



OXO-BIODEGRADABLE PLASTICS ASSOCIATION

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SUPPLEMENTARY EVIDENCE TO THE ENVIRONMENTAL AUDIT COMMITTEE FOLLOWING THE HEARING ON 8TH JANUARY 2014¹

WHY OXO-BIODEGRADABLE?

Oxo-bio bags have been created to address the problem of plastic waste which gets into the open environment and cannot realistically be collected. Just imagine the hundreds of thousands of tons of plastic waste which have been swept into the sea by the recent hurricane in the Philippines.

Some western countries do not seem to care about this, because they think that they can collect all the plastic waste for recycling, but in UK we can still see plastic waste in our hedgerows and on our beaches every day. In January 2014 there were massive floods in the UK which will have swept huge amounts of plastic waste down the rivers and out to sea to join the great ocean garbage patches, where they will subsist for decades, slowly fragmenting into pieces of plastic.

If all the plastic had been made with oxo-bio technology, there would be no ocean garbage patches.

A conventional bag will not start to break up after six months as suggested by Mr. Baxter. The case against plastic bags in the UK and elsewhere is that they lie or float around for decades – some campaigners say hundreds of years.

It seems that the UK Government now understands this, and that is why they are considering different treatment in their proposed law for biodegradable bags than for conventional bags.

The Minister understands that despite the reduction that the 5p charge is expected to cause there will still be a lot of bags in circulation. He said to the Committee on 18th December that the government want to create a situation “so that where bags ARE used they are better by being biodegradable rather than simply single-use plastic bags.”

A Life Cycle Analysis conducted by Intertek for the UK Environment Agency in 2011² showed that plastic shopping bags have better environmental credentials than paper, cotton or bio-based plastic. A further LCA by Intertek in 2013 showed that oxo-biodegradable plastic has the best environmental credentials of all the materials studied.

¹ <http://data.parliament.uk/writtenevidence/WrittenEvidence.svc/EvidencePdf/5090>

² [http://www.biodeg.org/files/uploaded/biodeg/EA_Carrier_Bag_Report_%20Jul_2011\(1\).pdf](http://www.biodeg.org/files/uploaded/biodeg/EA_Carrier_Bag_Report_%20Jul_2011(1).pdf)

³ [http://www.biodeg.org/files/uploaded/Intertek_Final_Report_15.5.12\(9\).pdf](http://www.biodeg.org/files/uploaded/Intertek_Final_Report_15.5.12(9).pdf)

With regard to biodegradability, there are very many scientific studies reported in peer-reviewed journals, and we have provided a Bibliography. The Committee was referred to the most recent – from the Technical Research Institute of Sweden and the Swedish University of Agricultural Sciences. A peer-reviewed report of the work was published in Vol. 96 of the journal of Polymer Degradation & Stability (2011) at pages 919-928. Given that these results were obtained by a wholly independent Government-accredited Laboratory of the highest reputation, it was surprising that Prof. Thompson suggested that they had somehow “cooked” the test material to produce an artificial result.

Prof. Thompson admits that he is a biologist, not a polymer scientist, and he has clearly misunderstood the processes by which laboratory tests are carried out on polymer materials. They are prescribed by the British, American and International standards organisations, who would clearly not permit any laboratory practice which would produce an artificial result.

The Swedish tests were performed using commercially sourced samples, and it is worth quoting from the conclusions. “After two years in the soil mineralization experiment, 91% biodegradability was achieved without reaching a plateau phase” This result has two important implications. The most important one is that it is possible to create polyethylene based materials that will almost completely biodegrade in soil within two years. It also indicates that the risk of plastic fragments remaining in soil indefinitely is negligible.

In answer to Mr. Goldsmith’s point, the bag would of course be visible during whatever useful life the UK government specified, but it would degrade and disappear leaving no harmful residues much more quickly than a conventional bag. An oxo bag has to pass the same EN13432 eco-toxicity tests as a bio-based bag.

