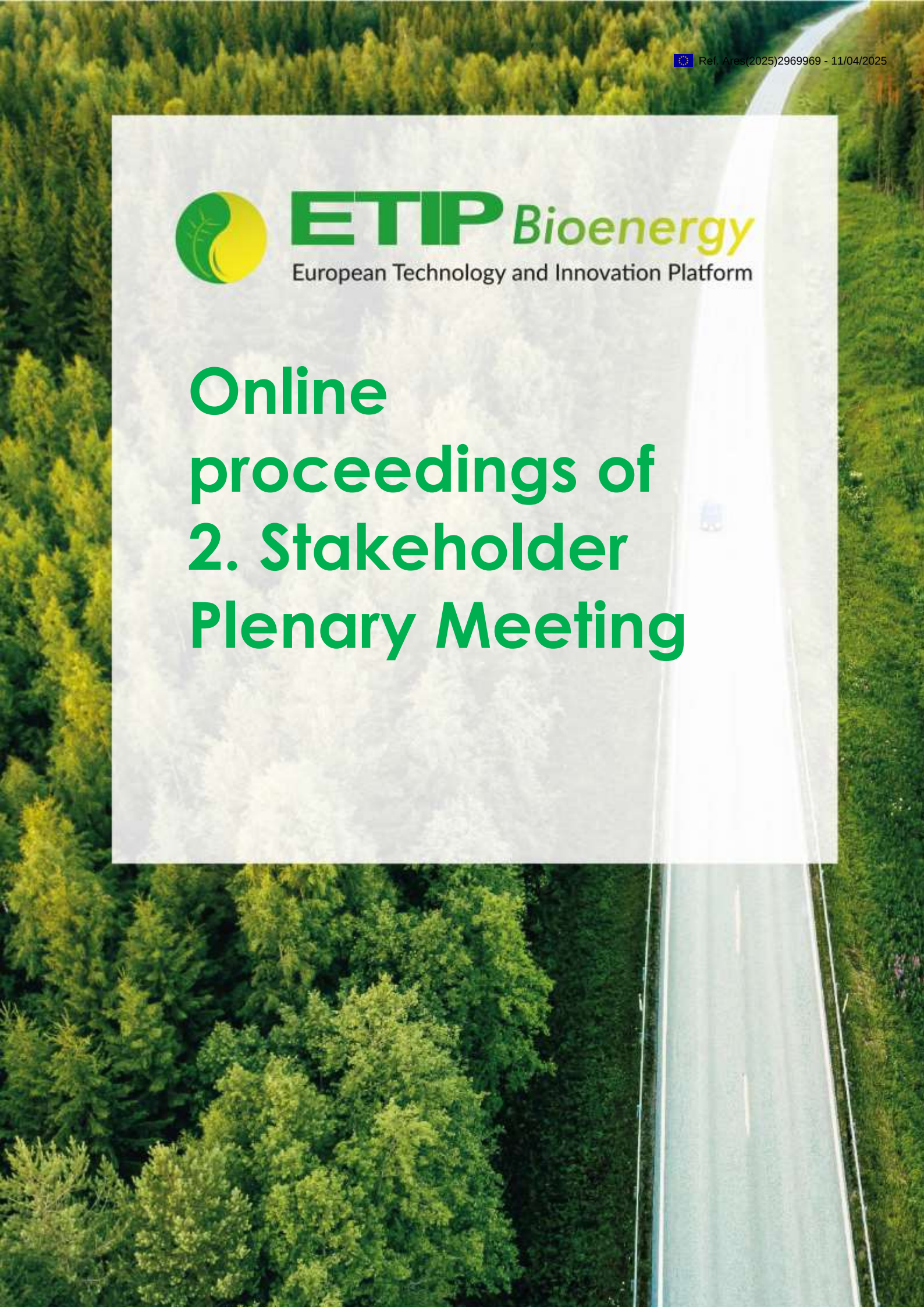
ETIP Bioenergy
European Technology and Innovation Platform

Online proceedings of 2. Stakeholder Plenary Meeting



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European Technology and Innovation Platform Bioenergy

12th Stakeholder Plenary Meeting, 12 March 2025, Brussels, Belgium

The European Technology and Innovation Platform Bioenergy held its 12th Stakeholder Plenary Meeting, on 12th March 2025 in Brussels. This meeting was an opportunity to discuss and disseminate the latest advancements and strategic directions in the bioenergy sector, with a strong emphasis on **industrial deployment for EU competitiveness**, insights from ongoing **Horizon Europe research and innovation projects**, and the vital inclusion of **citizens' views and societal perspectives**. The event started with a high-level overview of the European policy landscape for renewable fuels innovation, followed by a presentation on **bioenergy's significant contribution to the clean energy transition**, highlighting its current status as the largest renewable energy source in the EU. Discussions underscored the immediate applicability of bioenergy solutions and the urgency of increasing deployment to meet climate targets and ensure energy security.

