



Volvo Ocean Race Turn the tide on plastic at sporting events

User guide | June 2018

With the cooperation of





Photo: Jesus Renedo/Volvo Ocean Race

About the Race

Since 1973, the Volvo Ocean Race has provided the ultimate test of a team and a human adventure like no other. Over four decades it has kept an almost mythical hold over some of the greatest ever sailors – and the 2017-18 edition took the teams 45 000 nautical miles around the world, across four oceans, touching six continents and 12 landmark Host Cities.

At each of our stopovers we create a Race Village, with hundreds of thousands of visitors seeing the race boats, meeting sailors, visiting team bases and boatyard, and enjoying music, entertainment, food – and bars. The Race Villages feature the Volvo Pavilion, and Volvo Cars, Trucks, Buses, Construction Equipment and Volvo Penta. Our sponsors activate onsite and local and touring installations entertain guests including interactive elements on ocean health and plastic pollution. The Race Village and our in-port racing is an attraction for visitors and our corporate hospitality and sponsor programmes.

Volvo Ocean Race Sustainability Partners

Volvo Ocean Race sustainability programme is only made possible through the commitment and support of our sustainability partners.

Sustainability Partners

Founding Principal Partner



Principal Partner

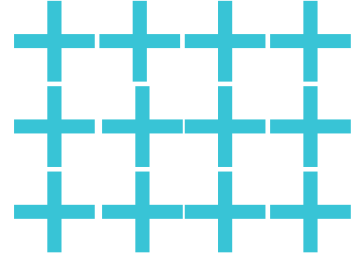


Main Partners



We Support





Let's turn the tide on plastic at sporting events!

As ocean racers and advocates, all those involved in Volvo Ocean Race recognise the critical environmental challenge facing us. That's why the Volvo Ocean Race Sustainability Programme centres on Ocean Health with a focus on plastic pollution.

With the race's global platform we have a unique opportunity and clear responsibility to fight for this urgent issue. We want to play our part in a cleaner future for our ocean.

Our sustainability programme aims to create awareness, activate discussion, highlight local relevancy and put out a call to action to business, government and individuals to play their part in turning the tide on plastic.

This guide has been produced to share our knowledge and learnings on how to reduce single-use plastic at sporting events (well - at all events!)

We hope it inspires you to take action to turn the tide on plastic at your event.

Meegan Jones
Sustainability Programme Manager
Volvo Ocean Race

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Photo: Beau Outteridge/Turn the Tide on Plastic

We're racing against plastic pollution

**Our oceans are awash with
plastic litter.**

**If we keep going the way we
are, there could be more
plastic than fish in the
ocean by 2050! ⁱ**

One of the biggest problems the ocean is facing right now is the amount of plastic that is being dumped into it.

One study estimates at least 8 million tonnes of plastic leaks into the ocean every year.ⁱ Most of this comes from land. Litter makes its way into gutters, storm water drains, streams and rivers, all emptying into the ocean.

Plastic in the ocean is killing sealife through strangulation and ingestion. There are now more microplastic particles in the ocean than stars in the galaxy and the effect of these tiny plastic particles accumulating in the food chain on human health is still being studied.

Read more on plastic pollution later in this guide.

Sport can lead the way

From local playing fields to the world stage, athletes, teams, clubs, events organisers, federations, stadia, spectators and fans are joining forces to turn the tide on plastic.

Sporting events can show true leadership by eliminating single-use plastic from their sites and advocating throughout their supply chain and fan base for everyone to play their part in making **#CleanSeas** a reality.

With the potential for sporting events to generate hundreds of thousands of pieces of otherwise avoidable single-use plastic, the pressure is on to clean-up quick and to use sport's global reach to raise awareness and action amongst our competitors, fans, spectators and supply chain.

Sporting events can achieve a drastically reduced plastic footprint with commitment, thoughtful planning and follow through.

This guide will help you tackle single-use plastic at your event. There is a quick checklist at the start of the guide and then it dives into the deeper detail.

Every event and circumstance is different. Use this guide to illuminate the potential single-use plastic issues at your event and set your single-use plastic plan in place. The guide shows examples of how we at **Volvo Ocean Race** have managed to significantly reduce our own plastic footprint.





Turn the tide on plastic at sporting events!



Stop!

Think twice!

When making a decision to buy any type of item that contains single-use plastic, take time to stop and **re-think** your need for the single-use plastic item.

Do you really need it?
What is the alternative?
There will often be a **better way!**

Ten quick tips

- ☐ **No plastic straws;** go without or source compostable straws.
- ☐ **No plastic shopping bags;** encourage paper or re-usable bags instead.
- ☐ Use **bulk dispensers** for condiments; no single serve sachets or tiny tubs.
- ☐ Have **re-usable** or **compostable** cups, plates, bowls, cutlery, stirrers; no disposable plastic (or plastic lined) serviceware.
- ☐ Have **water refill points;** don't sell or serve disposable plastic bottled water.
- ☐ Serve or sell **freshly prepared drinks,** wet pour beers and soda, or packaged in cans or glass.
- ☐ Avoid mixed material packaging (e.g. juice cartons) unless recycling is available.
- ☐ Use **tea and coffee urns** or espresso machines; avoid single plastic or foil capsules or disks.
- ☐ Have **plastic free celebrations;** don't permit balloons, glitter, confetti, disposable plastic spectator paraphernalia, or fireworks that use plastic canisters.
- ☐ Have **re-usable bungee or velcro straps** to attach branding and cables; not plastic disposable cable ties.

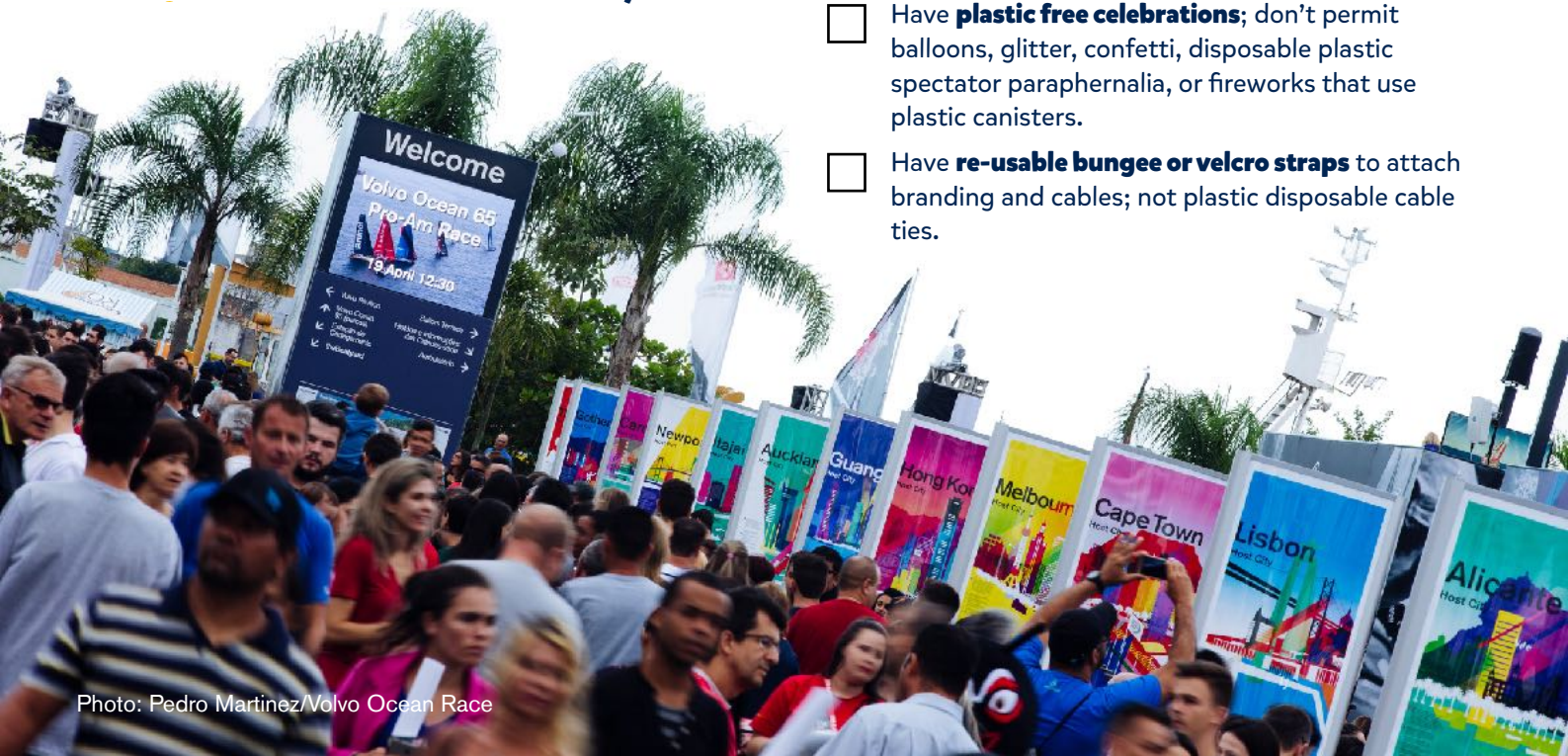




Photo: On Board Reporter: Jen Edney/Volvo Ocean Race

Chart a course to single-use plastic freedom!

