



2020-2021

# 綠林報

新時代 新挑戰



# GREENWOODS

## HKUSU

成立於1993年，常綠林為香港最早成立的大專綠色組織之一，二十多年來致力提高港大同學的環保意識及宣揚綠色生活的重要性。除了舉辦不同的綠色活動，我們亦會與校方商討與環保有關的校政，令環保校園的理念得以實踐。推動保護大自然，和維持人與人和諧共存的關係，就是常綠林的目標。最重要的是，我們相信每個人在環保踏出的每一步，都會令地球變得更美好。



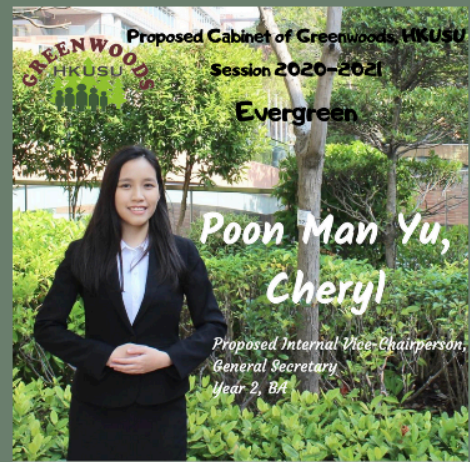




# 2020-2021 香港大學學生會常綠林 幹事會成員



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# 本年度活動



\*具體日期可能會因疫情而更改



# 網購背後



@ Eddy Kung

近年來，網上購物的風氣盛行，不少人都會選擇在網上平台購物，如Amazon、HKTVmall、淘寶等。全球網購人數達到18億，相當於全球每四個人就有一個人在網上購物。而上年爆發的新型冠狀病毒病，令人更傾向於網上購物，藉此減低外出購物染病的風險。



(圖片來源: Oberlo)



然而，很多人都只看到了網上購物的優點，如節省時間，卻忽略了網購所產生的垃圾，特別是速遞所需要的包裝垃圾。其實大部分商家爲了節省本錢，都會採用成本較低的膠袋包裝快遞，這些膠袋在送往堆填區焚燒時會產生大量的二噁英，毒化空氣。而且這些即棄膠袋和封箱膠帶在自然環境中大約要花上過百年才能完全溶解。因此，大部分塑膠垃圾都被擠壓在堆填區或漂流到大海，破壞海洋生態。此外，商家爲了減低貨品在運送途中受路途顛簸所造成的損毀，通常會對貨品作多重的包裝，例如防震泡沫、防水膠帶等，這無疑也產生了大量的垃圾。再者，貨品在運送過程中會排放大量的二氧化碳，特別是速遞需要大量的貨車車隊以及繁複的行車路線，貨車有時可能要多走幾趟才能成功送貨，過程中會消耗更多的能源和排放更多的二氧化碳。







針對上述的問題，其實一些網購平台如Amazon 都有採取一些措施，盡量減低網購所產生的垃圾，或採取一些補救措施。Amazon在2018年宣布投資太陽能與回收計畫，希望藉此抵銷其製造的大量碳足跡，目標是要在2030年前至少一半的亞馬遜快遞達到零碳排放。同時計畫在18個月內在英國10個物流中心部署太陽能板系統，預計為當地的物流中心安裝20兆瓦的太陽能板，將產生相當於4,500個英國家庭用電，預計每年減少6,000公噸碳足跡。此外，Amazon也提出了「無煩惱包裝」的概念，務求精簡包裝，並採用可再生的材料。而另一個計劃——「自有包裝運送」，則讓賣家以自己的包裝運送，不須外加亞馬遜的盒子。





作為消費者的我們，在網購前亦須三思，盡量減少購買不必要的產品。在選購貨品時，可以選擇一些「綠色包裝」的貨品，或要求賣家簡化包裝，將對環境造成的破壞降至最低，為環保出一分力。



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@ Sebin

## How to deal with "Corona Waste"?



(Image from Opération Mer Propre)

