Hong Kong's Long March towards Deep Decarbonisation and Sustainable Resource Use

香港迈向深度脱碳与可持续资源利用长征之路

Franz Gassner 范圣言*

Abstract

The article explores the call for deep decarbonisation and responsible resource by countering the modern throw-away society and habits based on data and policies on Municipal Solid Waste (MSW) of the Hong Kong S.A.R. Government. After exploring historical roots of Hong Kong's waste crises, misjudgements and barriers, positive responses towards Sustainable Development are evaluated. Due to the developed engrained throw-away habits any change to reduce waste and become more energy, resource, and emission responsible, turns out to be a significant challenge in Hong Kong. Pope Francis teaching on resource responsibility, waste prevention, and his call for just and sustainable life-styles figures as an inspirational framework for Hong Kong to transit towards a more sustainable society on the way to meet SDGs and the dual carbon goal of Mainland China.

摘要

本文通过分析香港特别行政区政府都市固体废物（MSW）数据与政策，探讨深度脱碳与负责任资源利用议题，对现代社会“用完即弃”的生活方式与习惯加以反思。在梳理香港废物危机历史根源、政策误判及障碍的基础上，进一步评估了各方在推动可持续发展方面的积极回应。由于“用完即弃”习惯根深蒂固，旨在减废以及提升能源、资源和排放责任意识的变革，在香港面临着重大挑战。教宗方济各关于资源责任、源头减废的教导，以及他对公正与可持续生活方式的呼吁，为香港迈向更可持续社会、实现联合国可持续发展目标（SDGs）及对接中国内地“双碳”目标，提供了一个富有启发性的框架。

* 范圣言，澳门圣若瑟大学宗教研究及哲学学院副教授
Franz Gassner, Associate Professor, Faculty of Religious Studies and Philosophy, University of Saint Joseph, Macau

INTRODUCTION

Resource exploitation "has exceeded unacceptable limits" (*LS* 11) deplored Pope Francis (2013-2025) in *Laudato Si'* (Francis, 2015), calling for a "bold cultural revolution" (*LS* 114), to overcome contemporary "throw-away cultures". Many people and organisations have been inspired by him to transit towards more consistent and sustainable life-styles by reducing and avoiding waste (Zero Waste Europe, 2015; Tornielli & Galeazii, 2015; Turkson, 2019; Rotondi & Santori, 2023; Laudato Si' Movement, 2026). Steering humanity off from "wasteful cities" (*LS* 44), Francis focused especially on resource responsibility (*LS* 22 & 113), encouraging waste prevention (Refuse!), Reuse, Repair, and Recycle (*LS* 192 & 211). Already in Buenos Aires he encouraged *cartoneros* and *recicladores* in their noble tasks, "because what is leftover is rich". (Francis 2013b). He pays attention to prevent food waste:

> Let us remember well, however, that *whenever food is thrown out it is as if it were stolen from the table of the poor, from the hungry*! I ask everyone to reflect on the problem of the loss and waste of food, to identify ways and approaches which, by seriously dealing with this problem, convey solidarity and sharing with the underprivileged. (Francis, 2013a; Francis, 2015, no. 50).

For decades, Hong Kong is facing a significant challenge with its daily amount of Municipal Solid Waste (MSW), with a food wastage of up to 3,600 tonnes per day. The article explores the historical roots of Hong Kong's waste crises and steps taken towards a higher level of resource and energy responsibility, which turns out to be a difficult long march towards sustainable development and carbon neutrality to mitigate climate change. This is of highest relevance for Hong Kong, being located at the coastal line and a thus a primary victim of extreme weather events due to increased GHG emissions and global warming.

