



BREAKING UP WITH PLASTICS

COVID-19 & PLASTICS
POLLUTION IN MALAYSIA

GREENPEACE

Greenpeace Malaysia

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Plastics: A Parallel Pandemic

Almost two years after it first began, the COVID-19 pandemic continues to raise serious concerns about our environment and future. Our choices matter now more than ever; how we protect ourselves in the pandemic inevitably impacts the quality of our surroundings. Everything we do to stay safe, like putting on a mask or shopping online, has its implications.



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The COVID-19 pandemic has changed our relationship with plastics, particularly in the state capital of Kuala Lumpur which has become one of Malaysia's hardest-stricken cities.

Prior to the COVID-19 pandemic, Malaysia had been progressing towards stricter environmental management and a reduction in pollution levels. But as the nation initiated movement control orders and lockdowns from 2020-2021 to combat the spread of the COVID-19 virus, most Malaysians have had to stay at home, changing the way people live and how they consume.

We've adopted a number of lifestyle changes over the past two years as a population. Consider some new norms: masking up daily; getting takeaway for most meals; buying nearly everything online. How has this new way of living impacted the environment and our efforts to be more sustainable?

At Greenpeace Malaysia, we believe it's time we talk about how COVID-19 has changed our relationship with single-use plastics. Confined at home, Malaysians have taken in and thrown out more plastic than ever. Even when we go out to shop, we see people relying on plastic

to cover themselves and their belongings. But more often than not, it's used once and thrown away.

There is an urgent need to review our recent consumption of single-use plastics as a society, as well as identify current and future threats and opportunities to the environment as a result of throwaway use.

We hope that these pages provide you with the information necessary to understand the implications of the pandemic on Malaysia's consumption and disposal of plastic. At the same time, it won't be all doom and gloom; there will also be suggestions and ideas to empower you to take action against plastic pollution, whether in your capacity as an individual, collective, or organisation.

Building on the good work being done across Malaysia over the years, here are some facts and tips on why we should all be breaking up with plastics with immediate effect!

Malaysia's struggle with plastic

How has Malaysia managed its plastic waste prior to the COVID-19 pandemic?

Malaysia is one of the world's 17 top biodiversity-rich countries.^[49] Some of our planet's most prized plants and animals live here, but plastic waste is a major concern to our terrestrial and marine ecosystems; you need only look at horrifying images of wildlife choking on plastic objects or integrating plastic into their habitats for hard proof.^[57] Mismanaged plastic waste—a result of improper disposal of plastics—leads to plastic polluting our landscape and waterways. Burning plastics releases toxic chemicals into the air we breathe.^[14] There's no running away from the consequences of unsustainable plastic use.

Unfortunately, Malaysia was ranked 8th in 2015 among countries with the most mismanaged plastic waste around the world.^[5] Solid waste management is one of the main environmental problems in Malaysia, exacerbated by the country's rate of growth. Trash separation at the source has been made mandatory since 2015, but public awareness is still low.^[20] Gaps in the nation's waste management system, paired with the behaviour of plastics in the environment, are contributing to local air, water and land pollution. At the same time, increasing production of virgin plastic (over 99% of which is made from fossil fuels) is contributing to climate change.^[19]

The World Bank indicated that Malaysia recycled just 24% of key plastic resins in 2018^[36], while Khazanah Research Institute (KRIS) reported that only 11.4% of household plastic waste was recycled in 2017.^[34] This low recycling rate is unsustainable considering that Malaysians generated over 200,000 tonnes of municipal waste monthly in 2020, of which plastic comprised a quarter^[40]. Even though there have been some positive policy measures in recent years (such as banning plastic straws and bags in some states in Malaysia^[21]), it is likely that the increase in overall plastic waste during the pandemic will have outweighed any benefit from these consumer-targeted measures. Adding to the systemic failure of plastic waste management (and exacerbating the issue in Malaysia) is the disastrous impact of the global plastic waste trade. Malaysia has been a recipient of significant amounts of plastic waste from other countries since China banned imports of most plastic in 2018. In fact, the World Bank in 2021 estimated that up to 70% of the existing installed recycling capacity in Malaysia is used for imported plastic scrap.^[36] Unfortunately, a lot of plastic waste in Malaysia ends up illegally dumped or incinerated with dire consequences on human health and the environment.^[27]

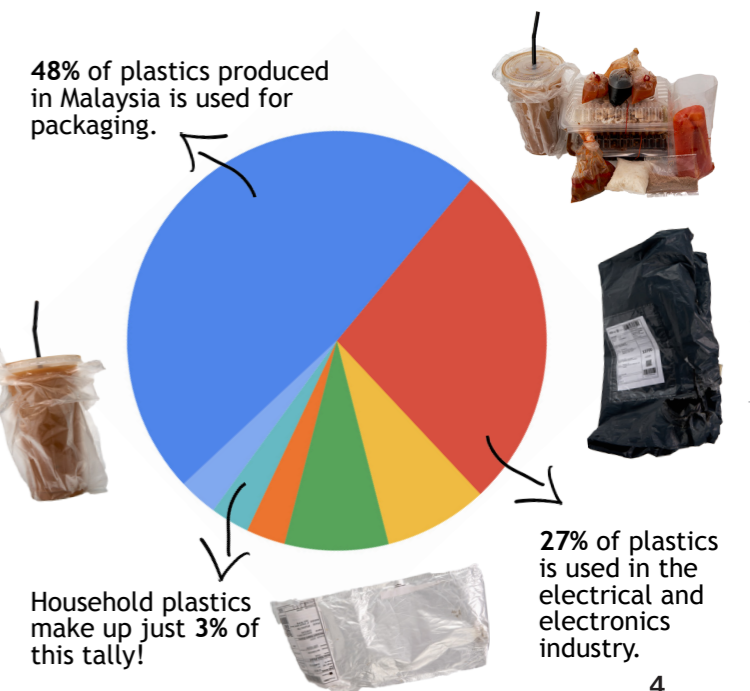
However, conflicting reports and a lack of updated information highlight the difficulty of sourcing reliable data on plastic waste management in Malaysia. Not only does the Malaysian government seem to lack commitment in developing a lasting solution to the plastics problem, public health authorities have not published current data on plastic waste management for the general public, and follow-up questions on fulfilled data requests were not entertained.

The Malaysian Plastics Industry^{[7][15]}

Key facts about how plastics are consumed in Malaysia.

1,300+
Number of plastic manufacturers in Malaysia (2018).

RM320 billion
Total value of manufactured plastics goods in Malaysia (2018).



Plastics in Malaysia during COVID-19

A lot of our recent choices are being made in response to the COVID-19 pandemic. But the quick and decisive actions we've taken to try to stay safe comes at a price: we're using more plastics than ever today.

Face Masks

In April 2020, the Malaysian government provided each household 4 face masks to be worn only by those who displayed symptoms of COVID-19.^[1] By May 2021, the Ministry of Health not only said that wearing a mask in public was mandatory for all individuals, but also “double-masking” was encouraged.^[4] By August 2020, the Ministry of Defense had officially instituted a mandatory mask requirement, announcing that those who fail to comply would face a fine of up to RM1,000 or more and/or jail time.^[5] As a result, for most of 2020-2021, we have been putting on face masks

to go outside, even if only to receive deliveries at our own doorsteps. In September 2020, it was estimated that up to 7.04 million face masks were discarded each day in Malaysia.^[2] Disposable face masks, made from polymers such as polyethylene and polyester, are a source of plastic pollution and microplastics in the environment. While the possibility of mechanical recycling and disassembly of face masks has been studied, masks are presently not favoured for recycling as used face masks may harbour residual pathogens.^[2]



The amount of face masks Malaysians use in one year is enough to cover the entire city of Putrajaya!

Generated from estimated daily face mask use in Malaysia (7.04 million/day in 2020)^[2], area of Putrajaya (49 sq kms)^[37], and average surface area of mask models (230cm²).^[29]

Food Deliveries & Takeaways

Many Malaysians have turned to deliveries and takeaway since March 2020 in response to standard operating procedures (SOPs) which have restricted dining in public. Rakuten Insight reported in April 2020 that 54% of Malaysians admitted to utilising food delivery services more frequently during the COVID-19 pandemic.^[6] Reef Check Malaysia reported that takeaway containers, food wrappers, straws and plastic bottles comprised 47.4% of the 11 tonnes of trash found during its beach cleanup in September 2020.^[46] Malaysia's low plastic recycling rate, combined with an absence of policymaking to offset a surge in F&B-related single-use plastic consumption, is bad news for our environment.