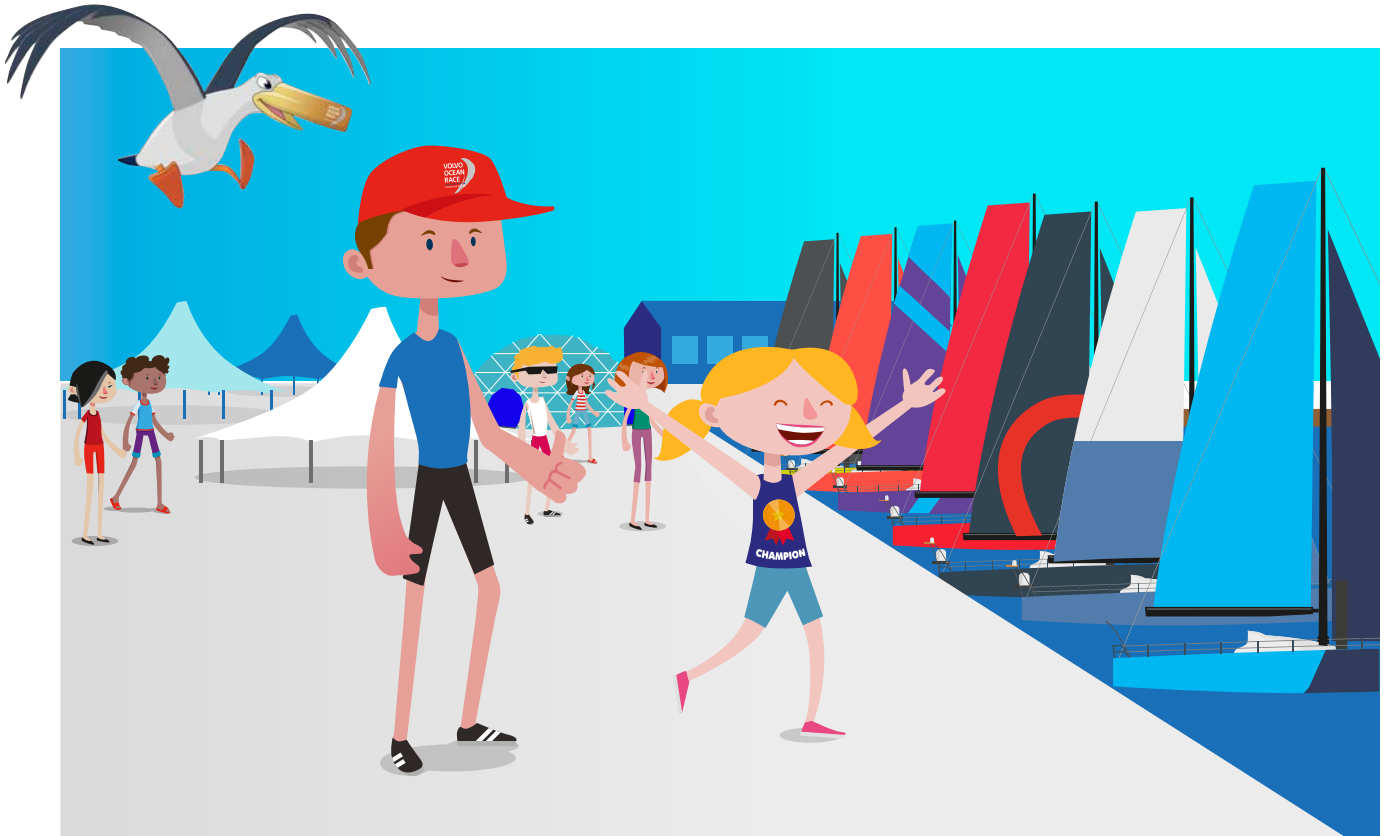
To avoid single-use plastic and to come up with alternatives, you need a Single-use Plastic Plan.

The destination, setting, event type, style of activities, amount of catering, health regulations, resource recovery systems, and local solutions will all factor-in to the best way to approach single-use plastic avoidance for your event. **Use these P's to help chart your course >>>>>**



Create your Single-use Plastic Plan

- What **potential plastic** is there?
- Where are the **places** it could appear?
- Who are the **people** you need to participate?
- Define the **policy** you'll try to stick to.
- Keep it all in check through plastic **policing!**



Single-use plastic at sporting events

Plastic makes an appearance through every area of most sporting events - food and beverage service, merchandise, branding, and deliveries. It's walked onto the site by spectators, and brought in by sponsors. Identifying where it could appear and working out how to stop the flow is your mission!

Single-use plastic appears most often through food and beverage service - bottles, cups, containers, wrappers, sachets, cutlery, straws, and stirrers. Go **re-usable**, or switch to natural materials that are **compostable**.

Single-use plastic can also sneak in through those crazy creatives from campaign agencies who come up with ways to promote their brands - think merchandise, gifts, prizes and **giveaways**.

Contract in to sponsor agreements that these single-use plastic items are not permitted.

Pretty litter can be a problem too - confetti, glitter and balloons. Offer people **experiences** rather than bling. Create **plastic-free celebrations!**



Plastic of various types will also be part of temporary signage and branding overlay, accreditation and ticketing. **Design for re-use**, plan-in end of life, and look for **recycled** and **recyclable** materials.

Everything that is delivered to the event site (décor, materials, food & beverage), all have the potential come packed and wrapped in plastic. Push back on your supply chain to **deliver without disposables**.

Sports fans can also buy up big in plastic paraphernalia. Clappers, fingers, horns, confetti bombs, balloons, streamers and signs.

Encourage fans to create ways to display their **passion without plastic!**

The Race is on!

We've settled into a single-use plastic comfort zone, but the race is now on to change our plastic habits.

Events might have previously held back because of lack of alternatives or systems to get off single-use plastic. Confusion on what is really a better option can lead to inaction. But the barriers to avoiding single-use plastic are now crumbling. Solutions are available, you just need to decide to do it!

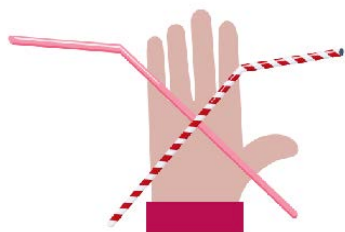
Set out on your single-use plastic prevention journey by remembering these five R's!

Photo: On Board Reporter: Martin Keruzore/Volvo Ocean Race



1. Rethink

...your relationship with single-use plastic.
Does your sporting event really need it?



2. Refuse

...to accept avoidable single-use plastic in any of your event's plans and question excuses of cost and convenience.



3. Reduce

... the plastic volume, the size, thickness, grade, and variety. Less is more!



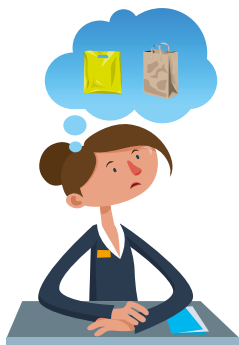
4. Replace

...single-use plastic with sustainable alternatives - think of re-usable, natural, compostable and creative options.



5. Recover

... unavoidable plastic and send for re-purposing, recycling or energy recovery.



1. Rethink

Does my event really need this plastic item?

Which single-use items can you immediately avoid by just not providing them, or coming up with creative alternatives?



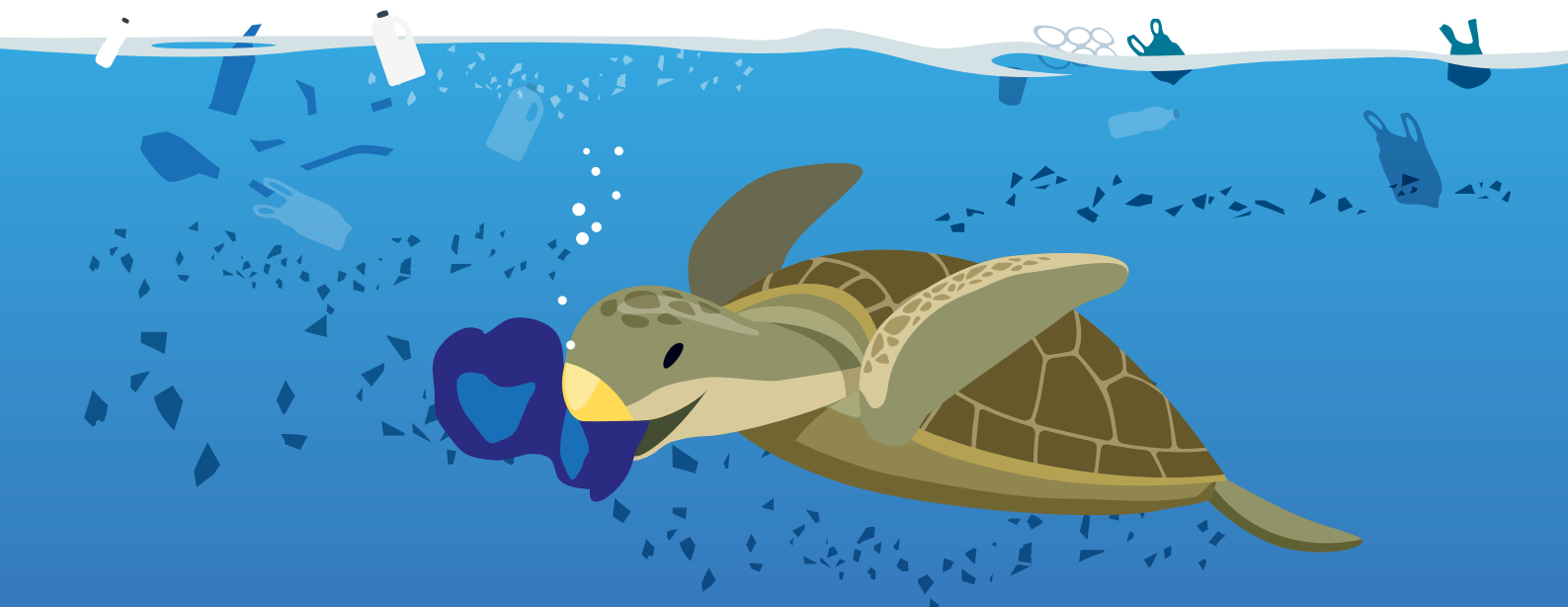
Single out single-use plastics.

Focus firstly on food and hydration. Where can plastic be avoided or replaced?



Volvo Ocean Race has avoided hundreds of thousands of single-use plastic bottles and service-ware - by putting in water refill points, not allowing bottled water for sale, or food served on plastic disposables.