It is sometimes alleged by campaigners that fragments of plastic might contaminate food and the environment. However, everything will fragment into the environment as it degrades, for example paper, textiles, conventional plastics, and bio-based plastics. Do they want to ban them all, even if they are not toxic?

AN IDEAL GOVERNMENT POLICY

1. Reduces number of bags in circulation
2. Raises money for good causes without imposing a significant burden on the poorest households
3. Encourages retailers to supply the IDEAL BAG
4. However, an exemption would not reduce the number of bags because people would switch to the exempt bag.
5. We would have no objection to that, because an oxo bag will not lie or float around in the environment for decades, and it will not contribute to oil-depletion, so there is no real need to stop people using them.
6. However, as the Government wishes to reduce the number anyway, we suggest a 5p charge for an IDEAL BAG and 10p charge for a bag made from old-fashioned non degradable plastic. Or bio-based plastic

AN IDEAL BAG :

1. Must be fit for purpose for the lifetime specified by the government
2. Can be re-used for shopping and other purposes
3. Is made at least 40% from recycled plastic
4. Can be recycled if collected during its lifetime, without the need for separate collection
5. If not collected, will safely degrade and biodegrade in the open environment in a timescale which the government decides, having regard to UK conditions.

6. Will not generate methane in landfill
7. Will cost little or no more than ordinary plastic bags

The IDEAL bag would therefore have recycled content and oxo additive. Recycled content alone would not work, because the bag would not biodegrade if it gets into the open environment.

The IDEAL bag would probably be made abroad, as existing bags are, unless UK bag manufacturers can become competitive.

COMPOSTABILITY is a red herring in relation to plastic carrier bags for the following reasons:

1. Bio-based plastic bags marketed as compostable are tested according to EN13432 to biodegrade in the special conditions found in industrial composting, not in home composting and not in the open environment. They do not therefore address the problem of plastic litter. Prof. Thompson said that EN13432 "is not a standard that will actually meet the objectives that we are seeking in terms of reducing waste in the environment and the natural habitat, because to call something biodegradable, even from that perspective, we are talking about it degrading in industrial composting at 50° C, with specific conditions of pH and humidity after it has been pre-shredded. Mr. Newman says that 73% of all the marine littering along the coastline of the Adriatic was plastic bags, but if they were bio-based they would not rapidly degrade under those conditions.
2. Mr. Newman is therefore incorrect when he says "there is no other standard to internationally recognised biodegradability at present than the 13432 compostable standard, and indeed it is not even a relevant standard, except for eco-toxicity. Oxo-biodegradable plastics are tested according to American ASTM D6954; British BS 8472; ISO 17556; UAE 5009, and the French AFNOR Accord T51 808. These are not mere guidelines, but are detailed scientific tests which have to be performed to prove that an oxo-bio plastic is degradable, biodegradable, and non-toxic. There is no EN standard for oxo-biodegradable plastics because lobbyists have been blocking it for many years.
3. They cannot be made into compost. This is because EN13432 requires them to convert into CO₂ gas within 180 days. This contributes to climate change but does nothing for the soil.
4. Mr. Newman suggested that they were useful as garbage sacks for transporting organic matter to a composting plant, but oxo-bio bags have also been trialled and found satisfactory for this purpose. Perhaps in Italy they do more processing of organic waste than we do in the UK, but some Councils in the UK are collecting organic waste for recycling, and they are specifying the type of bag which must be used. They will not accept the type of bag which Mr. Newman says would contaminate the organic waste stream. This has nothing to do with carrier bags, which tend to be re-used for shopping and then as a bin-liner for mixed waste which goes to landfill. Bio-based plastic should not be sent to landfill - where it would generate methane. As Ms. Baker said "any compostable [carrier] bag that was handed out in a supermarket would be a general-purpose bag. It would end up in the commingled waste stream and therefore would contaminate the whole of the

domestic plastic household waste stream, and would not be able to be reprocessed.

