

PLASTIC IN OUR DAILY LIVES

Pack your bag with:

- ✓ reusable bottle
- ✓ Tupperware
- ✓ coffee cup
- ✓ reusable shopping bag

Do you know how many tons of plastic are produced every year?
About the same as the weight of the entire human population.

That was roughly 320 million tons in 2012 (1). Six years later (in 2018) annual plastic production already increased to 359 million tonnes (2). And in 20 year that number is expected to be 600 million tonnes a year (3). And since the majority of monomers used to produce plastics are derived from fossil hydrocarbons, each year almost 2 million Olympic-sized swimming pools of crude oil are extracted (4) and about 8% is used for the plastic production (5).

While this oil does not directly generate CO₂, the plastic that is produced with it is not any better for the environment. In fact, basically none of the created plastic can be biodegraded. But it can be degraded by weathering processes, that is a combination of sunlight, wind, heat, and wave action (6). And while that might sound good, it's actually a big issue for the environment. That's because what is formed are the infamous **microplastics** which do not decompose fully into biologically usable components, and so this plastic reaches all corners of the earth, including the oceans where they accumulate (7). There they can even be found in the deep sea and the Arctic (8)! In fact, it's estimated that **8 million tonnes of plastic** end up in the ocean each year, which is equivalent to **unloading one full garbage truck of plastic into the ocean every minute.**

If this rate is not reduced, by 2050 the ocean will have more plastic than fish (by weight) (3).

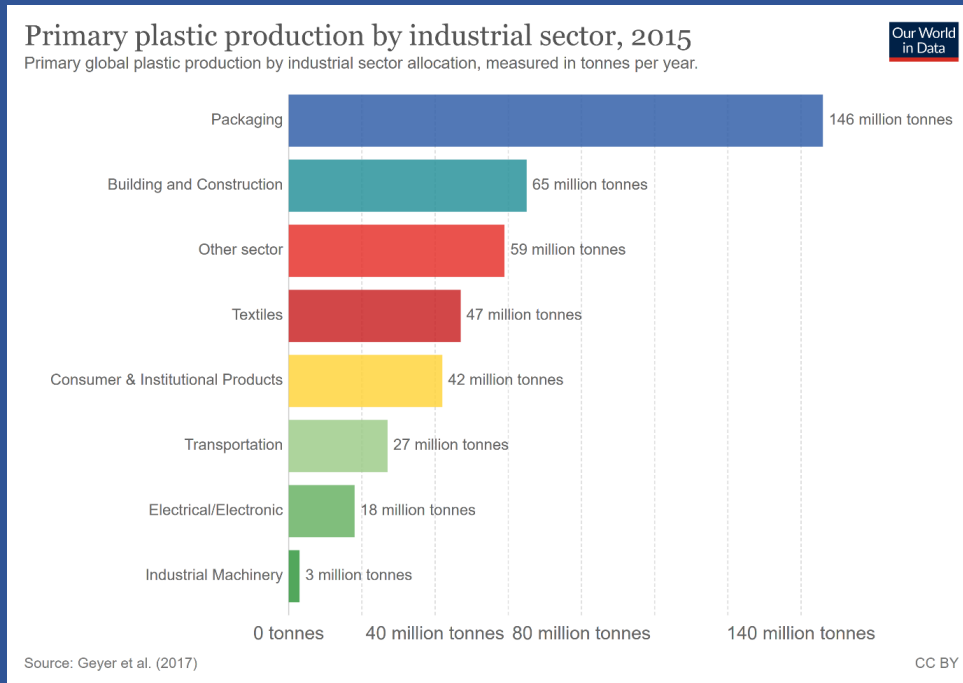
But this plastic does not merely float around. It is well known that plastic waste is confused with food by marine animals, or in case of microplastics is absorbed unconsciously through their filters (9). The confusion with food has drastic consequences for the sea animals, because the plastic waste clogs up their digestive tract. These animals end up starving to death with a full stomach. Or they get caught in the waste and are strangled by it. It has been estimated that 100'000 marine mammals die each year as a result of eating plastic (10)

And maybe karma is getting back to us, because it's estimated that through the food chain **we might be eating 5 grams of plastic every week** (11). What effects this has on our bodies is not known, but most likely not good ones.