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Medical Waste

During the pandemic, healthcare workers have been required to wear personal protective equipment (PPE), disposable gloves and face masks while engaging with the public. These items not only contain plastic components or materials, but they are also often single-use. Clinical waste, also known as medical or healthcare waste, includes tools and items used to vaccinate the population, such as syringes and needles.^[50] Up to 1,000 kg of medical waste was generated at Seberang Jaya Hospital daily in March 2020, of



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Empty vials of the COVID-19 vaccine are an example of locally-generated clinical waste during the pandemic.

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Our growing reliance on online shopping raises concerns for the volume of plastic use generated by online shopping platforms.

30,958,860kg
Clinical waste generated in Malaysia in 2020^[48]. COVID-19 related clinical waste comprises 21.46% of this figure.

which approximately 12% was COVID-19 related^[5]. In June 2021, government news outlet Bernama reportedly stated that the volume of clinical waste generated nationally was up 111.94% compared to 2019 and that there was a backlog of clinical waste for incineration^[42]. This increase in clinical waste is a sign that our healthcare systems are in higher demand, and the need for better management of medical waste is a major concern.



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Polystyrene food packaging wrapped in plastic bags, seen littering the alleyways of Kuala Lumpur.

Online Shopping

Forced to survive mostly indoors, Malaysians nationwide are doing most of their shopping online, driving significant growth in online retail. The COVID-19 pandemic spurred the local e-commerce market to grow by an estimated 24.7% in 2020.^[8] Consider Singapore-based e-commerce platform Shopee: the start of the COVID-19 outbreak saw its revenue grow by 110% in Q1 2020 alone^[9]. In the last quarter of 2020, Shopee drew more than 47.33 million monthly visits from Malaysia alone (up 24.7% from Q3), and this figure has continued to grow through Q2 2021 (reaching 53.98 million monthly visits)^[43]. The platform ended 2020 with RM7.41 billion in revenue—up 116% from the previous year^[44]. Unfortunately, most online shopping platforms like Shopee also advise sellers to wrap products in large amounts of bubble wrap in addition to styrofoam and tape^[45].



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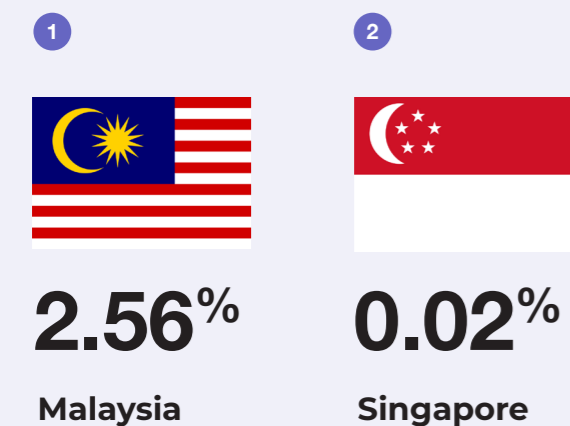
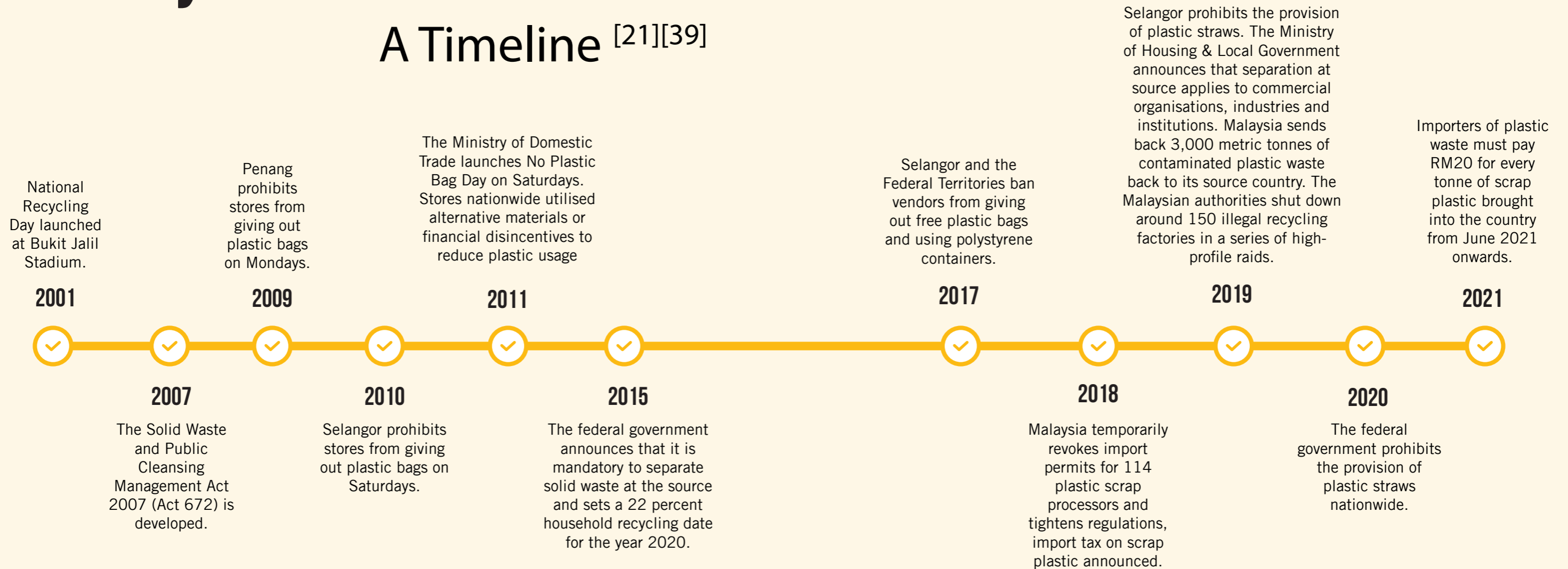
Discarded face mask disintegrating in a drain, where it can quickly become a source of microplastic pollution.

The Threat of Microplastics

Disposable face masks have been studied as a potential source of microplastics in the environment.^[47] Microplastics are tiny particles of plastic that can infiltrate food, water, and air. A study by Curtin University reported that in 2020, Malaysian rivers contained microplastics from the degradation of plastic debris caused by ultraviolet (UV) light from the sun, indicating that mismanaged plastic waste is likely a key factor causing the presence of microplastics in our waterways.^[11] The implications of this are not just harming Malaysian wildlife. In 2019, a study by the University of Newcastle and WWF found that globally on average, people may be ingesting a credit card worth of plastic each week, most of which comes from microplastics in drinking water.^[55] Microplastics have become so prevalent they are contaminating hard-to-reach areas—including the Arctic^[12]—and some samples have even found microplastics in human placentas,^[13] raising serious health concerns.

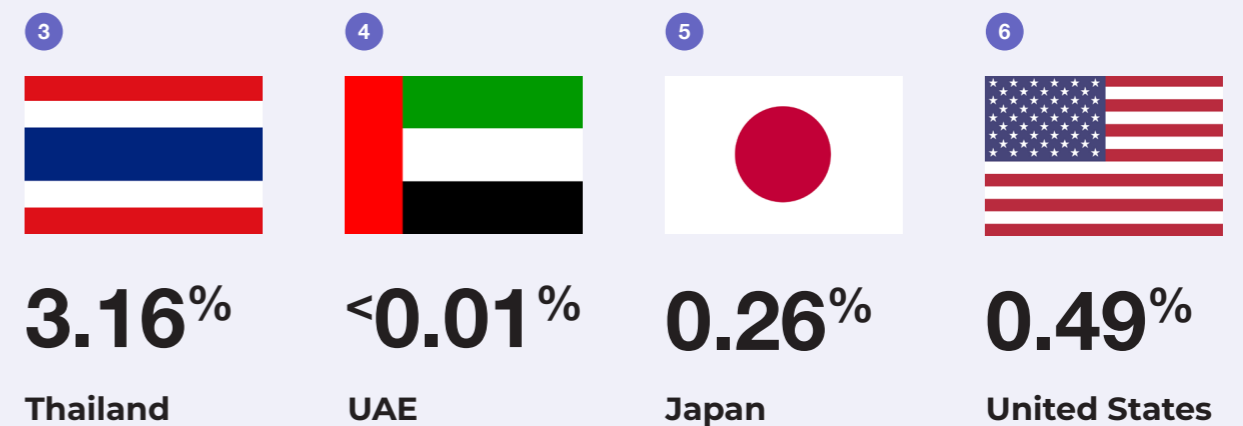
Malaysia vs. Plastics

A Timeline [21][39]



Projected Share of Global Mismanaged Plastic Waste in 2025

Due to a lack of recent projections on future production of plastic waste, these figures were based on a 2015 report by Our World in Data.^[51] It is crucial that more research is conducted on the impacts of unsustainable plastic waste management, particularly in developing and third world countries.



