Symphony Statement

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Symphony environmental technologies

A British Public Company

GOOD NEWS FOR OXO-BIODEGRADABLE PLASTIC FROM UK GOVERNMENT REPORT

1. On 18th February 2011 the Environment Agency of the UK Government published a Life Cycle Assessment of Supermarket Carrier Bags.[1] The Report shows[2] that the global-warming potential (GWP) of the lightweight oxo-bio carrier bag is much lower than that of starch-polyester blend bags. This report is good news for oxo-biodegradable[3] bags, and is actually even better news for the reasons mentioned below.
2. However, when describing oxobio bags at 1.2.1 the Report misses the fundamental point about oxo-biodegradable technology. This is that the prodegradant additive included at manufacture turns ordinary plastic at the end of its useful life into a material with a completely different molecular structure. At that stage it is no longer a plastic and has become a material which is inherently biodegradable in the open environment in the same way as a leaf. Approximate timescale for degradation can be set at manufacture as required. For a video of plastic film degrading, go to http://degradable.net/play-videos/4.
3. By contrast starch-polyster bags are designed for industrial composting and will not readily biodegrade in the open environment.
4. The Report does not consider the effects of littering, and therefore no credit has been given for the main purpose for which oxobio plastics have been developed - so that they will harmlessly degrade then biodegrade in the presence of oxygen if they escape the collection processes and find their way into the open environment.
5. There is no evidence in the Report, nor anywhere else, that degradable plastics of any kind encourage littering. A litter-lout would not know that oxo-bio products were biodegradable unless they were so labeled, because they look and feel the same as normal plastic. It is absurd to imagine that such a person would examine a label before deciding to discard as litter. In any event a lot of litter is accidentally discarded, without any conscious decision.
6. The Report found[4] that 76% of these lightweight plastic bags were re-used, and that 53% of households re-used them as kitchen bin-liners. Other uses were as bin-liners in other rooms, as garbage sacks, and for a variety of other uses. The Report found that 18% were re-used for shopping, but the Report gives no credit for this type of use (known as primary use). If they had, the oxo-bio and conventional lightweight bags would have been rated even higher.

[1] http://www.environment-agency.gov.uk/static/documents/Research/Carrier_Bags_final_18-02-11.pdf

[2] Table 5.1

[3] Commonly known as "oxo-bio." These are lightweight bags made from high-density polyethylene (HDPE) and are referred to in the Report as "HDPE prodegradant bags"

[4] 4.4

7. The Report makes an important point about terminology. It says[5] "We have avoided calling lightweight bags "single use" or "disposable", because consumers are increasingly reusing lightweight carriers for shopping. Additionally a high proportion were used as a genuine replacement for another product and the secondary reuse of these bags plays an important part in reducing their global warming potential." Indeed "The reuse of conventional HDPE and other lightweight carrier bags for shopping and/or as bin-liners is pivotal to their environmental performance and reuse as bin liners produces greater benefits than recycling the bags.[6]"
8. Paper bags, durable LDPE "bags for life," and non-woven Polypropylene bags were also considered, but the cotton carrier bag was not even included in the Table, because its GWP is more than ten times that of any other carrier bag.
9. The Report also says[7] "Starch-polyester blend bags have a higher global warming potential than conventional polymer bags, due to the increased weight of material in a bag, higher material-production impacts and a higher end-of-life impact in landfill."
10. The Report confirms that biopolymer bags emit methane,[8] which is a greenhouse gas 23 times more powerful than CO_2 and that these bags have impacts upon photo-chemical oxidation (smog formation).
11. It has been assumed in the Report that all the agricultural crops used to make the Novamont starch-polyester blend bags are grown in Italy where the film is made, but this needs to be checked, and road and fuel usage factored in from the place where the crops are grown to the polymerisation factory.
12. "The starch-polyester carrier bags weighed almost twice as much as conventional HDPE carrier bags. They had the highest impacts of the lightweight carrier bags in every category apart from abiotic resource depletion. The categories were[9] acidification, eutrophication, human toxicity, fresh water aquatic toxicity, marine aquatic toxicity, terrestrial ecotoxicity, photochemical oxidation, and resource depletion.[10]
13. Abiotic resource depletion is defined[11] as "the depletion of non-living (abiotic) resources such as fossil fuels. In fact starch-polyester bags do have a considerable impact on the depletion of fossil fuels and are therefore not truly renewable, due to the fuel consumed in the agricultural production and transport processes, and in the polymerisation of the material. See http://www.biodeg.org/files/uploaded/biodeg/Hydro-biodegradable_Plastic_Production_Process.pdf
14. Bio-based plastics (except for a small proportion made from vegetable wastes) are also in competition with food for the use of scarce land and water resources. The peer-reviewers commented[12] "We think it is difficult to accept the exclusion of the impacts of land-use in a study where also paper, PLA and cotton products are involved, and similarly the impact of water-use is missing."
15. The oxobio bags should have scored better in the Report even in relation to fossil-fuels. It is true that oxobio bags, in common with all polyethylene and polypropylene bags, are made from oil or natural gas, but this has been extracted in order to make fuels, and plastic is made from an inevitable by-product which used to be wasted. The calorific value of an oxobio bag is the same as the oil or gas from which it was made, and this can be captured in a safe modern incinerator and used to generate heat and/or electricity.

