Oxo-Biodegradable Plastics Association
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# Comment on

## "The New Plastics Economy – Rethinking the Future of Plastics"

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This Report advocates a circular economy for plastics, as opposed to the linear economy of make, use and dispose which we have at present. We agree with this, but it obviously applies only to plastics which can be collected. According to the Report, an estimated 32% of plastics and plastic packaging escapes the collection system globally, generating high costs and reducing the productivity of vital natural systems such as the ocean and clogging urban infrastructure.

Oxo-biodegradable technology has therefore been introduced, to deal with plastics which get into the open environment and cannot realistically be collected. See http://www.biodeg.org/The%20Relevance%20of%20Biodegradable%20Plastic%20-%206-10-15.pdf

Oxo-biodegradable technology causes plastic to convert automatically into non-toxic biodegradable materials if discarded in the open environment.

If collected during its useful life it can be recycled. See http://www.biodeg.org/recycling.html
The report points out however that there is inherent quality-loss during mechanical recycling of conventional plastics. In open-loop mechanical recycling, polymers are kept intact but the degraded quality and / or material properties require applications with lower demands. This is why plastic packaging is recycled into similar cheap short-life products and not into products with a higher specification such as building films.

The authors of the Report were aware of oxo-biodegradable technology but did not invite the oxo-biodegradable industry, nor academics who are experts in the technology, to participate in the study, with the result that the report is much less useful than it might have been. The OPA is willing to participate in any further initiatives and will assist in devising clearly defined labelling and materials marketing standards.

The Macarthur Report is concerned with the accumulation of plastic waste in the oceans. It points out that each year approximately 8 million tonnes of plastic leak into the ocean and that estimates suggest that plastic packaging represents the major share of this leakage. They say that by 2050 the ocean is expected to contain more plastics than fish by weight. However, if all the plastic had been made with oxo-biodegradable technology this problem would not exist.

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Urgent action is needed, and there is no time to wait until everyone has been persuaded not to cause litter and until all plastic gets collected for recycling. This is why there is already legislation in 22 countries[1] to ban plastics which are not biodegradable. Their governments considered banning plastics altogether but they realised that this is not practical, and that their people would not accept it.

The Report wants to mobilise large scale innovations - bringing together the world's leading business leaders and academics. We agree – and oxo-biodegradable is just such an innovation which everyone should be using, not just the 22 countries who have set an example to the rest of the world. Oxo-biodegradable technology should be part of the "New Plastics Economy."

The report points out that "over 90% of plastic is derived from virgin fossil feedstocks, representing about 6% of global oil consumption." However, oil is extracted to make fuels, and until there is no need for these fuels oil will continue to be extracted and refined. An inevitable by-product of refining is naphtha, from which plastics are made. It is better to use this by-product than to use land and water resources and refined fossil fuels to produce vegetable based plastics - which are not "renewable feedstocks."

The report recommends scaling up industrially-compostable plastic packaging for targeted applications i.e. garbage bags and organic waste. However, the problem with these vegetable-based plastics is that they are required by EN13432, ASTM D6400 and equivalent standards to convert rapidly into $CO_2$ gas. This contributes to climate-change but does not produce compost for the soil.

These plastics are tested to biodegrade only in the special conditions found in industrial composting, not in the open environment, and are therefore useful only for transporting organic waste to municipal composting facilities. If used for ordinary garbage bags they will generate methane in landfill, which is an even more potent greenhouse gas than $CO_2$. They are also far more expensive and are weaker than oxo-biodegradable plastics. As the Report points out, these "compostable" plastics can interfere with recycling schemes.

With regard to "drop in" plastics, it is difficult to see that they are anything more than a marketing device, because they too use land and water resources and refined fossil fuels to produce vegetable based plastics which are indistinguishable from ordinary plastics. They are much more expensive than ordinary plastics and are not even biodegradable.

The report suggests that oxo-biodegradable plastics have not been proved. However, Oxo-biodegradation is officially defined by CEN (The European Standards Organisation) as "degradation resulting from oxidative and cell-mediated phenomena either simultaneously or successively." Oxo-biodegradable plastics have been studied by scientists for many years, most recently at the Technical Research Institute of Sweden and the Swedish Institute of Agricultural Sciences, and a peer-reviewed report of the work was published in Vol 96 of the Journal of Polymer Degradation and Stability (2011 – Pages 919-928). They found 91% biodegradation within 24 months. If it merely fragmented without biodegrading, CEN would not have defined oxo-biodegradability at all, and the American and British Standards authorities would not have included tests for oxo-biodegradability in ASTM D6954 and BS8472.

[1] United Arab Emirates; Pakistan; Argentina (Nequen); Albania, Brazil (some states and cities); Burkina Fasso, DRC, Ivory Coast, Gabon, Iran, Kosovo, Macedonia, Mali, Mauritius Montenegro, Morocco, Peru, Serbia, Slovenia, Togo, Tunisia, Yemen.