Open-BIO
Opening bio-based markets via standards, labelling and procurement

Work Package 1

Project Management

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Periodic Report

Publishable Summary

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1 Publishable summary

The Open-BIO project (www.open-bio.eu) aims at increasing the uptake speed of standards, certification systems, labels and data sheets for bio-based products. Public acceptance of bio-based products is increased through ensuring, verifying and visualizing the sustainable sourcing of raw materials, the effective bio-content, the end-of-life options and clear indication of their (comparative) functionality in relation to the regular products. These positive effects will indirectly result in faster growth of the bio-based product industry and increased share of bio-based in the total use of final (consumer) products and intermediates. The Open-BIO project promotes these positive effects by facilitating the development and improvement of standards, labels, product information lists and their related certification systems.

The project builds upon another, pending FP7 project KBBPPS, which focusses on pre-standardization work regarding bio-based (carbon) content and basic biodegradation, plus functionality testing. As it covers first standards developments, it forms a ground layer for work in Open-BIO towards product information that suits all stakeholders and brings social acceptance for the bio-based products.

In the first half of the project the first step was to define where the KBBPS project and CEN stood and to build upon their work. The project needed to enlarge the knowledge gathered regarding bio-based content as it would support further Inter-laboratory study work to define precision of the test methods developed so far. A complete set of products for test has thus been defined.

The same type of work as with functionality was executed when the new research elements regarding end-of-life options had to be defined. A study of what type of tests are available, what industry needs exist and what seems to be feasible was a start. This was followed by defining a test programme for the second part of the project. Here properties like mechanical and chemical recyclability, anaerobic digestibility or compostability needed to be explored and defined.

The project prepares the grounds for CEN/TC 411 and for ISO where required. Through continuous exchange with CEN working groups, wherein partners participate the deliverance of a total and integrated solution for European standardization is guaranteed. The envisaged co-normative studies supply results of different nature: precision data, terms and definitions but also new test procedures or generic advices regarding labels and product information. The research will be fully horizontal, not product-specific, which will help acceptance by the CEN community. The first 18 months have also been used to discuss with the standardization community how further proposals of new work can be developed.

1.1 Bio-based content and sustainability

Two precision definition studies regarding testing for the bio-based carbon content and the bio-based content were executed. The interim performance characteristics for both methods were presented to CEN, which will be incorporated in the finalized standards. End goal is to have precision data for determining bio-based content for a broad range of products. That same definition work needed to take place on a different level in the work regarding defining renewable or sustainable products. By making enquiries about a redefined concept for renewable elements and molecules amongst stakeholders (including CEN) and literature research, the 'renewability' of a bio-based product has been developed. This would fit into the gap that existed between CEN standards' work on bio-based content and sustainability.

1.2 Bio-based product functionality

The objective of work package 4 “Functionality Testing is to demonstrate the functionality of novel Bio-based Products. Functionality properties include chemical, mechanical and other functional (additional) properties. The work is a follow-up on KBBPPS results regarding products of major importance and functionality barriers. Based on these KBBPPS results product categories were selected for testing on mechanical, chemical and other functionalities. This is work is described in D4.1 Product category selection (submitted December 2014). Selected are bio-based packaging films, bio-based mulch films, disposable cups and plates, WPC decking, bio-based solvents, bio-based adhesives and binders and bio-based insulation materials.

At present work focusses on determining the key functionalities to be tested in the second half of the project and the specific products for testing. The deliverable describing the key functionalities will be submitted within the next month. Preliminary results give a very divers set of commercially available products, functionalities and tests. Focus will be on properties where bio-based materials differ from petrochemical materials, like moisture barrier, sensitivity and uptake. Another example could be thermal properties like HDT and thermal degradation. End-goal of the project is to have proven revision proposals for several functionality test standards.

1.3 Bio-based product biodegradability

On biodegradability the focus of KBBPPS had been on soil and fresh-water (first tests on biodegradability of bio-based lubricants). It was agreed to await their first result before continuing to a programme that would encompass additional type of products. Hence Open-BIO first focussed on developing the work plan for the marine biodegradation work. Several draft

standards for fresh-water and soil degradability have been developed and are ready for discussion with CEN and ISO. The project will continue to deliver standard updates.

Marine biodegradation test take a while so not many results can be reported. Three different cases are examined: a) Pelagic, (water column), b) Sublittoral (on the sandy seabed), and c) Eulittoral (intertidal, buried in sand of the coastal zone), which are most typical near-shore marine environments exposed to pollution by plastic wastes. Experiments in three scales are currently in progress: a) laboratory, b) mesocosm, and c) field full-scale tests in the sea. Although the general trend shows analogous behaviour between lab and field and mesocosm tests, quantitative differences have been identified with respect to the rate of biodegradability. Further research is needed to analyse the influence of fouling to biodegradability (increase or decrease the biodegradation rate).

1.4 Bio-based product compostability, digestibility and recyclability

In the first half of the project literature studies with regard to industrial composting, decentralized composting (= home and farm composting) and anaerobic digestion were published. A first version of a list with improvements for the European standard on industrial compostability (EN 13432) has been drafted and some laboratory tests in order to evaluate the link between a 12 week composting process and shorter composting processes were initiated. A first version of a draft standard for home compostable products was prepared and moreover some field tests were started in order to evaluate the relation between home composting under lab conditions and under field conditions. Also research with regard to the inoculum for the evaluation of the disintegration under home composting conditions was initiated. Related to anaerobic digestion of bio-based materials, a first draft of a disintegration methodology under anaerobic conditions was written and some tests were executed in order to evaluate the suitability of the developed methodology. Besides also research with regard to the influence of bio-based plastics on mechanical recycling was initiated by adding bio-based films (PLA and Mater-Bi) to sorted film recyclates. Related to chemical recycling of bio-based products, a desk study with a review of current practices and future potential has been developed and a preliminary version of a test method for the chemical recycling of PLA has been drafted."

1.5 Bio-based product labelling and certification

Also in the first half of the project the study on existing labelling schemes was initiated. It deals with the question, whether the EU Ecolabel can be extended to explicitly cover bio-based products (BBP), and if yes, how. After an assessment of the existing ecolabel criteria, a set of criteria is developed for a selected group of bio-based products. After the development of the criteria catalogues, a strategy for implementing these combined bio-based and ecolabels will be drafted as well.

The existing criteria catalogues of the EU Ecolabel of those product categories that may contain bio-based products have been assessed. Risks and opportunities have been identified for adding bio-based content related criteria to the criteria catalogues. Based on desk research, expert interviews and a stakeholder workshop it was decided that the EU Ecolabel holds potential for considering bio-based content and that the main focus of the further research should be on this label. However, it needs to be taken into careful consideration that bio-based products are very diverse and do not have the same environmental impacts across categories. Therefore, the next steps will look at different exemplary bio-based products groups. The selection of these groups is the next deliverable.

1.6 Bio-based product information for business, public procurers and consumer markets

A mapping of existing product information databases brought insights about existing schemes and relevant features for online product information on bio-based products. Broad stakeholder surveys were conducted with business and public procurement stakeholder as well as consumers. This resulted in a list of preferred product information attributes. Furthermore the need for standardized product information was underlined by stakeholders. Based on these results a database concept was developed and tested among stakeholders. The foreseen, final online database and interaction tool will present product specific and general information about bio-based products for each target group.

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