A central focus of the meeting was the **industry panel on scaling up renewable transport fuels**. Experts explored the readiness for large-scale deployment, identified key barriers, and shared valuable lessons learned from industrial experiences. This was complemented by a broader panel discussion that further examined the challenges and opportunities associated with the widespread adoption of biofuels and bioenergy technologies.

The afternoon sessions provided valuable insights from various **Horizon Europe research and innovation projects**. Presentations covered topics ranging from promising intermediate crops and the impact of agricultural practices on soil health and biodiversity to the techno-economic and environmental considerations for advanced biofuel production, including aviation and marine fuels.

The meeting also dedicated significant attention to the **societal aspects of bioenergy**. Engaging citizens, shaping future policy pathways, and understanding regional biomass potential and stakeholder engagement best practices were key themes explored, recognising the importance of public acceptance and inclusive development for the sustainable growth of the bioenergy sector.

European policy and support for renewable fuels innovation

Maria Georgiadou, from the European Commission's Directorate-General for Research and Innovation, provided an overview of European policies and initiatives supporting renewable fuels innovation. She discussed the EU Competitiveness Compass, which aims to boost EU competitiveness by aligning EU and national policies, addressing the innovation gap, creating a joint roadmap for decarbonization, and enhancing security while reducing dependencies.

Maria Georgiadou also introduced the Strategic Energy Technology (SET) Plan, established in 2007 and integrated into the Net-Zero Industry Act (NZIA). Within this framework, the SET Plan's Implementation Working Group on Bioenergy and Renewable Fuels (IWG8) focuses on demonstrating the viability of advanced biofuels, renewable hydrogen, and synthetic fuels, particularly in sectors like aviation, and promoting large-scale biomass cogeneration for heat and power.

She highlighted the European Commission's study "Development of outlook for the Necessary Means to Build Industrial Capacity for Drop-in Advanced Biofuels (2024)." The study outlines the essential factors for growing advanced and sustainable biofuel production in the EU. It underscores the importance of biofuels in reducing transport emissions and achieving the Fit for 55 and climate neutrality goals, while boosting the EU's industrial competitiveness, GDP, and employment. The study predicts a significant rise in advanced biofuels' role as technologies and value chains evolve, driven by ambitious policies and EU support. Additionally, it identifies the potential for mobilizing sufficient biomass, including using intermediate crops, intercrops, cover crops, and marginal lands, to meet future demands by 2050.

Download the presentation: *European policy and support for renewable fuels innovation – Maria* Georgiadou, European Commission DG RTD.

Bioenergy's Contribution to the Clean Energy Transition

Patrik Klintbom, Chair of ETIP Bioenergy, underscored the critical role of bioenergy in the EU's clean energy transition. He highlighted that bioenergy constitutes almost 60% of the renewable energy in the EU (in 2021), making it the largest renewable source in the energy mix, yet often the least discussed. He emphasised that bioenergy is one of the few renewable alternatives readily available for deployment now, stressing the urgency to seize the current window of opportunity to increase its use. Electrification is not the alternative in everything. Transport will remain dependent on liquid and gaseous fuels for decades, and more for aviation and shipping. If we don't deploy biofuels now, we will continue to import a lot of fossil fuels. The recipe for deployment is the SET PLAN. "When it started, the SET PLAN was to make EU more energy secure. Now the SET Plan is even more critical for achieving this goal", he remarked.

Download the presentation: *Bioenergy's Contribution to the Clean Energy Transition – Patrik Klintbom, Chair of ETIP Bioenergy, Sweden*.