Since the outbreak of COVID-19 in Wuhan in December 2019, wearing disposable masks has become an essential part of our lives in order to contain the spread of the virus. Wearing masks is the most effective way known so far to prevent transmission via respiratory droplets and it is estimated that we will have to wear masks for a very long time, at least until the vaccines are made and distributed around the world. Some take extra precautions and wear disposable gloves made of latex or plastic while doing grocery shopping to make sure they are not in contact with the virus. Hand sanitizers constantly have

been in high demand due to its quick and easy way of usage. All these can definitely reduce the risk of getting infected with the coronavirus, but what about the waste produced? Where do the disposable masks, gloves and plastic bottles of hand sanitizers go after we use them? The whole world is heavily depending on them and it is time to be aware of the new type of pollution, “Corona Waste”, and come up with ideas to deal with it.



(Image from OceansAsia)

A marine conservation group, OceansAsia put an alarm on this issue after their visit to Soko Islands in Hong Kong for the usual investigation and analysis of beach plastic waste in February 2020. Gary Stokes, Director of Operations, and his team found an unusual number of surgical masks washed up on the beach of Soko Islands. This was around 6 weeks



after the general public started wearing masks and they assumed it was due to current and tidal actions carrying the masks around the ocean, some eventually ending up in uninhabited islands. Global plastic wastage is observed to be 275 million tonnes per year and of this, 8 million tonnes enter the ocean every year, risking marine animals, such as dolphins and porpoises, to suffer pain and death by mistakenly consuming plastic as food. With disposable masks and gloves, it will add to a potential threat to the wildlife.

## The pathway by which plastic enters the world's oceans

Estimates of global plastics entering the oceans from land-based sources in 2010 based on the pathway from primary production through to marine plastic inputs.

Our World  
in Data

**Global primary plastic production:**  
270 million tonnes per year

**Global plastic waste:**  
275 million tonnes per year  
It can exceed primary production in a given year since it can incorporate production from previous years.

**Coastal plastic waste:**  
99.5 million tonnes per

This is the total of plastic waste generated by all populations within 50 kilometres of a coastline (therefore at risk of entering the ocean).

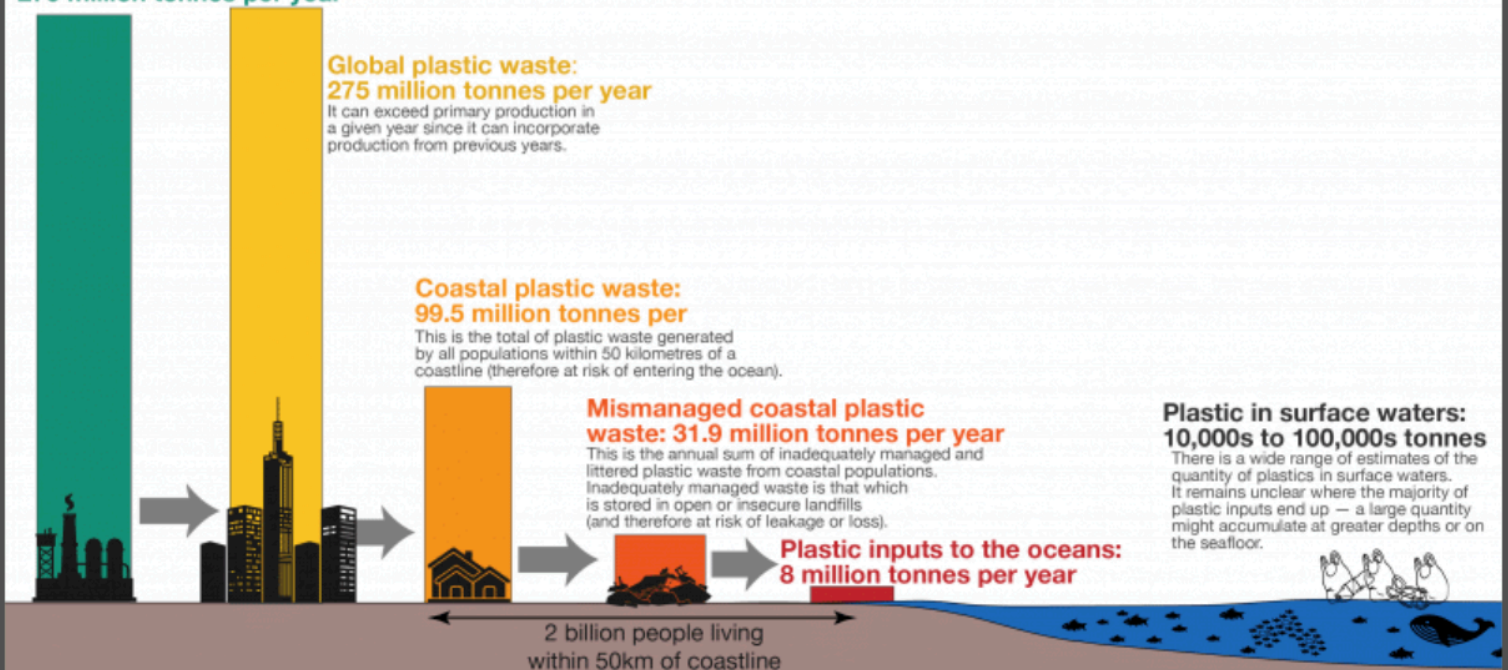
**Mismanaged coastal plastic waste:** 31.9 million tonnes per year

