

Discussion on Ideas for Reducing Our Plastic Trash Problem

About the Author

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Dr Ross Headifen is an engineer who, with his wife, spent 13 years in Melbourne running an environmental engineering company. They also spent 2 years volunteering in East Africa installing groundwater wells for rural villages. It was quite noticeable that here was a society with only a small amount of plastic trash. It was clear to see that the recent introduction of plastic bags and water bottles by the West was going to cause immeasurable environmental harm in those countries in the next few years.



A large collection of plastic bottles of just 150 m of a Melbourne city beach. That equated to a bottle every 3 m.

In 2009, Ross started researching the topic of making plastics biodegradable. Working with a friend in Florida who was making one-off use disposable plastic bailers for groundwater sampling, they converted them over to biodegradable plastic. In the course of this development they researched and learned about the enormous, worldwide plastics trash problem and various ways to degrade plastics.

Introduction

In a time where the buzz is all about greenhouse emissions reduction and protecting our planet, the plastics issue is a key part of this. So much energy is used to make one-off use plastic items, or items of convenience. Some only have an effective life of just minutes before being discarded. They then remain un-degrading in the environment for centuries becoming our great grandkids problem. Reducing consumption of these items and providing incentives to not litter are the focus of this article.

These are ideas developed while researching the biodegradable plastics issues, while talking with people in the community and from local action groups, and while walking along the esplanade and picking up plastic bottles and bags every day. There are many other people with good ideas too that will help control this plastics trash problem.

Solutions to Limit Plastic Trash

Plastic trash comes from a variety of sources and each should be treated and addressed separately to achieve an effective control. On our beaches and in our parks, the plastic trash is mostly public consumer related items, such as bottles, bags, cups, straws and the likes. They mostly have one thing in common and this makes their control a somewhat easier problem to tackle. The commonality is they are all items of convenience for consumers, one-off use disposable plastic items. Trash either comes from careless people leaving their items behind, or being washed in by high tides on beaches or being carried onto beaches by city stormwater drains.

Below is a suggested list of options that could be enacted to help remedy our burgeoning plastic trash problem.

Council and State Level Actions

1) Reduce Cost of Manual Pick up Methods for Existing Trash

Some of the trash on the beaches and in parks cannot be picked up by machines due to access or terrain. It needs manual pick up which can be expensive to employ commercial contractors to do. Hence lower cost pick up solutions ought to be considered. .

- a) There is a 'Work for the Dole' scheme. Can the local councils engage some of these people to do regular trash pickup along the beaches? This could be a lower cost way for the councils to get extra support to tackle this trash problem without paying commercial contractors.
- b) The trash problem is worse over the summer months and this coincides with students being out of school. There are many students looking for part time summer work and this may suit. They are a lot less expensive that a commercial contractor to pay. If 1 hour per 100 m of beach was allowed for every 2nd day that may be sufficient.

Since councils are on a limited budget, the spending of funds to reduce the amount of litter should mean lesser funds are needed for litter clean up. This is a better solution for the beaches and parks.

- 2) Install Litter traps on all storm water outlets.
- 3) Educate beach goes about the problem they are causing.
 - a) At the moment there are no consequences for littering. People can litter knowing someone else will pick up their trash. So perhaps some beach patrol rangers on weekends and holiday eve nights over summer. These rangers could walk along the beach reminding people to not leave litter



when they leave and giving out post cards advertising how bad of a problem litter is on the beaches saying they will be issuing fines to people seen littering the beach. (Catching litters in action is akin to catching graffiti vandals. Unless they are caught in the act it is not possible to take action. However all graffiti vandals know it is illegal and they will be in trouble if they are caught. So they do not openly graffiti. We can't stop it but if the vandals are often forced to do their actions at remote times of night in dark places.) Currently litterers have much less concern about being caught for littering as up till now it has not been enforced. Who knows maybe the fines imposed will pay for the cost of the beach rangers. It probably would not take long to spread the word around. Issuing a few fines and getting news of them on the TV would spread the word around Melbourne about 'if you litter the beaches it will cost you'.

b) Some plastic trash can be easily controlled as it comes from specific areas. For example the area of Middle Park where the volley ball nets are located. Part of the permit to use this area should be the responsibility to clean up the trash left after events. It wouldn't take more than 15 minutes to do a pass around the courts area to pick up trash before leaving the area. Alternatively, the operator should be made to inform the spectators and participants to not litter this playing area. The same applies to the Beach Tennis site and the numerous cafes/kiosk along the beach. They should all have to police litter around their facilities out to about 50 m daily. The goods sold by the kiosks and cafes are often the goods that make the litter along the paths and beach. So they should have some responsibility for that litter. The piers and paths the fishermen use are often littered with plastic bait bags and other plastic bags. From the piers the bags blow into the water directly. Posting clear and head high signage at these frequented spots, and the occasional visit in the evening by a beach ranger to remind them to take their trash away, could help. On piers that have fishing trash left there, put up a sign that says; *'Due to the amount of plastic trash left there by fishermen the council is banning fishing from that pier for 1 month. Fines will be imposed for illegal fishing during this time.'* Then send the beach rangers out to issue fines to people fishing from that pier while the ban is on. This will only happen a few times and the fisherman will stop leaving their trash.