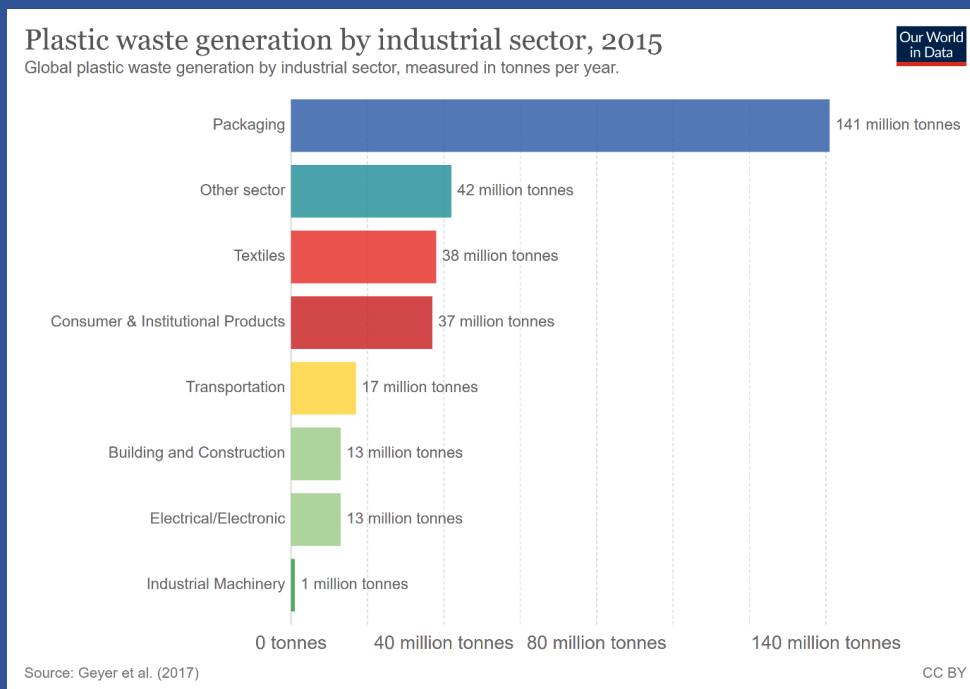
Plastic is everywhere because it's a very useful material since it's so cheap and durable. Durable here means up to about **1000 years** (12). So it's quite ironic that something that can be used for so long is often used only once. That type of plastic is called single-use aka one-way plastic. Where do you find it? Think about all the packaging of food and sold items. In Europe, of the entire annual plastic production,

packaging makes up an astounding **40%** (13). In 2015, 146 million tonnes of packaging plastic were produced worldwide.

The issue is that since this plastic is mostly only used once, lots of it must be constantly produced. In fact, of those produced **146 million tonnes** of packaging plastic **141 million tonnes** turned into **plastic waste**.



In order to reduce the amount of plastic in the environment in the future, reduction in consumption of single-use plastic is one of the most important actions we can take today.



What can I do?

Use reusable coffee cups and water bottles

- Swiss tap water is of such an excellent quality (high purity and with lots of minerals) that it doesn't make any sense to waste money on bottled water!
- **Good news for the coffee drinkers:** you can now get a **KeepCup** with a **20% discount** at the ETH Store until 24.03.2020. Then save **0.30 CHF** every time you bring your KeepCup or own coffee mug at many cafes at ETH. Here is the price reduction you get in other Swiss stores:

Vergünstigung mit Mehrwegbecher	
Firma	Preisreduktion
Avec	keine
Brezelkönig	Upgrade***
Coop to go	25 Rappen
Coop Restaurant	20-60 Rappen
Hiltl	30 Rappen**
K Kiosk	keine
McDonalds	keine
Migros Restaurants*	50 Rappen
Press & Books	keine
Spettacolo	Upgrade***
Starbucks	80 Rappen
Sutter Begg Basel	keine
Tibits	30 Rappen**
Tchibo	50 Rappen
*Zürich & Basel **plus Take-Away-Rabatt von 50 Rappen	
***Upgrade auf die Grösse «Grande» im Wert von 1 Franken	