导言

教宗方济各（2013－2025）在《愿祢受赞颂》（*Laudato Si'*）通谕中痛陈资源开发"已远超出不可接受的限度"（Francis, 2015, LS 11），并呼吁发起一场"勇敢的文化革命"（LS 114），以超越当代"用完即弃的文化"。许多个人和社会组织深受启发，通过减少和避免浪费，迈向更加一致且可持续的生活方式（Zero Waste Europe, 2015; Tornielli & Galeazii, 2015; Turkson, 2019; Rotondi & Santori, 2023; Laudato Si' Movement, 2026）。为引导人类远离"浪费型城市"（LS 44），方济各尤其聚焦于资源责任（LS 22 & 113），倡导在源头杜绝废物（拒绝！）、再利用、修复和回收（LS 192 & 211）。早在布宜诺斯艾利斯时期，他就鼓励拾荒者和回收者从事这项崇高的工作，"因为被丢弃的东西本身就是财富。"（Francis, 2013b）。他还特别关注杜绝食物浪费：

> 让我们牢记：每当食物被丢弃，就如同从穷人的餐桌上、从饥饿者手中偷走了一样！我呼吁每一个人反思食物损耗与浪费的问题，探寻切实可行的途径与方法，通过认真应对这一问题，向弱势群体传递团结与分享的精神。（Francis, 2013a; Francis, 2015, 第50段）。

数十年来，香港日均都市固体废物（MSW）构成了重大挑战，其中食物浪费高达日均3,600吨。本文探讨了香港废物危机的历史根源，以及迈向更高层次资源与能源责任所采取的各项措施——事实证明，这是一条通往可持续发展和碳中和、缓解气候变化的艰难长征。这对香港具有至关重要的意义：香港地处海岸线，温室气体排放增加和全球变暖导致极端天气事件频发，香港因此成为首当其冲的受害者。

1. HISTORICAL ROOTS OF HONG KONG'S WASTE CRISES

As in New York, Singapore, or Macau, household and construction waste was used in colonial Hong Kong to expand its territory. Waste was used for land reclamation from the 1840s up to the late 1960s (Fabian & Lou, 2019, p. 3). Until the 1950s household waste consisted of materials that decompose quickly, like vegetable matters from kitchens or road sweepings. Due to industrialization the waste composition changed dramatically in the late 1950s. Harmful toxic or non-degradable MSW begun to replace organic natural waste. (Fabian & Lou, 2019, p. 3). The answer was sanitary landfills and the establishment of the Environmental Protection Department (EPD) in 1986 (Fabian & Lou, 2019, p. 9). Also waste incinerators were deployed for a few years, but phased out in 1993 due to air pollution concerns. Since then Hong Kong relies mainly on land-fills to handle its daily MSW, at a time when other cities in Asia began a new approach and implemented methods to reduce the daily MSW. The Hong Kong government did not see at that time to follow their approach:

> On the whole, sustainability and pollution mitigation remained subordinate to development plans because the colonial government did not want to risk appearing too restrictive in the eyes of investors, businessmen, and land developers, many of whom had already considered to relocate to Guangdong province where labour and production costs were much cheaper [...]. Such pro-growth mindset persists all the way till after the 1997 handover. (Fabian & Lou 2019, p. 6).

1. 香港废物危机的历史根源

与纽约、新加坡或澳门一样，殖民时期的香港也曾利用家居废物和建筑废料造地。从19世纪40年代到20世纪60年代末，废物一直用于填海造地（Fabian & Lou, 2019, 第3页）。直到20世纪50年代，家居废物主要由易分解材料构成，如厨余垃圾或道路清扫物。随着工业化进程，废物成分在50年代末发生了剧变，有毒有害或不可降解的都市固体废物开始取代天然有机废物（Fabian & Lou, 2019, 第3页）。对此，应对措施是兴建卫生堆填区，并于1986年成立环境保护署（EPD）（Fabian & Lou, 2019, 第9页）。香港也曾一度启用废物焚化炉，但因空气污染问题于1993年逐步淘汰。此后，香港主要依赖堆填区处理每天产生的都市固体废物，而此时亚洲其他城市已开始探索新路径，推行减少每日都市固体废物的方法。当时的香港政府并未选择效仿他们的做法：

> 总体而言，可持续发展和污染减排始终从属于发展计划，因为殖民政府不愿在投资者、商人和地产开发商面前显得过于严苛——尤其是其中许多人已在考虑迁往劳动力及生产成本更为低廉的广东省……这种“增长至上”的思维模式一直延续到1997年回归之后（Fabian & Lou, 2019, 第6页）。

Implementation of a quantity-based waste charging scheme is indispensable in facilitating resources circulation in Hong Kong.