The Problem with Plastics & Plastic Recycling

When a material like plastic—pliable, long-lasting, versatile—finds its way into the natural environment, it can kill wildlife, damage ecosystems, and disintegrate into microplastics that seep into our water, land, air and food. Bearing in mind the harmful properties of plastic, we are better off switching to more sustainable consumption habits that incorporate less single-use plastic, such as reuse and refill systems.

How are plastics actually made?



- 1 Ethane & propane are refined from natural gas, oil, or plant matter. It has been stated that oil & gas wells produce the chemicals needed to make 99% of plastics.^[53]
- 2 The gases are treated with heat in a process known as cracking, turning them into monomers to which potentially toxic additives are added to give specific characters to plastic.^[54]
- 3 The resulting “fluff”-like material is melted down and moulded into tubes of plastic which get cut and shipped to factories where they will be reshaped into plastic products.

Plastics are necessary in healthcare. Plastics can be created with specific properties (e.g. inert, sterile), making it highly suitable for medical applications.

Plastic preserves food. Plastics in food packaging keeps food dry and provides an air-tight seal, which can make food last longer, reducing food wastage and preventing contamination.

Plastic is lightweight, durable and malleable. Compared to some other materials (such as glass), plastic could reduce the energy required in transporting goods and producing automobiles, and it functions as a raw material for parts in construction and electrical appliances.

For & Against Plastics

Nearly all plastic is made from a non-renewable resource. 99% of plastic is made out of oil, which is a limited resource on our planet. Plastic is also not a fully recyclable material; most plastic can only be recycled a couple of times at most, and it is usually downcycled into lower quality material^[23].

Plastic pollutes water. Plastic waste can end up in our rivers and oceans, harming ecosystems, breaking down into microplastics and killing marine life.

Plastic pollutes air. The production and incineration of plastic produces toxic emissions such as benzene, dioxin and heavy metals which are harmful to the environment and human health, potentially triggering myriad of serious health issues^[41].

Littering! Because plastic is so abundant and is the primary material in single-use packaging, it is common for consumers to improperly dispose of plastic such as tossing it into the environment and even burning it.

Is recycling plastic the solution for Malaysians?

Even if recycling practices become widespread, plastic waste will likely remain a pressing issue.

In 2016, Malaysia’s Urban Well-being, Housing and Local Government Ministry began enforcing Act 672 of the Solid Waste and Public Cleansing Management Act 2007, which required residents to separate their waste.^[30] However, the law was only ratified in select states and territories, namely Putrajaya and Kuala Lumpur, Johor, Malacca, Negeri Sembilan, Kedah, Perlis and Pahang. Residents who do not comply may receive a fine between RM50.00 to RM500.00. And in spite of this law, by 2018, the Deputy Housing and Local Government Minister claimed that Malaysians generate 38,000 tonnes of waste on a daily basis, but only 24% of this was separated and recycled while the rest went straight to landfills.^[31]

When waste is not segregated properly at a local level, large amounts of recyclable plastic end up in landfills, burned, or enter our waterways. Furthermore, Malaysia may have the capacity to recycle at least 3 out of 7 categories of plastics, but the local recycling industry is focused on easily-retrievable, high-value plastics, such as PET mineral water bottles.^[32] A study also found that 81 percent of plastic manufacturing companies will opt for cheaper and higher quality virgin resin rather than recycled plastic pellets.^[33] Plastics are highly versatile and can be produced in various forms, and this poses problems for recycling. Recyclers in Malaysia have pointed out that mixed, multi-layered and soiled plastics limit recycling, as well as the cost, time and energy-consuming nature of the processes.^[15]



Plastic packaging from online deliveries, often made from non-recyclable plastics, overflows from a bin in Kuala Lumpur.



Plastics soiled with food cannot be recycled, and must almost always be washed prior to being sent for recycling.

Most rigid plastics can be recycled in Malaysia, but multi-material plastics pose a challenge in recycling. The most commonly recycled flexible plastic locally is LDPE. Currently, most manufacturers using recycled plastics will firstly opt for imported plastic as raw materials, because of guaranteed supply, lower price, large volumes and homogeneous resins. The second choice for raw materials are local industrial rejects (factory-grade) plastic.^[15]

The largest challenge faced by the local plastic recyclers is the lack of stable demand for recycled plastics, as well as fragile supply chains—for example, agents or structures in the recycling community which are not resilient enough to withstand shock, such as plastic scavengers who cannot work during the pandemic. Furthermore, what you put in your bin at home may be difficult and costly for local recyclers to sort and process. Local plastic recyclers in Malaysia usually prefer to use imported waste because it offers a steady supply of large volumes of similar material at a lower price. On the other hand, household waste (also known as municipal or post-consumer waste) is usually the last choice for Malaysian recyclers due to inconsistent quality, more impurities, and higher costs.^[15]

The entire concept of effective plastic recycling might as well be a myth that pushes the plastic waste problem onto consumers. The oil lobby has been promoting recycling since the 1970s, knowing the whole time that recycling plastic will never be viable^[22] (in part because most plastic can only be effectively recycled once before it is “downcycled”^[23]), and especially because virgin plastic is cheaper, even more so since oil prices dropped during the pandemic^[24]. In fact, globally only 9% of all plastic ever made has been recycled^[25], and it is estimated that around 2% has been “effectively” recycled into similar quality material^[26], highlighting the fact that no country has found recycling to be a feasible solution for plastic waste.

Types of Plastic Waste Generated in Malaysia^[34]

Plastic waste that falls under the Type 1, 2 and 5 categories are known to be recyclable, but this is not always the case at every recycling centre. Even if your plastics are the right type, it is not guaranteed to be recycled and you will need more information from your local recycling company about what specific items they can accept. Some Malaysian recycling plants even claim to accept all types of plastics despite the fact that it may not be as environmentally-friendly or efficient to recycle every type of plastic.^{[6][10]} It should also be noted that when plastics are coated with food waste or other non-recyclable materials, it can contaminate entire batches of material and make it too costly to sort and clean, in which case it may be discarded—even if some materials were technically recyclable.

CATEGORY	CODE	TYPE OF PRODUCTS	RECYCLABLE
Polyethylene terephthalate, PET [Type 1]		Mineral water bottles, fizzy drink bottles, pre-prepared food trays and boil-in-the-bag food pouches, shampoo & vegetable oil bottles.	Yes
High density polyethylene, HDPE [Type 2]		Packaging household and industrial chemicals, snack & food packages, cereal box liners, milk & non-carbonated drinks bottles, margarine tubs, toys, buckets, rigid pipes, crates, garden furniture & flower pots.	Yes
Polyvinyl chloride, PVC [Type 3]		Pipes & fittings, credit cards, shampoo & vegetable oil bottles, synthetic leather products.	No
Low density polyethylene, LDPE [Type 4]		Films such as plastic bags/films, polystyrene, foam, garment and produce bags, garbage bags, packaging films, bubble wrap.	No
Polypropylene, PP [Type 5]		Large moulded products such as battery casings, bottle tops, ketchup & pancake bottles, yoghurt & containers, crisp bags, straws, medicine containers.	Yes
Polystyrene, PS [Type 6]		Yoghurt pots, fast food trays, disposable cutlery, video cases, vending cups, seed trays, coat hangers, low cost brittle toys, egg boxes, hot drink cups, protective packaging for fragile items and insulation.	No
Other		Plastics with polymers other than the six most common, such as nylon, or those which are not readily identifiable.	No

Busting the Bioplastics Myth!

By the way, switching from oil-based to plant-based won't fix the problem!

News of plastic alternatives are always exciting, but it's worth remembering that any material can be problematic and unsustainable if it's only used once before being discarded. Merely substituting materials won't fix the problem: if we were to replace plastic with plant-based or biodegradable plastics, we are simply creating a different kind of environmental issue. For instance, even if bioplastic products gain widespread use over their oil-based counterparts, they could still give rise to unsustainable agricultural or forestry practices in the absence of behavioural change.

