

Greening our Way to Infection, Defra Warns Against Bioplastics and Montreal

Michael Stephen, an international expert on bioplastics, shares his thoughts and opinion on important issues impacting the bioplastics industry. Today, Michael writes about greening our way to infection, Defra warns against bioplastics, UK MPs and Montreal.



Michael Stephen

Greening our way to infection

Everyone ought to read this article from New York on why banning lightweight plastic bags is a serious mistake –and comes at the worst possible time ([The ban on single-use plastic grocery bags is unsanitary—and it comes at the worst imaginable time](#)). This was followed by an article in Bloomberg Green ([Plastics Had Been Falling Out of Favor. Then Came the Virus](#)) saying “With health concerns at the top of consumers’ minds, companies are abandoning eco-conscious policies and re-embracing single-use items.”

There is also a very relevant article in the UK’s Daily Telegraph (16.3.29) saying “Supermarkets urged the UK government to ditch the 5p carrier bag charge to try to halt the spread of Coronavirus. – Retailers who held talks with Environment Secretary, George Eustace last week, warned that shoppers risked spreading the virus by bringing reusable bags from home.”

Not only should the UK government stop their attacks on what they call “single-use plastics” but the EU should ditch its “Single-use Plastics Directive” 2019/904.

The only justification for banning any kind of plastic product is that plastic can lie or float around for decades if it gets into the open environment, but this problem can be solved by making the plastic with oxo-biodegradable technology. This is why the people who want to get rid of plastic altogether are desperate to deny that oxo-biodegradable plastic converts into biodegradable materials. They know perfectly well that it does (Even Ellen MacArthur now says so), but instead they are choosing to put our lives at risk by banning plastic. It is time to say no to these people.

I find it staggering that it takes a crisis of this magnitude to bring some reality to the plastic issue.

Not only should governments stop banning plastics, but they should start actively using plastics to protect their population against bacteria, fungi, and viruses by insisting that all new plastic surfaces are made lethal to microbes – See my column on 2nd March “Using plastic to protect health.”

In summary the New York article says:

“The COVID-19 outbreak is focusing attention on those “sustainable” shopping bags that politicians and environmentalists have been so eager to impose on the public. These reusable bags can sustain the COVID-19 and flu viruses—and spread the viruses throughout the store.

Researchers have been warning for years about the risks of these bags spreading deadly viral and bacterial diseases, but public officials have ignored their concerns, determined to eliminate what they call “single-use” bags and other plastic products despite their obvious advantages in reducing the spread of pathogens.

In New York State, a law took effect this month banning “single-use” plastic bags in most retail businesses, and this week Democratic state legislators advanced a bill that would force coffee shops to accept consumers’ reusable cups—a practice that Starbucks and other chains have wisely suspended to avoid spreading the COVID-19 virus.

John Flanagan, the Republican leader of the New York State Senate, has called for a suspension of the law. “Senate Democrats’ desperate need to be green is unclean during the coronavirus outbreak,” he said.

The risk of spreading viruses was clearly demonstrated in a 2018 study published in the Journal of Environmental Health. The researchers sent shoppers into California grocery stores carrying polypropylene tote bags that had been sprayed with a harmless surrogate of a virus.

After the shoppers bought groceries and checked out, the researchers found sufficiently high traces of the surrogate to risk transmission to the hands of the shoppers and checkout clerks, as well as on many surfaces touched by the shoppers, including packaged food, unpackaged produce, shopping carts, checkout counters, and the touch screens used to pay for groceries.

An earlier study of supermarkets in Arizona and California had found large numbers of bacteria in almost all the reusable bags—and when a bag with meat juice on the interior was stored in the trunk of a car, within two hours the number of bacteria multiplied tenfold.

The researchers also found that the vast majority of shoppers never followed the advice to wash their bags, which “suggest a serious threat to public health,” particularly from fecal coliform bacteria, which was found in half the bags. An outbreak of viral gastroenteritis among a girls’ soccer team in Oregon was traced to a reusable grocery bag.