5. Bio-based compostable plastic can be considered “renewable” only if you ignore the oil-based content of the material (which can be 40% or more) and if you ignore the fossil fuels burned by machines which clear the land, plough the land, make the fertilisers and pesticides and carry them to the farm, harrow the land, spray the crops, harvest the crops and carry them to a factory for polymerisation, and the energy consumed by the machines at that factory. Insofar as the growing crops absorb CO₂ - that would be true of the vegetation which was there before.
6. The government wants plastic products to be recyclable, but bio-based bags cannot be recycled with ordinary plastics. Expensive separation processes would be necessary, but would not justify the cost, as they are dealing with a low-value and readily available material. Both the Roediger Report and the Austrian report make it clear that Mr. Newman is wrong when he suggests that “traditional polyethylene can be recycled with compostable plastics, up to 10% of the volume of that polyethylene, without making any damage to polyethylene recycling.” The recyclers who gave evidence agree that he is wrong. Mr. Baxter said “if starch-based products get into our recycling machines they will stop. LDPE recycles at 200°C; starch is at a 150°C.
7. The Environmental Audit Committee itself has found⁴ that “A large biofuel industry based on current technology is likely to increase agricultural commodity prices and, by displacing food production, could damage food security in developing countries.” It would be impossible to grow enough crops in the UK to meet demand for bio-plastics to replace existing polymer bags. Huge public subsidies would be needed to create a bio-based polymer industry in the UK but this would be a misapplication of taxpayers’ money.

RECYCLING

We wish to support the recycling industry by our proposal that a bag should not qualify for the lower charge unless it is oxo-biodegradable AND contains 40% recyclate.

The Committee has received a lot of evidence from people who have expertise in recycling, but are not experts in recycling oxo-biodegradable plastics. The witnesses who gave evidence:

1. Did not say that they had recycled any oxo-biodegradable plastics
2. Did not therefore have any experience of problems or customer complaints
3. Did not suggest that oxo-biodegradable plastics cause any problem with the recycling process itself.
4. Did however suggest that customers for their recyclate would not buy it if they thought it contained any oxo-bio feedstock.

We were aware of their views so an expert opinion was sought as to whether there was any foundation for them. The Committee has received the expert evidence in the form of the Roediger report of 2012, which said:

“We are therefore able to confirm that plastic products made with oxo-biodegradable technology may be recycled without any significant detriment to the newly formed recycled product.

⁴ Report 15th January 2008 (HC 76-1 of 2007-08). Para 53
<http://www.publications.parliament.uk/pa/cm200708/cmselect/cmenvaud/76/76.pdf>

The report was reviewed and revalidated as follows in December 2013 after studying the Austrian report prepared for EuPC in November 2013.

1. The TCKT report makes it clear that “compostable” plastics cannot be safely recycled together with oil-based plastics in a post-consumer waste stream.
2. We have no reason to change our 2012 opinion, and we consider **that plastic products made with oxo-biodegradable technology may be recycled together with conventional oil-based polymers without the need for separation and without any significant detriment to the newly-formed recycled product.**

The scientific evidence before the Committee is therefore that oxo-biodegradable plastics can be recycled with ordinary plastics without any need for an expensive process of separation.

Both the Roediger Report and the Austrian report make it clear that Mr. Newman is wrong when he suggests that traditional polyethylene can be recycled with compostable plastics, up to 10% of the volume of that polyethylene, without making any damage to polyethylene recycling. The recyclers who gave evidence agree that he is wrong. Mr. Baxter said “if starch-based products get into our recycling machines they will stop. LDPE recycles at 200 °C; starch is at 150 °C.

Mr. Baxter said “generally speaking you will only put film back into film.” Roediger said “If the new product to be made from recyclate which contains a pro-degradant formulation is intended for short-life uses such as garbage-sacks, bin-liners, shopping bags, bread wrappers etc. the effect of any pro-degradant formulation is unlikely to manifest itself before the end of the intended service-life. Biodegradability for such items is in any event desirable, because a proportion of them will find their way into the land or sea environments, where they could otherwise subsist for decades after being discarded.”