c) Visual Signage. An A2 or A1 sign at every entrance to the beach through the bluestone wall. Many of these entrances have litter bins there with the 'No butts and no bottles' notices stuck to them but they are not readily obvious to read and some bins don't have the notices. The idea would be to erect a sign on a pole at head height to the footpath. Use these signs to tell people:

Do not Litter our precious beaches.

Deposit all your trash in bins.

Recycle all bottles.

Fines for Littering will be imposed. (Assuming the council can do this)

d) Use these signs to start a catchy ad campaign:



4) Other actions

a) Along the Port Melbourne length of beaches there are no recycle bins. Installing these with appropriate signage would help.

b) Ban the use of disposable plastic water bottles smaller than 2 litres on beaches and in parks. This would cut down the water bottle use by 75% in one easy step. It would make people bring their own reusable water bottles to refill rather than buy the disposable water bottles. Concern may be expressed about the local retailers being disadvantaged on this. However they would have the opportunity to sell cold water to people to put in their reusable bottles. People are prepared to pay \$4 or more per liter for cold water in a disposable bottle so they would also expect to pay for cold water refilled into their own bottle if they do not want to carry around a 2 liter bottle.

There are existing precedents for this type of action. The University of Canberra recently banned all water bottles on its campus. The NSW town of Bundanoon has banned water bottles from the town. Instead they installed water bubblers to let people refill their own reusable bottles with chilled water.

c) The local councils could approach all the retailers and grocery markets along coastal or park regions and get their managers to place signage about how bad plastic bag trash has become for the environment. They could also train their staff to actively promote, at the checkout counter, reusable bags instead of free plastic bags. At the moment many stores do not even ask if a customer has a reusable bag, they just start putting the items in a new plastic bag. Conscientious stores could offer a \$1 off the bill over \$20 say, to any customer who brings their own bags. Encourage the cafes to go back to cardboard cups and straws and away from plastic ones.

At the State and Federal Levels –

1) Reduce the incentive for people to use disposable plastic items. It is difficult to understand why manufacturers are immune to the environmental damage their products knowingly will make. Manufacturers should be held partially responsible for environmental damage their products are causing. Back in the middle of the last century, when cities were smaller and plastics were in their infancy, we did not place as much importance on environmental issues. Now with larger high density cities and throw away plastics so commonly being used, we need a change in how we think about the cost of an item. It is no longer only the cost for a manufacture to produce it, but to keep our environment clean and safe, the costs needs to include effective disposal procedures. These disposable one-off use plastic items or items of convenience, have become a big part of our pollution of beaches and parks. As such we are not currently paying the true price for these items. Councils are paying cleaning companies to keep their beaches and parks clean on a daily basis in some places. Community action groups are being formed with people willing to volunteer their time to clean these places. Yet the manufacturers have no responsibility for any of this. Does this make sense?

a) Introduce a Bottle Refund Scheme. We know it was tried not too long ago, but it was rejected by most states. This really has to be enacted as nothing else is working and it gets steadily worse. Thirty years ago, almost no one bought water in disposable water bottles. According to statistics from the USA, *'According to the Beverage Marketing Corp, the average American consumed 1.6 gallons (6 liters) of bottled water in 1976. In 2006, that number jumped to 28.3 gallons (106 liters).* This is a 17 fold increase! In Australia 550 million liters of bottled water were consumed in 2004-2005 year. If they were half liter bottles that could mean up to 1 billion disposable bottles were used. Only approximately 35% were recycled. The rest went to landfills eventually or unfortunately the ocean. So the bottled water concept started out as a small idea that few thought would take off because tap water is free. In the 2011 Australian Open, water was being sold in disposable plastic bottles for \$8.40 per liter. A 600 ml of bottled water uses approximately seven times as much energy as 600 ml of water from the tap in Australia. The industry has actually expanded into a large industry, growing in excess of 10% pa. The plastic bottle industry is creating a major environmental problem which is unprecedented in history. (In the USA, volunteers picked up 189 million plastic bottles in 2008 from roads, water ways and parks). Plastic bottles take up 38% of landfill space in

Australia. Getting rid of the small plastic bottles would save landfill space significantly. The price of a product should include an allowance for the product to be disposed of effectively.

