



Newsletter 02_2020

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Welcome to the second issue of the Newsletter BIO-PLASTICS EUROPE

The first year of BIO-PLASTICS EUROPE is just over, but there is already a lot to report: For example, the working group at Kaunas University of Technology, Lithuania, is mapping the current waste collection and management systems. The TICASS institute in Italy is monitoring and documenting tests in the project and what is the respective project status. The Prospex Institute in Belgium teaches the project participants how to inform citizens and stakeholders about their research results and how to promote exchange. In addition, two new networks have been set up in the last few months: the European Bioplastics Research Network and the Historic Cities against Plastic Waste Network. Enjoy reading.

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EU project BIO-PLASTICS EUROPE picks up speed

By Franziska Wolf and Jelena Barbir, Hamburg University of Applied Sciences (HAW), Germany

After the official start of the project in October 2019, the EU project BIO-PLASTICS EUROPE (www.bioplasticseurope.eu) looks back on a successful first project year.

The 22-partner strong international project consortium selected distinctive bio-based plastic products, including (disposable) cutlery, hard and soft packaging, agricultural mulch films, children's toys and fishing materials. "Five different plastic alternatives have been tested in the laboratory since September 2020", says Dr Jelena Barbir, project coordinator at HAW Hamburg. First results are expected to be announced by the beginning of 2021.

Within BIO-PLASTICS EUROPE, the primary focus is on developing sustainability strategies and solutions for bio-based products in support of the EC's plastics strategy which seeks to substantially reduce plastic waste. Also, the biodegradability of bio-based plastics is assessed. Here, the project will provide concrete recommendations for EU policymaking, in particular related to European plastic reduction and recycling targets. The development of safety standards for bio-based plastic products is another important field of action: safety

of plastics is becoming a hot topic in the EU, and there are currently insufficient established specifications.



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Besides the laboratory-based research on suitable bio-based and ideally biodegradable alternatives to conventional plastic products, two networks support the transfer of latest knowledge to distinctive communities: whereas a European wide research network offers a platform to exchange latest plastics research between academic actors, the "Network of Historic Cities against Plastic Waste (HISCAP)" is dedicated to the European-wide exchange of success stories on the prevention of plastic waste.

In the coming months, BIO-PLASTICS EUROPE will publish its first research reports which will be disseminated widely to expert and lay audiences.

State-of-play of plastics waste collection and management: EU and worldwide

By Zaneta Stasiskiene, Lina Draudviliene, Jurate Petkeviciene and Kastytis Pamakstys, Kaunas University of Technology (KTU), Lithuania

In the project BIO-PLASTICS EUROPE, the working group at Kaunas University of Technology, Lithuania, is mapping current waste collection and management schemes.

Plastics have become one of the most omnipresent materials used all over the world, with an increase in global production by an average of about 9% per year since 1950. In 2018,

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production reached 359 million tonnes. This rapid growth has been driven by two underlying trends: (1) the continued growth in population and consumer demand exhibited in all markets, and (2) the replacement of other materials (e.g. paper, metals, glass) because of the low cost of plastics, its performance ratio, and by the continuous addition of new applications. It is estimated that an overwhelming majority of the plastics production, i.e. 90%, is fossil-fuel based.

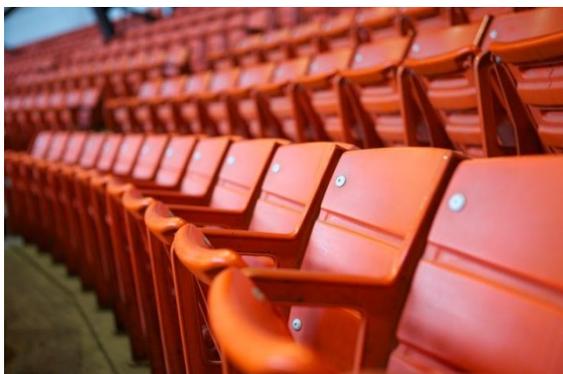


Photo by LAWJR on Pixabay (CC0)

