The EU Ecolabel and bio-based products

Learnings from the Open-Bio project

Open-Bio (Opening bio-based markets via standards, labelling and procurement) was an FP7 project that ran from 11/2013 until 10/2016. One aspect of the project was to investigate how labelling can help to promote market access for bio-based products. This article summarises the general issues that frame the whole exercise of creating an ecolabel for bio-based products and which should be clear to the community of policy makers, label experts, bio-based producers and consumer organisations.

Bio-based content – why?

Based on the Commission's Lead Market Initiative 2008-2011, all objectives of Open-Bio were directed towards market uptake of bio-based products, since they were perceived as being something positive. Producing and consuming more bio-based products is expected to create added value, jobs, innovation and rural development in Europe. Also, replacing fossil resources with renewable ones is an important step towards the future and towards increased independence from oil and gas imports. Bearing all of that in mind, it makes a lot of sense to improve consumer confidence and thus market uptake by creating a better labelling of bio-based products that clearly marks them as preferable to consumers.

However, the experts consulted in the early phase of the project agreed unanimously that a label exclusively highlighting the bio-based content of a product would be of no value to consumers. It is assumed that most consumers will either not understand the wording at all or will automatically perceive *bio-based* to equal *green*. It was therefore agreed that any end consumer label for bio-based products should be combined with environmental criteria in order to provide added value to consumers, which is why the research work in Open-Bio focused solely on the EU Ecolabel as a multi-issue environmental label and looked at how bio-based products could be integrated.

Now, from the perspective of an ecolabel such as the EU Ecolabel, the reasons listed above, which are mostly socio-economic, are not sufficient to consider being bio-based as being preferable to other products. Like any other product, bio-based products need to show their **superiority over their whole life cycle** in terms of recognized environmental impact categories, such as global warming potential (GWP) of the whole process chain, toxicity or end of life options.

Life Cycle Assessments (LCA) are used to calculate the environmental impacts of all kinds of products. The EU **Ecolabel requires LCA evidence that bio-based products perform better** in certain impact categories before it is able to give preference to them. This, however, is quite difficult to achieve, since there is not a lot of independent, third party reviewed LCA evidence on many bio-based products and since bio-based products are not a homogenous group. For one group of end products, there might be different options of bio-based materials that perform differently in terms of environmental impacts. From a scientific LCA point of view, it is therefore quite difficult to achieve a clear position on bio-based products.

From a more strategic point of view, however, it is indeed possible to phrase some general reasons why bio-based products should be given preference also from an environmental perspective. First of all, even though the evidence is not comprehensive, there is already a lot of information showing that many single bio-based materials perform better than their conventional counterparts e.g. in terms of GHG emissions, toxicity or end of life options. And this is despite the fact that most bio-based solutions are much younger than their conventional (fossil) counterparts and consequently have a lot of development potential to improve their performance. Second of all, renewability of resources in itself is an advantage that is not included in the recognized catalogue of environmental impacts of the LCA methodology. Recent research has highlighted that the world needs to leave its fossil resources in the ground to a large extent in order to be able to reach the 2°C climate goal [1]. Energy needs can be replaced to a large extent by solar and wind resources – but for materials, using biomass as feedstock is one of few solutions to adhere to this goal, since we need some kind of carbon source for organic chemistry.

Several other aspects relevant to bio-based products are not included in current LCA methodology, either, which is why the researchers suggest to allow for some flexibility in reasoning when developing labelling criteria, too. One example for a methodological gap is the assessment of temporary carbon storage, which is particularly relevant for bio-based products, as they temporarily remove CO2 out of the atmosphere.

The bottom line is: Promoting bio-based products has been a **political decision** and there are different positive effects associated with doing so. Labelling is one tool to support the market uptake of bio-based products. The EU Ecolabel requires LCA evidence that bio-based products perform better than comparable conventional products in order to promote them. It is possible to provide this evidence in some cases, but not in all. However, the researchers argue that while LCA evidence is important, it is also not the be-all and end-all to evaluate environmental impacts, and there are **overarching environmental reasons** to promote bio-based products.

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Bio-based content – how?

Another controversial question to be decided on when developing labelling criteria for bio-based products is how to declare the bio-based content in products. bioplastics MAGAZINE has repeatedly reported about the on-going debate between defenders of measuring the bio-based content in products and those that prefer to provide the information based on a mass balance calculation (sometimes combined with quite free allocation methods) (cf. bM 03/14, bM 04/14, bM 05/14, bM 01/15).

It is important to understand that this debate will also be quite decisive for labelling issues: If a catalogue of labelling criteria contains the wording "plastics made from renewable resources" it refers to those plastics with zero % measurable bio-based content. Currently, this is the case for the Nordic Ecolabel criteria on absorbent hygiene products under revision. There might be other cases which the researchers are not currently aware of.