实施废物按量收费制度，对于推动香港资源循环而言不可或缺。

This choice led to a steady increase of daily MSW, from 1981 to 2011 by 80 %, when the population grew only by 36%, influenced by economic growth and life-style changes. In 2011, the daily waste in Hong Kong reached 13,458 tonnes, consisting of 9,000 tones MSW and 4,458 tonnes of Construction and Special Waste (HK EB, 2013, p. 4). Of the 9,000 tonnes MSW were 3600 tonnes or 40 % of food waste daily. (HK EB, 2013, p. 15). The MSW in 2011 was therefore 1.27 kg per person per day. As the remaining three landfills gradually filled up to the brim, in 2013, the Hong Kong Government was finally alarmed and prepared to follow the example of Seoul and Taipei, as the Secretary of the Environment summarizes, "indeed, as a community, we are generating so much waste every day that we are no longer able to carry on like we have been. *We have a waste crisis that needs urgent addressing.*" (HK EB, 2013, p. 3, emphasis added, FG).

2. BLUE PRINT FOR SUSTAINABLE USE OF RESOURCES 2013-2022

Compared to other Asian cities, the daily domestic waste per person and day stayed high, as Hong Kong did not follow other Asian cities in the 1990s to introduce Waste Charging Schemes (WCS) in combination with other measures to become more resource responsible:

这一选择导致每天产生的都市固体废物持续增加，从1981年到2011年增长80%，而同期人口仅增长36%。这主要受经济增长和生活方式变化的影响：2011年，香港每日废物总量达到13,458吨，其中包括9,000吨都市固体废物和4,458吨建筑及特殊废物（香港环境局，2013，第4页）。在9,000吨都市固体废物中，食物浪费每日高达3,600吨，占40%（同上， 第15页）。因此，2011年人均日产生都市固体废物1.27公斤。随着剩余三个堆填区逐渐填满至饱和，香港政府终于在2013年敲响警钟，准备效仿首尔和台北的做法。正如环境局局长所总结的："作为一个社会整体，我们每天产生的废物量已如此之多，以至于我们再也无法像过去那样继续下去了。*我们正面临一场亟需紧急应对的废物危机。*"（同上，第3页；作者按：强调为原文所加）。

2. 香港可持续资源循环蓝图 2013－2022

与其他亚洲城市相比，香港人均日家居废物量一直居高不下，原因是香港在20世纪90年代未能效仿其他亚洲城市推行废物收费计划（WCS），并辅以其他措施以提升资源责任意识：

> In hindsight, the 1980s and 1990s would have been the prime time to develop a more sustainable waste management system for Hong Kong but the colonial government missed this opportunity. The SAR government has inherited this legacy from its colonial past and has done little to rectify the problems until the early 2010s when they finally realized that the three existing landfills are about to run out. (Fabian & Lou, 2019, p. 7).

WCS incentivizes citizens and social systems to develop a higher level of resource responsibility and to reduce waste, as the Secretary of the Environment Mr. Wong affirmed:

> Since the mid-1990s, a number of leading Asian cities have achieved very good results in waste reduction. Their experience tells us that Hong Kong can do very much better if we take coordinated and simultaneous action on waste prevention, reuse, recycling, recovery, treatment and landfilling, as part of a whole resources' management chain. Hong Kong has fallen behind because we have only taken some of the steps. We need to urgently fill in the gaps. (Wong, 2013, p. 1). (Figure 1)

The Hong Kong Government published its *Blue Print for Sustainable Use of Resources 2013-2022* with a 10-Year Plan to reduce the MSW by 40 % until 2022 as compared to 2011, calling for a new and bold "social contract" in order to reach this goal:

> The Government cannot do it alone. Hence, we propose *a new social contract* with the community. We need the people of Hong Kong to adopt these targets as their own. The Government will work hard in social mobilization, and we will provide polices and the necessary tools to realize these targets but we need citizens to participate and change their behaviour. Let's do our part and go green for Hong Kong. (HK EB, 2013, p. 24).