Ms. Baker said that “Many of the applications that reprocessed plastic goes into are long-life. They may be pipe tree guards, plank wood—you name it. Some of these products are meant to last for 30 years. Roediger laboratories had considered Ms. Baker’s point, and they said:

“Thick cross-section products for extrusion and injection moulding

It is our opinion that up to 25% d₂w-containing recyclate can be incorporated into extrusions or mouldings that have a thickness >1 mm without having any detrimental effect on outdoor exposure. The main reason for this is that the amount of active pro-degradant is so small in concentration that the degradation mechanism would be at the same rate as any recycled polyethylene without d₂w. In other words it is suitable to be used for items such as buckets, road cones, garden furniture, or any other thicker-walled article.

They also reported that “Since polymers lose stabilisation each time they are reprocessed, it is good practice when making long-life products to add new stabilisers, whether the feedstock contains oxo-biodegradable plastic or not. If suitably formulated, the stabilisers will also neutralise any pro-oxidant which may be present.”

The Roediger report continued re Building Films....

“If the new product to be made is a plastic film intended for long-term durability - such as a building film for damp-proofing or waterproofing, the presence of oxo-

biodegradable additive is irrelevant if the film is buried with no access to oxygen. This is because the process of oxo-degradation cannot proceed in the absence of oxygen.

Further, the specification in some countries for these films requires the use of a virgin polyolefin, and recyclate is not therefore used. For other building films the specification will usually require stabilisers. There will of course be no pro-degradant formulation in recyclate made from conventional in-house scrap or scrap whose provenance is known.

In the case of lower-grade building films, where no guarantee is given, these are often made from recyclate whose origin is not known, and the manufacturer should always add stabilisers, whether the feedstock contains a pro-degradant formulation or not.”

PAFA Standard for Damp Proof Membrane 6/83A is strict - 80 Degrees for 56 days-strict mechanical test required. Unlikely that PCW scrap would work, with or without oxo-bio input, unless stabilised

Shopper bags are HDPE/chalk and printed - highly unlikely to be used for DPM - only for new shopper bags or refuse sacks.

With regard to bottles, the high-value recycling business is in bottles made from PET. Carrier bags are not made from PET and there is no oxo-biodegradable additive for PET bottles.

When the facts and the evidence are examined, there is no justification for claims that the UK recycling industry will be damaged. Indeed they will be supported by our proposal that the IDEAL bag would have both recycled content and oxo additive. For several years Tesco supplied their customers with oxo-biodegradable bags, and all the bags collected for recycling were actually recycled in the UK without any problems. That is a fact.

One of our members has undertaken to the government that if existing recyclers do not wish to take the oxo-bio bags than they will take them for recycling. However, EuroPackaging, one of the largest plastic recyclers/manufacturers is quite happy to work with oxo-biodegradable plastic – see TENDER below.

Even if the recyclers who gave evidence were correct, it would be a simple matter, as Dr. Whitehead said, for the government to specify a particular colour for oxo-bio bags, so that separation could be done. The oxo-bio waste plastic could be recycled, but there would be no purpose in separating the bio-based waste, as it cannot be made into compost (see above). As Ms. Baker said “you either keep the starch and throw away all the plastic, or you keep the plastic and throw away the starch. It is not economically viable and it is not practical.”

OIL

Oil is extracted to make petrol, diesel and other fuels, and an inevitable by-product (naphtha) is used to make plastic. The same amount of oil would therefore be extracted even if plastics did not exist, and it makes sense to use this by-product.

TENDER

DEFRA issued a tender in December 2013 for a publicly-funded Project on Biodegradable Plastic Carrier Bags.

The successful tenderers were Aquapak Polymers and Axion Consulting.

Although these companies seem to have expertise in recycling, the tender was for a project on biodegradable plastic carrier bags, and they appear to have no expertise with biodegradable polymers.

Indeed, Axion's evidence to the Environment Select Committee is AGAINST an exemption for biodegradable bags.