The Open-Bio consortium is hesitant about either the inclusion or the exclusion of such criteria, since there is still a lot of controversy around the issue of products declared according to "mass balance plus free allocation", even within the consortium. It needs to be decided on by the label experts whether they wish to give preference to these materials from renewable resources without a measurable bio-based content. The researchers see their role in clarifying the background of the wording and the implications such an inclusion might have.

Sustainability certification – an unfair burden for bio-based materials?

In the context of growing awareness of the environmental impact of biomass feedstocks, also bio-based chemicals and materials are more and more faced with the requirement to prove a sustainable origin of their feedstock base. This is usually done through an independent, third-party sustainability certification. Especially in order to receive the EU Ecolabel, there is an increasing number of criteria catalogues that require a **sustainability certification** for palm oil and its derivatives.

While it is understandable that products made from unsustainably produced palm oil should not receive an ecolabel, this criterion poses a serious burden for bio-based materials. The sustainability certification of feedstock is an extra cost for the producers of a bio-based material, which manufacturers of petro-based products never have to pay. **While different forms of producing petroleum can have serious negative impacts on the environment and surrounding communities**, too, this is never considered in any label. For these feedstocks, the world is accustomed to accepting them any way they come. For biomass, which has become recently received much more attention as a feedstock – mostly through the debate around food vs. fuels – the requirements are much higher, but there is no incentive that can compensate for these extra costs. This is not consistent, neither in terms of creating a level playing field on the market nor from an environmental perspective.

End of life

Bio-based products can offer special end of life options such as biodegradability or compostability, which is often quoted as an important environmental advantage and an important product functionality. However, in the framework of developing an ecolabel, this is a controversial issue.

First of all, not all bio-based products are biodegradable or compostable. Second of all, biodegradability depends on a lot of factors such as temperature, presence of micro-organisms and time (a good explanation of the different terms and the important differences can be found in InProBio's Factsheet #3 on Biodegradability [3]). This means that the terms need to be used carefully and the products in question need to be properly tested in order to ensure that they fulfil the technical requirements.

The most important issue, however, is that these special end of life properties only make sense in certain contexts. In general, the waste hierarchy prefers re-use and material recycling over other options. It is not quite clear how organic recycling (=composting) or anaerobic digestion are seen in this context, since their definitions are missing from the Waste Framework Directive [2]. From an energetic perspective incineration is often more efficient than producing compost, even though incineration is less preferred in the waste hierarchy compared to recycling. It is therefore not clear how to evaluate the option of composting or anaerobic digestion in general.

However, in **specific contexts**, biodegradability or compostability can offer certain benefits. The EU Ecolabel category on lubricants, for example, has recognized the importance of lubricants being biodegradable in water, since large amounts of these materials are lost in nature, which is an inherent part of their normal usage. For most other products, however, it is illegal to dispose of them in the environment. So incentivising biodegradability in nature, which could seem like encouraging people to throw their waste into the environment, could be counterproductive to enforcing the waste hierarchy. Therefore, it needs to be carefully considered whether a product group under criteria development or revision for a label is usually used and lost in sensitive environments.

The bottom line is that while biodegradability is not the one-stop solution it is sometimes presented as, it can still offer benefits in certain contexts and should be carefully evaluated for ecolabelling purposes.

Communication

Apart from the criteria 'behind the scenes' which we evaluated in terms of their appropriateness for bio-based products, it could also be important to clearly state the fact that a product contains a significant share of bio-based resources on the product itself. This would make bio-based products as such more visible, familiarize consumers with the concept and in turn strengthen general awareness and confidence, which could lead to more market uptake. This is already done for lubricants or detergents, for example, and should be practice for all other product groups that will contain a relevant share of bio-based materials in the future.

References

[1] McGlade, C. & Ekins, P. 2015: The geographical distribution of fossil fuels unused when limiting global warming to 2°C. in: Nature (517), 8 January 2015, 187-202.

[2] See for example BBIA (Biobased and Biodegradables Industry Association) 2016: BBIA writes to the EU regarding the Circular Economy Package. London, 29 April 2016. http://bbia.org.uk/bbia-writes-to-the-eu-regarding-the-circular-economy-package/

[3] http://innprobio.innovation-procurement.org/bio-based-products-services/factsheets/

EU Ecolabel
www.ecolabel.eu

EU-ECOLABEL

Only lubricants that are made of at least 50% renewable natural resources, are biodegradable, and minimize CO_2 emissions, are eligible for the European ECO label.

Figure 1: EU Ecolabel mentioning the renewable feedstock base and the corresponding environmental benefits

www.biobasedeconomy.eu