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POSITION PAPER

JUL 2012

European Bioplastics comments on the study

„A LIFE CYCLE ASSESSMENT OF OXO-BIO-DEGRADABE, COMPOSTABLE AND CONVENTIONAL BAGS“ (MAY 2012, INTERTEK)

Picture on cover shows oxo-fragmentable bags at compost site (source: BPI, composting site Wisconsin, USA).

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In May 2012, the Intertek-study „A Life Cycle Assessment of Oxo-biodegradable, Compostable and Conventional Bags“ – commissioned by pro-oxidant additives producer Symphony Environmental Ltd. – was published. The study attempts to create a comparison of oxo-fragmentable and biobased compostable plastic bags by compiling an LCA.

The study has not been critically reviewed by a panel of experts and, consequently, is not in line with ISO 14040 and 14044 standards. Furthermore, the study works with incorrect and incomplete assumptions about biobased compostable carrier bags. These are discussed in detail below while numerous, fall into 3 major areas:

1. **The study is unbalanced.** The LCA quotes a series of studies that are favourable to the "oxo-biodegradable" materials (for instance, claims that "oxo-biodegradable" bags present no problem in compost or recycling streams). The authors seem to be unaware of the many other studies that show completely different evidence.

2. **"Oxo-biodegradable" as a purported solution to littering.** The study suggests that "oxo-biodegradable" bags represent a solution for littering. A brand-new impact category has even been invented: "littering". However, no standard test method is described and, therefore, any conclusion is arbitrary and based on unverified assumptions.

3. **The study is full of incorrect or partial assumptions** (e.g. behaviour in landfill, manufacturing site in China, reuse as a liner of bio-bins, PE sourced in Asia but considered as if it were European, wrong carbon content values, etc.)

„In principle, an LCA shines a spotlight on a single product and identifies the areas where it could/should be improved. There is no question that an LCA is an important tool to establish improvements in environmental performance of a product. Unfortunately however, LCAs are increasingly used as a comparative marketing tool using e.g. selected parameters and impact categories favourable to one's product, which cannot and should not be the intent of an LCA“, elaborates Professor Ramani Narayan of Michigan State University.

Due to the methodological and data-wise incomplete and confusing set up of the study and, therefore, the limited validity of the results, European Bioplastics Chairman Andy Sweetman urges: „The plastics industry and interested stakeholders should contemplate the results of this study with great care“.

European Bioplastics comments on selected key-assumptions of the study as follows:

Page	Statement study	Position EuBP
7 (26)	They (EuBP: biobased bioplastics) may also be in competition with food crops for the use of land and water resources.	There is enough arable land for producing food, feed and bioplastics. In a conservative scenario, the agricultural cultivation area needed to supply the current European market consumption with bioplastics can be calculated around 75,000 hectares, which is less than 0.05 percent of the total agricultural area available in EU 27. *(Calculation based on assumption of two tonnes of bioplastics per hectare; 1.78 billion hectare of utilised agricultural area. Source Eurostat.)*
9 (34)	The degradation rate of these (EuBP: biodegradable) bags in landfill conditions occurred but at a low rate of approximately 30% degradation over 100 years.	Landfilling is not the intended end-of-life solution for biodegradable bags, because they are recovered by means of organic recycling. However, even if biodegradable carrier bags are landfilled no biogas is expected as described in detail in a European Bioplastics Fact Sheet (http://en.european-bioplastics.org/wp-content/uploads/2011/04/fs/Landfill_FactSheet.pdf).
10 (38)	Symphony Environmental Ltd has also carried out trials with industrial composters which show that oxo-biodegradable plastic can be processed in an industrial composting process and produce satisfactory compost.	This is a vague statement missing substantiation. Intertek should make data available and name sources so that a verification of these results is possible. Especially as in this context several institutions have raised concerns that this is not the case.
10 (41)	ExcelPlas Australia et al (2004) reports that "there is currently little evidence to show that polymer residues in the soil are harmful. In fact the contrary appears to be true. Some results suggest that pure polymeric fragments may function like the long-lived components in humus and may provide useful properties as a soil additive".	European Bioplastics strongly wonders how any evidence of harmful polymer residues in soil can be disregarded, whether minor or not. For the sake of the environment, European Bioplastics recommends a conservative approach: do not spread any such residues at all, until proven harmless.
11 (45)	Thomas et al (2010) report that oxo-biodegradable plastics are not compostable according to EN13432; ASTM D6400; Australian 4736 and the comparable ISO standards, but this is due to the timeframe for mineralisation specified in these standards for commercial reasons rather than the inherent compostability of the product. These standards were written before oxo-biodegradable plastic was widely used.	The mineralisation timeframe has been adopted by all the known standards on compostability: EN 13432; ASTM D6400; EN 14995; ISO 17088; AS 4736. Soon the ISO 18606 on compostability of packaging will be published. This will also adopt the same timeframe. A relatively fast and total mineralisation rate reassures against the risk of residues build-up. This is a prerequisite for the acceptance of compostable plastics by the main stakeholders.

