

# Oxo-Biodegradable Plastics Association

A not-for-profit organisation Limited by Guarantee.  
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## OPA SUBMISSION TO THE GOVERNMENT OF NEW SOUTH WALES, AUSTRALIA

The World has changed since the NSW government issued their discussion paper entitled “Cleaning up our Act” and we think that NSW should not now proceed to phase out lightweight plastic shopping bags. Quite apart from the health issues discussed below, the table on page 23 of the discussion paper shows that lightweight supermarket bags represent only 0.6% of plastic litter.

### PUBLIC HEALTH ISSUES

On 22nd March 2020 the London Sunday Telegraph wrote:  
<http://digitaleditions.telegraph.co.uk/data/170/reader/reader.html?social#!preferred/0/package/170/pub/170/page/64/article/26440>

“The war on coronavirus has made the war on plastic redundant. In the United States, new regulations restricting the use of plastic bags are being suspended, and one mayor has called for a ban on the American equivalent of “bags for life”, given that (unwashed) they could end up spreading this virus. ... Similar measures could follow in the UK, with supermarkets reportedly urging the Government to scrap the bag tax. Old, pointless regulations are being discarded .....

The same points were being made on Fox News television in the USA on 18th March  
<https://video.foxnews.com/v/6142685355001/>

And in the State of Maine USA <https://wgme.com/news/coronavirus/state-considers-delaying-new-law-banning-plastic-bags-amid-coronavirus-spread>

And in Albuquerque New Mexico <https://www.abqjournal.com/1433324/coronavirus-is-why-plastic-bag-ban-should-go.html>

The New Hampshire Governor has urged shoppers in the State to leave their reusable bags at home, and in New York State “Republican Minority Leader Frank Mauriello (R-Colonie) urged Governor Cuomo to pause the statewide ban on the use of plastic grocery bags. He says “lifting the ban could help save lives and prevent additional coronavirus cases in our communities.” <https://cbs6albany.com/news/coronavirus/could-coronavirus-cause-new-york-to-backtrack-on-plastic-bag-ban> New York State will not now enforce its plastic bag ban, which went into effect on March 1.

In March the Massachusetts Food Administration asked the Governor to rescind bans on plastic bags in several towns over concerns that handling reusable bags poses a threat to grocery store workers.

In Alaska, the Three Bears supermarket chain asked shoppers to keep their reusable bags at home given the potential risk to customers and employees.

On 25<sup>th</sup> March, the Mayor of Boston announced that the city is temporarily suspending its plastic bag ban for essential businesses, in order to promote health safety and give them flexibility amid the coronavirus public health crisis.

The Daily Telegraph on 8th March, points out that due to the Coronavirus epidemic “Starbucks has now banned those re-usable cups we were all told were the future, in favour of disposable ones; with experts saying that controlling disease should be given greater priority than environmental concerns. Will plastic shopper bags make a comeback too? Hygiene has always been one of the arguments in their favour, given that people rarely wash the re-usable alternatives.”

And in Forbes Magazine on 17th March- <https://www.forbes.com/sites/patrickgleason/2020/03/17/pandemic-prompts-call-to-suspend-or-repeal-bag-bans--taxes/#298421f0464d> “Grocery store employees are on the front lines in the fight against the spread of the coronavirus. These critical and vulnerable workers shouldn’t be forced to handle reusable shopping bags that scientific researchers have found can act as Petri dishes for bacteria and carriers of harmful pathogens. Yet that is the result of well-meaning but misguided laws on the statute books across the U.S.

The eight states where lawmakers have imposed plastic bag prohibitions are California, Connecticut, Delaware, Hawaii, Maine, New York, Oregon and Vermont. Hundreds of cities, towns, and counties have also imposed a bag ban or tax. All of these laws seek to force or encourage the use of reusable shopping bags, which pose a public health risk at any time and especially during the current pandemic.

There is mounting evidence that reusable bags are dangerously effective when it comes to spreading bacteria and disease. There is also proof that reusable shopping bags are ineffective when it comes to reducing litter and benefiting the environment.

Governors and state lawmakers can continue to help fight the spread of the virus by taking action to suspend or repeal the many bag bans and taxes across the U.S. that now pose an even greater public health risk than in the past.”

Essential as lightweight single-use plastic bags are, the problem still remains that if they get into the environment they can create microplastics and lie or float around for decades. This problem can be solved by insisting that the bags are made with oxo-biodegradable technology. See below.