What plastic could be at your event?



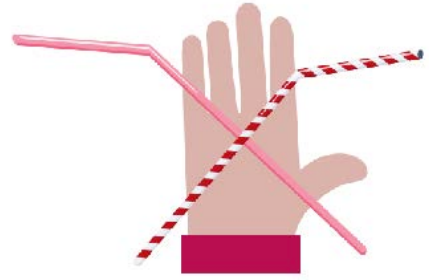
Reveal your sporting event's current plastic personality!

Tick off which plastic might make an appearance.

Which can be avoided? Strike it out now.

- | | | |
|--|---|---|
| <input type="checkbox"/> Bags | <input type="checkbox"/> Condiment containers | <input type="checkbox"/> Polystyrene boxes |
| <input type="checkbox"/> Balloons | <input type="checkbox"/> Confetti | <input type="checkbox"/> Polystyrene balls & packing |
| <input type="checkbox"/> Banners | <input type="checkbox"/> Cutlery | <input type="checkbox"/> Race bibs |
| <input type="checkbox"/> Beer cups | <input type="checkbox"/> Fan paraphernalia | <input type="checkbox"/> Rope |
| <input type="checkbox"/> Bin bags | <input type="checkbox"/> Fireworks ¹ | <input type="checkbox"/> Shopping bags |
| <input type="checkbox"/> Bottle caps | <input type="checkbox"/> Flags | <input type="checkbox"/> Shrink wrap |
| <input type="checkbox"/> Bottles | <input type="checkbox"/> Gaffa tape | <input type="checkbox"/> Signs |
| <input type="checkbox"/> Bowls | <input type="checkbox"/> Giveaways | <input type="checkbox"/> Stationary |
| <input type="checkbox"/> Boxes | <input type="checkbox"/> Glitter | <input type="checkbox"/> Stickers (peel-off section) |
| <input type="checkbox"/> Branding | <input type="checkbox"/> Hazard tape | <input type="checkbox"/> Sticky tape |
| <input type="checkbox"/> Bubble wrap | <input type="checkbox"/> Heat sealed food pouches | <input type="checkbox"/> Stirrers |
| <input type="checkbox"/> Buckets | <input type="checkbox"/> Ice-cream wrappers | <input type="checkbox"/> Straws |
| <input type="checkbox"/> Bunting | <input type="checkbox"/> Inflatable pouches (packing) | <input type="checkbox"/> Streamers |
| <input type="checkbox"/> Butter (single serve) | <input type="checkbox"/> Laminated paper | <input type="checkbox"/> Sweet wrappers |
| <input type="checkbox"/> Cable/Zip ties | <input type="checkbox"/> Lanyards | <input type="checkbox"/> Tattoos (peel off section) |
| <input type="checkbox"/> Cartridges (ink/toner) | <input type="checkbox"/> Lids | <input type="checkbox"/> Tickets |
| <input type="checkbox"/> Chop sticks | <input type="checkbox"/> Merchandise | <input type="checkbox"/> Toothpicks (plastic wrapped) |
| <input type="checkbox"/> Cigarette butts | <input type="checkbox"/> Packets | <input type="checkbox"/> Trays |
| <input type="checkbox"/> Cling wrap | <input type="checkbox"/> Pallet 'cling' wrap | <input type="checkbox"/> Tubs |
| <input type="checkbox"/> Clothing | <input type="checkbox"/> Pallet (blue) banding | <input type="checkbox"/> Uniforms |
| <input type="checkbox"/> Coffee and tea capsules | <input type="checkbox"/> Pens | <input type="checkbox"/> Wine goblets |
| <input type="checkbox"/> Coffee cups | <input type="checkbox"/> Plates | <input type="checkbox"/> Wrapping/sleeves |
| <input type="checkbox"/> Coffee cup lids | <input type="checkbox"/> Ponchos (rain) | <input type="checkbox"/> Wristbands |

2. Refuse



What single-use plastic can you do without right now?

Use the checklist on page 11 to identify which single-use plastic could be at your event and strike a line through any you can do without.

Enforce it! Police it!

Remember to contract it in, and to get the message right through to people like the mixologist curating the bar menu, or the person doing the ordering for the kiosks, catering or food trucks. Once it's contracted in, check and double check all the way through the event life cycle to make sure plans and policies are followed through.

Be ready to take affirmative action!

Straws

Forget about plastic straws. You don't need them. Ban them immediately from everywhere. If you have drinks such as juice boxes which come with straws - look for alternatives to the juice box!

You may need to provide straws for accessibility reasons. **Choose re-usable or compostable.** There are some wonderful paper straws to be found.

Sachets and tiny tubs

You should be able to avoid all small plastic packets or tiny tubs, often provided for sauces and condiments. **Provide bulk dispensing instead!**

Plastic shopping bags

Don't allow any vendors to give out plastic bags. Put a reusable bag campaign in place.



At Volvo Ocean Race we also take direct action by having beach cleans at every stopover, arranged by Volvo Cars. Here is a selection of straws found on one of our beach cleans.

3. Reduce

Less is more! Reduce the number, size, thickness, grade, and variety of plastic used.

Even if you can't completely eliminate it you can reduce the impact!

Musto Reduces!

In December 2016, Musto, Volvo Ocean Race's official supplier of sailing apparel and footwear, were challenged by Vestas 11th Hour Racing and us to reduce their environmental impact by finding a more sustainable alternative to the plastic packaging they used to package their garments.

The standard thin film plastic garment bag used was 60 microns thick. They ran trials and settled on a reduced thickness bag for the Volvo Ocean Race Collection, halving it to a 30 micron bag.

The next thing they did was to put an additional fold in the garments meaning they could halve the size of the bag!

The project has resulted in reducing more than 4 000 kg of plastic packaging across two product collections, and has paved the way for Musto to avoid over 11 000 kg of plastic each year.

[Find out more.](#)

4. Replace

Replace single-use plastic items with more sustainable alternatives.

The destination, setting, event type, style of activities, amount of catering, health regulations, resource recovery systems, and local solutions will all factor in to the best way to approach single-use plastic avoidance.

* Re-usable

Transitioning away from single-use plastic items will often mean looking for re-usable options.

* Bulk dispense

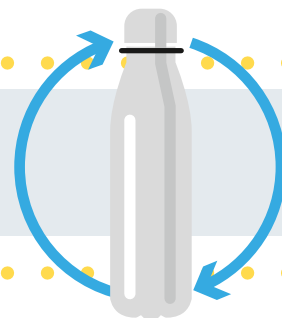
Single-serve packs are the culprit. Think of how you can supply through bulk dispensers rather than single packs.

* Compostable

If re-usable is not possible, then look for items made from materials which are compostable.

And then compost!

4. Replace



Refillable not disposable

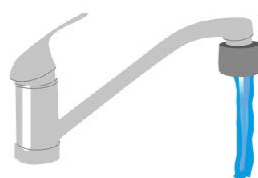


Drinking Water

Not serving or selling pre-packaged water in disposable plastic bottles or cups should be your target. To make this stick, decouple water provision from bar sales.

Identify everywhere drinking water is needed across the event and develop a way to provide water that is not dependant on packaged water.

Remind people to bring their bottles or cups. Offer drinking water provision as a sponsorship opportunity. Give away or sell branded water bottles or cups, which are also a sponsorship opportunity. Require in all catering/food service/venue contracts that water refills rather than packaged water is served.



Volvo Ocean Race will avoid more than 300 000 single-use plastic water bottles by having water refill stations.

Solutions include:

- Water refill points.
- Office-style water coolers.
- Jugs and glasses in hospitality/bars.
- Paper cups for running races (collected for

Bluewater is Volvo Ocean Race's office water supplier. They can take almost any quality water, and with reverse osmosis technology, recreate purified, safe and mineralised drinking water. [Find out more.](#)

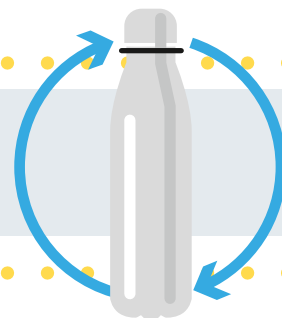


Re-usable cup system

Volvo Ocean Race at the Itajai stopover avoided more than 200 000 single-use cups by implementing a re-usable cup system.



4. Replace



Re-usable cup system

Beer, wine, smoothies, water cups

Reusable cups at large scale events and sporting arenas are becoming the go-to solution to get off disposable plastic (or paper) cups.

There are different systems possible and what works for your situation will depend on who has financial and operational control over beverage service.

In controlled hospitality zones, cups could simply be provided by the bar or beverage sponsor/supplier. Once used, they would be collected up by staff, washed back of house and re-deployed.

For events where patrons are likely to be more 'on the go' with their drinks, a deposit/refund system can be put in place.

Special edition cups can be produced which are kept as souvenirs by patrons, offering a potential income stream for the event or vendor.

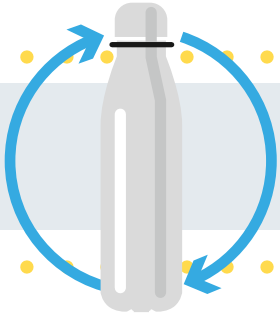
Options include:

- Restaurant or bar system with waiters/cleaners.
- Deposit/refund system, via the bar or a special cup pick up/drop off point.
- Honour system with dedicated return points.
- Purchase an 'event cup' as a keepsake.
- Offer self-wash stations (if health regulations allow).

Re-usable cup system at Volvo Ocean Race Itajai stopover.



Photo: Pedro Martinez/Volvo Ocean Race



4. Replace

Re-usable service-ware

Plates, bowls, cutlery, coffee cups

Take things to a whole new level and get off disposables for food service by having re-usable plates, bowls, cutlery, chopsticks and even coffee cups.