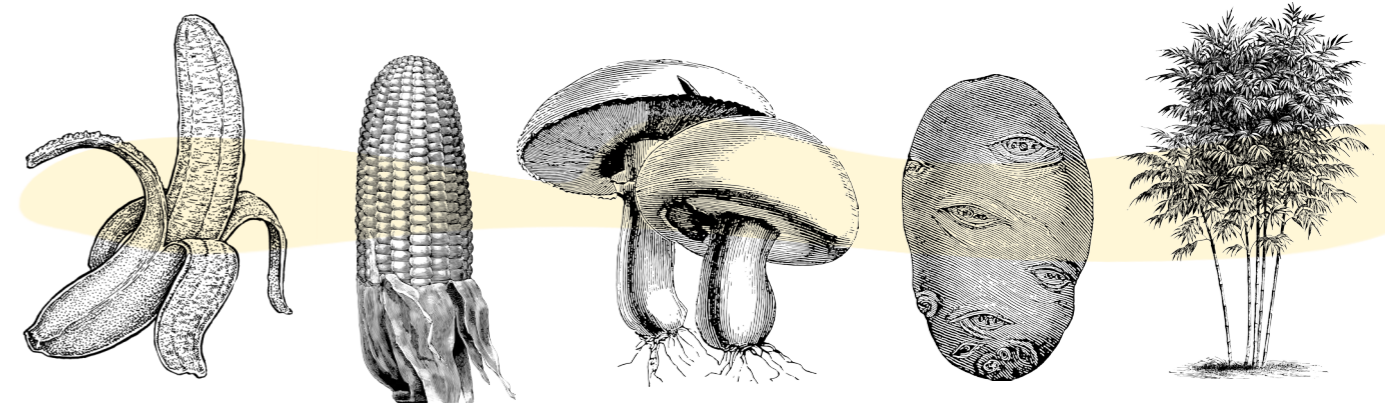
Furthermore, bioplastics or bio-based plastics made from biomass resources or feedstocks such as sugar, starch, oil or lignocellulosic biomass are derived from agricultural crops, which can lead to competition with food crops, threaten food security and drive land-use change and agricultural emissions.^{[55][56]} Additionally, as the word "bioplastics" does not have a standardized definition, it may also still refer to bio-based materials which contain fossil fuels. Another problem is what happens when they are thrown out. Biodegradable compostable plastics degrade only under very high temperatures and humidity conditions that are rarely, if ever, met in the natural environment. Bioplastics can also break apart into smaller pieces (just like regular plastic) which can be ingested by animals and enter the food web.

Prior to the COVID-19 pandemic, researchers at the University of Plymouth discovered that samples of "biodegradable" plastic bags only disintegrated

"...most biodegradable plastics available today won't decompose in a landfill, and it's a prime example of industry "greenwashing"..."

upon exposure to temperatures achievable with industrial composting methods.^[35] Some were sturdy enough to hold heavy shopping after being buried underground for 3 years. In fact, most biodegradable plastics available today won't decompose in a landfill, and it's a prime example of industry "greenwashing".^[28] Labels that say 'eco', 'bio' or 'green' have been used by companies around the world to market their products and services as if they were environmentally-friendly even when it's not true.

Remember: cultivating an ecologically-conscious lifestyle is not about discarding and replacing the plastics you already have. If we want a lasting solution to plastics, we must get rid of the throwaway mindset which pervades society at present. Our best bet is to start reusing what we have at home—most disposable plastic items, such as takeaway containers and cutlery, can be repurposed until they break down. Whether employed as storage containers for spices, stationary or even detergents, these types of plastics can be cleaned, repaired and reused many times. Most importantly, to tackle this problem effectively we need to focus on less consumption and more reuse.



PIVOTING AWAY FROM PLASTICS

By now, we hope we've made it clear that Malaysia's plastic problem has been made worse by the pandemic. But it's not a dead-end: there are many individuals, communities and organisations across the country battling plastic pollution by synergising their efforts while disseminating useful information to the public. In this section, check out ideas and methods for Malaysians to say goodbye to plastics.

GREEN PICKS

The top 5 better choices to help reduce dependency on single-use plastic!



1

Reusable Face Masks

The simple choice of substituting disposable face masks for reusable, cloth-based masks goes a long way towards alleviating plastic pollution during the pandemic.

Take a gander at our catalogue of eco-conscious local businesses on Page 24!



2

Bamboo (Straws)

Looking to swap your belongings for eco-friendly alternatives? Go for natural items like bamboo straws and jute bags, and be wary about greenwashing!

Learn about the truth behind biodegradable plastics by going back to Page 12!



4

Beeswax Wraps

Say goodbye to plastic cling film, as beeswax wraps are here to stay! Thanks to a surge of popularity in recent years, these naturally-made wraps can be reused again and again, providing up to a year's worth of use. The best part: you can even make your own!

Find out how to reduce single-use plastics at home on Page 15!



3

Homemade Sanitiser

Sanitiser fluid is such a must-have item during the pandemic that even businesses have been offering plastic bottles of the stuff as a bonus to customers. While it's simply not as good as handwashing, it's handy when you find yourself without soap and running water. Make your own batch with only three ingredients!

Discover ways to DIY plastic-free COVID-19 protection on Page 21!



5

Strategic Signs

Time and time again we see community leaders talking about the ills of unsustainable plastic use, but manifesting behavioural change remains a challenge. For a start, displaying signages and prompts in strategic locations can remind people to bring their reusables, and will go a long way towards changing mainstream attitudes.

Find out ways to mobilise others against single-use plastics on Page 17!

Kitchen

Beginner

Plant what you can. Growing produce with the seeds, roots and stems you would otherwise throw away not only saves you money but reduces the need to purchase more products and to deal with post-purchase packaging materials.

Intermediate

Ditch the sponge. Most kitchen sponges are made from polyurethane and last for a short time. If a compostable, biodegradable option isn't available near you, old clothes work just as well and cost nothing. With a hammer, nail and some old textiles, you can also make a visually appealing tawashi dish sponge.

Pro

Quit cling film. With long-lasting alternatives such as beeswax wraps and covered bowls and containers, you not only reduce plastics in your kitchen but get more bang from your buck. Learn how to make your own on Page 25.

Bathroom

Beginner

Tried the bamboo toothbrush? Arguably one of the easiest swaps to make in living a plastic-free life, bamboo toothbrushes are biodegradable and have antibacterial properties.

Intermediate

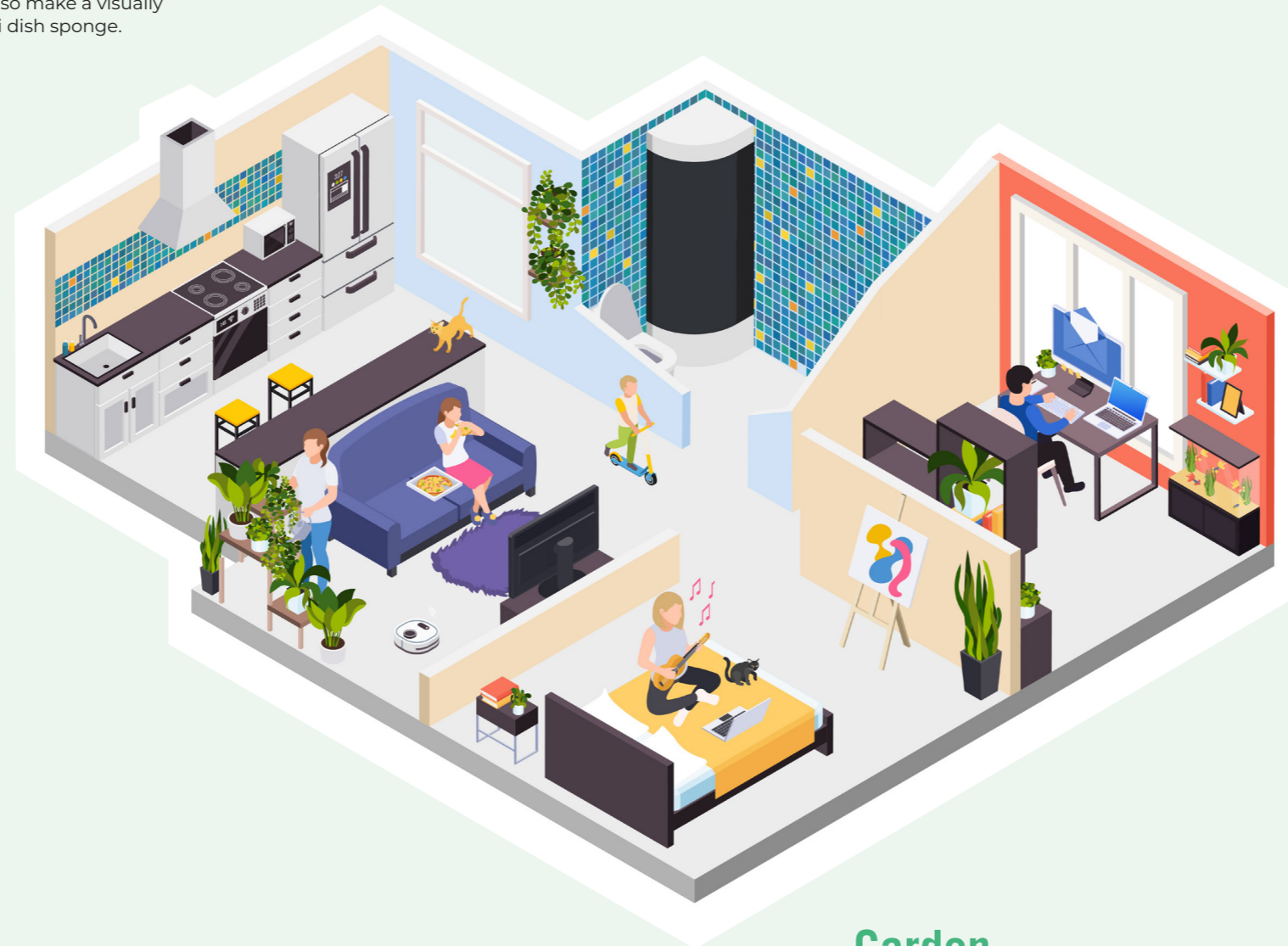
Pick up a bar of soap, or heck, shampoo. The containers that carry our hygiene products pile up fast. Thankfully, bar soaps and shampoos (which can be wrapped with paper, if not sold naked) are on the rise as brands push for zero waste in the shower.

