

We have received the UK Government's long-delayed response (April 2021) to the Call for Evidence made by BEIS on 22nd July 2019 to which the OPA responded on 11th October 2019 <https://www.biodeg.org/wp-content/uploads/2022/08/BPA-submission-to-BEIS-October-2019.pdf>

THE CONSULTATION

The Dept for the Environment (DEFRA) and the Dept. for Business (BEIS) had been refusing to disclose most of the responses to the Call for Evidence. We therefore appealed to the Information Commissioner, and have at last received all the responses, including the 139 which DEFRA refused to disclose until they were ordered to do so.

The Information Commissioner has made it clear that “when any individual or organisation attempts to influence the future direction of a public authority, there is a pressing need for transparency so that the public can see who is trying to influence policy and why. This acts as a deterrent for anyone wishing exercise, or to accept, undue influence.”

Until very recently the Government were still withholding five of the responses. We commented on four of them on 21st September 2022, and have now received the fifth and final response - more than 17 months after requesting disclosure! It is now clear that there was never any justification for withholding these responses, and the delay has been inexcusable.

Having read all the submissions, we are now quite satisfied that DEFRA and BEIS misled Parliament and the public when they said in April 2021 that “There was a clear consensus in relation to plastics containing prodegradant agents aimed at aiding the biodegradation process, which was that such technologies are unproven and likely to be a source of microplastic pollution.” There was no such consensus.

In fact, the submissions contained substantial support for banning bio-based “compostable” plastic and very little support for banning oxo-biodegradable.

We opened this final submission, which DEFRA had tried so hard to keep secret (they are still withholding the name of the Respondent!) and we found that it contains no support for the so-called consensus. It contains nothing negative about oxo-biodegradable plastic at all, and is very critical of “bio-based” plastics. As we still don't know the name of the Respondent we will refer to them as “they” and to their submission as “the Fifth submission.”

The Fifth submission says “Our understanding is that the bags are separated regardless of what they are made from, so they expressly do not enter the anaerobic digester as they have been found

to be indigestible in the bioreactor. In industrial composting, our understanding is that plastics labelled as compostable are generally removed before being added to the composting facility as there is a suspicion that the plastics will not compost fully or completely.”

We agree with this. Several studies, including one recently at the University of Bayreuth, <https://www.chemeurope.com/en/news/1176729/> show that “finished compost from composting plants contains a large number of biodegradable plastic particles. Also, since applicable legal and certification standards (EN13432, ASTM D6400 etc) are not violated by the sizes and quantities of the particles detected, this calls into question the contribution of these standards to effective environmental protection.”

It has been clear for some time that industrial composters do not want bio-based bags – See <https://www.biodeg.org/subjects-of-interest/composting/>

The Fifth Submission continues “Even on large scales the cost of a bio-based plastic relative to its synthetic equivalent is approximately double. On smaller scales this can rise to 2.5 times to triple the cost for the unit price of packaging. Combining this with the fact that some bio-based plastics require specialised machines and equipment, along with training for plastic converters to handle the plastic, the overall on-cost can be too great to be considered for large scale commodity packaging.” We would agree with that. Bio-based plastic is being kept alive by lobbying, PR, and subsidies – it should be allowed to die quietly.

On ecotoxicity of plastics they say “By using, and including in standardised testing, the established OECD eco-toxicity testing for both land and water organisms, the environmental safety of the biodegradable plastic can be verified both in the short and long-term.” We would agree with that. d2w biodegradable plastic is tested to prove non-toxicity according to ASTM D6954 or BS8472 and the OECD ecotoxicity standards, and has been proved to be non-toxic to plants, daphnia, fish, and earthworms.

They continue “Current testing regimes for biodegradation in aerobic conditions alongside standards that simulate weathering of plastics are applicable to additive-based biodegradable plastics. They are capable of demonstrating the biodegradability of an additive-based biodegradable plastic should the material be exposed in the open environment.” These standardised test methodologies are found in ASTM D6954 and BS8472, which are applicable to environmental conditions found all over the world, but in the EU they have not developed a suitable standard because the relevant committee of CEN is dominated by the “bio-based” industry.

As to recycling, the Fifth submission says “it is reported that compostable plastics can contaminate recycled plastic processes if they are included in quantities greater than 3 % by weight, and it is for this reason that retailers such as Tesco have removed PLA from their preferred materials supply list for packaging.” However, “additive-based biodegradable plastics would be recognised by current recycling plastic streams as a standard plastic and thus could be recycled together without the risk of contamination.” We agree with this. See <https://www.biodeg.org/subjects-of-interest/recycling-2/>

They continue: “industrial composters are removing *all* plastics from their feedstocks suggesting, as they have stated, that they cannot process this material as per their timeframes for producing compost on an industrial scale.”

Answering Q29. How, if at all, would waste collection systems need to be adapted to accommodate the mass introduction of biodegradable plastics? They say “If the biodegradable plastics are additive-based then the effect will be minimal and waste management streams will not have to change. This is because the plastic material will be recognised, sorted and processed as if a conventional (nonbiodegradable) plastic.”

In answer to Question 25. What evidence, if any, is available on the impacts that biodegradability certification and labelling systems may have on consumers' behaviour towards the disposal of items carrying such labels? They say:

"There are currently no known studies that demonstrate how consumers behave when confronted with biodegradation certification and labelling systems. However, some of the most relevant work on consumer engagement was done by the World Economic Forum in 2015. What consumers wanted was for companies to come up with creative initiatives that they could then join and make their own." This is exactly what Symphony Environmental has done with its d2w brand. In any event much of the plastic is accidentally discharged into the open environment, and people who deliberately discard litter will not bother to read a label, if there is one.