11 (46)	It is clear that biobased compostable plastics cannot be recycled as part of a mixed post-consumer waste stream with conventional and/ or oxo-biodegradable plastics and that they would compromise such a recycling stream.	Certified compostable plastics are not intended to be recycled with conventional plastics in the first place. Nonetheless, in small amounts, lower than 5 percent, e.g. flexible packaging can be recycled along with the remaining plastic stream without consequences on the recyclates' quality (study by Ecoembes to be published soon. Also, it is highly probable that conventional plastics treated with oxo-additives (to make them fragment in the landscape) cause severe problems for the recycling of conventional plastics *(DEFRA study: EV0422 Assessing the Environmental Impacts of Oxo-degradable Plastics Across Their Life Cycle Loughborough University, United Kingdom, 2010* *„Recycling Oxo-degradable plastics are not suitable for recycling with main-stream plastics. The recyclate will contain oxo-degradable additives that will render the product more susceptible to degradation. Although the additive producers suggest that stabilisers can be added to protect against the oxo-degradable additives, it would be problematic for recyclers to determine how much stabiliser needs to be added and to what extent the oxo-degradable plastic has already degraded. On this basis it seems unreasonable to claim recyclability of oxo-degradable plastics in existing recycling streams.")*
16 (71)	Although the re-use of plastic carrier bags as bin-liners and for other purposes has been found to be a significant factor in their impact within previous studies, and differentiates them from paper bags, it was not found to be a differentiating factor between the three types of bag considered in this study. This is because the re-use of each bag has been assumed to avoid the same quantity of bin liners and therefore the same impact. Therefore, bag re-use has been excluded from this comparison. This does not mean the study assumes that this re-use does not occur but it presents a worst case scenario.	This assumption excludes an important benefit of biodegradable and compostable carrier bags – their second use potential as biowaste-bags. Here conventional bags simply cannot be used. Biodegradable and compostable carrier bags can be reused as multi-purpose waste bags. When used as biowaste bags, they help in increasing the amount and quality of bio-waste collected. (Example: BASF pilot project Berlin 2011 in cooperation with BSR, compostable waste bags given to 21,000 households, incorrect disposal fell from 37-67% and organic waste collection increase 10%.) According to a study carried out by the Consorzio Italiano Compostatori (CIC) in 2012, the amount of non-compostable materials in biowaste passes from 10% up to 2%, on average, when biodegradable waste bags are used for collecting organic waste instead of non-biodegradable ones. These figures suggest that citizen behaviour is influenced by the kind of waste bag they are using. A higher organ waste quality and also a higher amount is reached.

19 (86)	The production of HDPE is based on Ecoinvent data on the production of HDPE over 24 different sites in the year 1999. This was originally derived from Plastics Europe data and includes the production, delivery and refining of crude oil, the cracking of ethylene and its polymerisation into polyethylene.	The Ecoprofile of Plastics Europe reflects the European context. However, on page 22 (97), it is stated that HDPE, chalk and d2w are sourced in Asia. Therefore, the corresponding Asian electricity mix needs to be taken into account. This can greatly affect the results.
22 (97)	This study has assumed that biobased bags are also produced in China.	The carrier bags made with Mater-Bi (Novamont) are converted in Europe only. The study wrongly allocates 13,500 km to the biodegradable material
22 (98)	As the biobased bag is thicker and heavier than the conventional and oxo-biodegradable bags, the transportation of biobased bags requires more trucks, consuming more fossil-fuel, emitting more exhaust pollution, and occupying more road space.	The statement is vague, qualitative and not quantitative. It needs to be substantiated, so that the reader of the study can better understand how this factor has been quantified.
29 (114.2)	The oxo-biodegradable bags were significantly superior to the conventional and bio-based bags in terms of litter effects, and the oxo-biodegradable bag was also marginally superior (0.01%) in terms of photochemical oxidation.	The authors include a new impact category: litter. No test method to define biodegradation of bags when littered is shown. Therefore, conclusions are fully arbitrary and not scientifically based.
24 (104)	The carbon content of starch-polyester was assumed to be 50% based on the figure for Mater-Bi reported by Razza et al. (2011)	This assumption is wrong. The LCA scientists of Intertek seem to confuse the ratio Cbio/Ctot (the biobased carbon content) with the carbon content
24 (108)	Murphy et al. assumed that the degradation rate for biobased material in landfill was 30%. Based. Based on the assumed carbon content of starch-polyester (50%) reported by Razza et al. (2011) this would provide a total dissimilable organic carbon content of 15%, which is comparable with other biomass products such as paper (12%) estimated by Smith et al. (2001). Degradation in landfill is assumed to be 100% anaerobic by Smith et al. and therefore the dissimilable organic carbon content of starch-polyester has been assumed to be emitted as 50% carbon dioxide and 50% methane.	Here, again, the study refers to 50% carbon content, however, the value given in the Mater-Bi Environmental Product Declaration and by Razza et al. is the biobased carbon content. *For degradation in landfill, see European Bioplastics Fact Sheet on Landfill (http://en.european-bioplastics.org/wp-content/uploads/2011/04/fs/Landfill_FactSheet.pdf*

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