



# **KBBPPS**

## **Knowledge Based Bio-based Products' Pre-Standardization**

**Work package N° 2**  
**Stakeholder consultation and dissemination**

### **Deliverable N° 2.4:**

## **Final event report**

**Public**

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KBBPPS

Work Package N° 2: Stakeholder consultation and dissemination

Deliverable 2.4: Final event participant list and report

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## 1 Summary

On 2<sup>nd</sup> of June 2015, the EU funded research project KBBPPS held a final workshop in York, United Kingdom. Aim of the workshop was to disseminate its results on bio-based products to the public. Work regarding test methods for bio-based (carbon) content, sample preparation, product functionality, biodegradation in fresh water and soil, labelling and ecotoxicity has been discussed. This workshop intended to discuss the final results of the KBBPPS project and to have a discussion on four main leads (statements) that have come forward from the research work in an interactive manner with the audience. This was done to determine how best we can utilise our research to make a positive impact in support of bio-based products, both within Europe and beyond. Advisory partners were actively involved in this workshop, presenting their point of view on results.

The presentations of the work package leaders gave an overview of the results that have come forward in this project. Overall, good progress has been booked. For each work package, an advisory partner was invited to give their expert opinion and position on the outcomes. Then the work package leader opened a group discussion with a proposition, putting emphasis on harmonisation and communication of the results. The harmonisation and global cooperation between US and EU standards was a much debated topic, as there are substantive differences as well as differences in terminology.

General information about the workshop, together with the agenda, the participant list and the given presentations is available at <http://www.bio-based.eu/kbbpps/home>



## 2 Introduction

The aim of the European Union's FP7 project „Knowledge Based Bio-based Products' Pre-Standardization (KBBPPS)“ is to execute pre- and co-normative research, which will be used directly in the CEN standardization process on the same topic. This will provide the European and global market with horizontal standards on biogenic carbon and biomass content as well as biodegradability that have been assessed on a first set of selected bio-based products.

The final workshop took place on 2<sup>nd</sup> June 2015, from 10:30h to 17:30h at The King's Manor (University of York) in York.

The following presents the main goals of the final workshop organized within the KBBPPS project:

1. Dissemination of the results on bio-based products to the public.
2. Discussion on work regarding test methods for bio-based (carbon) content, sample preparation, product functionality, biodegradation in fresh water and soil, labelling and ecotoxicity.
3. Discussion on propositions (statements) that have come forward from the KBBPPS project members involved in the research work in an interactive manner with the advisory partners and the audience.
4. Discussion on how we can utilise our research to make a positive impact in support of bio-based products, both within Europe and beyond.



### 3 List of participants

S. van Kruchten (NEN), was in charge of moderating the workshop and the participation was kept to a maximum of 40 (mostly invited) people. In the end only 14 people effectively attended. This was to the benefit of the discussion, but was less than hoped for. The website of the

| First name | Family name        | Company / Organisation                         | City       | Country        |
|------------|--------------------|--|------------|----------------|
| Michael    | Carus              | Nova-Institut GmbH                             | Hürth      | Germany        |
| James      | Prof. Clark        | University of York,<br>Green Chemistry Centre  | York       | United Kingdom |
| Bruno      | De Wilde           | Organic Waste Systems (OWS)                    | Gent       | Belgium        |
| Thomas     | Dr. Farmer         | Department of Chemistry,<br>University of York | York       | United Kingdom |
| Jasmine    | Garside            | Beta Analytic                                  | London     | United Kingdom |
| Lorenzo    | Dr. Herrero Davila | University of York                             | York       | United Kingdom |
| Jaap       | Hooijmans          | ECN  | Petten     | Netherlands    |
| Martin     | Dr. Markotsis      | Scion  | Rotorua    | New Zealand    |
| Johnny     | Pallot             | Roquette / ACDV                                | Lestrem    | France         |
| James      | Dr. Sherwood       | University of York                             | York       | United Kingdom |
| Lambertus  | Dr. van den Broek  | Wageningen UR Food<br>& Biobased Research      | Wageningen | Netherlands    |
| Maarten    | Dr. van der Zee    | Wageningen UR Food<br>& Biobased Research      | Wageningen | Netherlands    |
| Suzan      | van Kruchten       | NEN  | Delft      | Netherlands    |
| Luciano    | Vogli              | CIRI EA - University of Bologna                | Ravenna    | Italy          |