[5] P56
[6] Executive Summary
[7] 8.2
[8] P 13, 39, 52
[9] 3.7.2
[10] P 57
[11] P 103
[12] P 110

16. Credit for recycling was given to conventional plastic but not to oxobio - on the erroneous basis[13] that oxo-bio bags had a negative impact on the quality of recycling HDPE. This is not correct – see http://www.biodeg.org/position-papers/recycling/?domain=biodeg.org.
17. Also, oxobio bags are frequently made with a high recycled content.
18. In any event recycling of post-consumer plastic waste is an issue often discussed but not really relevant. The Report itself points out[14] that "due to the oversupply of post-consumer plastics, recycled material is used in low grade applications...." and that the plastic carrier bags collected at end-of-life for recycling are exported for recycling to China.[15] It also points out[16] that when HDPE bags are recycled instead of being re-used, it increases most of their environmental impacts.
19. One of the peer-reviewers commented [17] "Postconsumer shopping bags are printed, and probably often contain some unwanted materials; this would make it very difficult to use shopping bags as a high value plastic."
20. The Report does not give starch-based plastics any credit for recycling, but it does not factor in the adverse effects of starch-based polymers in the recycling stream. It is well known that those plastics cannot be recycled with normal oil-based plastics and will compromise such a recycling stream.
21. At 3.3.1 the Report says **"**Any environmental impacts associated with storage activities at the bag importers and supermarkets have been excluded." If they had been included oxobio and conventional bags would have scored even higher, because they are half the weight and thickness of the starch-polyester bags and take up half as much space in warehouses and trucks. The other types of bags considered in the Report are even thicker and heavier.
22. At 5.2.2 the Report says "The impacts for the [oxobio] bag are very similar to the [ordinary] HDPE bag. The percentage contribution of each lifecycle stage on each impact category is almost identical to the HDPE bag because of their similarity in material content, production, transportation, secondary reuse and end-of-life. However, in general, the material-extraction and production lifecycle stage has a larger impact because the HDPE prodegradant bag is heavier."
23. The bag selected for the study had a 4% loading of catalyst containing cobalt stearate, but a Symphony d_2w bag with a much lower loading of a manganese catalyst would not be measurably heavier than a normal HDPE bag. The Report includes the weight of titanium dioxide but does point out[18] that this is not used in clear bags, and that "the impact of some HDPE bags would therefore be overstated in terms of freshwater ecotoxicity."
24. Credit for composting has been given to starch-polyester bags,[19] and this of course assumes that the starch-polyester shopper-bag would find its way into a composting plant. This is highly unlikely except as part of a dedicated scheme, and its most likely destination would be landfill where it could emit methane. Moreover, industrial composters do not generally accept post-consumer plastic waste because it is not economic to separate compostable plastic from ordinary plastic. Even if compostable plastic did get into an industrial composting unit it would be of little or no value for the compost because EN13432 requires it to convert to CO_2 gas within 180 days - contributing to global warming but doing nothing for the value of the compost to the plants. This cannot be honestly described as "organic recycling" or "recovery."