> 回望过去，20世纪80-90年代本是香港建立更可持续废物管理体系的最佳时机，但殖民政府错失了这一机遇。特区政府承袭了殖民时期的历史遗留问题，直到2010年代初才着手解决，此时他们终于意识到现有的三个堆填区即将饱和。（Fabian & Lou, 2019, 第7页）。

废物收费旨在激励市民和社会培养更高水平的资源责任意识，并减少浪费。正如环境局长黄锦星所强调的那样：

> 自20世纪90年代中期以来，许多亚洲领先城市在减废方面取得了非常显著的成效。它们的经验告诉我们，如果香港能够协调一致、同步推进废物预防、再利用、循环再造、回收、处理及堆填各环节的行动，将其作为一条完整的资源管理链条来统筹运作，那么香港的减废成效完全可以大幅提升。香港之所以落后，是因为我们只走了其中的部分环节。我们需要尽快补齐这些缺口。（黄，2013，第1页）(图1)

香港政府发布了《香港资源循环蓝图2013-2022》，提出一项十年计划，目标是到2022年将都市固体废物较2011年的水平减少40%，并呼吁建立一项全新而大胆的"社会契约"，以实现这一目标：

> 政府无法独力完成这一目标。因此，我们提议与社会各界建立一项新的社会契约：我们需要香港市民将这些目标视为己任；政府将全力推动社会动员，并提供相应的政策和必要工具以实现这些目标。但我们更需要市民积极参与，改变自身的行为习惯。让我们各尽其责，努力为香港践行绿色生活。（香港环境局，2013，第24页）

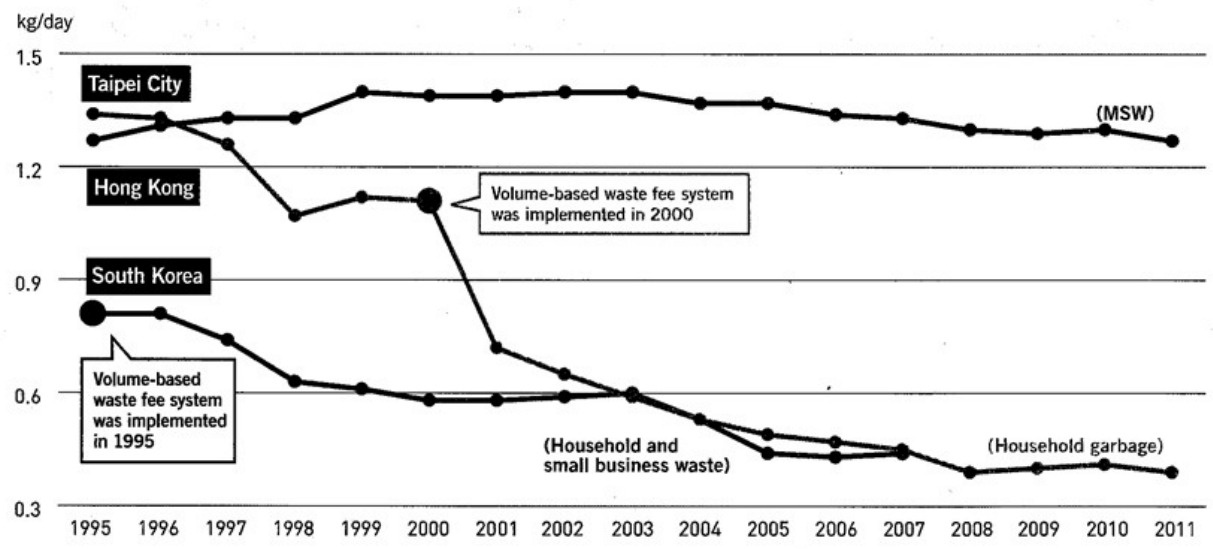


Figure 1: Waste disposal rates per capita and day for Hong Kong, Taipei City and South Korea; the disposal rate of Taipei City is in 1995 slightly higher than in Hong Kong, but this changes in 1996, when Hong Kong's disposal rate surpasses that of Taipei City (Source: HK EB, 2013, p. 8).

