

# U3AC Environment Group Workshop: Plastic

## Tuesday 16<sup>th</sup> April

### Report

Brian Wallis welcomed the members to the seminar and explained its context. Our second speaker had been taken ill suddenly. Leslie Miller-Bernal introduced Dr Claire Barlow, the Deputy Head of Cambridge University Engineering Department. She is an active researcher into waste, eco-efficient man-made materials, sustainable industry and plastic 'waste'. (Dr Barlow's PowerPoint will also be on the U3A Website.)

Claire began by offering various definitions of *plastic*. Plastics can be shaped or moulded when soft and then harden. They are made from either natural substances eg cellulose, or synthetics eg polyethylene. They are *polymers* which are high molecular weight compounds made from repeated small single units joined together.

She felt that the *No More Plastic* movement was misguided. She cited the English Heritage use of a so-called 'plastic free' wrapper made from potato starch- it can't go into plastic recycling waste stream as it contaminates it making it the batch useless, and won't breakdown in industrial compost systems such as that employed by our local Amey waste management plant.

David Attenborough in his autumn 2017 Blue Planet series had drawn attention to plastics. William McDonough (and Michael Braungaut) in his excellent book, *Cradle to Cradle*, had commented that we can no longer throw things away as we're now realising that we're living on a small planet.

Marine plastic was indeed a problem. There were huge garbage patches in our major oceans. Plastics were washed up on every beach; it is accumulating in sea and land animals including us. Marine life was being adversely affected. The top three marine plastics were plastic bags, food wrappers, containers, bottles and lids. It gets there from litter and badly or non-regulated regulated garbage sites in poorly regulated countries.

Every time we wash clothes with synthetic fibres microplastic fibres go into waste water. (These fibres are less than 0.5 micrometres {a millionth of a metre.}) There were about 200 microplastic fibres in the average bottle of water.

In the UK, 38% of plastics are used for packaging. As light and cheap materials, they have a variety of other uses too such as in the building industry, electronics, vehicles and for medicine eg hip joints and glasses. Plastic packaging is in use for a few weeks to several years. Plastic packaging usually can be reused; a plastic bag used 10 to 20 times is ecologically sound whereas a replacement like the cotton bag have to be used at least 20, 000 times to pay for the high use of water and chemicals such as fertilisers and insecticides.

Plastic packaging has many functions: labelling fulfilling legislation requirements, marketing, advice on how to use; prolonging the life of food eg cucumber's shelf life increased from 3 days to 14/15, and bananas 15 to 38 days; greatly reducing food waste, protecting from damage allowing handling and transport around the world; maintaining hygiene and safety, preventing tampering, etc.. Food especially can be vacuum packed preserving it.

She described cheese packaging in detail. As it contains living organisms, the packaging has to let carbon dioxide out and stop oxygen entering. Cheese wrapping has multiple layers of different plastics and this extends its life from a few days to several weeks. This was not recyclable. She had investigated alternative plastic alternatives but these were thicker and more expensive. The best alternative single material is PET.

Plastic waste has a number of fates; some is recycled in UK, some is exported but with the recent China ban that part is now going to less regulated countries, some is burnt for energy but most is landfilled. Plastics are sorted in waste management centres. It's not easy to recycle plastics as they can't be purified; the pelleted

material made from them is a mixture/ not just one plastic it cannot be used for many functions. Most recycled plastic is downcycled ie used for a lower grade application so is worth much less. As a result only 2% of plastic waste is recycled in the UK.

'Bio'polymers have been introduced as an alternative to artificial plastics but they do not break down in industrial composting as employed for our green waste in Cambridge. They are also dangerous to recycling operations: if they get into the recycling waste the entire batch is spoilt and has to be landfilled. Biopolymers are produced using monocultures, using lots of water and chemicals such as fertilisers, insecticides etc. and their production uses lots of energy; they are much more expensive to produce than our usual plastics. They don't break down in anaerobic digesters too and take longer to decompose in a compost heap (or may not decompose at all).

Oxodegradable polymers are another type of 'biodegradable polymer': these are 'ordinary' polymers to which heavy metals have been added so they break down into lots of tiny flakes and heavy metals. These polymers are banned on the continent.

Mumbai has enacted legislation reducing the use of plastic for packaging but retaining it for medical blister packs, milk and water bottles. (Latter have to be recycled.) Other countries have bans too. The English charge on plastic bags had drastically reduced their use. Many countries such as Germany encouraged the system of returnable bottles with deposit schemes.

There were new sustainable packaging alternatives such as materials left over from mushroom growing – looked like cardboard but would rot. Edible food packaging eg icecream cones may become more common. Plastic bottles filled with waste can be used as building blocks. Cardboard could be coated to give it impermeability.

There were some good examples of Energy from Waste plants eg the London Belvedere site which produces enough energy for 160,000 houses. Waste is transported there by river. The plant like all such in the UK is very carefully controlled. Such systems would reduce use of oil, thus counteracting climate change and lessen landfill needs.

So, in conclusion what could we do about the mountains of plastic waste? Stop using unnecessary and/or 'disposable' plastics, encourage the use of recycling. Wash clothes less often at lower temperatures and preferably dry outside. Plastic waste has to be clean before being recycled. We could burn plastic. (The Environment Agency monitors gas emissions from Energy from Waste incinerators and shuts them down if they're not working properly.) Black plastic which is not removed by automatic waste management plants is being replaced. The Government could increase the number of recycling sites by giving financial incentives for recycling and fund more research into recycling. There could be more designed-in recyclability and products could be made more from recycled materials.

#### Feedback

Feedback forms were completed by 64% of the 53 delegates. The event was considered to be very good/excellent. The speaker was rated very highly, "fantastic", "very informative", and "comprehensive". Many commented that they would be pleased to get the seminar report and a copy of Dr Barlow's PowerPoint.

*Elizabeth May*

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