TrustXBio award

The award ceremony of TrustXBio Innovation Challenge was an opportunity to learn about the German startup Biomassets Gmbh, winner of the challenge. The idea of the TRUSTxBio Challenge was to accelerate the development of new innovations that use digital technology solutions to enhance transparency and build public trust in bioenergy feedstocks. Biomassets was the winner of this challenge by addressing the issue of residual biomass on EU fields and aiming to transform farmers' residues into valuable products for biomass-energy projects. They focus on integrating the entire biomass value chain, from sourcing agricultural biomass like straw and manure to delivering energy (electricity, heat, syngas, etc.) and returning ash and nutrients as fertiliser. Biomassets employs innovative processes for straw transformation, including optimised harvesting, decentralised storage, and direct feeding of energy production. Their approach leverages data-driven analysis using satellite and statistical data to ensure predictable availability and quality of biomass, supported by ESA-BIC funding. The company's aim is to offer a cost-efficient, year-round supply of seasonal biomass and a multi-level business model that provides everything from availability analysis and technology provision to the trade of renewable energy and biomass quality information.

Download the presentation: TRUSTxBio: *Empowering Trust and Innovation in Biofuels and Bioenergy Challenge – Kalina Tcolova CSD, Daniela Horna, Biomassets GmbH*.

Industry Panel: Renewable transport fuels at scale

David Chiaramonti, Politecnico di Torino, presented data to assess the biofuels sector's readiness for production scale-up. He emphasized that biofuels demand in the transport sector could significantly increase, potentially reaching 42.8 Mtoe by 2030, compared to 16.5 Mtoe in 2021. This increase is especially likely if advancements in battery electric vehicles (BEVs), alternative fuels infrastructure, electrolyzers, and direct air capture (DAC), fall short of expectations. Regarding feedstock availability, Chiaramonti also cited the afore-mentioned EC study on building industrial capacity for drop-in advanced biofuels, which found that 310-836 million dry tons of sustainable biomass could be mobilized by 2030. The most significant potential lies in primary residues from arable crops, manure, and primary forestry residues. By 2050, the potential is 294-892 million dry tons, with dedicated lignocellulosic and oil crops produced on unused or degraded land and as cover- or inter-crops. He highlighted that a well-designed value chain can make sustainable biomass for energy a driver for more sustainable agriculture. While biomethane also shows substantial potential, its use could be limited by the readiness of vehicle fleets for high biomethane consumption. He noted that international collaboration is important, but differing

regulations hinder biofuels capacity deployment. He emphasized the need to valorize all value chain products, carbon, and sustainable agricultural management practices, given the impact of various policies on cost reduction. An EU strategy is needed to deploy potential and build capacity and as well as moving beyond the research community to engage policymakers and communicate these findings to a broader audience.


Download the presentation: *Are we ready for scale up? – David Chiaramonti, Politecnico di Torino, Italy*.

Emanuela Sardellitti, representing Fuels Europe, presented the perspective of fuel refiners on the obstacles hindering biofuels deployment. Liquid fuels currently supply 97% of the energy used for transportation in Europe. Refineries are integrated into a vast and interconnected value chain, particularly with the petrochemical industry. This integration is vital for European competitiveness and the overall economy. Within Europe, 8 out of 85 refineries have been converted to biorefineries. The transition to renewable fuels by 2050 requires a total investment of 650 billion euros. This funding is expected to come from private investors. There are currently 27 projects in the pipeline that have progressed beyond the investment decision stage. However, a major challenge lies in the lack of a clear, long-term vision in EU policy for the future of the fuel refining sector beyond 2050, after the completion of the energy transition. To facilitate long-term investments, the regulatory framework must be technology-neutral, stable, and supportive.


Download the presentation: *Barriers to deployment of biofuels – Emanuela Sardellitti, Fuels Europe*.

Franziska Mueller Langer, DBFZ, presented **lessons learned from industry and demonstrations**, emphasizing the urgent need for harmonized technology push and market pull policies. The pressure to act is increasing dramatically, and the drivers for change may shift. Current forecasts indicate a huge need for renewable fuels, yet oil companies are withdrawing from

their renewable targets. She remarked that ambitious strategies and targets don't automatically create a framework that supports the development and scaling of innovative technologies in the desired regions, using sustainable feedstocks. While case studies for advanced biofuels often demonstrate technical success, they haven't always achieved the necessary commercial success. The biofuels sector urgently needs several changes. These include **harmonizing long-term technology push and market pull policies**, which also encompasses steering instruments to lower risks, for GHG mitigation and the decarbonization of transport and other sectors. Furthermore, **a consistent framework for renewable refineries is needed**, regardless of product application. The biofuels sector would also benefit from comprehensive monitoring of policy impacts on technology and market development. Additionally, improvement of established biofuel options should be allowed and built upon as a foundation. Promoting R&D&D on innovations in advanced biofuels, including hybrids with other renewables, is necessary as they are more complex and therefore (usually) more cost-demanding. The biofuels sector also needs acceptance of a transition process that allows starting with promising technology options, gaining experience, and learning lessons for continuous improvement. Finally, international cooperation should be encouraged to share opportunities and risks for new value chains, as well as knowledge and technology transfer.