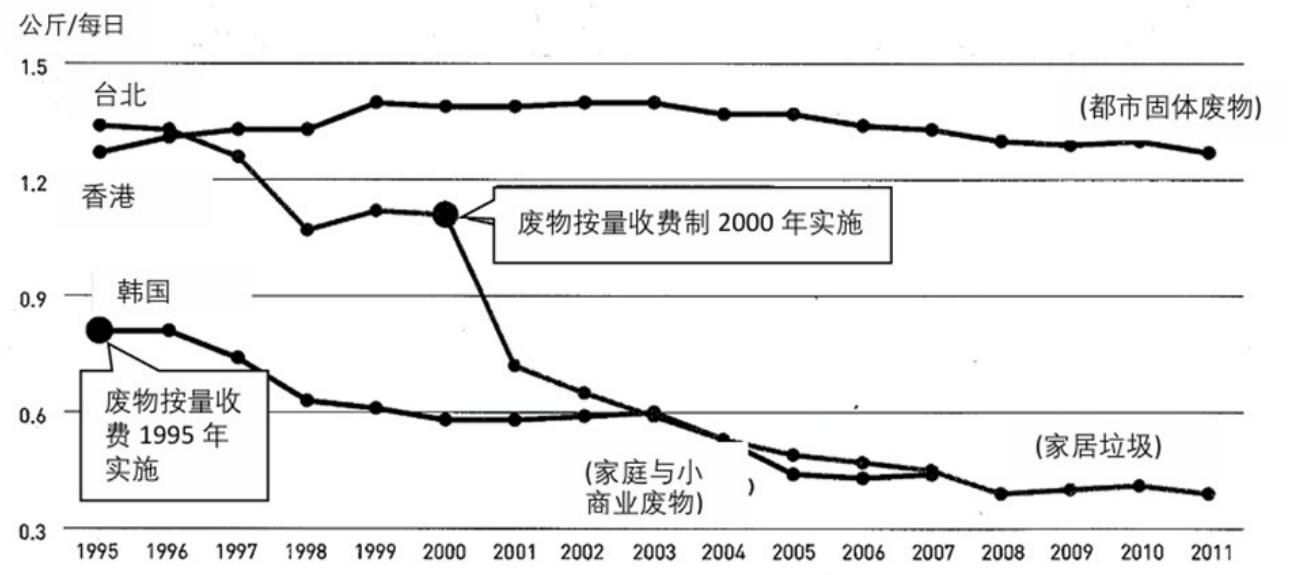


图1：香港、台北及韩国人均日废物弃置率；台北弃置率1995年略高于香港，但这一情况在1996年发生逆转，香港的弃置率超过了台北。（资料来源：香港环境局，2013，第8页）

It is commendable that the *Blue Print* emphasizes in its title the concept "resources" over "waste", affirming correctly that "waste" streams "contain a treasure trove of useful resources, much of which can be reused, recycled and recovered" (HK EB, 2013, p. 3), also in agreement with Francis' statement "what is leftover is rich" in 2013 (Francis 2013b). The *Blue Print* admits "to have relied for too long on landfills to the extent that these are filling up and need to be imminently extended. In future, landfill space must be regarded as one of the city's most precious assets – to be more prudently used as a last resort." (HK EB, 2013, p. 7). Hong Kong had to learn also to be more "transparent about the process of recyclables collection and treatment" (Fabian & Lou, 2019, p. 8). The Environmental Protection Department (EPD) admitted in 2019 that the recycling rate in 2010 (52%) "was drastically overstated as they had mistakenly included 'imported waste' (foreign waste awaiting to be exported to China) into their calculations." (Fabian & Lou, 2019, p. 9). But the key point in the *Blue Print 2013* is its plan to introduce a WCS for Hong Kong:

> One of most forceful tools in waste reduction is MSW charging, which can reduce waste generation by over 20% according to overseas experience. When combined with other ongoing initiatives, we are confident of achieving a 40% reduction in waste disposal by 2022. (HK EB, 2013, p. 18).

The "Polluter Pays Principle" (PPP) and "Producer Responsibility Schemes" (PRSs) are seen as effective tools "in changing the behaviour of businesses to redesign products and packaging to reduce or even eliminate waste." (HK EB, 2013, p. 9). The Waste Reduction Target in the *Blue Print* is set by 40 % reduction in 2022 as compared to 2011:

该蓝图在标题中以"资源"取代"废物"，这一点值得肯定，因为它正确地指出"废物"流"蕴含着丰富的有用资源，其中大部分可以被再利用、循环再造和回收"（香港环境局，2013，第3页），这也与方济各在2013年提出的"剩余之物即为财富"的论断不谋而合（Francis 2013b）。蓝图承认"长期以来过度依赖堆填区，以至于堆填区即将填满，亟需扩建。今后，堆填空间必须被视为香港最珍贵的资产之一——应作为最后手段更加审慎地使用"（香港环境局，2013，第7页）。香港还需要学会在"可回收物收集和处理过程中更加透明"（Fabian & Lou，2019，第8页）。环境保护署(译者按：环保署是环境局下属执行机构)在2019年承认，2010年回收率（52%）"被严重高估，因为他们错误地将'进口废物'（等待出口至中国的境外废物）纳入计算"（Fabian & Lou，2019，第9页）。但2013年蓝图的关键要点在于计划为香港引入一套废物收费制度（WCS）：

> 减废最有力的工具之一是都市固体废物收费制度，根据海外经验，该制度可将废物产生量减少超过20%。若与其他正在推行的措施相结合，我们有信心到2022年实现废物弃置量减少40%的目标。（香港环境局，2013，第18页）

"污染者付费原则"（PPP）和"生产者责任计划"（PRSs）被视为"改变企业行为、促使其重新设计产品和包装以减少甚至消除废物"的有效工具（香港环境局，2013，第9页）蓝图设定的减废目标是到2022年较2011年的水平减少40%：

> By 2017, we will have reduced the MSW disposal rate on a per capita basis by 20% from 1.27 kg per day to 1 kg or below. By 2022, we will have further reduced the MSW disposal rate on a per capita basis from 1 kg to 0.8 kg or below, representing a 40% decrease from 2011. (HK EB, 2013, p. 18).

The aim to reach a 40 % reduction of MSW from 2011 to 2022 was based on the experience in Seoul and Taipei City in the 1990s, together with synergetic effects of Producer Responsibility Schemes (PRSs), or the Food Wise Campaign, set off in 2013. Following the Principle of the "Waste Hierarchy", the *Blue Print* favours correctly "Waste Avoidance" over "Recycling". "For instance, using bottled drinks all the time and recycling the used plastic bottles is not as good as avoiding bottled drinks in the first place." (HK EB, 2013, p. 15). This aligns with science and the Zero-Waste-Movements:

> It is more efficient and healthier to prevent waste formation in the first place than to treat waste after it has formed. At its core, Zero Waste acknowledges that humans are part of the natural world. It aims for cradle-to-cradle, closed-loop cycling of non-toxic matter that will allow the biosphere in which we are embedded to continue intact into the future. (Robertson, 2014, p. 281-282).

As we will see, the implementation of the *Blue Print 2013-2022* turned out to be very challenging, in fact unrealistic. One causal main factor for this is the delay of the implementation of the WCS for about one generation as compared to Taipei City or Seoul. Habits matter, for better or for worse, or any substantial change of engrained throw-away-habits and social systems in Hong Kong turned out to be so far almost unsurmountable.

> 到2017年，我们将把都市固体废物的人均弃置量减少20%，即从每天1.27公斤降至1公斤或以下。到2022年，我们将进一步把人均弃置量从1公斤降至0.8公斤或以下，较2011年的水平减少40%。（香港环境局，2013，第18页）

到2022年将都市固体废物较2011年减少40%的目标，是基于首尔和台北市在1990年代的经验，并结合生产者责任计划（PRSs）以及2013年启动的"惜食运动"所产生的协同效应而制定的(译者按："惜食运动"-Food Wise Hong Kong，是香港特区政府于2013年5月18日正式启动的一项全港性厨余减量运动)。根据"废物管理层级"原则，蓝图正确地优先提倡"废物避免"而非"循环再造"。"例如，长期饮用瓶装饮料然后再回收使用过的塑胶瓶，远不如从一开始就避免饮用瓶装饮料。"（香港环境局，2013，第15页）这与科学认知及零废弃运动的理念是一致的：从源头预防废物的产生，远比废物产生后再进行处理更为高效，也更有益健康。零废弃的核心理念在于承认人类是自然世界的一部分，它追求的是无毒物质的"从摇篮到摇篮"闭环循环，从而使我们赖以生存的生态圈能够完好无损地延续至未来。（Robertson，2014，第281-282页）