For small events you could create a BYO campaign, encouraging participants to bring their own kit, and offering self-wash stations.

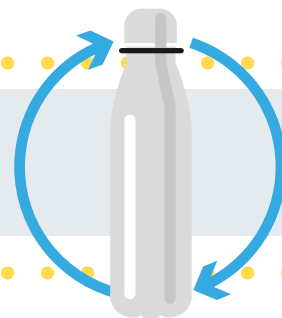
Services also exist in some locations, offering for-hire, small event kits, which come in trailers and everything you need to deploy a reusable and wash-up system.

For larger events, the hire-in and washing system will need to be factored in to your event's budget. This is also a great potential sponsor activation.

At Volvo Ocean Race in Hong Kong, we instigated a re-usable serviceware system. A 'Re-Use Hub' was set up next to the food trucks. Each morning the vendors were supplied their stock of plates. Customers would not however, be given cutlery. They instead had to visit the Re-Use Hub where they picked up their cutlery and were engaged in the idea of a re-usable instead of a disposable serviceware system.

Re-Use Hub, for re-usable plates, cups and cutlery, at the Volvo Ocean Race Hong Kong stopover.





Food and beverage serviceware

Disposable Serviceware

If you must go with disposables for food and beverage service, choose options that firstly are not plastic, and secondly can be either **composted** or **recycled**. Set down exactly what vendors can use.

Cups

Some beverage cups may be recyclable after they have been used. If that is not the case in your location, then go with **compostable cups**.

Plates, bowls, boxes, trays

The first thing to do is **choose reduced or even no packaging** - for example use a tray instead of a pizza box with a lid, or push for handheld options. Put an item on a serviette instead of a thick cardboard tray. Use skewers. You see what we're saying.

In most cases cardboard serviceware can't be recycled once food-soiled. The exception would be paper plates and containers that have had 'dry' food on them such as burgers or fries.

If you're likely to have a lot of wet food items rendering serviceware non-recyclable, then choose **certified compostable options**. This could be bagasse (sugar cane fibre), bamboo, palm leaf, or other natural compostable fibres. PLA (corn starch) containers are only an option if disposal systems are guaranteed, and you can effectively communicate that these are not plastic. See the next page under 'bioplastics'.

Cutlery, chopsticks, stirrers, toothpicks

Beware of plastic cutlery and stirrers. Be on the lookout for plastic packaged toothpicks and chopsticks! Don't forget the ice cream vendor and their pesky plastic spoons. Wooden or bamboo options are available for all of these items.

Non-alcoholic beverages

Many beverages are also likely to come in single-use plastics, either bottles or cups, such as soda/soft drink, juices, and smoothies.

To get off single-use plastic bottles, encourage freshly made drinks or 'wet-pour' sodas and a re-usable cup system.

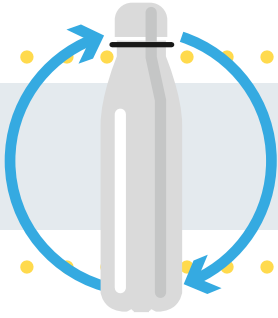
If bottled or packaged drinks are necessary, then if the destination has a reuse/refill bottle system, of course preferentially choose that option.

Otherwise, to get off disposable plastic, choose cans or glass. It goes without saying that these should then be collected for recycling!

To get ahead of potential plastic, start off by aligning with beverage sponsors or suppliers, food and beverage operators that can serve plastic-free options. Include this as a decision making factor when reviewing options. Don't sign a beverage sponsor deal or operator contract and then discover whether they can provide their drinks without single-use plastic.

Remember to contract it in to every area of the event that could have beverage service.





4. Replace

Compostable and 'bio plastics'

If going without altogether, or having re-usable options is not possible then looking for alternatives to disposable plastic is the next job. This is where nature-based alternatives enter the playing field.

The challenge is that the options are confusing and there is a bit of 'greenwash' out there with vague claims and not a lot of detail. You need to make sure that any nature-based serviceware is sent for appropriate disposal and does not end up in landfill. If you plan to send your serviceware for composting, you need to make sure the facility will accept your chosen serviceware. To help make the right choice and to decipher various claims, this may help:

Compostable

This means the packaging will decompose quickly, in one compost cycle, generally 10 to 14 days. Different countries have different standards for what is officially 'compostable'.

Compost processing could be windrow, vermiculture or 'in-vessel/hot chamber' composting. Some materials will only be compostable in the latter high-temperature systems. Remember to check!

Biodegradable

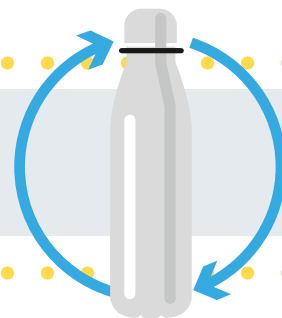
If packaging is claiming to be 'biodegradable', this means the material will decompose through natural processes, involving bacteria and fungi, generally accepted to be within six months. Being biodegradable does not necessarily mean it will be compostable.

Claims of 'compostable' and 'biodegradable' in packaging material are regulated by standards such as the US standard ASTM D6400, European standard EN 13432 and Australian standard AS4736-2006.

Degradable, 'oxo' degradable or 'photo' degradable plastic

This means the plastic will disintegrate into small pieces of the same material in the presence of sunlight or oxygen (fragmentation). The problem is though - how long these tiny plastic fragments will persist in soil or marine environment. Avoid these materials.





Bio or plant plastics

Bioplastics are either starch-based or cellulose-based. Often bioplastics are called nature-based plastics or plant plastic.

These are products that perform like plastic, but are made from renewable plant-based resources, rather than the fossil fuels of conventional plastic. A well-known option is cornstarch (PLA – polylactic acid).

Using bioplastics is beneficial as compared with oil-based plastics, since you are not using a fossil fuel resource. Depending on production processes, bioplastics may have smaller carbon footprints than their plastic counterparts.

Not all bioplastics are biodegradable.

The challenge is that these bioplastics are biodegradable only in commercial composting facilities, and can't be simply in any compost bin.

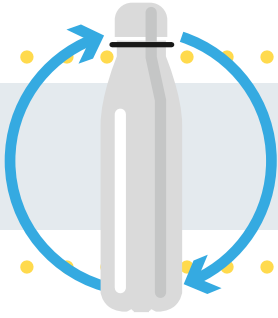
Watch this video from 1 million Women which perfectly explains the difference between degradable, biodegradable and compostable.

The other complication is they look like plastic and can contaminate your recycling if people mistake it for plastic. It can also damage to your reputation if you don't message this well, and people are thinking you're using disposable plastic when you said you wouldn't.

If you are considering using plant plastics, then you need to:

- Identify where they can be composted. This is only possible in industrial composting facilities.
- Ensure your bin signs are effective in getting these items into the compost bin and not the recycling (plastics) bin.
- Communicate at the point of sale that the 'clear' plastic look-alike items are actually plant plastic and can be composted.





4. Replace

Life Cycle Impact of re-usable versus disposable

Is a re-usable serviceware system actually any better than disposable, when you look at the whole of life cycle impacts?

Disposable and re-usable serviceware have common impacts in their backstory - it is here that the bulk of the impact is created - raw materials extraction, materials production, product manufacture, transport and energy for every step.

The actual impact of each item will depend on its material source and manufacturing provenance. When factoring in repeated use, including the energy for washing, water provision and wastewater disposal, studies have shown that a re-usable system is still most often the optimal solution.

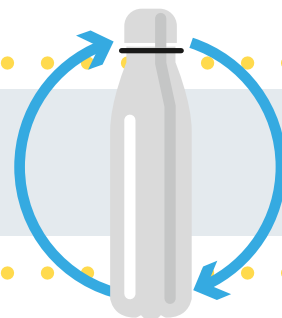
Lifecycle impact studies undertaken have shown that a net benefit is realised when the item is re-used between 3 and 10 times.ⁱⁱ

The Business Case

The financial and operational viability for a re-usable system is something that must be considered. The viability will depend on variables such as the cost of rental or purchase of re-usable versus disposable, the infrastructure and staffing costs for return points, deposit/refund handling and washing. Reduced waste management costs could also be factored in when assessing the feasibility. If souvenir cups are possible then revenue streams from the sale of these cups can also be included in the analysis.

Re-usable crockery, cutlery and personal re-usable cups at the Volvo Ocean Race Itajai stopover.





Hydration and Energy

Hydration & Energy

Marathon, triathlons, fun runs and other events that need hydration for competitors have the potential to create huge volumes of plastic waste.

Cups at hydration stations

As plastic cups are hazardous underfoot and not too practical to drink from, hopefully these are already out of your plan. The options are:

- **paper cups** (ensure they are recyclable or compostable). These are more practical as they allow the competitor to pinch the top to stop the water bouncing out.
- **re-usable cups** with a target throw spot that competitors can be directed to return them to. (only practical for smaller numbers of competitors.)

Energy supplements

Other single-use plastic will appear in sporting events such as energy gel pouches, isotonic powder sachets and energy bar wrappers.

It's difficult to control what competitors bring with them but there are two strategies you can implement to try and dampen the disposable plastic impact:

- Partner with an energy product provider that has a **producer responsibility approach** to their packaging, such as a 'take-back' packaging programme.
- Have a **detailed resource recovery plan** to make sure that plastic packaging from these items are targeted and not missed because the packaging is typically quite small.

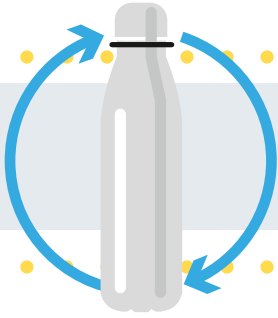
Coffee and tea

The rule to follow is to never use coffee and tea pods, disks or capsules. Have coffee urns or espresso machines. Provide loose leaf tea or pre-made tea in urns. If you must use tea bags, avoid double-packaged individual tea bags and stay clear of the 'mesh' bags. You may be surprised to know that even standard tea bags are woven with plastic!