Download the presentation: *Lessons learnt from industry and demonstrations – Franziska Müller-Langer, DBFZ Germany*.

Research and Innovation: Insights from Horizon Europe Projects on Economics and Environment

Promising Intermediate Crops and the Impact of Agricultural Practices on Soil Health and Biodiversity

Efthymia Alexopoluou, from the Centre for Renewable Energy Sources Greece, presented promising intermediate crops and the impact of agricultural practices on soil health and biodiversity. She presented the **results of multiannual trials conducted by several ongoing and past EU projects**. These trials focused on three promising oilseed crops (camelina, crambe, and carinata) and two lignocellulosic crops (sorghum and sunn hemp). All intermediate crops discussed were cultivated using low-tillage systems and selected for their tolerance to heavy metals and physical soil constraints (such as salinity). **Camelina** demonstrated the highest Technology Readiness Level (TRL) and is ready for scale-up. It has proven suitable for double cropping systems and marginal lands, and research is currently exploring its **potential for intercropping** with legumes. **Crambe** shares a similar growing cycle with camelina, making it also **suitable for double cropping systems**. It shows promise in marginal and polluted agricultural

lands and is compatible with existing machinery. Seed yields are similar to camelina (1-2 t/ha), but its TRL is lower due to limited seed provision and less developed breeding and variety availability. **Carinata** has a longer growing cycle than camelina or crambe, but offers **higher seed yields** (2-3 t/ha). While it can be integrated into cropping systems, double cropping may not always be feasible. Carinata presents opportunities for intercropping with legumes and is compatible with existing machinery. However, seed provision for establishment is limited, with only one company in Europe currently offering high-yielding carinata varieties.

Regarding intermediate lignocellulosic crops:

Sorghum has a high Technology Readiness Level (TRL) and is ready for scaling up. It has shown **strong results in double cropping systems and marginal lands** and can produce **high biomass yields** even with a short growing cycle (June to October, yielding >15 t/ha dry matter). Seed availability is good, with multiple biomass varieties to choose from. **Sunn Hemp** thrives as a spring and summer crop. Trials in the Mediterranean region with April and June sowing showed good results, with higher yields from April sowing. Even with a short growing cycle (June to September), biomass yields exceeded 10 t/ha dry matter. However, seed options for establishment are limited.

Download the presentation: *Promising Intermediate Crops and the Impact of Agricultural Practices on Soil Health and Biodiversity – Efthymia Alexopoulou, CRES, Greece*.

Unlocking Marginal Lands for Biodiversity, Industrial Feedstocks, and Sustainable Bioeconomy Value Chains

Charalambos Panayiotou from ATLANTIS Environment & Innovation Ltd presented the MarginUp project, a Horizon Europe project focusing on developing sustainable and circular value chains to produce bioproducts and biofuels from natural raw materials grown on marginal lands. MarginUp is exploring new approaches for assessing the impacts of bio-based value chains on the environment, socio-economy, biodiversity and ecosystem services. The core idea of MarginUp is to introduce climate-resilient and biodiversity-friendly non-food crops on land that is currently considered marginal or of low productivity. The MarginUp project encompasses seven international case studies, examining various marginality factors and new cropping systems across Europe. Examples include the use of energy crops like *Robinia pseudoacacia* in abandoned lignite mines in Western Macedonia (Greece), paludiculture crops in drained peatlands in Havelluch (Germany), and *Salix viminalis* in desertified orchards and vineyards in Kecskemet (Hungary). A comprehensive impact assessment methodology is being employed, which considers various aspects of the use-case sites, such as land use planning, biodiversity, soil and geology, water resources, economic activity, ecosystem services, and climatic conditions. Preliminary impacts observed in one of the case studies include reduced organic waste production, a reduced CO_2

footprint, an **increase in pollinator richness and diversity**, and a reduced use of fertilisers. Key insights from stakeholder analysis indicate that while economic feasibility is a priority, the long-term environmental impact remains crucial, highlighting the need to balance profitability with long-term sustainability.