A Consortium consisting of Europackaging and Symphony Environmental and Nottingham University submitted a tender.

Euro Packaging have an extensive expertise in blown film extrusion, with an annual capacity of circa 100,000 tonnes, and currently supply carriers into the UK's major grocery retailers. They have experience of working with biodegradable technologies. They have on-site recycling capabilities, and a vast know-how of the implementation of recycled materials into flexible film products.

They said in the tender " Through a partnership with Symphony Environmental Technologies, Euro Packaging intend to utilise the d2w additive as an environmentally responsible solution for vest carrier manufacture. ... Oxo-biodegradable products have successfully overcome the commercial obstacle often associated with added value films due to their additive based application, and their compatibility with polyethylene has enabled carrier bag manufacture with uncompromised mechanical performance ... It has been demonstrated by independent LCA (Intertek Report May 2012 A Life Cycle Assessment of Oxo-biodegradable, Compostable and Conventional Bags) that a high-density polyethylene carrier bag incorporating oxo-biodegradable technology is the most environmentally efficient method of manufacture of a carrier bag. The addition of oxo-biodegradable technology enhances the overall environmental impact. .. At the end of its useful life the bag can be collected and recycled along with conventional plastic packaging waste. However, if the bag escapes this path and becomes litter- the oxo-biodegradable technology will allow a rapid and harmless bioassimilation of the waste material....."

EuroPackaging continued "In a landfill scenario the oxo-biodegradable bag will continue to degrade whilst oxygen is available. Once the anaerobic zone is reached the bag will cease degrading and become a carbon sink- preventing the uncontrolled emission of methane (a greenhouse gas 23 times more harmful than CO2). As the oxo-biodegradable carrier bag does not interfere with the conventional recycling stream the costly exercise of detection and separation is not required... Symphony's d2w additive is an already proven technology, and critically, the technology - which is based upon being compatible with Polythelylene film - has already been proven to be extrudable using existing blown film equipment and technology, with no need for process modification...."

"With existing UK manufacturing sites already established, Euro Packaging are perfectly positioned to develop a UK based dedicated flexible film extrusion and conversion facility in conjunction with this proposal....As the bio-based materials are 3 times more costly than conventional and/or oxo-biodegradable plastics, they cannot be recycled, they have a much poorer LCA score and cannot offer the same efficient functionality as modern well developed plastic polymers- their use is highly unsatisfactory."

EuroPackaging's state-of-the-art warehousing and customer-driven transport strategy enable them to distribute up to 1,300 pallets of products every day to customers in

over 20 different countries. They also employ more than 1,000 professionals worldwide, and generate revenues exceeding £150 million. “

The combined expertise of Europackaging, Symphony and Nottingham University is exactly what is required for this project.

The OPA would like to know who DEFRA appointed as assessors for this tender. We would be concerned if they included some of the people well known to be prejudiced against oxo-biodegradable plastics to whom DEFRA so often turn for advice.

We may have to ask the courts to rule on this matter if a contract is awarded to Aquapak and Axion.

INTERNATIONAL

The government of the UAE realised that they would never be able to prevent some of the plastic waste getting into the environment on land or sea. So they carefully considered the effectiveness and safety of oxo-biodegradable technology before passing legislation which makes it mandatory to use the technology. They rejected the bio-based alternative as it did not address the litter problem and had many other disadvantages.

Not just carrier bags, but all disposable plastic goods and packaging

Nine other countries have followed their example – the largest being Pakistan. These have a combined population of 195 millions.

British factories and retailers cannot now export to those countries unless their disposable plastic products and packaging are made with oxo-biodegradable technology.

ITALY

OPA members in Italy have provided the following comments on the evidence heard by the Committee on 8th January:

“The idea that the law is valid and enforced is just wishful thinking. The Italian companies concerned are pushing hard to have just the compostable bags allowed, but apparently the Italian Government is sick of being challenged by the EU Commission.