Snacks and sweets

Do without single wrapped sweets and snacks by setting up canisters with dispensers or scoops. Buy freshly made slices and cakes, cut up into pieces rather than plastic packed and store-bought options.





4. Replace

Accreditation

Accreditation

Single-use plastic is also a potentially common feature in accreditation, ticketing, competitor bibs, etc.

Competitor bibs

These are often made of Tyvek which is HDPE plastic and is recyclable. However it is not always accepted for recycling, and generally not in standard mixed recycling services. If you can't find a non-plastic option, then have a system to collect up the bibs and send them to a facility that will accept them for recycling.

Wristbands

Wristbands are a tricky one. Their small size will often mean, even if they are made from recyclable material, they probably won't make it through to recycling. They are often made of vinyl (PVC). Your best option is to go with paper, or if it needs to be durable, from plant based materials or from recycled plastic content.

Lanyards and Swing Tags

Lanyards (the bit that goes around the neck!) and accompanying swing tags will be used for staff and VIP accreditation. Go for an unbranded and re-usable lanyard and a plastic-free swing tag.

Ticketing

Try for virtual ticketing and bar codes, rather than physical tickets. If actual tickets are necessary, then paper is your friend here (sustainably sourced, not laminated, and veg based inks of course!)

Merchandise

Fan paraphernalia

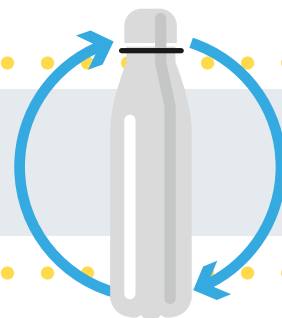
Passionate fans will come to sporting events ready to cheer on their team or sports hero and show their colours by cloaking themselves and surroundings with their fan paraphernalia. Some will be home-made but a lot is actually produced by clubs or licensed or renegade vendors. Clappers, fingers, horns, confetti bombs, balloons, streamers and signs. Sporting events should not add to the plastic arsenal by producing their own single-use plastic merchandise and fan paraphernalia.

There is the chance to engage with teams, clubs, individual athletes and their brand and licensing agencies to create merchandise that is not designed for disposal and not made from single-use plastic. You may also need to do a spectator and fan campaign to get them to buy into the idea of a single-use plastic free cheer squad!

At our Newport stopover, we had the 'Paint the Town Volvo' campaign which had local businesses and homes dress up their store and house fronts to cheer on their sailing team and the race in general. They were challenged to not use plastic and to put an ocean health theme into their creative execution.

Giveaways

Sponsors, brand activations, teams, and the event itself may wish to hand out items to event attendees. Rather than cover the site with single-use plastic swag, get all those who may want to have giveaways to get creative and go plastic-free. They can be encouraged to have experiential activations, or to source natural and sustainable materials for their giveaways.



Signage, bags, pretty litter!

Laminated Signage

It's virtually impossible to have no signage at sports events and so your challenge is how to reduce the amount of single-use plastic, which translates basically to avoiding single-use signs if you can.

Laminated paper is hidden plastic in the signage scene. So many event co-ordinators are tempted to laminate paper and place it all over the site. Rather than switching on the laminator and plastic coating all your quick signs, use robust paper that is a bit water-proof and does not need lamination. You can also use re-usable plastic pouches to weather-proof signs. (And remember to collect them up!). Or put out re-usable chalk or white boards for messages.

Pretty Litter

Not to be a party pooper but some celebratory elements are plastic-ful. Foil confetti and glitter is actually metallicised plastic. Balloons, while made of latex, behave like plastic and take ages to break down.

If you can get your messaging right and be in control of any photos and consequential negative comments, then you could use unbleached rice paper confetti. It is not harmful to the environment but the image of spraying litter around probably isn't the best one for your event. Replace confetti with champagne or a bubble machine!

Options to replace fireworks are laser or light shows. Add a water wall and there can be a spectacular spectacular!

Plastic Bags

The ubiquitous shopping bag is something you should be able to avoid immediately. Don't permit any vendors to give out plastic bags. Job done!

However the rubbish bins are likely to use plastic bin liners. The key here is firstly to use ones made from recycled plastic, and secondly to drastically reduce the number used. Recycling and composting plants want the resources delivered to them 'loose' and not in bags. Get into the fine detail of cleaner operations to make sure they aren't using unnecessarily large numbers of bin liners, and that they are emptying and reusing plastic sacks. They can also collect up the plastic refuse sacks for film plastic recycling when they are done.

Which bag is that?



Plastic bags are particularly tricky to identify. The softer glossy type of plastic bags are LDPE. (They'll stretch out if you pull them.)

The crackly noisy type of bags that most supermarkets use, are HDPE.

But another type of crackly plastic is PP, and that's the type of bag that a men's shirt would be packaged in, or packet of cookies or crisps. The short-cut identifier for PP bags is if it's crackly sounding but doesn't stretch, rather it just splits, then it's PP.

Branding

Volvo Ocean Race has avoided 180 000 plastic zip ties through re-usable bungees.

Sporting events often come cloaked in branding. When taking over an existing facility or in a 'greenfield' site, branding and signage overlay is a potentially huge single-use plastic source.

For those settings where temporary branding is a necessity, here are some tips to reduce your plastic footprint:

Rethink

- Review whether you really need all that branding.
- Avoid PVC.
- Plan for re-use.

Reduce

- Consider the lifecycle impact of the materials including the manufacture of the substrate, the transport needed and the identified disposal options.

Replace

- Use non-plastic options such as timber, painted surfaces, screen printing on natural fabrics and materials, and of course projections and screens.
- Use materials that are made from recycled content such as rPET.
- Avoid multi-substrate materials. This will render it non-recyclable.
- Rather than cable/zip ties, go for re-usable bungees to attach branding.

Recover

- Use materials that are made from plastic you have identified as accepted for recycling locally.
- Plan for recovery through re-purposing of branding material in to other items.



PVC - Warning

PVC has a controversial reputation. During its manufacture, use and disposal, PVC can leach its toxic additives. The various plastisers and chemicals used to give its useful properties have been under scrutiny and continue to be regulated.

Be wary of 'biodegradable' or 'degradable' PVC claims. Carefully scrutinise and seek expert advice (not that of the manufacturer!), if 'green', 'eco', or 'environmentally friendly' PVC is promoted to you as an option.

Forgotten plastics



If you want your event to be completely free of disposable plastics – then looking for the hidden and forgotten plastics takes things to the next level.

Plastic linings

Items lined or coated with plastic include metal cans, the inside of metal lids on glass jars, coffee cups, milk and juice cartons and tetra packs. For some items, plastic linings may render the item non-recyclable.

Hygienic wipes

If baby wipes/wet wipes are used for the event, source those made without plastic. Most brands have plastic woven through the cotton or wool. They are not flushable, compostable or recyclable.

Cigarette Butts

Made from a 'natural plastic', cellulose acetate, it is as enduring as the other plastics, and is not recycled by typical recycling systems. However bespoke cigarette butt collection and recycling services are increasingly available.

Metallised plastic film

Those colourful chip packets, cookie packs, freeze dried food pouches and sweets wrappers are made from a combo of plastic and aluminium. Space blankets (for emergency warmth) are also made from metallised plastic film.

This material can't be included in most recycling bins. However some producers are taking responsibility for their wrappers with return/collection deals via Terracycle. Check the collection and recycling options are before you source anything with this packaging.

Foil Confetti and Glitter

Yes, that's made from metallised plastic too!

Chewing Gum

Yes! Whilst originally using a natural tree gum, the word is out that many gum brands these days use polyethylene and polyvinyl acetate! Yum!

Tetra Pak/UHT Cartons

These cartons are made from a cardboard with an aluminium lining and then coated in plastic. Not all recycling centres accept these cartons as the facilities to actually separate the three materials for ultimate recycling is not everywhere. Tetrapak are however working on natural 'bio' alternatives to plastic for their lids and linings.

Tea Bags

Yes, the normal 'paper' looking teabags have plastic threads woven through them. They are not compostable and not recyclable. Worse still are the plastic mesh types, and of course you should forget using tea discs or capsules!

Balloons

Whilst balloons are made from latex rather than plastic, they can take up to 4 years to biodegrade in nature and so have the the same damaging effects to sealife as plastic does.

Fireworks

Spent fireworks canisters are plastic! You could be shooting up the fireworks along with the canister and littering. Don't do that. Options to replace fireworks are laser or light shows.

Stickers and Temporary Tattoos

Most stickers are made from plastic. But there are plastic free stickers, you just need to ask for them! Temporary tattoos are fun to have at events but those little peel off bits are single-use plastic!

Lids, Labels, Nozzles and Hinges

Many items of disposable packaging come with various component parts. A cardboard tube of crisps will come with a foil lining and peel-off seal and then a plastic lid. Other items will come with plastic components such as labels, nozzles, hinges and caps.

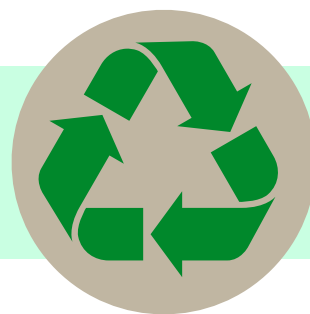
Sweets and Crisps

Sponsors and stalls, media centre, volunteer welfare etc often love to have single wrapped sweets and crisps to give out. Go for bulk dispensing with a scoop or naturally self-wrapped items such as bananas or pistachios.



5. Recover





Recycle

Don't despair, but despite all your efforts residual disposable plastic will still appear!

Open gated sites and those that do not confiscate food and beverage upon entry, will have plastic walked onto the site by attendees.

Apart from hard plastic (bottles mainly) most events will have film (soft) plastic, and branding overlay as their major disposable plastics left to manage.