This is the annual sum of inadequately managed and littered plastic waste from coastal populations. Inadequately managed waste is that which is stored in open or insecure landfills (and therefore at risk of leakage or loss).

**Plastic inputs to the oceans:**  
8 million tonnes per year

**Plastic in surface waters:**  
10,000s to 100,000s tonnes

There is a wide range of estimates of the quantity of plastics in surface waters. It remains unclear where the majority of plastic inputs end up — a large quantity might accumulate at greater depths or on the seafloor.



(Image from OurWorldinData)

Surgical masks, made of polypropylene, are known to take 450 years to decompose. We are putting a huge burden on the environment and on the next generations to come. But we know for a fact that wearing masks is unavoidable and required for a Covid19-free world. So what should we do about it? Can reusable masks that are as effective as surgical masks be made and used more widely? Will they have any environmental effects? For now, we should work on what we can do, by recycling plastic bottles of hand sanitizers and washing our hands with water and soap when we can. Also, wearing gloves only when necessary, such as taking care of the sick, cleaning and disinfecting and by health-care workers, will reduce the plastic waste. Wearing gloves in our daily lives, for example when we go for grocery shopping, will not protect us from getting the virus so instead of consuming them, we can wash our hands more regularly and remember not to touch our face.





自去年12月新冠肺炎在武漢爆發以來，爲了防疫，戴口罩已成爲了我們生活中必不可少的部分。目前，佩戴口罩是已知防止病毒透過呼吸道飛沫傳播的最有效方法，估計在疫苗研發成功及流通之前，我們還要戴很長一段時間的口罩。也有人採取額外的預防措施，如在購物時戴上由乳膠或塑料製成的一次性手套，以確保他們不會接觸到病毒。同時，搓手液也因使用方便，有著極高的需求量。以上種種方法都可以降低我們感染冠狀病毒的風險，但其產生的廢物，包括一次性的口罩、手套和搓手液的塑膠瓶又該何去何從？在全球極度依賴防疫用品的同時，我們是時候意識到它們帶來的污染，並想辦法應對。

海洋生態研究組織「OceanAsia」於2020年2月到香港索罟群島進行海灘塑料廢物的常規調查和分析後，運營總監Gary Stokes及其團隊發現了大量廢棄的防疫用品及垃圾被沖到沙灘，當中包括不少外科口罩。在新冠肺炎疫情下，口罩使用量急劇增加，團隊指出這些垃圾在潮汐下只需六星期便會沖到香港不同的海灘上，終使塑膠海洋垃圾急增。據調查，每年全球塑膠廢料約2.75億噸，當中就有800萬噸流入海洋。不少海洋生物，如海