## THE DISCUSSION PAPER

In his introduction to the discussion paper, the NSW Minister for Energy and Environment, Matt Kean, says that Plastic has vastly improved the quality of our lives and allowed us to pursue unparalleled advances in technology, transport, communication, healthcare, safety and education.”

He is right about that, especially in relation to healthcare and safety.

The Minister then says “plastic has also become synonymous with the global consumer economy “ - usually described as our “throw-away Society.” Of course, nobody likes waste, but there is nothing wrong with a “throw-away” society provided the throwing is done responsibly. Unfortunately a lot of it is not, with the result according to the Minister that “plastic is piling up in our natural environment and posing a risk to human health.”

“The plastic that is littered today” he says “will still exist in hundreds or even thousands of years’ time—possibly longer. Even when plastic does break down, it doesn’t go away, it often becomes microplastics or nanoplastics, which can adsorb dangerous chemicals. The plastic itself and the chemicals attached can be breathed in, absorbed through the skin or ingested.” The Minister is talking about ordinary plastic, and what he says is true - so we need to stop using ordinary plastic.

The scientists who invented plastic designed it to be durable, but they realised that this very durability would cause a problem if the plastic gets into the open environment as litter. Professor Gerald Scott and his colleagues therefore found a way in the 1970s to make the molecular structure of plastic dismantle automatically by oxidation when it had served its purpose, and they called this new type of plastic “oxo-biodegradable.” It is made from ordinary polymers, but the manufacturer of the product adds a catalyst to the polymer mix which accelerates oxidation if it becomes litter in the open environment, so that it becomes biodegradable much more quickly than ordinary plastic – yes, it really does!

It is important to distinguish oxo-degradable from oxo-biodegradable, plastics. Oxo-biodegradable plastics fragment and create microplastics after weathering, but for 50 years or more the molecular weight remains too high for the plastic to be consumed by microbes. By contrast however, the catalyst in oxo-biodegradable plastics will rapidly reduce the molecular weight so that they become biodegradable, and they should not be banned. Indeed it should be made compulsory to use this technology, as has already been done in the United Arab Emirates and elsewhere.

Given that the problem which causes so much public concern is the plastic which escapes into the environment from which it cannot realistically be collected for recycling, it is surprising that so much of this discussion paper is devoted to recycling. If you can collect it there are many ways of dealing with it, of which recycling is only one.

Recycling has become a political issue all over the world. It may be justifiable for some materials, but it has very limited value in relation to plastics.

So, our advice to governments is:

1. Reduce unnecessary use of plastics, but do not deprive your population of its benefits and force them to use materials which are less beneficial to human health or the environment.
2. Improve the education of your people and your waste-management systems so as to minimise the irresponsible disposal of waste materials.
3. Recycle where it makes economic and environmental sense (eg for PET bottles) but otherwise use modern non-polluting incinerators.
4. Recognise that no matter how hard you try, some of the plastic will escape into the open environment. Therefore, make it oxo-biodegradable so that it will become biodegradable much more quickly and be recycled back into nature.

#### USE PLASTIC TO SAFEGUARD HEALTH

Instead of attacking plastics, governments should be urgently using them to safeguard the health of their people against Coronavirus and other dangerous microbes.

Coughs and sneezes undoubtedly spread diseases, but ... surface contamination has been found to be more significant than first thought, with some infectious agents surviving in hospitals for 46 months." According to the Greifswald University Hospital in Germany viruses can survive on plastics for up to nine days at room temperature. Outside hospitals, communal objects such as door handles, telephones, worktops, keyboards, doorbells, credit cards, plastic banknotes, wc seats, and even chip-and-pin devices could be sources of infection.

It is clear that all plastic items that people touch, should be made with anti-microbial additives such as the d2p technology developed by leading OPA-member Symphony Environmental Technologies. These items can be made lethal to bacteria and fungi for the lifetime of the item, and the anti-microbial properties of the plastic do not wear off. Symphony believes that they are also effective against coronavirus, and has initiated tests by an independent laboratory to confirm this. Tests will also be run on COVID-19 itself as soon as practicable.

Symphony's anti-fungal and anti-bacterial additives are already added to toothbrushes, overalls, facemasks and gloves, and they have NSF approval for water pipes. In February 2020 they secured FDA approval in the USA for their anti-bacterial bread packaging.