The website of the New York Department of Health calls reusable grocery bags a “Smart Choice” and advises shoppers to segregate different foods in different bags; to package meat and fish and poultry in small disposable plastic bags inside their tote bags; to wash and dry their tote bags carefully; to store the tote bags in a cool, dry place; and never to reuse the grocery tote bags for anything but food.

How could that possibly be a “smart choice” for public health? Anyone who has studied consumer behavior knows that it’s hopelessly unrealistic to expect people to follow all those steps. If the Department of Health actually prioritized public health, it would acknowledge what food manufacturers and grocers have known for decades – disposable plastic is the cheapest, simplest, and safest way to prevent foodborne illnesses.

Instead, leaders in New York and other states are ordering shoppers to make a more expensive, inconvenient, and risky choice—all to serve a “green” agenda that’s actually harmful to the environment. In addition to health issues, the ban on plastic bags will mean more trash in landfills (because paper bags take up so much more space than the thin disposable bags) and more greenhouse emissions (because of the larger carbon footprint of the replacement bags).”

Defra Warns Against Bioplastics

According to LetsRecycle.com ([Plastic alternatives ‘not the answer’](#)) The head of circular economy at DEFRA (the UK Dept of the Environment, Food, and Rural Affairs) warned against bioplastics on 10th March at the launch of a report produced by the environmental think-tank Green Alliance entitled ‘[Fixing the system](#)’.

Maya de Souza said that switching to biodegradable plastics is not the answer to reducing the UK’s reliance on single-use plastic packaging. “The government always recognises trade-offs, so if we shift to bioplastics, we lose a lot of land space to grow materials.” She is obviously talking here about “bio-based” plastics.

I would agree with her, and there are at least [20 other reasons why bio-based plastics are not very useful](#).

According to the Green Alliance report, at page 18, contamination with PLA – the most common “compostable” plastic – can cause cosmetic and structural problems to PET plastic products containing recycled content. This is the case even at concentrations of just 0.1%, the report said, and would render the finished product unusable for many applications.

The report of the meeting said that “it is hard for composters and AD operators to distinguish between PET and PLA, which means most plastics are removed from organic waste and sent to landfill or incineration to avoid contamination.”

This is exactly what is happening in the Netherlands and Canada, and the industrial composters in other parts of the world don't want it either (see my column on 9.3.20).

Ms. de Souza seems attracted by the idea of recycling plastics, but for the reasons given in my column of 7th January this is not a good idea.

She concluded by saying “we're taking onboard a whole section of different materials and that's very much part of the strategy.”

The main problem facing governments around the world is plastic waste which gets into the open environment, from which it cannot realistically be collected for recycling or composting – so these processes are an irrelevance. My advice to Ms. De Souza is that oxo-biodegradable (as distinct from oxo-degradable) plastic should be very much part of the government's strategy, because its production does not require agricultural land, and it is tested according to ASTM D6954 to biodegrade if it gets into the open environment – not just in an industrial composting facility.

Nor does it place demands on fossil resources, because it is a by-product of refining oil, which would be extracted even if plastic did not exist.

Happy to talk, Maya.

UK MPs

I was surprised to read in Packaging News that 98% of 100 MPs polled believe compostable packaging alternatives can be part of the solution to “the plastic waste problem.” However, one would need to see the questions to see whether there is any substance to this marketing claim.

“The plastic waste problem” is plastic which has escaped into the open environment from which it cannot be collected for composting or anything else.

I would be surprised if the MPs had been told that “compostable” plastic:

- Does not convert into compost – it is required by EN13432 and ASTM D6400 to convert rapidly into CO₂ gas, and the last thing the planet needs is more CO₂
- Is tested by those standards to biodegrade in the special conditions found in an industrial composting facility, not in the open environment
- Uses huge amounts of land and water and consumes fossil fuels and emits pollutants, in the agricultural production and polymerisation process.

- Worst of all, that industrial composters and waste managers do not want it, so it ends up in landfill where it generates methane – a greenhouse gas more powerful than CO₂. First the [composters of Oregon](#) who gave 9 reasons for not wanting it, then the [City of Exeter](#) then the [Suez waste management company](#). This was followed by a damning TV documentary from the [Netherlands showing that “compostable” plastic is actually sent to landfill](#) and now the same story from [Toronto, Canada](#)

I can see no case for investing public money in “compostable” plastic, and no case for giving it special tax treatment.