The working group at Kaunas University explores recycling inefficiencies, assess the technical and economic barriers to bio-based plastics recycling and analyse alternative recycling options. The results provide a solid basis for defining key priority areas for enhancing waste collection and management in Europe. The first systematic analysis of state of the art of plastic waste collection and management within the EU and beyond provides empirical evidence that, globally, the Asian region shows the largest plastics production capacities. Zooming in on country level, China's plastics demand by volume is today the biggest in the world, with a share of 30% in worldwide plastics production, hereof half of it resembling single-use plastic products.

The high level of production and use of especially single-use plastic products

lead to an enormous amount of plastic waste. Even though problem awareness is high in many countries, this does not translate into change of producer and/or consumer behaviour which is needed to reduce waste generation. This is mainly because of the following barriers:

- *Perception:* Consumer perceive plastics as practical and convenient.
- *Habits:* Consumers and producers are caught in strong, often cultural habits.
- *Knowledge:* Consumers and producers do not know enough about suitable alternatives.
- *Innovation:* Producers lack innovative ideas.

Especially behaviour-based solutions could foster a promising trend: In recent years, the replacement of conventional plastic polymers appears to increase as the production of plastics partly or fully made from biomass is rapidly expanding. In 2018, the total production volume of bio-based building blocks and polymers worldwide reached 7.5 million tons. This is approximately 2% of the production volume of petrochemical polymers. Forecasts for 2023 predict a doubling of the growth rate to about 4%. There appears a large unseized potential in bio-based solutions, but low oil prices and a lack of political support counter this development.

This likely sustainable development has been induced by several factors, for example, the introduction of new legislation related to single use plastic, societal pressure as well as the depletion of non-renewable resources. However, the sustainability of bio-based plastics is viewed critically, not only in the scientific community. BIO-PLASTICS EUROPE addresses this critique by taking a life-cycle

perspective for analytical assessments. Currently ongoing assessment may therefore provide valuable insights, i.e. that bio-based plastics may show a totally different environmental impact along different stages of their life cycle. Therefore, there is no simple answer to the question if bio-based plastics can replace fossil-based plastics, i.e. represent a more sustainable alternative. More research is needed to explore which directions in bio-based plastic development should be prioritized in future.

For this reason, further research, and simulations on defining key priority areas for enhancing bioplastic waste collection and management will be pursued by the BIO-PLASTICS EUROPE consortium. Key research findings will later be summarized in the "Handbook on the Impacts of bio-based and biodegradable Plastic on existing Waste Management Frameworks". Comprehensive guidelines on how to identify key priority areas for waste collection and management represent another key output of the project.

Scaling up monitoring and evaluation methodologies at overall project level to provide a visual for the BIO-PLASTICS EUROPE logical workflow

By Elisabetta Arato and Stefano Gianazzi, Tecnologie Innovative per il Controllo Ambientale e lo Sviluppo Sostenibile (TICASS) srl, Italy

As co-leader of a working group TICASS controls and documents who has done what in the project, at what time and what is pending. In a nutshell: the who's who doing what of the project.

Building an 8.5 million Euro budget project from scratch is quite challenging. Ensuring that nothing gets lost while moving from paper to implementation is even more challenging. TICASS puts in place day-to-day control actions for assessing overall project progress. This helps to ensure a sound and timely check of the technical activities, to verify that what was written at the proposal level and what has been fine-tuned over the first year of project implementation is aligned and shows no

gaps and overlaps. Using the approved project proposal as key guidance, the team carries out interviews, organizes update meetings, performs cross-checks, identifies and develops what is crucial for project implementation, for example, specific experimental protocols for testing activities in field and controlled environments.