Download the presentation: *MarginUp! Unlocking Marginal Lands for Biodiversity, Industrial Feedstocks, and Sustainable Bioeconomy Value Chains* – *Charalambos Panayiotou, ATLANTIS*, *Cyprus*.

Techno-economic and Environmental Considerations for Aviation and Marine Fuels Production from Biomass Derived Microbial Oil

The presentation delivered by **Kostis Atsonios** from the Centre for Research & Technology Hellas (CERTH) focused on the BioSFerA project, a Horizon 2020 initiative that developed and validated a novel biorefinery concept based on a two-step biological gas-to-liquid process using syngas from Dual Fluidised Bed Gasification for the production of hydrotreated triacylglycerides (HTAGs), which can be further processed into biofuels like SAF. The project integrates anaerobic digestion with syngas and liquid substrates to produce purified lipids, followed by hydrotreatment and fractionation to yield diesel-like biofuel and SAF. Business cases for SAF, marine fuel, and microbial oil production were evaluated and Life Cycle Assessment (LCA) was performed, showing that the BioSFerA concept achieves 50-86% GHG emission savings compared to the fossil fuel comparator. He also briefly introduced the FUELPHORIA project, a follow-up Horizon Europe initiative aiming to demonstrate robust and cost-effective technological solutions for the production of advanced biofuels and RFNBOs, including a demo focusing on turning biogenic CO_2 into microbial oil for marine fuels and SAF.

Download the presentation: *Techno-economic and Environmental Considerations for Aviation and Marine Fuels Production from Biomass Derived Microbial Oil* – *Kostis Atsonios, CERTH, Greece*.

Integration of biotechnology and thermo-catalytic processes for the conversion of organic waste to jet-fuel

Patricia Pizarro de Oro, from Rey Juan Carlos University, presented BIOCTANE project, working on the integration of biotechnology and thermo-catalytic processes for the conversion of organic waste to jet-fuel. This Horizon Europe project aims to develop a sustainable conversion process for organic waste streams from agriculture, industry, and municipalities into market-ready renewable jet fuel. The core of the BIOCTANE approach is the synergetic coupling of biotechnological, catalytic, and thermochemical routes to maximise the recovery of chemical energy and the use of organic matter.

Download the presentation: *BIOCTANE project: Integration of biotechnology and thermocatalytic processes for the conversion of organic waste to jet-fuel – Patricia Pizarro de Oro, Ray Juan Carlos University, Spain*

Bioenergy & Society: The Future of Bioenergy from various Perspectives

Igniting Interest, Powering Change: Engaging Citizens in Bioenergy

Kalina Tcolova, Centre for the Study of Democracy, highlighted the challenges to effective citizen engagement in bioenergy. Building a more resilient and inclusive bioenergy future requires to **prioritise fair market competition, clear sustainability criteria, and a stable policy framework**. A comprehensive and coordinated approach to sustainability across all bio-based products is essential, alongside fostering **inclusive, socially fair, and gender-responsive stakeholder engagement** to build public trust. Key to accelerating the social acceptance of bioenergy is the need to **build long-term public trust at a societal level**, inform and engage citizens on the opportunities and challenges of bioenergy, and create participatory processes involving all stakeholders. Credibility is vital for building trust and effective communication. This requires clear objectives, appropriate people and methods (without excluding opposing views), transparency, and consideration of how the process is perceived. Relevance is a key element in communication for bioenergy. This can be enhanced by using understandable language, ensuring appropriate timing and communicating outcomes, and adapting to changing circumstances. Perceived fairness and balance of the stakeholder engagement process are important. A clearly stated, appropriate, and agreed process, along with suitable methods, can help manage conflict and enhance legitimacy.

Download the presentation: *Igniting Interest, Powering Change: Engaging Citizens in Bioenergy – Kalina Tcolova, CSD, Bulgaria*

CCE2ACT Project

Natalie Bargues, Greenovate Europe, presented the CEE2ACT project, which aims to empower countries in Central Eastern Europe to contribute to the development of **bioeconomy strategies and action plans**. This is achieved through knowledge transfer and the adoption of innovative governance models. A main highlight of the project is its bottom-up, multi-stakeholder approach, driving exchange and collaboration within and between CEE countries, as well as with Austria, Finland, Germany, Spain, Sweden, and the Netherlands. Key elements of the CEE2ACT approach to stakeholder engagement include, organisation of platforms for stakeholder engagement to inform strategy development, national bioeconomy hubs, Business model for engaging stakeholders and ensuring the hub's long-term sustainability. The project offers several digital tools, including an inventory of bioeconomy good practices, a bioeconomy self-assessment tool for policymakers, an e-learning platform and a B2B tool to facilitate partnerships and connect bioeconomy stakeholders.