Pro

Consider sanitary product alternatives. There are more biodegradable sanitary products on the market today, such as silicone menstrual cups, reusable pads and cotton tampons. Men can do their part too: swap disposable plastic razors for safety razors or other alternatives.

AT HOME

Ways to reduce plastic consumption in the comforts of your own home!



Pets

Beginner

Choose plastic-free toys. Considering that most pets handle toys with their mouths, buying (or making) toys made from natural materials such as wood, cotton and bamboo are less likely to harm your pets and the environment.

Intermediate

Cook for your pets. Pet owners can avoid the continuous generation of plastic waste from purchases of pet food by simply looking up vetted recipes on the internet. Manufactured pet foods may contain disturbing additives that result in strange pet behaviour.^[58]

Pro

Don't throw pet litter in plastic bags. They'll simply end up in the landfill. Waste from certain pets, such as dogs and cats, are recommended to be buried in the ground or composted a safe distance away from where edible plants are being grown.

Living

Beginner

Many home cleaning products can be replaced with vinegar and baking soda! Much of the plastic in our homes is used to carry harmful chemical reagents. Vinegar and baking soda are not only safe but sold in glass and cardboard containers respectively.

Intermediate

Whatever you need, get it in bulk. Make fewer trips to the store, and when you do, get enough to last a while. You'll quickly notice that the plastic you bring home has been reduced. This, on top of savings made from bulk purchase discounts which are best split between friends and neighbors!

Pro

Pay attention to clothing labels. Clothing made from petroleum-based materials like polyester and nylon inevitably disintegrates with each wash, sending microplastic particles into our waterways. Keep to natural fibres.

Garden

Beginner

Tie and wrap plant parts, such as ripening fruits, with newspaper and twine if necessary. People often use plastic for this purpose but plastic is so durable that it can cut or damage plants during the growth process.

Intermediate

Say no to polybags and plastic pots. These can last for a long time before disintegrating and potentially contaminating the earth. Sow plants in egg cartons and cardboard before moving to the ground, or keep them in terracotta and ceramic pots.

Pro

Make your own compost! You won't need to spend a dime on plastic bags of gardening soil again and you will significantly reduce your household waste at the same time. Compost will also save you money on plant fertiliser.

AT WORK

Ways to mobilise colleagues, employees and employers against plastics!



Juniors & Executives

Intermediate

Download and disseminate Zero Waste collateral. Sharing relevant information and guidelines on plastic-free living goes a long way.

Supervisors & Managers

Use signs and visual prompts. Place reminders in parking lots and entrances to remind workers and patrons to bring their own bags and reusables.

Pro

No containers, no flasks, no takeaways. Rebel against colleagues and superiors who resist going green by refusing their orders!

Bring it up with suppliers. Plastic waste in the workplace often comes from packaging of supplies. Is restocking without plastic packaging an option?

CEOs & Directors

Intermediate

Make recycling, refill systems and composting part of work culture. Provide bins for trash separation and try to compost all organic waste and leftovers.

Founders & Owners

Sign up for the Zero Waste pledge. Get accredited as a sustainably-run business and capture a growing segment of values-driven audiences.

Pro

Prioritise sustainability in CSR. Make greening projects and activities a main component of the organisation's plans to give back to society.

Incentivise sustainable practices. Offer support to employees who want to include sustainability tools and principles into the workplace.



FOR BUSINESS OWNERS

Consumers can only do so much to tackle plastic pollution. There's a crucial need for businesses to invest more effort in reducing plastic waste as they bear significant influence over what we consume daily. **If you own a business which deals with single-use plastics on a day-to-day basis, check out some tips on making your operations more ecologically-conscious.**

1 Pack It Better

Plastic in its various forms is often used to protect goods in delivery. This forms major waste as most plastic packaging ends up in the bin after a short period of use. Instead of bubble wrap, consider recycling used cardboard or paper. So long as items in shipment are held in place, paper-based materials can be an abundant, biodegradable and effective alternative to plastics. Utilised in this manner, paper can also be reused and kept in circulation, prolonging its lifespan while reducing materials costs.



2 Incentives for Online Sellers

Given the shift in retail plastics use from physical stores to online stores, shopping platforms can provide incentives to encourage online vendors to use less plastic packaging. If you're a vendor on an online shopping platform, share your concern with your platform and let them know your willingness to reduce plastic packaging.

3 Returnable Packaging

Despite costing more upfront, returnable packaging schemes are commonly used in the the business-to-business (B2B) sector as it cuts out the need for short-term packaging solutions. In a returnable packaging scheme, businesses must return product packaging, such as wooden or recyclable plastic crates, back to suppliers as part of their regular dealings. This type of packaging can also suit business-to-consumer (B2C) models which run on subscription, such as vendors which regularly deliver fruit and vegetable bundles.

4 Audit Your Plastics

The first step for any business to reduce plastics is to conduct an honest audit of the single-use plastic products in the company. For instance: if you're running a restaurant, how many plastic packaging, containers and cutlery sets are being given out on a day-to-day basis? Which ones can be substituted with biodegradable alternatives, or eliminated altogether by prompting customers to bring their own reusables? Once you know where and how much plastic your business goes through, you can plan better sustainability strategies focused on reduction of disposable plastics in these areas.



5 Refill & Reuse Systems

Refill and reuse systems are one of the best ways for businesses to empower others to utilise reusables. For instance, businesses moving away from plastic packaging can provide employees and patrons refill stations instead of vending machines. Across the Klang Valley, mobile refill stations (e.g. vehicles which deliver a range of cleaning liquids) are widening the possibility of more mindful and environmentally-friendly operations.

6 Make It Public

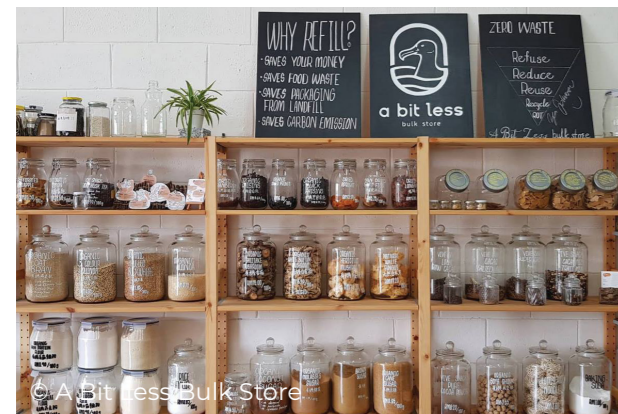
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7 Do It Together

Rid your premises of plastic fast with teamwork and joint initiatives. Forming pacts with like-minded collaborators can help businesses identify sustainable and synergetic ways to operate. For example, the Zero Waste Pledge is an endorsement programme by Zero Waste Malaysia that evaluates businesses and organisations in minimising waste and utilising resources effectively. Pledgers get certified, become part of a green network, and also get to highlight their commitment to green values via affiliated media channels.

ESCALATE!

