



Horizon 2020



HAW Hamburg

BIO-PLASTICS EUROPE

European Bioplastics Research Network

VIRTUAL MEETING

"Past and Current H2020 Projects Joined in Bioplastics Research"

24.06.2020

Questions & Answers

KEYNOTE SPEAKERS

Dr. Silvia Maltagliati & Ms. Nila Petralli. European Commission

1. Which is the most important question to be answered by research according to bio-based plastics?

Bio-based plastics should be sourced and produced sustainably. EC is working on many initiatives in order to set the framework for such sustainability and for clarification of what bio-based and biodegradable stand for. For example, please consider that, for EC and for the next Horizon Europe framework programme for R&I, there will be focus on 'bio-based' and 'biodegradable'. In fact, these are the correct terms for EC. On the contrary, 'bioplastic' is not recognized as a correct term and this will be part of the clarifications delivered by the EC initiatives. About sustainability of sources and products the full picture will be more clear and defined in the next future. However, there are already voluntary certification schemes that can help designing environmentally sound value chain.

2. Which is the role of additives in the vision for the EC?

Question is unclear. Additives to plastics, I guess, but I don't understand what 'vision for the EC' stands for.

3. When is expected 1st call to be launched for the new H2020 programme (2021-2027)?

New Horizon Europe (HE) programme will start Q1 2021

Mr. Christian Schulz, European Bioplastics

1. Are Bio-Plastics capable of preserving food?

There two sides to it: (Bio-based) Plastics in general help to save food due to being a material, being used for packaging in big amounts. As to this, plastic packaging in general helps to prevent food losses, by extending the shelf life, even if this is often forgotten.



Making use of special material barrier properties only available with bio-based plastics (such as e.g. oxygen barrier with PLA) in combination with other packaging could increase shelf life even more.

2. How ready are companies to invest in Bio-based or biodegradable plastic technologies? **ANSWERED-online**

If additional answer needed: Technology is available and ready and companies do actually invest in production plants for bio-based plastics (or their building blocks, out of which bio-based plastics can be produced). Even though this sounds great, compared to conventional plastic industry, bio-based industries need to go for a moonshot, as the biggest bioplastic production facilities have a capacity of around 200,000 metric tons per year, whereas conventional polymer production facilities can have several million metric tons output per year, easily. Once up-scaled, bio-based plastics will reach also far cheaper prices and compare economically to conventional plastics more easily. (In this way, the oil price can be helpful – the higher it raises, the more economically viable biobased plastics do become.)

3. Which generation of feedstock will increase in the future?

We do see developments towards second and third generation feedstock (waste streams as raw material for bio-based plastics) – but as their Technology Readiness Level (TRL) is beyond first generation feedstock materials, it will take more time to develop applications and markets for it. First generation bioplastics (virgin and recycled) will therefore be playing a leading role for more years to come. Nevertheless, if technology is adopted more and more waste streams will be available as a raw material source this will give second and third generation materials a boost.

Dr. Andrew Farmer, Institute European Environmental Policy (IEEP)

1. Do we have enough data to support policy making for bioplastics? If not, what data is still missing?

No. Of course we can always use more data, but the problem with any novel material or substance is that, by definition, there are things about it we don't know. There are questions about behaviour in different natural environments in the longer-term, etc. Therefore, research seeking to answer these questions is very important. This means that policy makers have to work with the best data available, but clearly it is important for researchers with new results to communicate these.

2. Do we need a better definition of bioplastics? Is talking only about bio-based plastics efficient?

This is not easy to answer. If we did sub-divide Bio-based plastics into categories (to inform decision making), I would not be surprised if someone immediately developed a new one that didn't fit these! I think it would be useful first to see how complex a policy framework might look like and, if it needs to, then look to refine or redefine bio-based plastics.

3. Was is MS policy? **ANSWERED** in the chat



For MS policy we mean policies developed by the Member States that are not EU-wide. Some EU law allows or requires MS to develop further policies to implement the EU law. Other times, MS policies are simply initiatives of the MS. A major class of policies largely seen at MS level are market-based instruments like taxes and charges (e.g. charges of plastic bags). It has been very difficult to agree such market-based instruments at EU level (though not impossible) and hence we see them mostly at MS level and they are diverse and varied. Thus, when talking about a policy framework for bio-based plastics, we need to think about what might be needed at national level as well as EU level.

SESSION1: Past H2020 Projects

Dr. Guy Buyle, CENTEXBEL

1. From which companies you managed to get larger quantities of PLA?

There are two main producers: NatureWorks and TotalCorbion. We worked with both of them to get material.

2. How important are the end of life solutions for the sustainability of the products?

For sustainability one needs to be able to recycle the materials and re-use them, rather than to biodegrade/compost them. So, having in place capacity for the (mechanical / chemical/ ...) recycling of PLA will be needed.