#### PLASTIPHOBIA

This describes the emotional reaction against plastic which spread like wildfire when David Attenborough's "Blue Planet" programme appeared on the BBC. Listen to this really clear explanation of why the anti-plastic panic is hurting us all. <https://www.biodeg.org/how-the-plastic-panic-hurts-us/>

In January 2020 a report was published by the Green Alliance [https://www.green-alliance.org.uk/plastic\\_promises](https://www.green-alliance.org.uk/plastic_promises) who had interviewed representatives from five of the UK's major supermarkets as well as from major consumer goods and beverage companies. One of them had received many complaints saying that "plastic is evil and has no place, regardless of any positives it might have in addressing food waste and what not... It's been ferocious."

However, these companies need to resist Plastiphobia, because the report finds that "Worryingly, the brands report that decisions to switch away from plastic are often made without considering the environmental impact of the substitute materials chosen." Multiple interviewees indicated the desire to avoid "kneejerk reactions", suggesting that, while they know they need to have a better approach to plastic and packaging, they "need to have time to get the right solution in place." One respondent added: there is "not a lot of joined up thinking going on." Another noted: "I think there's a lot of pressure to move to alternatives, which aren't necessarily better from an environmental and climate impact point of view."

The Report says that some decisions have been taken knowing it could actually increase environmental burdens. One supermarket representative was frank: "We are aware that [by switching from plastic to other materials] we may, in some cases, be increasing our carbon footprint." A brand representative bluntly complained about misinformation being spread

about the environmental credentials of non-plastic single use packaging formats: “The past year has just really annoyed me no end with companies coming out and boasting about not using plastic, even when they’re in single use glass, and their carbon emissions are going to be off the scale.”

PAPER? Some supermarkets had shifted to single-use paper bags, but the Report says that “This is a worrying trend, as paper bags can have much higher carbon impacts. A 2011 study for the Northern Ireland Assembly found that paper bags generally require four times as much energy to manufacture as plastic bags. A February 2018, Life cycle assessment of carrier bags in Denmark concluded that “When factors like ozone depletion, human and ecosystem toxicity and water and air pollution are accounted for, a paper bag would need to be reused 43 times to have a lower impact than the average plastic bag.”

REFILLABLES? concern with the in-store refill model is the reduction in shelf-life for some products, with one respondent noting that some fresh drinks would last just two days if poured into a customer’s own bottle, compared to 20 to 30 days in a factory sealed container.

REUSABLE BAGS? [Apart from the health issues mentioned above] “The increase in the use of so-called ‘bags for life’ that has accompanied the five pence single use carrier-bag charge in England is a case in point. Shoppers are often using bags intended for multiple use like single use bags, purchasing an average of 54 a year, resulting in an overall increase in plastic use.”

The NSW paper says (p14) “the heavier plastic bags now being offered, usually at a cost to the consumer, also pose similar risks to the environment when they are only used for a limited time and then disposed of.”

COMPOSTABLE PLASTIC? “One repeated concern was around the use of bio-based and compostable material for packaging. A Grocer survey of more than 1,000 individuals in 2019 found that consumers think that plant-based compostables are the most environmentally friendly packaging materials, ahead of paper, glass, cardboard, conventional plastic and aluminium, in that order. However, the retailers and brands we interviewed were wary about replacing conventional plastic with these novel plastics in their packaging. Some of this came down to cost, with one supermarket representative suggesting: “It’s difficult to see how that can get to a realistic cost position.”

Not only is it difficult to get to a realistic cost position because these plastics cost much more than ordinary plastic – but they are also addressing the wrong problem. They don’t solve the problem of plastic waste which has escaped into the environment, because you first have to collect them and take them to an industrial composting plant. They do not convert into compost, as 90% of the plastic has to convert into CO<sub>2</sub> (See EN13432; ASTM D6400; Australian 4736).