For many of us, it feels like single-use plastic isn't a choice but rather the sole, available option. So how can everyday Malaysians address the nation's overreliance on plastic? Here's what you need to know about pushing for bigger change!



YOUR WALLET IS YOUR VOTE!

People who believe in a zero-waste lifestyle can buy from speciality stores that help them avoid unwanted product packaging. These include zero-waste stores and bulk stores which allow patrons to purchase directly from bulk bins with self-brought containers. In practice, it means bringing your own cloth bags, bottles and jars to the store to buy unpackaged products such as food and cleaning supplies. Bulk shopping is an important practice because it helps consumers observe how much personal waste they are capable of reducing, empowering them to think and act more conscientiously.



A BIT LESS

A Bit Less Bulk Store is a zero waste grocery store that carries everyday items and staples, minus the packaging. Aiming to eliminate single-use plastic packaging, the store began offering eco-friendly deliveries during the MCO.

THE HIVE

Known as the first zero waste store in Malaysia, **The Hive Bulk Foods** was established in 2016. The store offers a wide range of eco-friendly household and personal care items which cater to a wide range of lifestyles including vegan, gluten-free, and minimalist.



BYOB

With stores across the nation (including in East Malaysia), **BYOB** is the biggest chain in Malaysia for straightforward, no-frills refills. Its wide range of products include detergents, cleaning liquids, personal care items, and even car wax!

PLUCKED

Plucked is a farm in Janda Baik, Pahang, which grows fresh and organic kale, mushrooms, and a myriad of other vegetables. Produce from the farm can be obtained online via AirAsia Fresh and Foodpanda or at premium supermarkets such as B.I.G. and Village Grocer.

BARTER AWAY!

Before money became the standard, people used to swap goods with each other. Bartering is known as the oldest form of commerce and is still conducted today by parts of society—corporations swap products for media space, while a growing number of individuals are adopting bartering as a flexible way of exchanging goods without using money. Swapping goods and services with others can be a green way to live as it not only reduces single-use packaging but avoids usable goods from going to landfills.



Barter markets also take place physically. The 'Buy Nothing Day' market organised by ThinkCity and DBKL in 2015 offered a physical platform to swap goods.

BARNYTHING MALAYSIA

Barnything is a platform for people to barter goods currently available in Malaysia and Singapore. It has a special feature which allows users to value their items with a unique currency in order to facilitate trading.

BARTERIT BY SAVEPOT

Barterit is a free online barter platform by Savepot Malaysia. It allows users to list items which they have, want, or wish to donate. It also allows NGOs to request for donations on its platform.



© labDNA

MAKE SOME NOISE!

Tired of shouldering the blame when there's clearly something wrong with the system? Greenpeace International has templates for emails, phone calls and petitions in the Not In Our Town section of its website. These methods of communication can pressure local authorities to take note of changing attitudes towards single-use plastics. But the government is not the only avenue to push for change; communities and businesses pay attention to consumer behaviour and attitudes too. The simple act of sharing your concerns with business owners you support, whether privately or publicly, will go a long way towards reducing unsustainable plastic use.



© Trash Hero Malaysia

Trash Hero Kuala Lumpur was founded in 2017 for volunteers to combat the city's mismanaged waste problem.

PLEDGE! SUPPORT! VOLUNTEER!

During the pandemic, many are struggling to make ends meet. Those able to fend for themselves are often occupied with survival, with limited time and effort to channel into urgent causes. But as humans, we want what's best for the planet. If you agree, please consider donating or pledging to a relevant cause. Whether or not it's as effective as volunteering physically is up for debate, but environmental organisations have a framework and the resources to curb plastic pollution more effectively on a systemic level, and they rely on our donations.

TRASH HERO MALAYSIA

This global movement led by volunteers provides motivation and support to communities to clean and prevent plastic waste. **Trash Hero** organises weekly clean-ups and has unique initiatives to prevent plastic use.

ZERO WASTE MALAYSIA

A key source for zero waste information and practices in Malaysia, **Zero Waste Malaysia** was established as a non-profit in 2016 to advocate sustainable living. Offered resources include handbooks to reduce waste in the workplace.

DIE-DIE MUST DIY!

Simply put, much of our pollution problem stems from excessive production and inefficient management of waste and resources nationwide, as well as a preference for short-term gain and convenience. When economic profits are favoured over social wellbeing, the environment becomes little more than a mine or a dumping ground for unscrupulous business owners. If this upsets you, take a break from capitalism now by making your own necessities to cope with the pandemic!

ECO SELF CHECK

How much do you contribute to the plastic in Malaysian landfills? Use this checklist to conduct a simple household survey on how much plastic is in your home! The key here is to look around for items that can be recycled, or even better, swapped for reusables. Amplify your impact by getting a family member involved.

ITEMS

- Shampoo
- Body Wash
- Face Wash
- Toothbrush
- Comb
- Detergent
- Cotton Buds
- Liquid Detergent
- Cleaning Supplies
- Utensils
- Plates
- Cups
- Water Bottles
- Food Containers
- Straws
- Cling Wrap
- Ziploc Bags
- Trash Bags

CLOTH MASKS

The practice of masking up is not likely to disappear from Malaysia soon even if the nation meets its vaccination goals. Save the planet (and a bit of money) by making your own cloth masks from old clothes or spare fabric.

- 1 Cut out a piece of cloth from an old T-shirt in the following pattern.



- 2 Fasten the straps behind your head with a clip or a knot.



There are many ways to experiment with designing your own reusable masks with the template above. Get creative! If all else fails, consider purchasing a reusable mask from local designers and social enterprises. Local brands such as The Asli Co, Inkaa Clothing and even Royale Culture offer reusable cloth masks during this time.



BEESWAX WRAPS

Though natural, biodegradable and reusable (for up to a year), beeswax wraps have not seen widespread use due to its relatively high cost compared to cling film. Expect this to change soon as more and more people discover the joys of making their own beeswax wraps at home!

Ingredients

- 100% Cotton Fabric
- Beeswax
- Baking Paper

Tools

- Iron
- Ironing Board

Steps

1. Cut a piece of cotton fabric into the size of the wrap you'd like to make. We recommend starting with ¼ meter squares, and to use 100% cotton fabric as it is able to thoroughly absorb beeswax.
2. Grate some beeswax over the fabric and place it between two sheets of baking paper. Iron the fabric through the baking paper until the beeswax melts and is absorbed.
3. Remove the fabric from the baking paper and hang it up to dry. Once dry, it should be ready to use. To re-use, wash the wrap gently with soap and cold water and hang out to dry.



SANITISER FLUID

This hot ticket item flew off the shelves for much of 2020 but what is it made of exactly? Hand sanitisers, which should only be used when hand washing is not an option, can be made at home with ease. All the ingredients you need can be found in most pharmacies or supermarkets.

Ingredients

- Isopropyl alcohol
- Aloe vera gel
- Tea tree oil
(optional, can be substituted with your choice of essential oil)

Steps

1. Mix 3 parts isopropyl alcohol to 1 part aloe vera gel. Aloe vera gel can be obtained from a pharmacy or prepared with fresh leaves. Remember to stand fresh leaves for 10-15 minutes after cutting and washing so that the yellow latex of the aloe vera plant drains, as it may irritate the skin on contact.
2. Add a few drops of tea tree oil to add a fresh scent and boost the antibacterial properties of your sanitiser fluid.
3. Store in a reusable container and avoid direct exposure to heat.



Eco-friendly in isolation

Community organisers share how they kept their environmental work going through the COVID-19 crisis.

Melissa Tan

Sustainability Advocate



Photo Credit: Melissa Tan

In addition to hosting a weekly Greenwashing room on Clubhouse, model and zero-waste advocate Melissa Tan also conducted a fashion consumer behaviour survey and hosted community circles for people to engage deeper in climate conversations during the pandemic. "I'm definitely feeling the limitations to what we can do virtually, but it also opens a door to be creative through these challenges," she acknowledges. After rising to international acclaim upon participating in Asia's Next Top Model, Melissa has become a beloved spokesperson of the local zero-waste movement. If everything were normal, she would have been hosting community events like clothes swaps and environmental festivals, or perhaps even bring her work outside of KL in 2021. "There is a perception that plastic equals safety and hygiene in the era of the pandemic," she adds. "But it is how we practice hygiene and the way we use items that matter. Viruses can survive on plastic just as long as other types of materials." To those looking for an easy first step towards a zero-waste lifestyle, Melissa suggests automating your reusables. "Keep your bottle, bag and container by the door beside your wallet and keys and you'll never forget them." And support local shops in your neighbourhood instead of ordering deliveries!