The Volvo Ocean Race Hong Kong race village was a closed site, and we had just 81 kg of mixed hard plastic brought onto the site by visitors. However we had 220kg of soft plastic which was about 12 cubic metres.

Plastic can be sent for mechanical recycling, which is where it is chipped, melted and extruded back into plastic pellets as 'recycled' plastic inputs. A relatively new option, and common for PVC, is 'chemical' or 'feedstock' recycling. This is where the plastic is broken down back to its chemical elements, which is then used as raw material for plastic production.

'Recycled' and/or 'Recyclable'

Some people confuse the concept of 'recyclable' and 'recycled'.

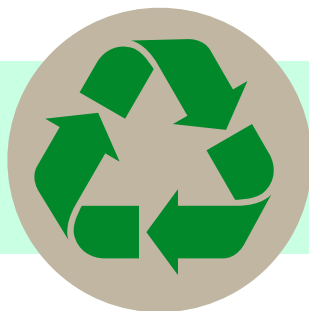
Recycled

Items can be made from recycled plastic. That means that the items are made from plastic that has been used already, collected for recycling, re-processed and the recycled plastic is then used as to manufacture the new item. A 'recycled' product.

Recyclable

This means that the material or item is able to be recycled. Remember, just because a material is able to be recycled, doesn't mean it will be. It will only be recycled if it successfully journeys through the recycling system from a recycling bin through to becoming an input material for another item.





5. Recover

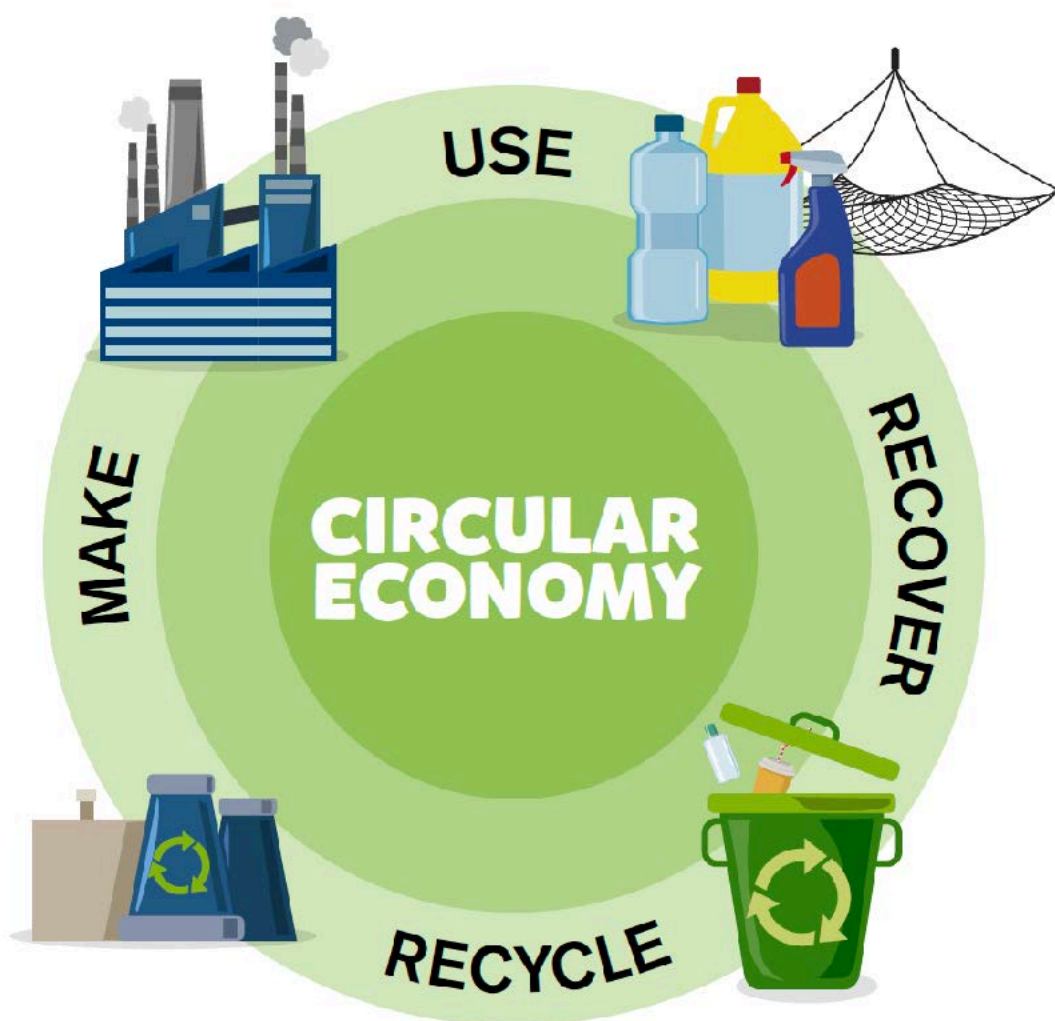
Zero Waste

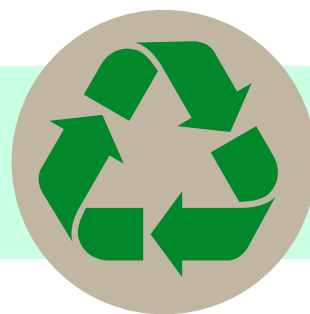
The concept of Zero Waste is catching on fast and is something you can aspire to for your event. A Zero Waste Event is one that sees residual materials as a valuable resource to be recovered rather than unwanted material to be discarded. Making a public commitment of 'Towards Zero Waste' and adopting the Zero Waste philosophy is a great first step. **Zero Waste Alliance International** (ZWIA) are the champions of the cause, and companies, cities, events and even countries are opting-in to the challenge.

Circular Economy

The concept of zero waste ties in tightly with the idea of a Circular Economy. The status quo in society today is a one-way system of extraction, manufacture and disposal - 'take, make, throw'.

A circular economy recognises that each material, function, process, product and user has a part to play in keeping resources from being discarded and lost, but instead making them part of an ongoing interacting system.





Repurposing

Whilst we'd prefer to not produce once-off plastic branding, the material or fabric that is used is quite often very useful as a salvageable material to be used to make secondary items.

Bags from banners is a popular option. Making useful items for production purposes can also be a good option. Wet-weather covers, pallet covers, laundry bags or totes are items that Volvo Ocean Race is looking at to repurpose the branding.

Plastic can also be compressed and made into eco-bricks or eco-pavers. If this type of programme exists in your destination, it could be an option for your unavoidable plastic waste.

At least one truckload of plastic is dumped into the ocean every minute!



Leave no trace

Many sporting events occur in nature and outdoors, and the principle of taking only photos and leaving only footprints (if that!) should be embraced.

One thing that can bind these events to the spirit of environmental stewardship is the **Leave No Trace** philosophy.

The Seven Leave No Trace Principles are:

- 1 Plan ahead.
- 2 Travel and camp on durable surfaces.
- 3 Dispose of waste properly.
- 4 Leave what you find.
- 5 Minimise campfire impacts.
- 6 Respect wildlife.
- 7 Be considerate of other visitors.

[Int.org](https://www LeaveNoTrace.org)

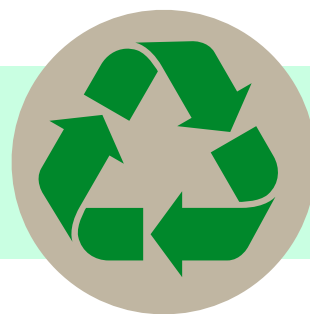
Recovery

If the plastic can't be recycled or repurposed, then energy recovery is an option. There are several technologies to recover energy from waste materials. Incineration (waste to energy) harnesses the heat from the combustion to create steam which is then drives turbines to create electricity.

Gasification, pyrolysis and **plastic to diesel** are recent options for plastic energy recovery. Whilst not currently widely used, these options are something to consider in the right circumstances.



Volvo Ocean Race partnered with film plastic recycling programmes at several of our stopovers to ensure that any film plastic (soft plastic) that was unavoidable was collected and recycled. Many recycling facilities do not accept film plastic with other mixed recyclable materials and so it is important you carefully plan and manage film plastic recovery.



Film plastic revisited

Unlike plastic beverage bottles, film or soft plastic is an area of plastic production that you may not have direct control over, and it is this pervasive, low value plastic that could be your last hurdle.

- bubble wrap
- shopping bags
- shrink wrap on cases of canned beverages
- heat sealed food pouches
- protective sleeves on merchandise and other product deliveries
- bags for uniforms and garments when delivered
- cling wrap on palletised deliveries
- cling wrap to protect furniture or other items in transit/storage
- inflatable pouches in packaging
- temporary covers for work areas or equipment
- single use rain ponchos

Purchasing power

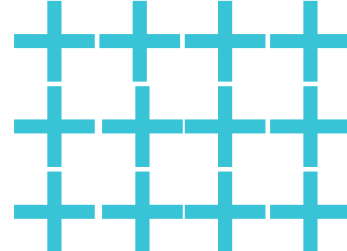
If you have purchasing influence, either through branding/sponsorship alignment or the sheer volume of your purchase, then work with the supplier to reduce the amount of single use film/soft plastic used in their product packaging and logistics handling. See our Musto example on Page 13.

Recycling film plastic

For the unavoidable film plastic that will arrive onto your site, make sure you have a collection and recycling plan for it. There may be a special soft plastic programme the local area, such as pictured on the previous page, from our Volvo Ocean Race Auckland stopover. Check out what the plastic bag recycling options are at local supermarket as this may be the main film plastic recycling programme locally.

Film plastic collected separately in order to accurately calculate the plastic footprint at the Volvo Ocean Race Auckland stopover - 554kg collected.





Stakeholders

Our experience at Volvo Ocean Race is that there are many layers of people that need to be engaged, informed, reminded, questioned, checked and followed up in order to turn your plans and stakeholder's best intentions into action.