## 4 Agenda

This workshop intended to discuss the final results of the KBBPPS project and to have a discussion on four main leads (statements) that have come forward from the research work in an interactive manner with the audience. This was done to determine how best we can utilise our research to make a positive impact in support of bio-based products, both within Europe and beyond. The following agenda was followed.

|       |       |   |  |
|-------|-------|---|--|
| 09:00 |       | Welcome   | James Clark,<br>University of York                             |
| 09:00 | 09:20 | Project introduction and link to standardization and EU policies  | Suzan van Kruchten, NEN  |
| 09:20 | 09:30 | Explanation of the goal and concept of the workshop   | Tom Farmer,<br>University of York                              |
|       |       | <u>Bio-based carbon content</u>   |  |
| 09:30 | 09:45 | WP3: Measurement of bio-based carbon content – Main results   | Jaap Hooijmans, ECN  |
| 09:45 | 09:50 | Proposition: "Why EN 16640 and ASTM D6866 shall be different"   | Jaap Hooijmans, ECN  |
| 09:50 | 10:00 | Project learnings and position from a KBBPPS advisory partner   | Jasmine Garside, Beta Analytics, US                            |
| 10:05 | 10:30 | Discussion in separate groups   |  |
| 10:30 | 10:45 | Coffee/ tea Break   |  |
| 10:45 | 11:00 | Recapture by moderators   |  |
|       |       | <u>End-of-life of bio-based products</u>  |  |
| 11:00 | 11:15 | WP6: Standards for bio-degradability in freshwater and soil   | Bruno de Wilde, OWS  |
| 11:15 | 11:20 | "Why we need a generic bio-degradability standard"  | Bruno de Wilde, OWS  |
| 11:20 | 11:35 | Project learnings and position from an advisory partner   | Martin Markotsis, Scion Research, NZL                          |
| 11:35 | 12:00 | Discussion in separate groups   |  |
| 12:00 | 12:45 | Lunch break   |  |
| 12:45 | 12:55 | Recapture by moderators   |  |
|       |       | <u>Bio-based content</u>  |  |
| 13:00 | 13:15 | WP4: Biomass content – Direct and indirect measuring methods  | James Sherwood,<br>University of York                          |
| 13:15 | 13:20 | "Why we cannot measure bio-based content" / Proposition: Bio-based content is best communicated by the bio-based carbon content | Maarten van der Zee,<br>Wageningen UR Food & Biobased Research |
| 13:20 | 13:30 | Project learnings and position from an advisory partner   | Johnny Pallot, ACDV, FR  |
| 13:35 | 14:00 | Discussion in separate groups   |  |
| 14:00 | 14:30 | Coffee / tea Break  |  |
| 14:30 | 14:35 | Recapture by moderators   |  |
|       |       | <u>(Bio-based) product functionality and market barriers</u>  |  |

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|       |       |   |                                 |
|-------|-------|---|---------------------------------|
| 14:45 | 15:00 | WP5: Barriers for bio-based products in standards and norms | Michael Carus,<br>nova-Institut |
| 15:05 | 15:50 | Discussion in separate groups                               |                                 |
| 15:50 | 16:00 | Comfort break   |                                 |
| 16:00 | 16:15 | Recapture by moderators                                     |                                 |
| 16:15 | 16:45 | Final discussion session                                    | Michael Carus,<br>nova-Institut |
| 16:50 | 17:00 | Conclusions and next steps following KBBPPS                 | Suzan van Kruchten, NEN         |





## 5 Conclusion

The following presents the main outcomes of the workshop. For a better structuring, this chapter has been divided per work package (as shown in chapter 4). During the finale event, work package leaders presented the results and formulated a proposition for discussion with the participants.