Mr. Newman is right when he says that the plastic carrier bag market has dramatically dropped. He does not say however that the market for the black plastic garbage sacks has correspondingly increased, because Italians used to use the standard plastic carrier bag to collect the non-organic waste and clearly we can't do that with the small brittle “compostable” bags.

The Sardinia project: the Government owned and amply subsidized the company that is doing this huge investment in Sardinia. The point is that nobody knows for sure if it is going to deliver, people from Sardinia included. Italy is familiar with mumbo-jumbo giant projects that miserably fail (while in the process wasting a lot public money!)

And finally the ridiculous statement that they have created thousands of jobs in Italy. Actually the threat of legislation forced some of our existing plastic companies to close and moved a lot of business towards Asia. This disastrous outcome is now very clear to our government who are now much more cautious to follow advice from the bio-based industry, because losing more jobs will be a real tragedy.”

In the view of the OPA, the Italian legislation is an attempt to give a special benefit to the bio-based plastics companies and in particular a large Italian company whose plastic is made to comply with EN13432.

The European Commission sent on 24/10/2012 a formal notice to the Italian Republic in the framework of infringement procedure 2011/4030. The Commission considers that Italy is in breach not only Article 16 of Directive 94/62/EC and Article 8 of Directive 98/34/EC, but also Article 18 of Directive 94/62/EC. The EU Commission (DG Environment) confirmed to the OPA on 11th December 2013 that the infringement procedure against Italy is still pending.

The UK and German Governments sent a Detailed Opinion to the EU Commission objecting to the proposed measure. The UK said⁵ that the Italian decree requires certain carrier bags to be biodegradable and meet a certain standard of biodegradability, effectively banning bags of other materials from the market. As such, the proposed legislation appears to be contrary to Article 18 of the Packaging Directive 94/62/EC, which provides that Member States shall not impede the placing on the market (in) their territory of packaging which satisfies the provisions of this Directive. The Essential Requirements set in the Directive ensure that packaging meeting the requirements may be placed on the market in any member state. Accordingly, plastic carrier bags which comply with the requirements for placing on the market as set out in Articles 9 and 11 and Annex II of the Packaging Directive may not be prohibited from being placed on the Italian market.

The UK continued “As a consequence of this prohibition, Italian retailers would be required to purchase biodegradable plastic bags, with the domestic manufacturers more likely to benefit from increased sales of such bags than those in other Member States. The prohibition would lead to cross-European retail chains having to produce specific bags for this market, losing economies of scale or being unable to supply this market. Moreover the Italian agricultural industry would potentially benefit from the decree, as there would be increased demand for the plant-derived ingredients of the biodegradable bags. This has the effect of discriminating in favour of domestic industry contrary to the EU Treaty. Furthermore, even if Art 18 of the Packaging Directive were amended, as proposed by the Commission in November 2013, the prohibition would still violate Articles 34 and 36 of the Treaty on the Functioning of the European Union.”

“The UK would also point out that the rationale provided in relation to the draft decree does not justify the imposition of the restrictions. Plastic packaging is already regulated under the Packaging Directive and accordingly the environment is protected to the extent required.”

Germany has objected on similar grounds. They said “Measures such as the Italian Ruling must be suitable and necessary, as well as appropriate for attaining the objective pursued; they must not constitute a hidden barrier to trade nor result in random discrimination, and must meet the criteria of proportionality.”

Plastic tested according to EN 13432 is designed to be taken to an industrial composting factory, of which there are very few, and to biodegrade in the special conditions found in the industrial composting process. Even if industrial composting facilities were available, most composters will not accept mixed waste plastics such as shopping bags because they do not want to separate compostable from non-compostable plastic.

Further and most important, it is misleading to describe this type of plastic as “compostable.” When something is described as compostable an ordinary consumer would think that it can be converted into compost, but EN13432 requires it to convert into CO₂ gas within 180 days. You cannot therefore make compost from it – only CO₂ gas. This process contributes to climate change but does nothing for the soil.

⁵ 2011/0174/l