How would a bottle refund scheme work? There are many ways, but here is one simple way it could be implemented. 1) The original bottle manufacturer or importer pays a tax of say \$0.25 for each bottle they sell or import. This is similar to a GST tax. This is paid to the state government monthly. 2) The manufacturer will pass this cost on to the retailer who then sells the bottled drink for at least \$0.25 more. 3) The consumer buys the drink and when finished with it has two choices. a) Take the bottle to a government funded return point and get \$0.25 back on it. Or b) Return the bottle to a conveniently located retailer who gives them say \$0.20 for it. When the retailer has collected a number of bottles, they are taken to a government funded return point and the retailer receives \$0.25 each for them. The government uses their \$0.25 profit to run the program and set up the return points. The added cost to the bottled drink would make some cost conscious consumers think twice about spending that amount and may revert to using reusable bottles, thus saving their pocket book and greenhouse emissions.

South Australia has a 10 cent refund which makes a small effect (3 % difference in trash content from SA to other states). In 11 states in the USA with a bottle refund, bottle recycling is approximately two and a half times that of non refund states. This refund value puts sufficient value on empty bottles so few bottles are left to become litter. The bottles that were still discarded would be salvaged by others wanting the \$0.25. Summer kids would be out in force looking for discarded plastic bottles to return. This also has a secondary benefit as it would take the bottle recycling from approximately 30% to a very high number. This saves on the energy and emissions (estimated to be reduced by over 350,000 tonnes for Victoria) used to create new bottles all the time.

b) Impose a Disposable Plastic Items Tax to cover environmental costs. Plastic straws on the beaches are very prolific. Plastic cups and their plastic tops, although less in number, do create more of an eyesore because they are larger in size. Plastic bags are numerous. Straws used to be made of a type of cardboard that was biodegradable. We only switched to plastic items as they were cheaper for manufacturers to make. A plastic straw has a useful life of about 30 minutes or less yet it may last in the environment for hundreds of years. Does this make sense?

In many places, coffee is often served in a cardboard cup. Why? That's because coffee is hot and thin plastic loses its strength at high temperatures. This shows people are accepting the use of a cardboard cup. Yet when cups are provided for a cold drink, they are generally plastic. Again, why? That's because plastic is cheaper to manufacture. However the back end costs of their environmental damage is considerable.

If a Disposable Plastic Items Tax was imposed to make disposable plastic items more expensive than

their biodegradable cardboard, or paper counterparts, then our plastic trash problem would be substantially reduced. The income from the tax could be used perhaps to help grow more forests for the cardboard requirements, or pay for beach and park clean ups for what trash was still left there. If manufacturers had to pay a 10 cent (or some other higher number) tax on every one of these type items they produced, the items would not be manufactured in such numbers. If the consumer had the choice of a free cardboard straw or a 10 cent plastic straw, it is not hard to imagine what would happen to plastic straws. In 2002 Ireland started charging for plastic bags and their plastic bag consumption dropped by 90%. China banned thin plastic bags outright and dropped consumption by 40 million bags and saved 1.6 million tonnes of petroleum. Reusable bags are now becoming a fashion statement. IKEA started charging for plastic bags and saw a 95% drop in consumption. In 2007 San Francisco banned non biodegradable plastic bags. In July 2010 Los Angeles banned non biodegradable plastic bags and taxed others at 25 cents. (Seven cents go to stores and 18 cents go to anti pollution and recycling programs).

c) Encourage industry leaders who manufacture disposable one off use plastic items to reconsider manufacturing with biodegradable cardboard versions of these items. This was how it was before plastics became so cheap and before we had such a visible plastics trash problem.

d) The 4 R's, the Ultimate Solution. We are familiar with the 3Rs of Reduce, Reuse and Recycle. The above points are all using one or more of these terms. These all have the goal of waste minimisation. However, even if disposable plastic items are Reused and Recycled, they will all eventually be discarded one day to a landfill. There is now new technology to offer a 4th R for Rejuvenation and bring the final solution to our plastic trash. Since 2008 there have been new companies who offer a biodegradable additive (www.goecopure.com, or <http://ecologic-llc.com/company/>) When added to a plastic at the time of extrusion or moulding, it makes the plastic susceptible to digestion by bacteria or biodegradable in a landfill. Once in an active landfill, the plastic will biodegrade down to biogas and humus or plant fertiliser. This will allow Rejuvenation of the soil again and finally close the cycle. (The plastic will retain all its original properties of strength and colour until it is disposed to a landfill.) These additives have USA FDA (Food & Drug Administration) compliance for food contact. What if all disposable plastics were required to be made with one of these additives in them, so that whenever they are discarded, they will return to the earth to rejuvenate the soils?