Given the large number of top research institutions and researchers involved, the project needed a minimal, operational common vocabulary and a shared methodology since numerous definitions exist. For example, terms such as "raw material" (e.g.: Can particles deriving from the degradation process of a bottle be considered as raw materials, at least in the Project Framework?), "product" (as in "Innovative product" or "final product") and "innovative product design" have been discussed thoroughly, in order to foster the proper mutual understanding. TICASS defined a set of key common terms which will be used uniformly within the project, namely:

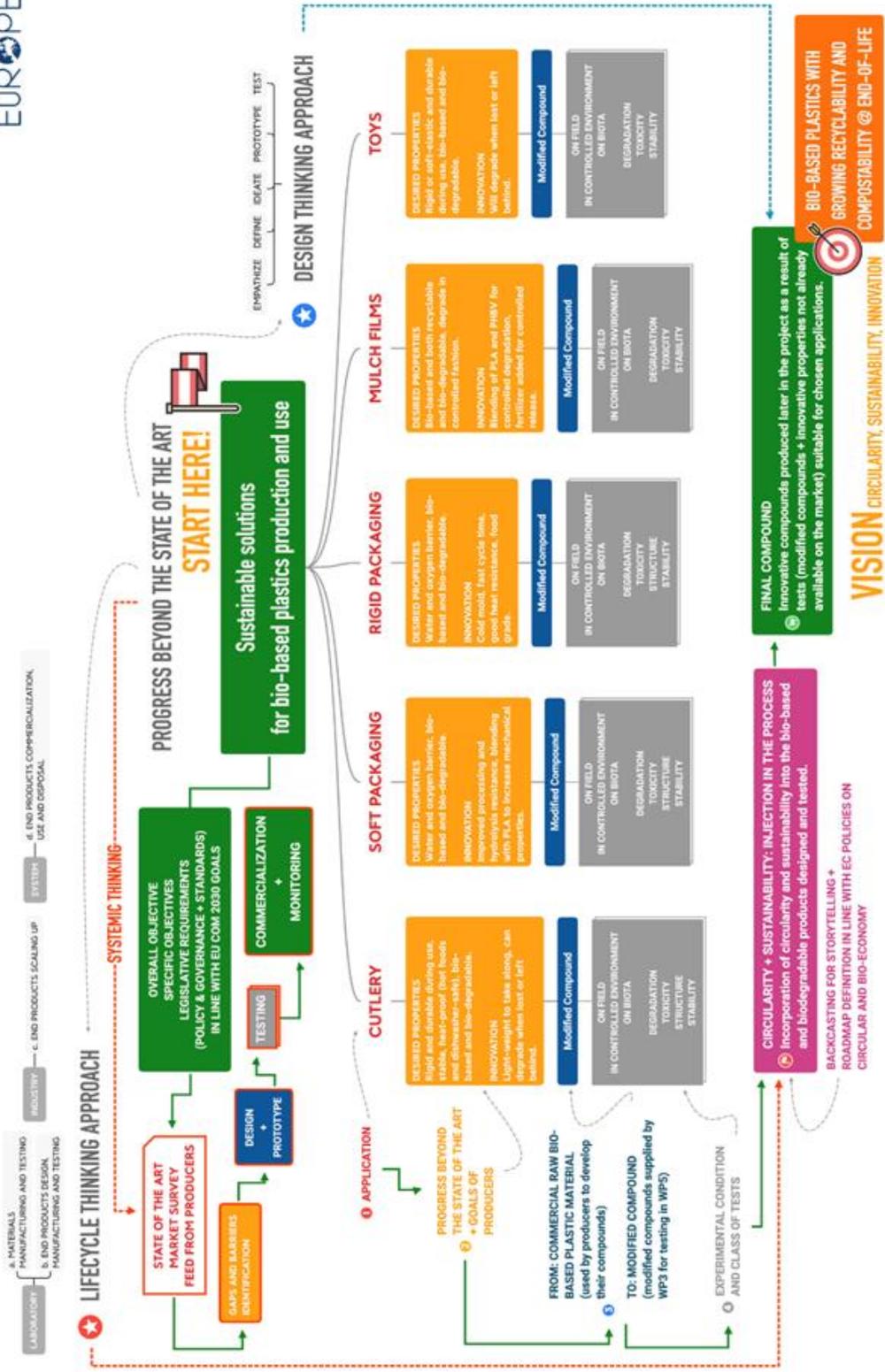
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- "Raw bio-plastic material": the commercially available material used by plastic producers to develop their compounds.
- "Modified compound": the modified compounds supplied by the project in order to be tested.
- "Final compound": the final innovative compounds produced by the working groups as a result of initial tests, resembling modified compounds with innovative properties that are not yet available on the market.
- "Comparable reference compounds on the market": the bio-based plastics and/or fossil-based which are compared against each final compound.
- Life Cycle Thinking considers the economic, environmental, and social consequences of a product or process over its entire life. Together with System Innovation and the Backcasting Method, the Italian partner, the University of Bologna, went "hands on" by analyzing the "now" to define a vision and forecasting how to cope with gaps.
- Design Thinking is used for practical and creative problem-solving. It is extremely user-centric, focusing on the individual first and foremost. It seeks to understand people's needs and comes up with effective solutions to meet those needs, and is, therefore, also called a solution-based approach to problem-solving.