(20Minuten, 05.01.2020)

Package your food smartly

- Pack a tupperware in your backpack and use it for takeaway and leftovers. Foodlab and Clara's Kitchen also accept it.
- **Recircle:** A tupperware that can be borrowed for 10.- to be used in canteens and partnering takeaways. You get a clean one, or your 10.- back when you return your used one.
- Fruits, veggies and nuts are **already packaged in their own peel and husks!** Buy them **loose** and try to avoid packaged ones. If you have to, use reusable fruit bags.
- Use reusable **beeswax wrap** instead of plastic foil. You order it [here](#) or make it yourself [here](#).

Groceries

Why buy an excessive quantity of food packaged in plastic and then in carton when you can fill the empty tupperwares, jars and bottles you have at home with the quantities of ingredients you really need at **Zero-Waste-Shops?**


- **Chez Mamie:** near Hauptbahnhof ([Zollstrasse 57, 8005 Zürich](#)) and Schaffhauserplatz ([Schaffhauserstrasse 74, 8057 Zürich](#))
- **Foifi** (Schiffbaustrasse 9b, 8005 Zürich)
- **Zollfrei** (Freilagerstrasse 71, 8047 Zürich)

The uncomfortable truth about recycling, or why it’s the last of the 3 R’s















Of course recycling is good intention, but unfortunately the various main plastic-packaging are still disposed indiscriminately and represent an enormous burden on waste management systems. Although it would consume 66% less energy than making new plastic with many litres of fossil oil, because plastic is not just plastic, certain types need recycling using various separation and cleaning processes that are so expensive that it’s way cheaper to just make new one (14, 15). Do you know the little recycling triangle with the 7 numbers in it? Well, **only the ones with 1 and 2 are actually commonly recycled.**

The 1 is for PET, which is well collected in Switzerland. But then **PET accounts for just 10%** of our plastic. Of all the plastic in the world, **only 9% is recycled** and the rest is incinerated, ends up in landfills or in the environment (13). In Switzerland we don’t have landfills, so of our 90 kg plastic waste per person 80% is incinerated to recover energy (16). While this is unarguably better than landfilling it, it’s also the end of the line for that plastic, meaning that for the next plastics more fossil fuels needs to be pumped out of the ground.

Which plastics are recyclable?