[13] P20
[14] 3.4
[15] P 19
[16] P 58
[17] P 108
[18] P116
[19] Table 3.2

25. One of the peer-reviewers pointed out[20] that "it is unclear from the Report if the products studied are real alternatives. Some, like the paper or starch bag seem to have a very low (if any) real market share." The packaging manager of Tesco (Britain's largest supermarket) said on 20th October 2009 that the supermarket "does not see the value in packaging that can only be industrially composted" and that "local authorities do not want it, as it can contaminate existing recycling schemes."
26. The type of composting used for the Report[21] is "in-vessel" composting. This composting system "provides for the rapid high temperature composting of organic wastes in a continuous flow plant. The insulated silos, each with a capacity of 32 m3, are suspended above a concrete base in a large steel structure. A single silo-cage bank consists of between 8 and 28 silos, depending on the annual input or output requirements."
27. To the extent that credit for composting has been given to starch-polyester bags, credit should also have been given to oxobio bags, because they too can be composted under those conditions.
28. The environmental impacts linked with the construction, maintenance and demolition of industrial buildings and the manufacture of machines, equipment and vehicles have been excluded from the primary data used in the study.[22] If they had been included, oxobio bags would have scored even higher, because the films from which they are made can be manufactured with the same machines as ordinary plastic and there is no need to re-equip factories or build new ones.
29. Symphony is now supplying d_2w oxo-biodegradable technology through 63 Distributors to 92 countries and to some of the world's largest companies, who have conducted strict due-diligence on Symphony and its products. The technology has recently been recognised by legislation in the UAE after detailed inspection of Symphony's laboratories and production facilities by the UAE authorities; and other countries are following their example. We are required to prove to our customers and we do prove, under strict commercial confidentiality, that d_2w oxo-biodegradable plastic:

    1) Does degrade and does biodegrade in the terrestrial or marine environment in the presence of oxygen much more quickly than ordinary plastic.
    2) Does not contain heavy metals
    3) Is not toxic in the soil nor anywhere else in the environment.
    4) Is no more likely to attract toxins in the marine environment than the trillions of naturally-occurring fragments already present in the oceans, and much less likely than fragments of ordinary plastic.
    5) Has little, or in some cases no, extra cost compared with ordinary plastic.
    6) Can be made with the same machines and workforce as ordinary plastic and does not therefore disrupt supply-chains or cause loss of jobs.
    7) Has the same strength and other performance characteristics as ordinary plastic during its useful life.
    8) Can be recycled and can be made from recyclate.
    9) Can be used to make PE bottles, but is not recommended for PET bottles, which can be economically recycled.
    10) Complies with Annex II para 3 of the EU Packaging Waste Directive 94/62/EC
    11) Is not required to comply with EN 13432

[20] P 106
[21] C.4.3
[22] P 22

12) Does not cause oil-depletion.
13) Can be composted in an in-vessel commercial composting unit.
14) Has a better LCA rating than vegetable-based “bioplastics.”

30. Oxo-biodegradable plastic is entirely consistent with a policy of educating people not to litter, and with a policy of minimisation, recycling, incineration, landfilling or composting. Oxo-biodegradable plastic can be dealt with in the same way as normal plastic during its useful life, but any type of plastic has to be collected and taken to a disposal facility at the end of its useful life.

31. However, unlike ordinary plastic, if oxo-bio plastic does not get collected it will not lie or float around for 50 years or more. It will harmlessly biodegrade in a much shorter timescale.