Worse still for “compostable” plastics, the industrial composters and waste-managers don’t want them. First the industrial composters of Oregon gave 9 reasons why they were not wanted, 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. See:

SUEZ WASTE MANAGEMENT COMPANY <https://www.usinenouvelle.com/article/sacs-plastiques-compostables-le-grand-malentendu.N926789>

NETHERLANDS <https://bioplasticsnews.com/2020/02/17/the-composting-fairy-tale/>

<https://bioplasticsnews.com/2020/03/03/translation-documentary-monitor-compostable-plasticsble-netherlands/>

<https://bioplasticsnews.com/2020/03/03/nl-composting-industry-does-not-want-compostable-plastics/>

OREGON <https://www.biodeg.org/oregon-composters-dont-want-compostable-packaging/>

EXETER <https://www.biodeg.org/exeter-rejects-compostable-plastic/>

TORONTO <https://www.cbc.ca/news/technology/plastic-packaging-compostable-plastic-marketplace-1.5487617>

GENERAL

<https://www.packagingnews.co.uk/features/comment/michael-stephen-compostables-no-place-circular-economy-04-02-2020>

<https://www.circularonline.co.uk/opinions/why-supermarkets-should-not-cave-to-plastiphobia/>

<https://bioplasticsnews.com/2020/03/03/compostable-plastics-are-not-circular/>

21 Reasons <https://www.biodeg.org/wp-content/uploads/2020/02/21-reasons-why-2020-copy-anastasia.pdf>

People are already saying that “compostable” plastic is an expensive irrelevance, sustained only by aggressive marketing and by politicians who don’t have time to understand the issues, and that the industry really has no future despite all the money invested.

The Green Alliance report quotes one respondent “As a retailer, a lot of time is spent on responding to media and public perception of the plastics issue. This can detract from the more rigorous work required to develop longer term, systematic, sustainable solutions that have the potential to positively transform consumption patterns.” Another respondent said “I’d like to be having a more rounded, well informed debate around plastic...”

They are right. Supermarkets around the world need to be engaging with the OPA and its member-companies who understand oxo-biodegradable plastics, and challenging the EU - not lying down and waiting for muddled thinking and commercial lobbying in Brussels to remove this option from their decision-making process. See below.

## RECYCLING PLASTICS

Why would anyone want to invest a lot of time or 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.

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, how much fossil fuel have you burned, and how much greenhouse gas have you generated?

And for what? 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? We do not agree with the NSW paper that by reducing the amount of new plastic we make we reduce greenhouse gas emissions. In fact plastics have a better LCA than alternative materials, such as paper or biobased plastics

Because recycling of cheap contaminated plastic packaging makes little economic or environmental sense, it is not surprising 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 NSW paper correctly points out (p16) that “many plastics cannot be repeatedly recycled. Thermoset plastics (such as fiberglass and foams), which are made of polymers that become irreversibly rigid when they are heated, cannot be remelted or reshaped. This makes thermoset plastics difficult to recycle; often they can only be recycled into lower value products, which usually cannot be recycled themselves.”

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.

This is because plastic has a high calorific value, so the best way to deal with is to send it to modern, non-polluting, thermal recycling facilities and to use the calorific value released from the plastic to generate electricity and reduce dependence on other fuels, instead of wasting it by sending to landfill. In the past there was resistance to incinerators on the ground they emitted pollutants such as dioxins, but these objections have long since been overtaken by advances in technology.

There are many non-polluting incinerators now operating in the world. There is one close to the city centre of Zurich, Switzerland, 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!

Recycling is sometimes used as an objection to biodegradable plastic, on the basis that it would contaminate a post-consumer waste stream, but this is clearly inapplicable if the relevant waste plastic is not going to be mechanically recycled anyway.

Although oxo-biodegradable plastic is used for low-value items which are not worth recycling, experts in Austria and South Africa have found it suitable for recycling with ordinary plastic if anyone still wanted to recycle it. See

<https://www.symphonyenvironmental.com/resource/new-tckt-report-confirms-oxo-biodegradable-plastic-can-be-recycled-with-ordinary-plastic/>

They also found that bio-based plastics are not recyclable.

All recycling processes suffer from the same problem – you first have to collect the waste – so recycling does nothing to deal with the main problem which causes so much public concern – the plastic waste which has escaped into the open environment. We would agree with efforts in NSW to encourage people to collect plastic litter, but they will not collect it all.

## MICROPLASTICS

These are tiny pieces of plastic, which are being found all over the world on land, in the sea, and now even in the air we breathe. They are created by the fragmentation of ordinary plastics caused by the effects of uv light and mechanical stress. The problem is that although these plastics are fragmenting, their molecular-weight remains too high for biodegradation, so they persist in the environment, getting smaller and smaller over a period of many decades. The answer to this problem is to use oxo-biodegradable technology, so that if they do get into the open environment the molecular-weight of the plastic will rapidly reduce and it will cease to be plastic. It will then have become a source of nutrition for micro-organisms, who recycle it naturally, back into nature.