豚、海龜等，可能會誤食塑料而導致死亡。而即棄口罩和手套，也會對野生生物造成威脅。

分解以聚丙烯為原料的外科口罩需要450年，這為環境和下一代帶來了巨大的負擔，但是，在疫情影響下佩戴口罩是不可避免的。我們該如何減低疫情對環境造成的負面影響呢？我們能製造並更廣泛地使用功效媲美外科口罩的可重複使用口罩嗎？它們對環境會產生什麼影響？現時，我們應盡量減低疫情對環境造成的破壞，例如回收盛載洗手液的塑料瓶，並盡量用水和肥皂洗手。此外，我們應只在必要時才佩戴口罩，如在照顧病人、清潔消毒的時候，以及醫護人員才佩戴口罩，以減少浪費。在日常生活的部分情況下佩戴口罩，例如在購物時，未必能保護我們免受病毒入侵，反而，勤洗手和避免觸摸面部，能更有效地防疫。

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# IS THERE A SILVER LINING BEHIND THE CLOUD OF PLASTIC POLLUTION?

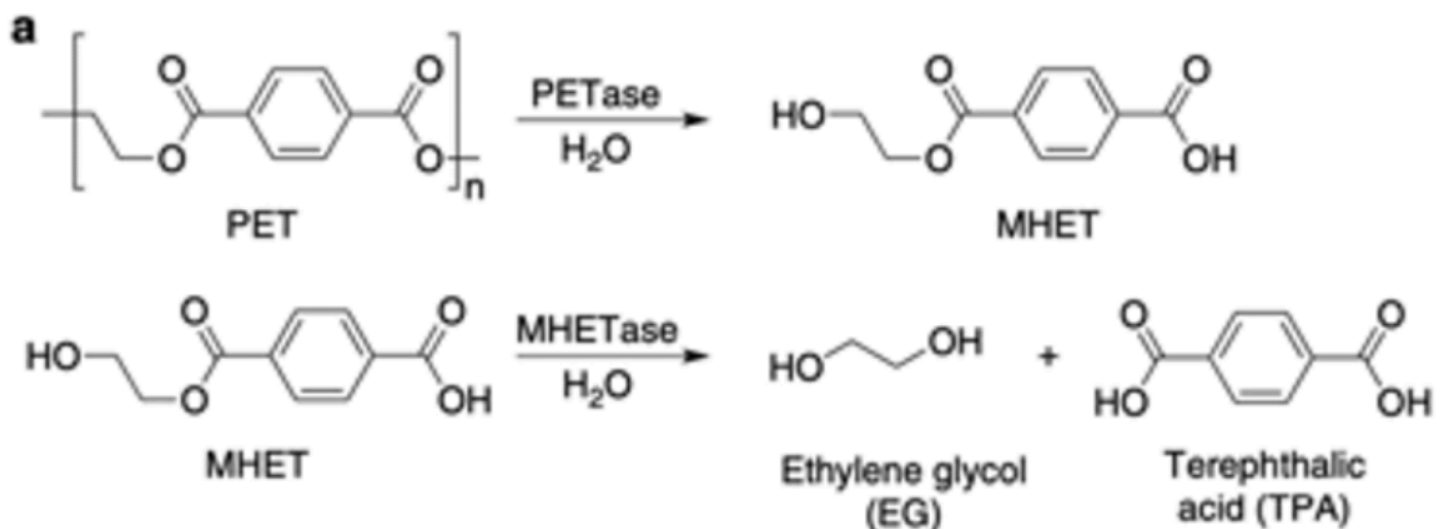
During the time of COVID-19, everyone has been busy fighting the pandemic. Most of the economic activities have been shut down, resulting in improved environmental conditions. Carbon and Nitrogen dioxide emissions have dramatically decreased and the problem of air pollution has been alleviated all around the world. However, there was no decline in the use of plastics, due to hygienic purposes, the use of surgical masks, gloves, and single-use cutlery has increased. You may notice that buying takeaway in a restaurant in Hong Kong during the pandemic comes with disposable plastic takeaway boxes that are provided without charging customers extra. So, is there any hope in reducing plastics, especially after the pandemic?