All the plans in the world will come unstuck unless you get right into the detail and work out not only where single use plastic could occur, but who to engage.

Catering operations will be in many areas of a sporting event, and each needs to be analysed and considered for plastic prevention and followed up with plastic policing! You could have these catering set-ups:

- Athlete/competitor catering
- Crew/workforce/volunteer catering.
- 'To-go' catering for workforce.
- Public catering (permanent and temporary concessions)
- Guest hospitality and corporate boxes.
- Sponsor's hospitality precincts.
- Media centre catering.
- Large contractor's workforce catering or refreshment zone (security, cleaners).
- Courtesy cars, limousines, shuttles
- Hotels and accommodation

Remember to **inform, require, check, double-check, police, correct, adapt** and **check again** that single-use avoidance plans are in place, and importantly - that this follows through to action!

So many people have a part to play in getting single-use plastic out of your food and beverage service. Think of which of these people are within your event's team that you have to engage:

- ☐ Catering manager
- ☐ Sponsorship manager
- ☐ Volunteer manager
- ☐ Competitor/team management
- ☐ Tournament management
- ☐ Community co-ordinator
- ☐ Security manager
- ☐ Cleaning/Waste Manager
- ☐ Site manager
- ☐ Event manager
- ☐ Talent management
- ☐ Guest relations co-ordinator
- ☐ Production co-ordinator
- ☐ Media centre co-ordinator
- ☐ Transport/transfers manager
- ☐ Car fleet management
- ☐ Accommodation co-ordinator
- ☐ Stakeholder hospitality managers
- ☐ Hospitality companies
- ☐ Catering contractors
- ☐ Catering co-ordinators/bookers
- ☐ Contractors with large workforce
- ☐ Bar/restaurant management and staff
- ☐ Competitors/teams/athletes
- ☐ Serviceware suppliers
- ☐ Outlet owners and management
- ☐ Venue management



It's you, it's me, it's all of us



Dee Caffari. Photo: Ainhoa Sanchez/Volvo Ocean Race

“

We talk about the oceans and plastic pollution as if it's someone else's problem but it's not. It's you, it's me, it's all of us.

No matter what job we do, where we live, or who we are”.

Dee Caffari, skipper of Turn the Tide on Plastic in the Volvo Ocean Race

”

Plastic Policing

Every day onsite you will need to check that your best laid plans are followed through. Here are some tips to follow:

- ☐ Request proof and approve in advance of disposable serveware that will be used, to ensure it is not made from disposable plastic.
- ☐ Request proof and approve in advance all merchandise and giveaways to ensure they are not made from disposable plastic.
- ☐ Every morning do a plastic health check around the event site. Also ask volunteers, cleaners and all event staff to continually look for plastic leaks during the event.

What's the problem with single-use plastic?



Too much to handle

Plastic was designed to last, not to be discarded. We're going through so much of the stuff that waste volumes are unmanageable.

Our collection and recycling systems can't keep up. It's estimated that 75% of all plastic ever produced has ended up as waste. Of that waste, 91% was not recycled, ending up in landfills, incinerated or accumulating in the natural environment.^{iv}

Convenience & consumerism

Society's throw-away attitude to consumption is a problem.

The need for convenience and our consumption habits means we turn to single-use plastic without a second thought. There is a disconnect between our consumption single-use plastic items and its impact on our environment and on our health.

According to the National Oceanic and Atmospheric Administration who study climate and ocean health, cleaning up less than one percent of the North Pacific Garbage patch would take 68 ships working 10 hours a day for a year.ⁱⁱⁱ



There are five main gyres:

1. North Pacific
2. South Pacific
3. North Atlantic
4. South Atlantic
5. Indian Ocean

Scientists are studying these areas to determine exactly how big they are, how much plastic is in them, and how we can clean up these ocean garbage patches and prevent more plastics from entering them.



Captain Charles Moore found evidence of the first trash gyre – the North Pacific Garbage Patch – when sailing to California in 1997.

What's the problem with single-use plastic?

While plastic is a remarkable invention, it has its place. If designed for disposal, single-use plastic is a problem.

Toxic to our environment

If you've been paying attention, you'll know that plastic pollution is a destructive force in our environment.

Plastic pollution is killing seabirds, fish, and marine mammals through entanglement and ingestion.

Plastic also leaches poisons out of landfills, and creates poisonous gases when burnt.

Plastic will take hundreds of years to break down and the long term effect on the health of the planet and on humans is unknown.

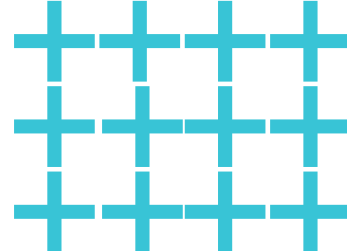
Every piece of plastic ever made, unless it has been burnt, still exists in our environment, even if much of it is now at a micro or nano level.



Photo: Credit: Heidi Acampora - Galway-Mayo Institute of Technology

Marine Degradation





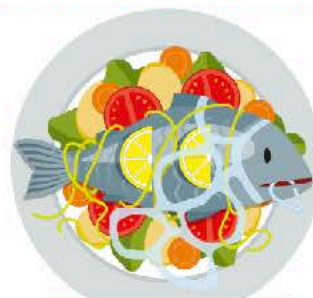
What's the problem with single-use plastic?

Affecting our health

Breaking down into microscopic pieces, and never going 'away', micro and nano plastics are entering the food chain, consumed by plankton and fish.

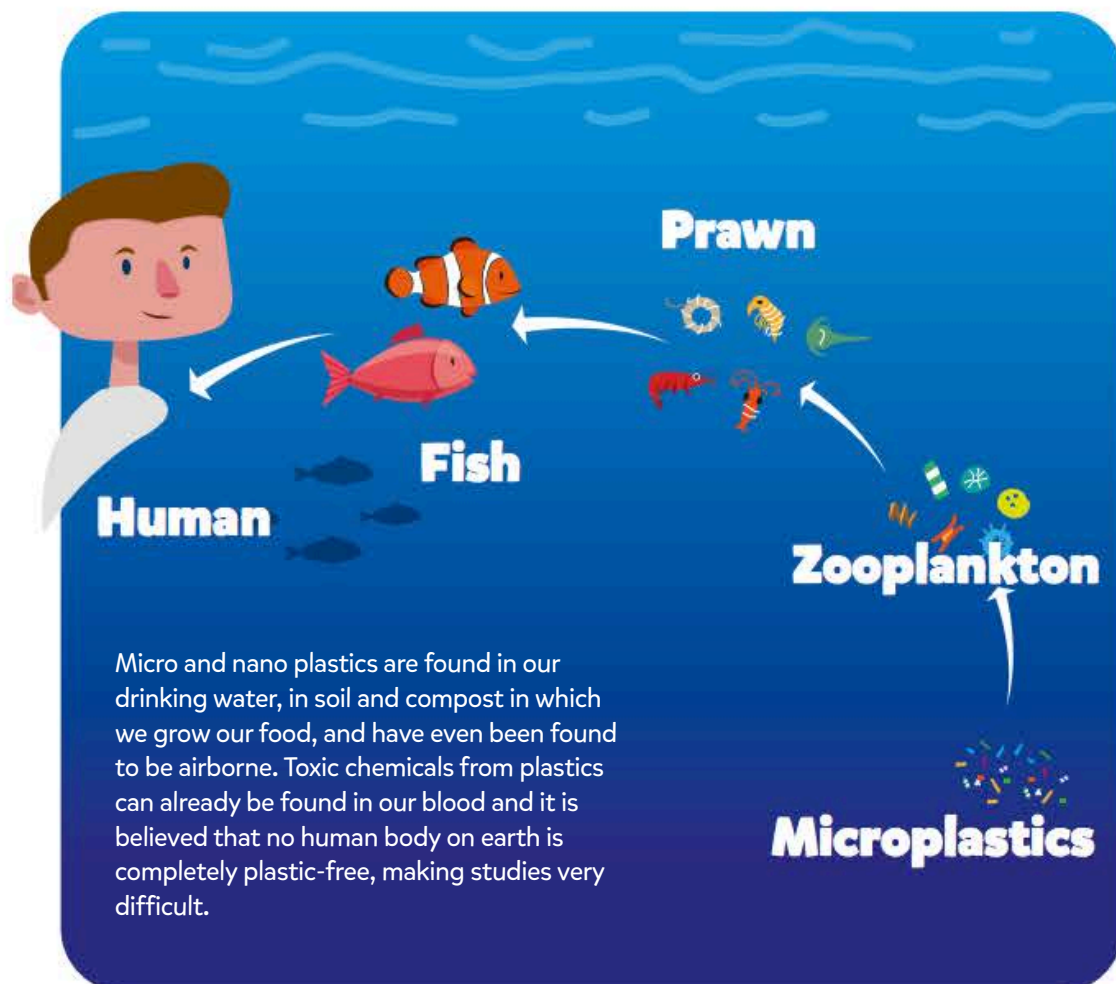
Plastic repels water and attract oils. The oils collect toxins. The oil and toxin coated poison pills are being ingested by sealife and making its way up the food chain to unknown effect.

The scientific research into the health effects from plastic is new, but early research suggests that plastic might be playing a role in many health conditions.



**Plastic
for dinner?**

NO THANKS



What's the problem with single-use plastic?

Recycling isn't fixing it

Despite great intention and dedication, recycling is only capturing 9% of the world's plastic 'waste'.^{iv} Lack of regulation, infrastructure and systems leads to less than effective collection and segregation systems.

Low value, low demand

Someone makes profit out of selling the recycled plastic. To do that, there needs to be a demand for the recycled plastic as an input material into manufacturing. Without legislation or voluntary commitment by manufacturers to drastically increase recycled plastic content in their products, this demand will never match the anticipated volumes of plastic that could have been recycled.