Aidil Iman

Climate Change Activist



Photo Credit: Aidil Iman

Erratic lockdowns and movement restrictions in Malaysia have made it near-impossible to participate in environmental activities, let alone organise events outdoors. But local climate change activist Aidil Iman (@notaidil) hasn't slowed down, choosing to focus his energy on disseminating information on social media. Hailing from Kuala Lumpur, he collates and shares stories of the environment alongside relevant data to help people act more responsibly with regards to the environment. "This is not exclusive to plastic, but access to government data in Malaysia is difficult across the board," Aidil notes. "Certain gazettes have expensive paywalls which most individuals might struggle to afford. So I find information from news media and reports that have been made public." Most of Aidil's efforts in the past 18 months, including a TEDx presentation at Sunway University, have been conducted virtually. If it wasn't for the ban on interstate travel, he would be in Kampung Pasir Gajah, Kemaman, right now. His motive? To visit the Turtle Conservation Society of Malaysia which has been producing reusable batik facemasks sewn by local women. "I believe what environmental activists can do under such circumstances is to keep exploring ways to communicate climate change creatively, such as through art, poetry and literature."

SHOP RESPONSIBLY

KL & SELANGOR

33 RiceMart
Food

A Bit Less Bulk Store
Food & Lifestyle

Athena Empowers
Women's Sanitary Needs

Barakah Organic Homestead
Personal Care & Gardening

Barkery Oven
Pet Foods

Basics Zero Waste Store
Food & Lifestyle

BYOB
Personal Care & Detergents

Community Eco Market
Conzerve
Food & Lifestyle

Foodies With Love
Food

Go Bulk Store
Food & Lifestyle

GroundControl
Gardening Supplies

Health & Eco Enviro i-ECO
Malaysia
Personal Care

In Between Cultura
Women's Sanitary Goods

Karun Hijau
Waste Management

Kinder Soaps
Personal Care

KitaRefill
Detergents

Liquid Etc
Personal Care & Lifestyle

Mayura Apothecary
Personal Care & Detergents

Minimize Zero Waste Store
Food & Lifestyle

Nourish & Nibbs
Food

NUDE The Zero Waste Store
Food & Lifestyle

NULL Zero Waste Factory
Personal Care

Origin Bulk Store
Food

Plucked
Produce

Seedy Zero Waste Store
Food & Lifestyle

Single Step Zero Waste Store
Food & Personal Care

The Bread Fox
Baked Goods

The Hive Bulk Foods
Food & Lifestyle

The Mineraw
Personal Care

The Olive Tree
Personal Care

Zero Waste Earth Store
Food & Lifestyle

ELSEWHERE

Bare Concept Store (Melaka)
Personal Care & Food

BYOB (Nationwide)
Personal Care & Detergents,

Eco Genesis Inc (Kota Kinabalu)
Food & Lifestyle

iCycle (Nationwide)
Waste Management,

Joyous Zero Waste Store (Johor Bahru)
Lifestyle

Koru Bulk Store (Kuching)
Personal Care & Lifestyle,

Minus Zero Waste Store (Johor Bahru)
Lifestyle

Bibliography

1. The New Straits Times, "Govt to distribute 4 face masks per household in Covid-19 fight", 2020. <https://www.nst.com.my/news/nation/2020/04/582545/govt-distribute-4-face-masks-household-covid-19-fight>, 2020. (Accessed 10 July 2021)
2. Sangkham, S. "Face mask and medical waste disposal during the novel COVID-19 pandemic in Asia". *Case Studies in Chemical and Environmental Engineering*, 2 (2020) 100052.
3. The Straits Times, "Malaysia implements mandatory mask-wearing in crowded places from Aug 1". <https://www.straitstimes.com/asia/se-asia/malaysia-implements-mandatory-mask-wearing-in-crowded-places-from-aug-1>. 1 Aug 2020. (Accessed 12 October 2021)
4. The Star, "Covid-19: Wearing of double face masks recommended, says Health DG". <https://www.thestar.com.my/news/nation/2021/05/22/covid-19-wearing-of-double-facemasks-recommended-says-health-dg>, 2021. (Accessed 10 October 2021)
5. Agamuthu P, Jayanthi B. "Clinical Waste Management Under COVID-19 Scenario In Malaysia". *Waste Management & Research: The Journal For A Sustainable Circular Economy*, Vol 39, No. 1, 2020. <https://journals.sagepub.com/doi/full/10.1177/0734242X20959701>
6. Forge Waste & Recycling, "Why can't all plastics be recycled?". <https://www.forgerecycling.co.uk/blog/why-cant-all-plastic-be-recycled>, 14 September 2018. (Accessed 15 October 2021)
7. MPMA, "Performance of the Malaysian Plastics Industry 2017". <http://mpma.org.my/v4/wp-content/uploads/2019/02/Performance-of-the-Malaysian-Plastics-Industry-2017-14-2019A.pdf>
8. GlobalData, "COVID-19 Accelerates E-Commerce Growth In Malaysia, Says Globaldata - Globaldata". <https://www.globaldata.com/covid-19-accelerates-e-commerce-growth-malaysia-says-globaldata>, 2020. (Accessed 17 July 2021)
9. The Malaysian Reserve, "Shopee Posts Over 100% Growth In Revenue, Orders In 1Q". <https://themalaysianreserve.com/2020/07/01/shopee-posts-over-100-growth-in-revenue-orders-in-1q/>, 2020. (Accessed 23 July 2021)
10. ENF, "Plastic Recycling Plants In Malaysia." <https://www.enfreycling.com/directory/plastic-plant/Malaysia>. (Accessed 30 September 2021)
11. Choong, W. S.; Hadibarata, T.; Tang, D.K.H.; "Abundance and Distribution of Microplastics in the Water and Riverbank Sediment in Malaysia – A Review". *Biointerface Research in Applied Chemistry Platinum Open Access Journal*, Volume 11, Issue 4, 2021. <https://biointerfaceresearch.com/wp-content/uploads/2020/12/20695837114.1170011712.pdf>
12. Ross, P.S., Chastain, S., Vassilenko, E. et al. "Pervasive distribution of polyester fibres in the Arctic Ocean is driven by Atlantic inputs." *Nat Commun* 12, 106 (2021).
13. Ragusa, A., Svelato, A., Santacroce, C., et al. "Plasticenta: First evidence of microplastics in human placenta." *Environment International*, Volume 146, 2021, 106274.
14. Rinku Verma et al. "Toxic Pollutants from Plastic Waste- A Review." *Procedia Environmental Sciences*, Volume 35, 2016, Pages 701-708. <https://www.sciencedirect.com/science/article/pii/S187802961630158X>, 2016. (Accessed 7 September 2021)
15. Chen, H. L. et al. "The Plastic Waste Problem In Malaysia: Management, Recycling And Disposal Of Local And Global Plastic Waste". *SN Applied Sciences*, vol 3, no. 4, 2021. Springer Science And Business Media LLC, doi:10.1007/s42452-021-04234-y.
16. Rakuten Insight, "Impact of COVID-19 on Consumer Behaviour". https://insight.rakuten.com/wordpress/wp-content/uploads/RI_Impact_of_COVID_19_Report.pdf, 2020. (Accessed 13 October 2021)
17. Senathirajah, Kala et al. "Estimation of the mass of microplastics ingested – A pivotal first step towards human health risk assessment." *Journal of Hazardous Materials*, Volume 404, Part B, 2021, 15 February 2021, 124004. <https://doi.org/10.1016/j.jhazmat.2020.124004>. (Accessed 13 October 2021)
18. Sea Circular, "Country Profile: Malaysia". https://www.sea-circular.org/wp-content/uploads/2020/05/SEA-circular-Country-Profile_MALAYSIA.pdf, 2020.
19. Center for International Environmental Law, "Fueling Plastics: New Research Details Fossil Fuel Role in Plastics Proliferation". <https://www.ciel.org/news/fueling-plastics>, 2017. (Accessed 23 July 2021)
20. Mohamad, Z. N., Mohammad, A. A., "The Awareness of Solid Waste Segregation Among Household of Banting Community." *Journal of Wastes and Biomass Management (JWBM)* 1(1) (2019) 15-17. (Accessed 23 July 2021)
21. Hashim U.A.B, Abdullah N, Takeshi M. "A Review on Plastic Policies in Malaysia and Japan." *Malaysia-Japan International Institute of Technology*. http://jsrsai.jp/Annual_Meeting/PROG_56/ResumeD/D02-4.pdf, 2019. (Accessed 30 September 2021)
22. NPR, "How Big Oil Misled The Public Into Believing Plastic Would Be Recycled." www.npr.org/2020/09/11/897692090/how-big-oil-misled-the-public-into-believing-plastic-would-be-recycled, 2020. (Accessed 23 July 2021)
23. Forbes, "These Three Plastic Recycling Myths Will Blow Your Mind." <https://www.forbes.com/sites/lauratenenbaum/2019/05/15/these-three-plastic-recycling-myths-will-blow-your-mind/?sh=323d305b75f0>, 2019. (Accessed 23 July 2021)
24. Reuters, "The Plastic Pandemic." <https://www.reuters.com/investigates/special-report/health-coronavirus-plastic-recycling/>, 2020. (Accessed 23 July 2021)
25. Geyer R., et al. "Production, use, and fate of all plastics ever made." *Science Advances*, 19 July 2017: E1700782. https://www.researchgate.net/publication/318567844_Production_use_and_fate_of_all_plastics_ever_made. (Accessed 23 July 2021)
26. United Nations Environment Programme, "Single-Use Plastics: A Roadmap to Sustainability". <https://wedocs.unep.org/handle/20.500.11822/25496>, 2018. (Accessed 23 July 2021)
27. Greenpeace Malaysia, "THE RECYCLING MYTH 2.0: The Toxic After-Effects of Imported Plastic Waste in Malaysia." <https://www.greenpeace.org/malaysia/publication/3349/the-recycling-myth-2-0/>, 2020. (Accessed 23 July 2021)
28. Plastic Oceans, "Eco-packaging: The Future or Greenwashing?". <https://plasticoceans.org/eco-packaging-the-future-or-greenwashing/>, 2020. (Accessed 15 October 2021)
29. Rengasamy S, Miller A, Eimer BC, Shaffer RE. "Filtration Performance of FDA-Cleared Surgical Masks." *J Int Soc Respir Prot*. 2009;26(3):54-70. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7357397/> (Accessed 30 September 2021)
30. Malay Mail, "Waste Segregation Enforcement Starts Today". <https://www.malaymail.com/news/malaysia/2016/06/01/waste-segregation-enforcement-starts-today/1131527>, 2016. (Accessed 23 July 2021)
31. New Straits Times, "Expert: Do more for garbage management". <https://www.nst.com.my/news/nation/2020/02/568254/expert-do-more-garbage-management>, 2020. (Accessed 23 July 2021)
32. The Rakyat Post, "Malaysia's Plastic Problem Everyone Forgot – What You Can Do About It" <https://www.therakyatpost.com/2021/06/20/malaysias-plastic-problem-everyone-forgot-what-you-can-do-about-it/>, 2021. (Accessed 23 July 2021)
33. Wahab, D.A. et al. "Recycling Trends In The Plastics Manufacturing And Recycling Companies In Malaysia". *Journal Of Applied Sciences*, vol 7, no. 7, 2007, pp. 1030-1035. *Science Alert*, doi:10.3923/jas.2007.1030.1035.
34. Khazanah Research Institute, "Plastic: An Undegradable Problem". Views 13/19. http://www.krinstitute.org/assets/contentMS/img/template/editor/Views_Plastic%20An%20Undegradable%20Problem.pdf, 2019. (Accessed 23 July 2021)
35. University of Plymouth, "Biodegradable bags can hold a full load of shopping three years after being discarded in the environment". <https://www.plymouth.ac.uk/news/biodegradable-bags-can-hold-a-full-load-of-shopping-three-years-after-being-discarded-in-the-environment>, 2019. (Accessed 23 July 2021)
36. World Bank, "Market Study for Malaysia: Plastics Circularity Opportunities and Barriers". <https://www.worldbank.org/en/country/malaysia/publication/market-study-for-malaysia-plastics-circularity-opportunities-and-barriers>, 2021. (Accessed 23 July 2021)
37. Department of Statistics Malaysia, "Federal Territory of Malaysia." https://www.dosm.gov.my/v1/index.php?r=column/cone&menu_id=bkInUlk2WXUyT0hVWm5IZXlubERjUT09 (Accessed 30 September 2021)
38. BBC Future, "The hidden reason processed pet foods are so addictive". <https://www.bbc.com/future/article/20210519-the-hidden-reason-processed-pet-foods-are-so-addictive>, 2021. (Accessed 2 August 2021)
39. The Star, "Ban On Plastic Straws In Selangor Eateries From July 1". <https://www.thestar.com.my/metro/metro-news/2019/05/18/ban-on-plastic-straws-in-selangor-eateries-from-july-1>, 2019. (Accessed 23 July 2021)
40. The Malay Mail, "SWCorp data shows trashpile averaged slightly over 200,000 tonnes a month since MCO 1.0, mostly from food and plastics". <https://www.malaymail.com/news/malaysia/2021/03/11/swcorp-data-shows-trashpile-averaged-slightly-over-200000-tonnes-a-month-si/1956803>, 2021. (Accessed 26 August 2021)
41. Centre for International Environmental Law, "Plastic & Health". <https://www.ciel.org/wp-content/uploads/2019/02/Plastic-and-Health-The-Hidden-Costs-of-a-Plastic-Planet-February-2019.pdf>, 2019. (Accessed 26 August 2021)
42. Bernama, "COVID-19: Sisa Buangan Klinikal Meningkatkan 111.94 peratus - Ahmad Masrizal". <https://www.bernama.com/bm/am/news.php?id=1969012>, 2021. (Accessed 12 September 2021)