### 5.1 WP 3 Bio-based content (Jaap Hooijmans, ECN)

Dhr. Jaap Hooijmans (ECN) presented the results from work package 3, on bio-based carbon content. In the presentation, an overview was given on present standards on bio-based carbon content. Specifically, the similarities and differences between the CEN and ASTM standards;

- CEN 16640  
Bio-based carbon:  $^{14}\text{C}$  related to the total carbon (TC) content
- ASTM D6866 (version 12)  
Bio-based carbon:  $^{14}\text{C}$  related to the total organic carbon (TOC) content  
Biogenic carbon:  $^{14}\text{C}$  related to the total carbon (TC) content

Following the presentation, the proposition was formulated as;

“Why EN 16640 and ASTM D6866 shall be different”

Simply put, there are several options in addressing the problem of differences between the EN and ASTM standards;

- Change bio-based to biogenic for all EN standards
- Change ASTM standards
- Make clear remarks in introduction and scope
- Do nothing

Jasmine Garside, Beta Analytic, shared the point of view from Beta Analytic, stating they would encourage the KBBPPS partners to put forward the recommendation to CEN that they use the same definition as ASTM D6866: biogenic carbon = % carbon derived from biomass as a fraction of Total Carbon (TC) in the EN 16640 standard, thus aligning the two standards. Using a different definition of bio-based carbon content (TC) in EN 16640 risks causing confusion in the industry. Changing the definition of bio-based (currently TOC) in the ASTM D6866 would be problematic due to the inclusion of this definition in US Federal law and its inclusion in the government program BioPreferred for over a decade that now includes thousands of products.

Harmonisation of standards is debated in the workshop; the consequences are debated (what if standards are not harmonised or what if the EN-standard will get introduced in the



US?), as well as the possibility of not harmonizing at all (risking misunderstandings on the market).

Mentioning terminology, thoughts are shared between participants on;

- Considering the difficulties of changing one or the other standards, the option of making clear remarks in introduction and scope seems to be the easiest option to implement.
- A translation in both standards explaining what the terms mean in the other standard, could already be helpful (term 'A' in ASTM is used as term 'B' in EN).
- Using the words bio-based and bio-genic. Some countries, as for example France and Italy, are actually in favour of using bio-genic. Bio-based is a new term, introduced later into the market. Or maybe define 'carbon that is bio-genic'. Or making a distinction between bio-based products and talking about "bio-genic derived" carbon.
- When it comes to timing of updating the terminology, this is the right time to act. We shouldn't wait too long then.

Conclusion of the discussion;

CEN standard is working well, but there is an existing difference between CEN and ASTM. Harmonising CEN and ASTM would be preferable, but difficult given the current status and embedding of the ASTM standard in the US. Question is how this can be solved. One possibility is to put clear remarks in the forewords of both standards about the differences in wording and terminology, another solution is to change carbon content into biogenic carbon content. This will have further complications in other standards and therefore will have to be discussed within CEN/TC 411.

## **5.2 WP 6; Standards for biodegradability in freshwater and soil (Bruno de Wilde)**

Bruno de Wilde (OWS) presented the results from work package 6. One of the results is that the standard for freshwater biodegradation tests needs an update, as new equipment is available and therefore the method outdated. The sample introduction has also been standardized, as well as the preparation of the inoculum. For solvents (freshwater and soil) there is no need for new standards directly, as current product guidelines are sufficient. For bio-lubricants the biodegradation in freshwater has been the first priority leading to two new work items, which are proposed within CEN/TC 19/WG 33 (oxygen based and CO<sub>2</sub> based). Bruno also mentioned the development of standards on biodegradability requirements in different product groups, leading to differences per criteria per product group and conflicts, for example the pass level can be different. Bruno also mentioned the introduction of environmentally safety measures in standards, which aren't included at the moment. For biodegradability, it seems that there are two kinds of horizontal standards; per product group or per environment (soil, freshwater etc.), which can lead to difficulties in practice (an example is given on testing on components separately, where ISO/ASTM different from CEN standards). Adapting the CEN-standard to the ISO-standard can mean a lot of products will lose their certification.

Martin Markiotsis (Scion) followed with a presentation Scion and the participation within KBBPPS (biodegradation tests and carbon content measurements).



Advantages of the collaboration with Scion in New-Zealand is that it is possible to run three 'summer-trails' in two years times. When asked about the use of standards in New-Zealand, Martin explained that there isn't a strong market-pull within the New Zealand market.