A report was published in 2017 by the Ellen MacArthur Foundation and endorsed by some of the world's largest producers of the very plastic packaging which is polluting the oceans. The Report claimed that "oxo-degradable" plastics simply fragmented into tiny pieces of plastic - but having engaged with our scientists they no longer say that.

They now accept in their May 2019 report that "oxo-degradable" (they mean oxo-biodegradable) plastics are manufactured so that they can degrade faster than conventional plastics and that they do become biodegradable, but they say that "it is not yet possible accurately to predict the duration of the biodegradation for such plastics."

For that reason a broad indication only can be given as to timescale. It is however possible to say with certainty that at any given time and place in the open environment an oxo-biodegradable plastic item will become biodegradable significantly more quickly than an ordinary plastic item. Sunlight and heat are not essential, but they will accelerate the process and it will therefore proceed more quickly in hot countries than in the UK.

It is not important how long a particular piece of plastic in a particular place will take to biodegrade – the importance of oxo-biodegradable technology is that it will gradually reduce the overall burden of plastic in the environment.

There is huge pushback against this technology from some of the largest companies in the world who make "bio-based plastics" and from other large companies who will not spend an extra 1% on oxo-biodegradable technology to protect the environment from their products, which we can see with their name on them, littered all over the globe. They have all heavily lobbied governments and international institutions.

## OXOBIODEGRADABLE PLASTIC - THE SCIENCE

The biodegradability of oxo-biodegradable polymers has been extensively studied and reviewed in scientific articles over more than 40 years since the publication by Professor Gerald Scott of his academic textbooks on the subject "Polymers in the Environment" - (Royal Society of Chemistry), "Degradable Polymers, Principles and Applications" (Kluwer Academic Publishers) and many peer-reviewed academic papers on this subject. In these publications Professor Scott has made it clear that oxo-biodegradable plastic will degrade and then biodegrade in the open environment very much more quickly than ordinary plastic, leaving no persistent fragments and no toxicity.

In 2018 the scientific evidence was reviewed by a distinguished former deputy judge of the High Court in England. <https://www.biodeg.org/uk-judge-find-the-case-for-oxo-biodegradable-plastic-proven/> This has been confirmed by later research published by Queen Mary University London in February 2020. <https://www.biodeg.org/wp-content/uploads/2020/02/published-report-11.2.20.pdf>

## THE EUROPEAN UNION

So if the EU has banned oxo-degradable plastics, Australia must do likewise – right? - Wrong.

The January 2018 report of the EU Commission was concerned about microplastics. It did not recommend a ban, but it did recommend that the European Chemicals Agency (ECHA) be requested under Art 69 of the REACH Regulation 2006/1907 to make a study.

The OPA submitted a substantial body of evidence to ECHA, and ten months into the study, ECHA advised that they were not yet convinced that microplastics are formed, and requested more time. Instead of granting more time, the EU Commission terminated the study, so there is no scientific justification for any ban from the European Union's own scientific experts and the purported ban is unconstitutional. It is not permissible to deprive people of the right to sell their products without due process.

ECHA also received a large number of submissions from all over the world that a ban of this technology would be seriously damaging for the environment if it were followed in their countries.

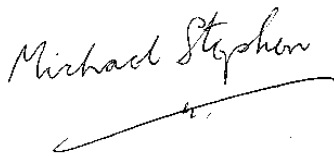
## CONCLUSION

The NSW paper concludes by saying "Understanding the environmental and human health impacts of plastics and developing innovative solutions is a complex and ongoing project. There are still many gaps in our knowledge and many as yet unknown opportunities to create better solutions for our state. Setting up a NSW Plastic Research Network will bring together key stakeholders, helping them to share knowledge and ideas to better understand the problem and come up with innovative solutions.

Bringing together research institutions, government organisations and other key organisations will help make sure we get the best new information available and come up with innovative solutions that provide value and opportunities for NSW."

The Oxo-biodegradable Plastics Association agrees with this, and is willing to participate in the NSW Plastic Research Network.

Regards,

A handwritten signature in black ink that reads "Michael Stephen". The signature is written in a cursive style and is positioned above a horizontal line that extends to the right.

MICHAEL STEPHEN  
Chairman, OPA,

Member of the Environment Select Committee of the House of Commons 1992-95