43. iPrice Insights, “The Map of E-commerce in Malaysia”. <https://iprice.my/insights/mapofecommerce/en/>, 2021. (Accessed 17 July 2021)
44. Vulcanpost, “Sea Limited Announces Full Year Financial Results - Grew Revenue By 101.1% In 2020”. <https://vulcanpost.com/736312/sea-limited-financial-results-q4-2020/>, 2021. (Accessed 12 September 2021)
45. Shopee Seller Education Hub, “Order Packaging Guidelines”. <https://seller.shopee.com.my/edu/article/387> (Accessed 12 September 2021)
46. Reef Check Malaysia, “2020 ICC Report”. <https://static1.squarespace.com/static/5c9c815e348cd94acf3b352e/t/5f7ad549c0d2c-c549fe49d1a/1601885607198/ICC+2020+Report+Malaysia.pdf>, 2020. (Accessed 12 September 2021)
47. Fadare, Oluniyi O, and Elvis D Okoffo. “Covid-19 face masks: A potential source of microplastic fibers in the environment.” *The Science of the total environment* vol. 737 (2020): 140279. doi:10.1016/j.scitotenv.2020.140279 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7297173/>
48. Ministry of Health Malaysia, “Keratan Akhbar 3.1.2021”. https://www.moh.gov.my/moh/resources/Keratan%20Akhbar/2021/Jan/Keratan_Akhbar_3.1_2021_.pdf, 2021. (Accessed 15 September 2021)
49. Iberdrola, “Megadiverse Countries”. <https://www.iberdrola.com/environment/megadiverse-countries>. (Accessed 13 October 2021)
50. World Health Organisation, “Health-care Waste”. <https://www.who.int/news-room/fact-sheets/detail/health-care-waste>. (Accessed 13 October 2021)
51. Ritchie, Hannah, and Max Roser. “Future mismanaged plastic”, *Our World In Data*. <https://ourworldindata.org/plastic-pollution#future-mismanaged-plastic>, 2015. (Accessed 23 July 2021)
52. This Is Plastics, “Plastics 101: How Are Plastic Made?”. <https://thisisplastics.com/plastics-101/how-are-plastics-made>. (Accessed 15 October 2021)
53. Earthworks, “Fracking For Plastic” <https://earthworks.org/issues/fracking-for-plastic/> (Accessed 15 October 2021)
54. Plastic Health Coalition, “Chemical Additives”. <https://www.plastichealthcoalition.org/chemical-additives/> (Accessed 15 October 2021)
55. Institute for Bioplastics and Biocomposites, “Biopolymers: Facts and Statistics”, Edition 4. Hannover, Germany: IfBB, 2017.
56. Giljum, Stefan, et al, “Land Under Pressure: Global Impacts of the EU Bioeconomy.” Brussels: Friends of the Earth Europe. www.foeeurope.org/sites/default/files/resource_use/2016/land-underpressure-report-global-impacts-eu-bioeconomy.pdf, 2016.
57. The New Straits Times, “Plastic thrown into oceans causing deaths of aquatic mammals”. <https://www.nst.com.my/news/exclusive/2018/10/417648/plastic-thrown-oceans-causing-deaths-aquatic-mammals>, 2018.