Download the presentation: *Best practices for stakeholder engagement and biomass potential in Central and Eastern Europe – Nathalie Bargues, Greenovate*

Shaping Tomorrow: Policy Pathways and Insights for the Future of Bioenergy

Anna Sager, RISE Sweden presented policy pathways and insights for the future of bioenergy. The presentation outlined policy needs and gaps for the renewable fuels and bioenergy sector, identifying a lack of alignment, unstable frameworks, gaps in cross-sector collaboration, limited financial support, and public awareness challenges. Policy needs include **clear regulations,**

financial incentives, stronger R&I support, integrated policies, and infrastructure investment. An initial question posed to the audience regarding the most underestimated role of bioenergy in the clean energy transition, collected responses highlighting its EU origin, flexibility, potential for negative emissions, and current availability. The audience survey also explored how bioenergy can best strengthen resilience in the clean energy transition, with energy security being the most popular answer.

Download the presentation: *Shaping Tomorrow: Policy Pathways and Insights for the Future of Bioenergy – Anna Sager, RISE Sweden*.

In conclusion, the 12th Stakeholder Plenary Meeting underscored the **critical role of bioenergy in achieving the EU's clean energy transition and enhancing its industrial competitiveness**. Key takeaways emphasised the need for continued policy support, overcoming deployment barriers for advanced biofuels, leveraging the outcomes of EU-funded research and innovation, and actively engaging with citizens and stakeholders to ensure a sustainable and socially accepted bioenergy future.

Agenda

Download pdf version of the agenda by clicking here

9.30 Setting the scene

European policy and support for renewable fuels innovation – *Maria Georgiadou, European Commission DG RTD*

Bioenergy's Contribution to the Clean Energy Transition – *Patrik Klintbom, Chair of ETIP Bioenergy*, *Sweden*

TRUSTxBio: Empowering Trust and Innovation in Biofuels and Bioenergy Challenge – *Kalina Tcolova CSD, Daniela Horna, Biomassets GmbH*

10.35 – Coffee Break

11.15 – Industry Panel: Renewable Transport Fuels at Scale

Moderated by Dina Bacovsky – BEST, Austria

Are we ready for scale up? – *David Chiaramonti, Politecnico di Torino, Italy*

Barriers to deployment of biofuels – *Emanuela Sardellitti, Fuels Europe*

Lessons learnt from industry and demonstrations – *Franziska Müller-Langer, DBFZ Germany*

12.20 – Panel Discussion – Scaling Up Biofuels and Bioenergy

Panelists: David Chiaramonti, Emanuela Sardellitti, Franziska Müller-Langer, Axel Kraft (Fraunhofer UMSICHT), Bert van de Beld (BTG)

13.20 – Lunch break

14.20 – Research and Innovation: Insights from Horizon Europe Projects on Economics and Environment

Promising Intermediate Crops and the Impact of Agricultural Practices on Soil Health and Biodiversity – *Efthymia Alexopoulou, CRES, Greece*

MarginUp! Unlocking Marginal Lands for Biodiversity, Industrial Feedstocks, and Sustainable Bioeconomy Value Chains – *Charalambos Panayiotou, ATLANTIS*, *Cyprus*

Techno-economic and Environmental Considerations for Aviation and Marine Fuels Production from Biomass Derived Microbial Oil – *Kostis Atsonios, CERTH, Greece*

BIOCTANE project: Integration of biotechnology and thermocatalytic processes for the conversion of organic waste to jet-fuel – *Patricia Pizarro de Oro, Ray Juan Carlos University, Spain*

15:40 – Coffee Break

16.20 – Bioenergy & Society: The Future of Bioenergy from various Perspectives

Igniting Interest, Powering Change: Engaging Citizens in Bioenergy – *Kalina Tcolova, CSD, Bulgaria*

Shaping Tomorrow: Policy Pathways and Insights for the Future of Bioenergy – Anna Sager, RISE Sweden

Best practices for stakeholder engagement and biomass potential in Central and Eastern Europe – *Nathalie Bargues, Greenovate*

17.30 – End