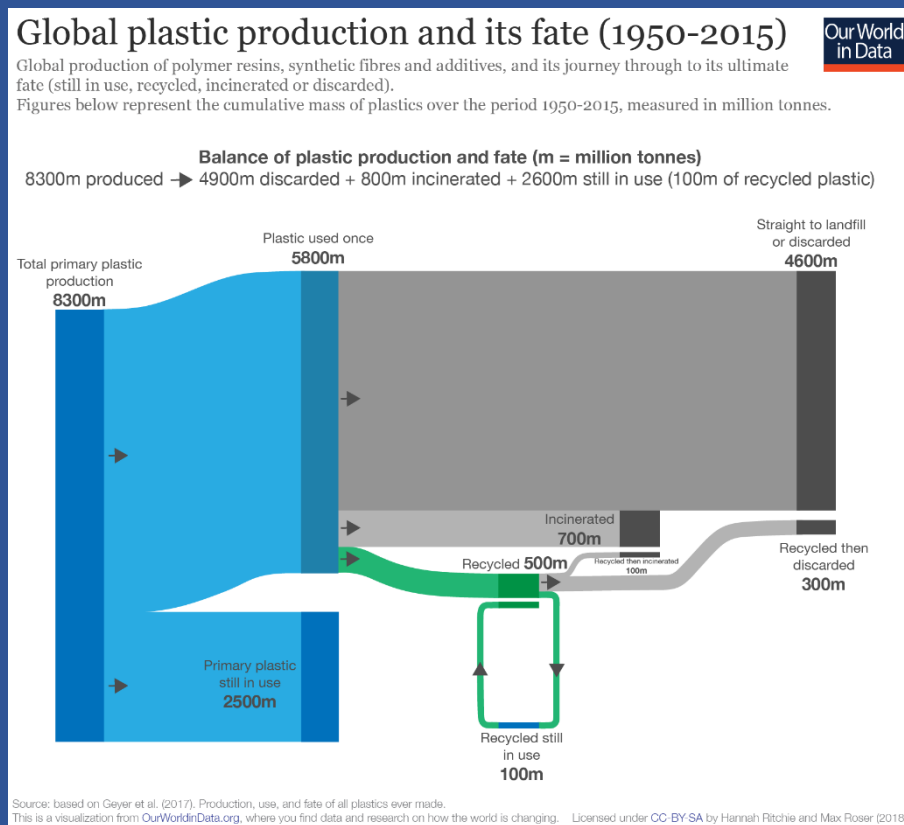


Summary of plastic polymer groups, their common uses, properties and recyclability. Numerical coding (from 1-7) is typically provided on plastic items and gives information of their polymer grouping below. Recyclability is based on common recycling schemes but can vary between countries as well as regionally within countries; check local recycling guidelines for further clarification.

Symbol	Polymer	Common Uses	Properties	Recyclable?
 PETE	Polyethylene terephthalate	 Plastic bottles (water, soft drinks, cooking oil)	Clear, strong and lightweight	Yes; widely recycled
 HDPE	High-density polyethylene	 Milk containers, cleaning agents, shampoo bottles, bleach bottles	Stiff and hardwearing; hard to breakdown in sunlight	Yes; widely recycled
 PVC	Polyvinyl chloride	 Plastic piping, vinyl flooring, cabling insulation, roof sheeting	Can be rigid or soft via plasticizers; used in construction, healthcare, electronics	Often not recyclable due to chemical properties; check local recycling
 LDPE	Low-density polyethylene	 Plastic bags, food wrapping (e.g. bread, fruit, vegetables)	Lightweight, low-cost, versatile; fails under mechanical and thermal stress	No; failure under stress makes it hard to recycle
 PP	Polypropylene	 Bottle lids, food tubs, furniture, houseware, medical, rope, automobile parts	Tough and resistant; effective barrier against water and chemicals	Often not recyclable; available in some locations; check local recycling
 PS	Polystyrene	 Food takeaway containers, plastic cutlery, egg tray	Lightweight; structurally weak; easily dispersed	No; rarely recycled but check local recycling
 OTHER	Other plastics (e.g. acrylic, polycarbonate, polyactic fibres)	 Water cooler bottles, baby cups, fiberglass	Diverse in nature with various properties	No; diversity of materials risks contamination of recycling

Source: based on general US & UK guidelines, and chemical polymer properties. Icon graphics from Noun Project. This is a visualization from OurWorldinData.org, where find data and research on how the world is changing. Licensed under CC-BY-SA by the authors.

And anyways, how much energy is actually recovered by burning plastic? According to one study, burning 1 kg of non-recyclable plastic in Europe generates around 2.8 kWh of heat and 0.9 kWh of electricity (17). That's a total of 3.7 kWh/kg. To put this number into context let's however consider the energy that also got into making the plastic, the so-called embodied energy. General plastics have an average 25 kWh/kg of embodied energy (18). That means that by burning plastic we only get back 15% of the energy. Not that amazing of a deal.



What can I do?

Many single-use plastics can often do more for you. For example, with a little bit of creativity you can upcycle your plastics into plant vases, decoration and containers to keep things tidy when it comes to smaller items. For even more inspiration click [here](#).

If you would like to learn more about Upcycling, please contact **Precious Plastic Zurich** on [Facebook](#), or visit their event at the Sustainability Week on Monday and Tuesday 11.30-13.45 in the HXE Foyer Höggerberg. They also meet regularly on the Höngg and are engaged in the upcycling of plastics.

In order to increase your recycling you should opt for plastic packaging of type 1 and 2. When shopping, we should also always be aware that with every cent we spend we support someone. If we buy our food packaged, we also support the packaging industry. So let's use the power of the consumer even if it often doesn't seem to be big.