The world never leaves us with no choice. Recently, Japanese scientists have brought a small bacterium, *Ideonella sakaiensis* (大阪堺菌) to the spotlight. Plastic polyethylene terephthalate (PET) (聚乙烯對苯二甲酸酯), which is usually used to make plastic bottles and other food packages, use an astonishing thousand years to decompose. And now, PET can be broken down by this microorganism. *I. sakaiensis* breaks down PET in two steps with two enzymes, PETase (PET酶) and the MHETase (MHET水解酶), resulting in two monomer compounds, terephthalate acid(苯二甲酸) and ethylene glycol (乙二醇). Unfortunately, *I. sakaiensis* can only break down PET, which is solely the fourth most used plastics other than polyethylene that makes trays and bottle caps, polypropylene that makes luggage and toy, as well as PVC which produces water pipes. Because of the organic, but slow decomposition process by the microorganism, researchers of the



Technical University of Denmark focuses the two enzymes that fasten the degradation of PET and introduce them into the industrial process. In the manufacture, the production of the two enzymes and the reduction of PET can be sped up and at the same time cutting costs.



(Image by Palm, G, J.)

Even though nature helps to clean up our mess, we should also take up our responsibility to reduce the use of plastics. Indeed, early in 2016, Ari Jónsson from the Iceland Academy of the Arts has invented a bottle that was made from 100% natural material,



agar. Just like the jelly we make, agar can be modified into a bottle shape under the right proportion and refrigeration. Yet, its nature is a double-edged sword. It decomposes very quickly which helps the environment, but it also means it is not long-lasting and will even start to decompose when it becomes empty.



(Photograph by Cross, D, T.)

Besides agar bottles, ball-shaped edible Ooho water bottles were invented by Skipping Rock Lab in the United Kingdom. Consumers can eat the containers, instead of disposing it to landfills, even if it just





needs 4 to 6 weeks to fully decompose. The membrane of the ball is made of calcium chloride and sodium alginate from algae, thickening the container naturally. This Ooho bottle is mainly focused on and distributed to competitors in a Marathon. From 2018 to 2019, thanks to Ooho water bottles, the number of traditional plastic bottles had been reduced from 920 thousand to 700 thousand in the London Marathon. But the creators of “Ooho” did not stop there, they took further steps to manufacture cardboard takeaway boxes and sachets to minimize the use of plastics.



(Photograph by OOHOWATER)



(Photograph by Notpla)



In 2017, Science Advance (美國《科學進步》期刊), research showed that only 9% of 8,300 tonnes of plastics produced was recycled, 12% was incinerated, and the rest was disposed to landfills, dumped illegally or disposed of in the sea. These plastics enter the ocean and become “microplastics” that are consumed by aquatic lives that become trapped and distresses the overall ecosystem until eventually, we reap what we have sown. Even though the technology mentioned in the article has been introduced for 5 to 6 years, we can see that the problem of plastic pollution remains stagnant. While we give the time for the biotechnology field to strive to improve its technology, this alone is not enough. We need to hustle the reduction of plastic waste at its source.







# 譯本

@幹事

在新冠肺炎疫情期間，人人忙於防疫。而大多數經濟活動放緩，碳和二氧化氮的排放量急劇下降，全球空氣污染問題明顯得到緩解。然而，即棄塑膠用品的使用量卻因防疫關係而有增無減，如外科口罩、手套和一次性餐具等。在疫情之下，一些餐廳基於衛生安全的考慮，會主動向客人提供一次性塑料外賣食品盒，而免收額外費用。那麼，「減塑」在疫情過後尚有一線生機嗎？

當然，世界永遠不會讓我們別無選擇，我們仍有選擇的餘地。最近，日本科學家發現一種小型細菌「大阪堺細菌」。通常用於製造塑料瓶和其他食品包裝的苯二甲酸酯，需要千年來分解，但現在PET可以被這種微





生物分解。大阪堺菌用兩種酶：PET酶和MHET酶，以兩個步驟分解PET，最後產生出兩種單體化合物：苯二甲酸和乙二醇。在生產過程中，可以加快兩種酶的生產並減少PET的生產，同時降低成本。不幸的是，大阪堺細菌只能分解PET，而PET是第四大使用塑膠，其他更常被使用的塑膠卻不能被大阪堺菌分解，例如用於製造托盤和瓶蓋的聚乙烯、用於製造行李箱和玩具的聚丙烯、以及用於製造水管的PVC。