Proposition:

*"Why we need a generic biodegradability standard"*

In the discussion following the proposition, there was discussion on the relation and maybe necessary distinction between bio-beginning and bio-end-of-life. Participants didn't think there is a relation that needs to be addressed more, although in communication of products it can be helpful to be clear on end-of-life. On the bio-solvents there was a debate on the absence of an incentive for using a new standard. The bio-solvents working group is mainly a 'vertical group' working in a TC that is focussing on horizontal standards, which means the working group is foremost working on defining what makes a solvent a bio-based solvent. Possibly the (further) development of the EU Ecolabel can stimulate the development of up-to-date standards for solvents. Further, there has been a debate on toxicity and composting. You can find toxic intermediates in your organic compost, but if you'll wait long enough, it will mature and loose its toxicity. This will technically be very difficult to measure. Conclusions of the discussion were;

- There is a non-link between bio-begin-of-life and bio-end-of-life
- There is a need for horizontal standards, structure is to be elaborated further
- Environmental safety; is still an open domain, potential toxicity of metabolites.

### **5.3 WP 4; Bio-based content (James Sherwood & Maarten van der Zee)**

James Sherwood (University of York) and Maarten van der Zee (WUR) presented the outcomes of the research done in work package 4 on bio-based content. It proved unsuccessful to develop methods for direct measurement of the bio-based content of products (stable isotopes, markers). Explanation of the different indirect methods and showing the different outcomes (which can be confusing on the market in B2B and B2C relations).

Proposition:

*"Bio-based content is best communicated by the bio-based carbon content"*

Mr. Johnny Pallot (Roquette), advisory partner, presented the different approaches between ASTM en prEN-standards 16640 and 16785-1 and he gave some examples of products that were analysed with regard to their bio-based carbon and bio-based content, showing big differences in outcomes (%). Bio-based carbon content explained as an indicator for biomass content is communicatively the easiest, but the method shows that for some products it isn't the preferable test method, as scores are lower.

During the following discussion with participants, it became clear that the majority was against the proposition: There were five reasons given on why bio-based content should be preferred over bio-based carbon content for communication.



1. **One claim** on the market would be preferred. As supporting the bio-based market is the main aim of the KBBPPS project, bio-based content makes the most sense as the bio-based content method gives a complete analysis.
2. Only bio-based content is preferred, because carbon content can give the **wrong impression**.  
(In the US only carbon is taken in account (also because of carbon footprint), but if you're looking into LCA you see that's not the most relevant. Can lead to wrong implications. )
3. **Strictness**; we are so strict. No other sector is so exactly working.  
For example, we don't see this strictness in biofuels; not measured. Why are we doing this so strict, and not just work with ranges? We're maybe too ambitious.
4. Bio-based content concept; **easy to integrate** products that are 100% bio-based who don't have bio-based carbon content.
5. An example of a bio-based product is the so-called 'fossil-tomato' ; using fossil carbon gasses for production of tomatoes in green house. The tomato is absolutely bio-based, but in the measurement it will be derived as **not bio-based carbon**.

Other considerations shared during this discussions are the rigidity and robustness of the bio-based content method. This is not yet clear because the methods are still under development, The Open-Bio project will look further into these issues. Additionally, it will be very difficult to measure carbon content in mixtures, so it isn't only a problem for bio-based content measurements.

For the market, issues as "revealing your recipe" and fraud are also threats for the bio-based content methods to succeed. When you're establishing a product in a larger supply chain, you'll always need to know what the biomass content is from the first product in the chain (otherwise you won't be able to calculate).

#### **5.4 WP 5; Barriers for bio-based products in standards and norms (Michael Carus)**

Michael Carus (Nova-Institute) showed the product categories that are now selected for further research, to determine a possible Action Resolution Plan that addresses market barriers specifically for bio-based products in 7 categories (plastics, disposable cups and plates, adhesives & binders, NPK Fertilizers, WPC Decking, insulation and mulching films). Industry-experts working on/with these products are interviewed and asked what barriers there are *specifically* for bio-based. There is a clear notion on the fact that we're looking for discriminating barriers, not challenges that all products (fossil-based or bio-based) are facing on the market. In Open-Bio, there is an opportunity to look further in the products performance in relation to functionality issues.