The Fifth submission advocates that packaging should bear a "recycle by" date, which communicates that the packaging has a clear shelf life which can be set through [additive-based] technology at a date sufficiently distant in the future to give recycling every chance to happen but then once the date lapses the biodegradation process is triggered through that technology. This allows us to avoid triggering a littering response and instead driving up recycling rates. However, if the waste-management system fails for whatever reason and the packaging becomes fugitive, the brand and the consumer have the confidence of knowing that it will return to nature leaving no microplastic or any harmful environmental effects."

THE GOVERNMENT'S RESPONSE TO THE CONSULTATION

We regret that the government has missed an opportunity to make a useful contribution to the debate.

They have failed to address the main issue facing governments today where plastic is concerned. This is the pollution caused by plastic which escapes collection and finds its way into the open environment, where it can lie or float around for many decades, and where it accumulates every day. Most of the government's paper is concerned with bio-based and biodegradable plastics which are not designed to biodegrade in the open environment and are often falsely marketed as "compostable" as to which see above, and <https://www.biodeg.org/subjects-of-interest/composting/>

The technology which has been specifically designed to address the main issue is d2w plastic, which biodegrades very much more quickly than ordinary plastic in the open environment, but the government's paper dismisses this in one short paragraph. We will of course be participating in any further consultation, and will be drawing attention to the very important new evidence from the Oxomar study <https://www.biodeg.org/subjects-of-interest/agriculture-and-horticulture/the-marine-environment/> in which the scientists said:

"We have obtained congruent results from our multidisciplinary approach that clearly shows that oxo-biodegradable plastics biodegrade in seawater and do so with a significantly higher efficiency than conventional plastics. The oxidation level obtained due to the d2w prodegradant catalyst was found to be of crucial importance in the degradation process. Biodegradability was demonstrated either by using the culture bacteria *Rhodococcus rhodochrous* or by a complex natural marine community of microorganisms.

The project ended with significant advances in the understanding of the biodegradation and non-toxicity of oxo-biodegradable plastics in the marine environment.

-we confirm that accelerated artificial aging (UV, temperature) which was perfectly mastered in this project, is a tool of choice which is particularly well suited to the study of the fate of OXO-bios in the marine environment (task 1). Accelerated artificial ageing does not invalidate the results."

The UK government relies on the HSAC study, to which the BPA has published a critique at <https://www.biodeg.org/wp-content/uploads/2020/09/opa-response-to-defras-hazardous-substances-committee-10-8-20-1.pdf>

Apart from this, the UK government seems to rely not on evidence but on the opinions of the organisations opposed to oxo-biodegradable plastic who responded to the consultation. The government congratulates the UK Plastics Pact, whose subscribers say *“We are creating a circular economy for plastics, capturing their value by keeping them in the economy and out of the natural environment.”* We agree with this, but even they would not claim that they have reduced plastic pollution to zero. If they had achieved this there would no longer be any public concern about plastic pollution and we would not be recommending d2w plastic to the UK government. The fact is however that thousands of tons of plastic are still getting into the open environment every week.

As indicated above, there is nothing circular about plastics marketed as compostable. They are simply wasted by being converted into CO₂ in a composting facility.

The Plastic Pact describes oxo-degradable plastic as “problematic” because it fragments into microplastics. This is true of oxo-degradable plastic (ie ordinary plastic), but the Pact says nothing about oxo-biodegradable plastic which, was created to *reduce* long term pollution by microplastics, not to create them. The European Chemicals Agency has not been convinced that microplastics are formed, and as Professor Jakubowicz explained to the Ellen MacArthur Foundation *“The degradation process is not only a fragmentation, but is an entire change of the material from a high molecular weight polymer, to monomeric and oligomeric fragments, and from hydrocarbon molecules to oxygen-containing molecules which can be bioassimilated.”*

“COMPOSTABLE”

This has been mentioned above. It is extraordinary how many politicians who are concerned about plastic persisting in the open environment are being persuaded by aggressive marketing and lobbying to choose “compostable” plastic, tested (according to ASTM D6400 or EN13432) to biodegrade in an industrial composting facility, instead of plastic tested to ASTM D6954 to biodegrade in the open environment.

Plastic marketed as compostable does not assist in dealing with plastic in the environment (because it has to be collected and taken to a composting facility). It is a linear process, because it cannot be recycled and is intended to be wasted by being converted in a composting facility into CO₂, not into compost. (EN13432)

It is claimed that plastic marketed as compostable assists the disposal of food waste, but it is not wanted even by the industrial composters and local authorities. In the UK the Epsom & Ewell Borough Council website says:

“We used to ask you to use bio-liners to line your food-waste caddy, but the food-waste recycling companies found that bio-liners compost down much more slowly than the food. That slowed the recycling process and made it much more expensive. They tried dredging the bio-liners out of the food waste, but the sticky bio-liners got tangled around the dredging equipment. Cleaning them off was very expensive. So they found that using ordinary plastic bags was, overall, much more cost-effective.”

By contrast oxo-biodegradable plastic is not intended to be wasted. It is intended to be used and re-used during its pre-programmed useful life (including for the disposal of food-waste) and to be recycled. Only if all else fails will it biodegrade and convert into CO₂.