TICASS is also supporting the consortium partners in explaining the project logic to the European Commission, to the Stakeholders and to the public – in other words, finding a suitable visualization for heterogenous target group. The team developed a visual tool, featuring the two main methodologies applied in the frame of BIO-PLASTICS EUROPE:

Apart from the strategic project level, chunks of the two methodologies are also used to tackle micro-problems in day-to-day management. Together with other consortium partners – e.g. Asso-bio, CNR and UNIBO –, TICASS developed the visual tool and used it to support discussion and joint analyses among partners, to show what the team is doing and how they are doing it.

Sustainable bio-based plastics for circular economy: transferring knowledge into practice through technical, policy and business model innovations



Visual tool for communicating the underlying project methodologies

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 660407

How COVID-19 changes stakeholder engagement

By Martin Watson, Prospex Institute (PI), Belgium

Prospex Institute is a specialised partner in BIO-PLASTICS EUROPE on the participation of citizens and stakeholders in research. The team has been leading the internal training on designing highly interactive and participatory online events that share information and learning between the researchers and stakeholders.

Is it possible to radically change economy and lifestyle and finally kick the plastic habit? Can the public really move away from fossil-based plastics and replace these with sustainably produced bio-based plastics? As a proposition is sounds both desirable and achievable but making this a reality is far from simple.

Finding technological solutions is a big part of this puzzle and the project team need to demonstrate that a "bio-based" product is both sustainable and creates a circular value-chain from production and use, to recycling and reuse. But any technical solution also needs a human solution to work.

Like many research and innovation projects supported under the European Commission Horizon 2020 programme, BIO-PLASTICS EUROPE dedicates considerable time, energy, and resources to engaging stakeholders to support the technical solutions being developed. However, how do the researchers and BIO-PLASTICS EUROPE partners engage stakeholders during a lockdown and the ongoing COVID-19 pandemic? Online conferences, workshops and events provide a partial substitute to face to face engagements. However,

the context of a digital platform is quite different from the in-person experience, so BIO-PLASTICS EUROPE has run internal training sessions to adapt and exploit this new virtual reality.

A good place to start is with the virtual stakeholder. Sitting behind their computer screen in the office or at home, the virtual stakeholder is often invisible and silent as the camera is turned off and the microphone muted. The virtual stakeholder is easily tempted by emails, social media, telephone calls and a host of work and domestic distractions. The virtual stakeholder feels no embarrassment or peer pressure to stay engaged in an event, they can simply slip away if something more interesting is happening somewhere else.