The only technology capable of dealing with the plastic waste problem in the open environment is oxo-biodegradable technology, which causes the plastic to become biodegradable very much more quickly if it gets into the open environment on land or sea. There is certainly a case for giving favourable tax treatment to this technology, so as to encourage people to switch from ordinary plastic, which could lie or float around in the environment for decades.

Commenting on these thoughts of mine, the Novamont lobbyist, David Newman, said in Packaging News on 12th March:

“Anyone can read the composting standards. Composting certification costs a fortune, around £15,000 because it is so complete. It involves testing the material for biodegradation, toxicity on plants, soil and water, as well as for further testing on food compliance etc.”

My response to this is that composting certification for plastic according to EN13432 (or ASTM D6400 or Australian 4736) does indeed cost a fortune, but it’s a waste of money because the plastic does not convert into compost, and it should not therefore be marketed as “compostable.” The standards themselves say that 90% of it must convert into CO₂ within 180 days.

Mr. Newman also said “the process of biodegradation involves bacteria consuming a material and releasing gasses as well as some water, just like any digestion process. “That is why it is called biodegradation.”

My response is that it may be biodegradation in the special conditions found in an industrial composting facility, but it is not composting. Composting is defined (ISO 17088 clause 3.5) as “an aerobic process designed to produce compost.” How can the process of biodegrading plastic in accordance with EN13432 be called “composting?”

Mr. Newman then continues “The problem with OXO’s is the bacteria don’t consume the material so you do not get biodegradation – which, a court in Italy has ruled on.”

My response is that the whole point of oxo-biodegradation is to reduce the molecular weight of the plastic so that it can be consumed by bacteria, and this is well understood. Mr. Newman should stop claiming that his favourite Italian court case proves the contrary. It was only a complaint by a large Italian company against a small Italian company about words used in its advertising See [Article](#)

Montreal Again

In my column on 7th February I commented that the Mayor has a bad case of plastiphobia.

On 13th March I read an article in the [Montreal Gazette by Joe Schwarcz, director of McGill University's Office for Science & Society](#). Joe has got it nearly right – but not quite.

He says “Most plastics are made from natural gas or petroleum, which is another concern, because these are non-renewable resources. So, we have a dual challenge. Find ways to cut down on the amount of plastic that gets discarded and find renewable resources that can be converted into “bioplastics.””

It is true that natural gas and petroleum are non-renewable resources, but as I have said several times in my column, they are extracted for fuels, and will be extracted for the foreseeable future whether plastics exist or not. Why not then use the by-product of refining these resources to make plastic instead of using scarce land and water resources to make “bioplastics.” Maybe one day the by-product will not be available, but while it is, let's use it.

Joe says that “PLA is deemed to be a “green” plastic because it is made from a renewable resource” and in defence of bioplastics he says “When the corn or sugar cane is growing, it uses up carbon dioxide from the air through photosynthesis.” But that would be true of the vegetation which was there before the crop was planted. He does accept that “the land dedicated to the crops requires deforestation and the use of fertilizer and pesticides.” It also uses a lot of fossil fuel to drive the tractors, trucks and other machinery, so it is not really renewable.

He is correct that “bioplastics are not necessarily biodegradable.” and he notes that “compostable” does not mean that the plastic will break down in the compost heap in your back yard.

I agree with Joe that “while polyethylene is not biodegradable, it is recyclable. But you have to remember” he says “that recyclable does not necessarily mean recycled. Unfortunately, much of the plastic that goes into the blue bins ends up in landfills or incinerators. Separation of plastics is the big problem for the recycling industry.”

Separation is not the only problem for recyclers. Why in fact would anyone want to invest a lot of money to recycle plastic? You have first to collect the waste, then transport it (perhaps for long distances), sort it, clean it, bale it, transport it again and unbale, then reprocess it. By the time you have done all this, how much time have you spent, and how much have you paid for labour, transport, and storage, how much have you paid for capital equipment, and how much fossil fuel have you burned?