3. In terms of energy? Does have a competitive advantage in comparison with other biobased polymers?

This was outside the scope of BIO4SELF. But, a good start to the question might be the following [document](https://www.rvo.nl/sites/default/files/2017/11/Biobased%20plastics%20in%20a%20circular%20economy.pdf) <https://www.rvo.nl/sites/default/files/2017/11/Biobased%20plastics%20in%20a%20circular%20economy.pdf> . Its Annex A compares several biobased polymers.

4. Do you have byproducts in this process?

At each step along the value chain from raw material till final product, one typically has some waste.

5. What would be a critical step that shouldn't be missed?

Good question.... It depends on the goal to achieve. In our case, that was to see if our developments could be transferred to industrial scale. So, for us it was: is the material / additive commercially available in sufficiently large amounts.

6. Do you use PDLA and PLLA?



We used predominantly PLLA. Limited tests were done with so-called stereocomplex (sc-PLA), a mix of PDLA and PLLA.

7. Which type of additives did you use? Did you use it to improve processability, thermal resistance or both? Did you analyze how these additives impact in the final biodegradability?

We investigated additives to prevent hydrolysis, to ease the processing and to change the mechanical properties (eg impact strength). We did not look into their influence on biodegradability. As mentioned, our main goal was to recycle these materials, not to biodegrade them.

8. What is the end of life scenario for the car seats?

Ideally they would be mechanically recycled.

9. Do you use another additive to intentionally start hydrolysis at the end of life of the products?

Not in BIO4SELF. But we have currently a regional and a H2020 project running which focus both on initiating degradation. These such additivation ideas are being worked on. Most of these developments are confidential. Please, feel free to contact for more info.

Ms. M. Beatrice Coltelli, INSTM-UNIPI

1. Is the antimicrobial contained within the powder or within the PLA/PBS blend?

In the powder. However some slight anti-microbial properties were found for untreated PLA/PBS films (<https://www.mdpi.com/2073-4360/11/11/1857/htm>)

2. From commercial point of view what means when you state that your product is almost 100% bio-based? What kind of issues you face in this case.

In the top-sheet less than 2% of a melt strength regulator not biobased was necessary. In the final weight of the diaper (including also other material) this amount is tending to zero (<https://www.mdpi.com/2073-4360/11/11/1857/htm>).

3. Regarding compostability of biodegradable diapers, was it experimentally checked within the POlyBioSkin project?

Yes, the three prototypes were tested following the EN13432, considering the compostability in composting plant

4. How the final products were tested?

Processability, mechanical properties, biocompatibility, biodegradation



5. What do you think about the future industrialization? which will be the main barriers for industrialization? did you have a strong support from the industrial companies project partners?

The future industrialization is not difficult because the participating partners can benefit of the developed knowledge

6. Are there challenges for scale-up for the products?

No, only minor.

7. Did you have problems of source of PLA?

PLA availability is a critical point to support chains of widely diffused products

8. How did you choose the circular strategies (reuse, recycling, redesign, remanufacturing etc) that best suit your applications?

Considering their maximum potentialities based on the results/info we have now and literature search, but more research is required, as I have evidenced in my presentation. The priority scale of EU Directive for waste management was obviously kept into account as a pivotal point.

9. What are the barriers to the market that may restrict uptake of bio-based products by the consumer?

I think that consumers would like to buy products better for health and environment, but they do not understand how. We should build a system to manage the end of life of products well (separation of biobased? collection with the organic wet fraction?) and labeling them in a clear way for consumers. EU can help much in this.

SESSION2: Current H2020 Projects

Dr. Jelena Barbir, HAW

1. What kind of feedstock you focused in BIO-PLASTICS EUROPE?

We focus on 2nd and 3rd generation feedstock.

Ms. Miriam Gallur Blanca, ITENE

1. What kind of actions are you planning for policy making? **ANSWERED online**

On policy actions in SEALIVE, we are looking for inputs from different interests to reach conclusions both on an overall policy “framework” and conclusions related to individual



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policies. We plan to promote these conclusions in different ways - engaging with events such as by the European Commission, own events and targeted communication pieces, e.g. to MEPs. Exactly what depends on the conclusions we reach and also on external timetables for policy development.

Dr. Aratz Genua, CIDETEC

1. What kind of feedstock is used? **ANSWERED online**
2. Do you develop solutions for separate collection? What do you mean with separate collection?

You can contact me at agenua@cidetec.es and I will be glad to answer your question.

3. Epoxies normally are thermosets, which is the thermal and the long term stability of your dynamic epoxy composites? **ANSWERED online**
4. When the project started and when it ends?

It started in June 2017 and it will end in November 2020.

5. Can you give us more details on feedstock used to synthesize epoxies?

Specific Polymers is the partner in charge of synthesizing the epoxy resins. They use several sources for that: a variety of vegetable oils (cardanol, peanut, castor, safflower, camelina, hemp...), lignin, brown algae...