Photo by bioplasticseurope.eu

BIO-PLASTICS EUROPE partners have therefore been looking at how to engage stakeholders in a virtual setting by making their events more interesting and useful than the distractions competing for attention. This will be particularly important as BIO-PLASTICS EUROPE attempts to leverage movement on health and safety standards, collection, and recycling schemes as part of the broader value-chain proposition.

Two new networks support the implementation of the EU plastics strategy

By Jelena Barbir and Franziska Wolf, Hamburg University of Applied Sciences (HAW), Germany

Plastic waste is a problem affecting the environment and human health. Regarding the COVID-19 pandemic and the increased use of plastic-based protective materials, this topic is omnipresent. In the last months two new networks have been created that each addresses specific needs.

The European Bioplastics Research Network (EBRN)

Although there are many research groups that study bioplastics on a global scale, the scientific community for bioplastics is fragmented by organizational reasons. In order to increase the reflection, transfer of knowledge and technology of bio-based and biodegradable plastics and thus accelerate the innovation process, BIO-PLASTICS EUROPE initiated the European Bioplastics Research Network where science, companies and politics from all over the world join together to discuss latest research on bio-based and biodegradable plastics. A first online event "Past and Current H2020 Projects Joined in Bioplastics Research" on 24 June 2020 showcased a range of European Commission Horizon 2020 projects and reached out to about 100 international researchers,

company representatives and political decision-makers from Europe.

The Historic Cities Against Plastic Waste Network (HISCAP)

Especially for popular historic cities, tourism is a major pillar of economic growth, but on the other hand it also provokes an increase of single-use products, e.g. the typical coffee to go cups that, at best, end up in waste bins. Due to their aged infrastructure, many historic cities struggle with appropriate waste disposal and look for effective solutions to tackle this challenge. For that reason, BIO-PLASTICS EUROPE created a network that targets these city needs. Its regular virtual gatherings showcase innovative and adequate plastic waste management and prevention strategies. The network which brings together city representatives, researchers and companies, serves as a platform for the exchange of knowledge and practical experiences. A first virtual event, jointly organised by Kaunas Technical University, Lithuania, and HAW Hamburg, Germany, featured the theme "Towards Zero Plastic Waste in Historic Cities". More than 60 delegates gained first-hand insights into best practices examples in a set of municipalities in the Baltic States. The next event will take place in December and will focus on best practices from the Mediterranean region.



Save the date: upcoming events at BIO-PLASTICS EUROPE in 2020

- The BIO-PLASTICS EUROPE project organises **a series of 12 virtual stakeholder meetings in 11 EU countries and Malaysia**. While a first meeting for German stakeholders brought together approximately 70 participants in September, the Austrian community of biopolymer research came together in early October to inform about perspectives, risks, and chances of newly developed plastics. More meetings covering further European countries are shown on the project website as organized by our project partners:
 - Universidad Politécnica de Madrid (UPM): **17 November 2020**,
 - Technologie Innovative per il Controllo Ambientale e lo Sviluppo Sostenibile srl (TICASS): **24-26 November 2020**,
 - Manchester Metropolitan University (MMU): **25 November 2020**,
 - NaturePlast SAS (NP): **08 December 2020**,
 - Turku University of Applied Sciences (TUAS) and Swedish Environmental Research Institute (IVL): joint event on **16 December 2020**.
- **Nov 4:** The research network EBRN gathers again, featuring 2nd & 3rd generation feedstock for bio-based and bio-degradable plastics.
- **Dec 15:** The Historic Cities Network HISCAP meets again showcasing best practices for sustainable plastic waste management in Mediterranean countries.

To save your virtual seat, please visit our website at www.bioplasticseurope.eu and register online for any event.

Thank you for reading! We hope that you have enjoyed our second edition of the newsletters and that you will follow us in the future!

If you still did not, please subscribe to our newsletter at:

www.bioplasticseurope.eu/news-events

Sincerely yours,

The BIO-PLASTICS EUROPE Project Team

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BIOPLASTICS EUROPE project website: www.bioplasticseurope.eu

