That is perhaps the most important challenge facing the European bioeconomy over the coming decade.

Looking Ahead

Every successful biochar project represents much more than another technological installation. It demonstrates that environmental protection, climate action, industrial competitiveness and regional development can reinforce one another when viewed as parts of the same system.

The future of biochar will therefore not be determined solely by better reactors, improved process efficiencies or new scientific publications. It will be determined by our collective ability to connect science with implementation, innovation with investment, policy with industry and local resources with long-term societal value.



Biochar Summit 2026 offered a clear indication that this transition has already begun. Congratulations to **Biochar Europe**, **Conexio-PSE** and **SINTEF** for creating a Summit that has evolved into much more than a conference. It has become a trusted platform where science, industry, entrepreneurship and policy increasingly learn to think – and act – as one ecosystem.

The opportunity now is to ensure that countries such as Greece do not simply observe this evolution but actively contribute to shaping it.

Because understanding technologies is important. Understanding the systems around them is essential.

HellaBiom Insights

"Interpreting systems. Enabling transitions."

HellaBiom Insights is an editorial series powered by the Hellenic Biomass Association (HellaBiom), dedicated to interpreting the systems shaping the future of biomass, bioenergy, biochar and the circular bioeconomy.

Photos' credit: Nikos Damatis, HellaBiom, www.hellabiom.gr