China has recently closed its borders to inbound plastic waste for recycling, putting pressure on many nations previously reliant on its recycling service, to find somewhere for their stockpiles of plastic to go.

A mix of materials

There are many types of plastic, each with different properties. Each type needs to be separated from the others, before recycling of it can occur. Also, many items are made from a mixture of plastic types, (think of a plastic beverage bottle made from PET, and its cap made from PP) If it's too labour-intensive to justify separating the plastic components of an item, or if plastics are laminated or woven together, then they are often just not able to be recycled.

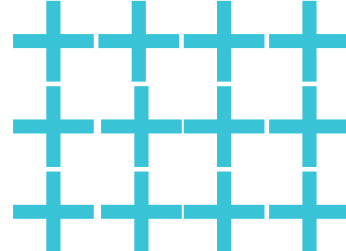
Where facilities exist

Although the technology exists to be able to recycle all plastic types, not all facilities will accept all plastic types because they haven't invested in the technology, probably because of lack of market for the various plastic types.



Only 9% of all plastic ever created has been recycled.





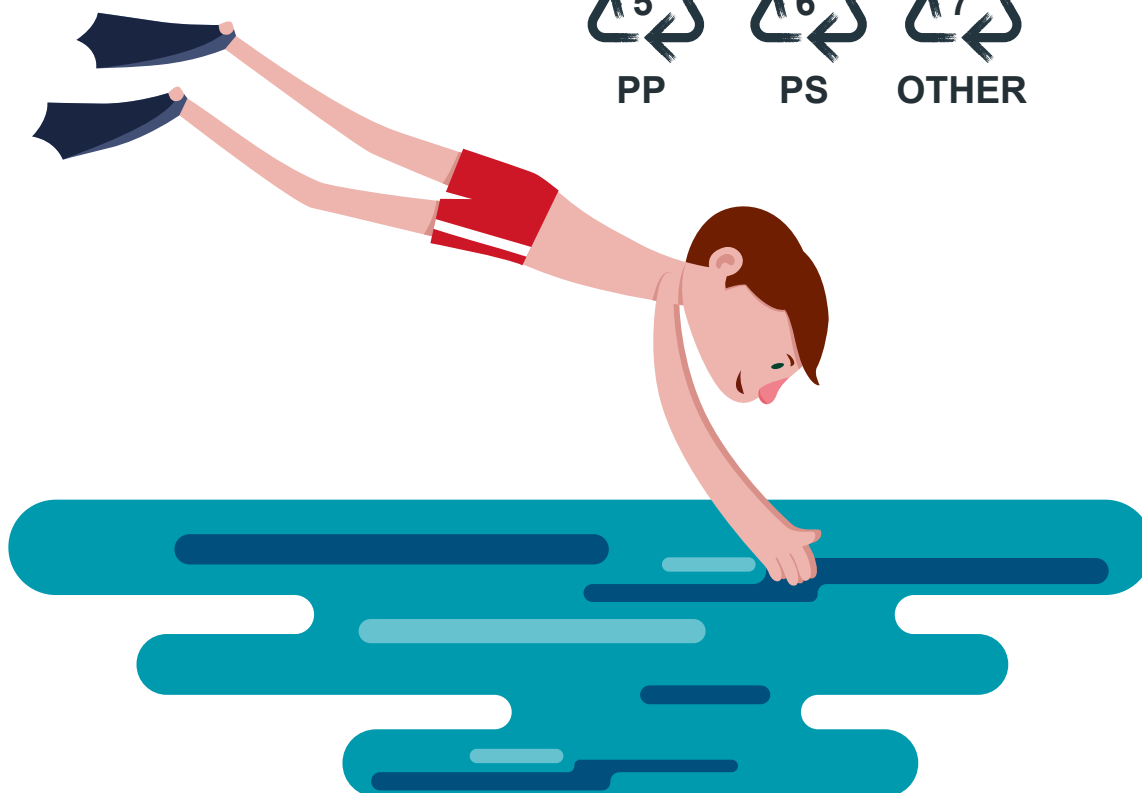
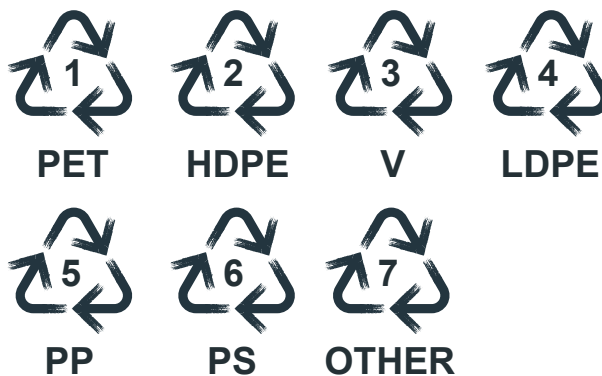
Know your plastic

There are many types of plastics, with properties that you would be familiar with - hard or soft, flexible or brittle, stretchy or not.

Plastics are 'hard' (such as bottles and containers), or 'soft' (such as bubble wrap, plastic bags, cling/pallet wrap, shade cloth, builders' sacks and plastic sheeting).

See the table on the following pages for the types of plastic, the likely items made from each appearing at events, and their identifier numbers.

A deep dive into the detail!



Know your plastic



PET - Polyethylene Terephthalate

- Bottles, containers, cups, trays, salad domes
- Polyester fabric (garments, flags, branding, scrim)

PET in its hard format is commonly accepted for recycling, however you will need to review where to send polyester clothing or banners for recycling.



HDPE - High Density Polyethylene

- Milk and juice bottles
- Bulk water and food containers and drums
- 'Polythene' pipes
- Fireworks canisters
- Plastic bags (woven sacks, 'crackly' grocery bags.)
- 'Tyvek' envelopes, coveralls, racebibs, wristbands
- Knitted shade cloth

HDPE in its hard form is commonly accepted for recycling. In its soft form such as bags or Tyvek, you will need to check if your waste facility will accept it mixed with hard plastics for recycling.



PVC - Polyvinyl Chloride (Vinyl)

- Banners, stickers, wraps
- Pipes, storage drums and containers
- Flooring, industrial wrap, building fittings
- Gloves, cable covers
- Temporary structures and inflatables

If PVC must be used, then sending it for recycling is essential. 'Vinyloop' is a technology to look for. It will need to be collected separately, not mixed in with your co-mingled recyclable materials.



(L)LDPE - (Linear) Low Density Polyethylene

- Squeezable bottles & flexible lids
- Six pack rings
- Foam packing such as for electronic equipment (not to be confused with polystyrene)
- Film plastic/cling wrap/stretch wrap
- Bags (the glossy and stretchy type), zip lock bags
- Lining on milk and juice cartons and paper cups

Whilst it is recyclable, check if your facility accepts it, especially if food contaminated. Film/soft LDPE may not be accepted by mechanized recycling plants as it could interfere with the automated systems. Check whether paper items lined with LDPE can be accepted for recycling and if it goes in with paper/cardboard recycling, with mixed recyclables, or needs to be separated.



PP - Polypropylene

- Bottle caps
- Disposable food containers
- Translucent rugged reusable containers
- Carpets and floor mats
- Ropes
- Garments/Fabric
- Crisp, cookie and chocolate packets
- Woven sacks
- Woven shade cloth

Whilst it is recyclable, check if your facility accepts it. The film PP packets, woven bags, straws, rope etc may not be readily accepted for recycling. In some facilities bottle caps (PP) must be removed from bottles (PET) in order for both to be recycled.

Know your plastic



PS – Polystyrene

Expanded polystyrene foam (Styrofoam):

- Food containers, trays and cups.
- Bean bag balls
- Fruit and vegetable boxes
- Packaging
- Buoys and floats

High impact polystyrene:

- Yoghurt pots
- Fruit and meat trays
- Coffee cup lids

Whilst it is recyclable, check if your facility accepts it. Polystyrene, especially food soiled, is often not accepted for recycling in typical facilities. Hopefully there will be no polystyrene in food service by design, but if it is likely to appear, have a recovery plan.



Other plastic: Polycarbonate (PC)

- Re-usable cups including wine goblets
- Office water cooler bottles
- Hard re-usable bottles/water bottles

Not often accepted for recycling. It is designed for re-use.



Other plastic: Nylon

- Cable (zip) ties
- Rope
- Textiles

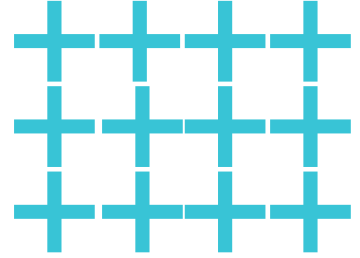
Not often accepted for recycling.



Mixed Materials

- Food pouches (metallized plastic)
- Tetra Pak
- Juice and milk cartons
- Plastic lined paper cups
- Coffee and tea pods and discs
- Printer cartridges and other electronics
- Space blankets

Not often accepted for recycling, however ask the waste handling company if they will accept it. Some product producers have their own take-back programmes.



Further Info

To find out more about the Volvo Ocean Race sustainability programme:

volvooceanrace.com/sustainability

Enquiries: sustainability@volvooceanrace.com

References

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ii **Compostable vs Reusable Cups:** Öko-Institut e. V. (2011)

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iii **Can you clean up the Pacific Garbage Patch?** NOAA: <https://marinedebris.noaa.gov/can-you-clean-pacific-garbage-patch>

iv **Production, use, and fate of all plastics ever made:** Roland Geyer, Jenna R. Jambeck and Kara Lavender Law: Science Advances, 19 Jul 2017: Vol. 3, no. 7, e1700782 <http://advances.sciencemag.org/content/3/7/e1700782.full>

Acknowledgements



Volvo Ocean Race Education Programme

Graphics and ocean plastic pollution information within this guide are drawn from the excellent Volvo Ocean Race education programme developed by our Sustainability Programme Education Manager Lucy Hunt.

View and download school education programme resources at: volvooceanrace.com/education

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