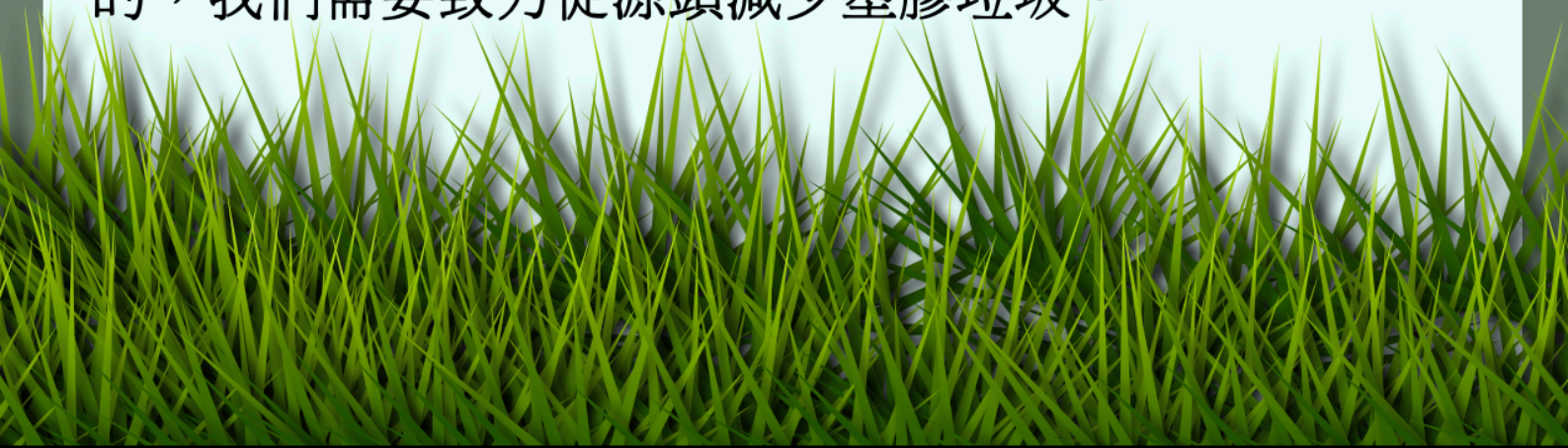
雖然有大自然為我們收拾爛攤子，但我們應該承擔起減少使用塑膠的責任。事實上，2016年初，冰島藝術學院的Ari Jónsson便發明了一種由100%天然材料——瓊脂製成的瓶子。就像我們做的果凍一樣，瓊脂可以在適當的比例和冷藏條件下變成瓶子的形狀。然而，這項特質是一把雙刃劍。瓊脂瓶分解得快確實有助於保護環境，但也意味著它並不耐用，甚至會在瓶內東西被清空後便開始分解。





即使把它扔到堆填區，也只需要4到6周就能完全分解。這種水瓶的外膜是由海藻中的氯化鈣和海藻酸鈉組成，瓶子自然地較厚。Ooho水瓶的主要用途是在馬拉松比賽中分發給參賽者，2018年至2019年，得益於Ooho水瓶的使用，倫敦馬拉松賽中的傳統塑膠瓶使用量從92萬個減少到70萬個。但Ooho的創造者並沒有就此止步，他們進一步製造紙板外賣盒和包裝袋，以儘量減少塑膠的使用。

據美國《科學進步》（ Science Advance ）期刊在2017年的研究顯示，在8300噸塑膠中，只有9%被回收利用，12%被焚燒，其餘均被棄置到堆填區，或被非法傾倒或棄置到海裡。這些塑膠流入海洋後，會漸漸變成“微塑膠”，水生生物可能會誤食或被困住，從而破壞整個生態系統，最後，我們將會自食惡果。儘管文章中提到的科技已被引進了長達5至6年，但在解決塑膠污染問題上仍未取得進展。雖然我們給生物技術領域爭取了改進其科技的時間，但光靠這一點是不够的，我們需要致力從源頭減少塑膠垃圾。





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