And for what? As I have said, plastic is made from a by-product of oil which is extracted to make fuels, and would be extracted whether plastic existed or not, so why not use this very cheap and readily available by-product to make virgin plastic? No wonder that so much plastic collected for recycling gets dumped in the jungle (or at least it did until the Asian countries realised they were being exploited by rich countries who could afford to indulge themselves in environmental ideology).

Whilst almost all pre-consumer waste (eg factory offcuts) is recycled or reused, almost all post-consumer waste plastic is not. There are reasons for this, one of which is that a great deal of water is needed to wash post-consumer waste to make it useable, so the amount of waste-water generated is enormous. Moreover, this process leaves prodigious quantities of dirty solid waste, including biological waste that is hazardous and highly undesirable.

The recycling charity RECOUP says (“Recyclability by Design”) that “where plastic products are particularly lightweight and contaminated with other materials, the energy and resources used in a recycling process may be more than those required for producing new plastics. In such cases recycling may not be the most environmentally sound option.” It is too costly in financial and environmental terms to collect it, transport it, sort it, bail it, store it, and then reprocess it.

The other reason for recycling is of course that if you have collected the plastic waste you have do something with it. It is not a good idea to send it to landfill, because plastic has a high calorific value, so the best option is to send it to modern, non-polluting, thermal recycling facilities and to use the energy released from the plastic to generate electricity, instead of wasting it by sending to landfill.

There used to be resistance to incinerators on the ground they emitted pollutants such as dioxins, but these objections have long since been overtaken by advances in technology, and there are many such incinerators now operating in the world. There is one close to the city centre of Zurich which extracts the calorific value from almost all of the city’s waste – and they even find significant amounts of gold and other precious metals in the ash!

I agree with Joe that “the term “degradable” on a label is misleading (and it should not be used), but I disagree with him that “Oxo-degradable” means that metallic catalysts have been added to the plastic to cause a more rapid degradation when exposed to heat or light.

He is confusing oxo-degradable (which does not contain catalysts and does not biodegrade except over a very long period) with oxo-biodegradable plastic, which does contain a catalyst to reduce the molecular weight much more quickly if it gets into the open environment. See ([Uk Judge Find the Case for Oxo-biodegradable Plastic Proven](#)). The purpose of reducing the molecular weight is to make the plastic accessible to microbes and therefore to make it biodegradable. This is a great environmental advantage, and if this technology had been more commonly used for the last 10 years we would have no ocean garbage patches.

Michael Stephen

Michael Stephen is a lawyer and was a member of the United Kingdom Parliament, where he served on the Environment Select Committee.

When he left Parliament Symphony Environmental Technologies Plc. attracted his attention because of his interest in the environment.

He is now Deputy Chairman of Symphony, which is listed on the AIM market of the London Stock Exchange, and is the founder and Chairman of the Oxo-biodegradable Plastics Association.

Earlier Postings in this Column

- 1/ 1/ 20 – [Plastiphobia, Microplastics and A Throw-Away Society](#)
- 7/ 1/ 20 – [Recycling, Lab Testing, Bangladesh and the Right Bioplastic](#)
- 14/1/20 – [Plastiphobia and Bioplastics Definitions](#)
- 21/1/20 – [Composting, the European Union and Unemployment](#)
- 30/1/20 – [Plastiphobia, Malaysia and a Case Against Compostables and Paper](#)
- 7/02/20 – [Coronavirus, MPs Letter, Montreal, Australia and the Dominican Republic](#)
- 14/02/20 – [Oman, MacArthur Foundation, Stifling Innovation, South Africa and Compostable Plastics](#)
- 24/02/20 – [Serbia, India, Pakistan and European Bioplastics](#)
- 03/03/20 – [Plastic To Protect Health and Common Sense on Plastic](#)
- 10/03/20 – [Plastiphobia, Singapore, Compostable Plastics, Doorknobs and Carbios](#)

Interview with Michael Stephen

- [Questions and Answers on OXO-Biodegradability](#)

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