正如我们将要看到的，2013-2022年蓝图的实施困难重重，甚至可以说是过于理想化了。造成这一局面的一个主要因素是，废物收费制度（WCS）的实施相比台北或首尔延迟了大约一代人的时间。习惯的力量不容忽视，无论好坏——迄今为止，要实质性地改变香港根深蒂固的"用完即弃"习惯和社会运作模式，是极其困难的。

3. HONG KONG'S WASTE SITUATION 2022 - 2024

In 2022 the disposal of MSW per person and day was not 0.8 kg or below as planned in the *Blue Print 2013-2022*, but 1.51 kg. (HK EPD, 2025, p. 11). The planned 40 % reduction of daily MSW per capita and day became a nearly 20 % increase (!), 1.51 kg in 2022 as compared to 1.27 kg in 2011. The overall waste in 2022 was 15,725 tonnes per day (HK EPD, 2025, p. 7), with 11,129 tonnes of MSW, and with 6797 daily tonnes being of domestic origin and 4382 tonnes of commercial and industrial origin. Figure 2 shows the MSW going to landfills in Hong Kong in 2022 according to the different waste types of MSW.

In addition, there were 4,128 tonnes of construction waste per day and 469 tonnes of special waste. The Recovery Rate of MSW in 2022 was 32 % and the Disposal Rate of MSW was therefore 68 % (HK EDP 2025, p. 27). The Recovery Rate of MSW is the amount of MSW which is recycled or resource-recovered, and does not end up landfilled. As there is now no incineration of MSW in Hong Kong in 2022, the Recovery Rate + Disposal Rate must yield 100 %.

How can this massive mismatch of a government policy target be explained, an almost 20 % increase instead of a 40 % reduction of daily MSW per capita from 2011 to 2022? It does certainly not mean that the Hong Kong Government and society did not do anything since 2013. Valuable efforts to cut MSW at different levels were made. In 2013 the Food Wise Campaign Hong Kong was launched. "The domestic food waste disposal has been reduced by 17% from 0.37 kg per person per day in 2013 to 0.30 kg in 2019." (HK EB, 2021, p. 7). In 2018 and 2019 two important initiatives were launched to reduce or go plastic-free, the *Plastic-Free Takeaway, Use Reusable Tableware* campaign, and the *Plastic-Free Beach, Tableware First*, especially to reduce disposable plastic tableware. About 700 local eateries of different sizes collaborate in the campaign. To boost environmental education, five pilot Community Green Stations were established to promote "public participation in waste reduction and

3. 2022至2024年香港废物产生状况

2022年，人均日都市固体废物弃置量并未达到《资源循环蓝图2013-2022》所规划的0.8公斤或以下的目标，而是高达1.51公斤（香港环保署，2025，第11页）。原计划实现人均日都市固体废物减少40%的目标变成了近20%的增长！——相比2011年的1.27公斤。2022年整体废物产生量为每日15,725吨（香港环保署，2025，第7页），其中都市固体废物为11,129吨，包括家居废物6,797吨和工商业废物4,382吨。图2展示了2022年香港按废物类别划分的送往堆填区处理的都市固体废物。

此外，每天还有建筑废料4,128吨和特殊废物469吨。2022年都市固体废物的回收率为32%，因此弃置率为68%（香港环保署，2025，第27页）。都市固体废物回收率是指经回收或资源化处理后、未送往堆填区处理的都市固体废物所占的比例。由于2022年香港已不再以焚化方式处理都市固体废物，因此回收率与弃置率之和为100%。

如何解释政策目标与实际结果之间的巨大落差？——2011至2022年间，人均日都市固体废物非但没有减少40%，反而增加了近20%！这当然不意味着香港政府和社会各界自2013年以来无所作为——各方在不同层面作出了宝贵的减废努力：2013年，香港启动了"惜食香港运动"。"家居厨余弃置量已从2013年人均日0.37公斤减少17%，降至2019年的0.30公斤。"（香港环保署，2021，第7页）。2018年和2019年，两项重要的减塑或"走塑"倡议相继推出——"无胶走塑外卖・重用餐具"运动和"无胶走塑海滩・餐具先行"运动(译者按："走"是粤语"不要、去除"之意，"走塑"即plastic-free)，旨在减少一次性塑料餐具的使用。全港约700间大小食肆参与了该运

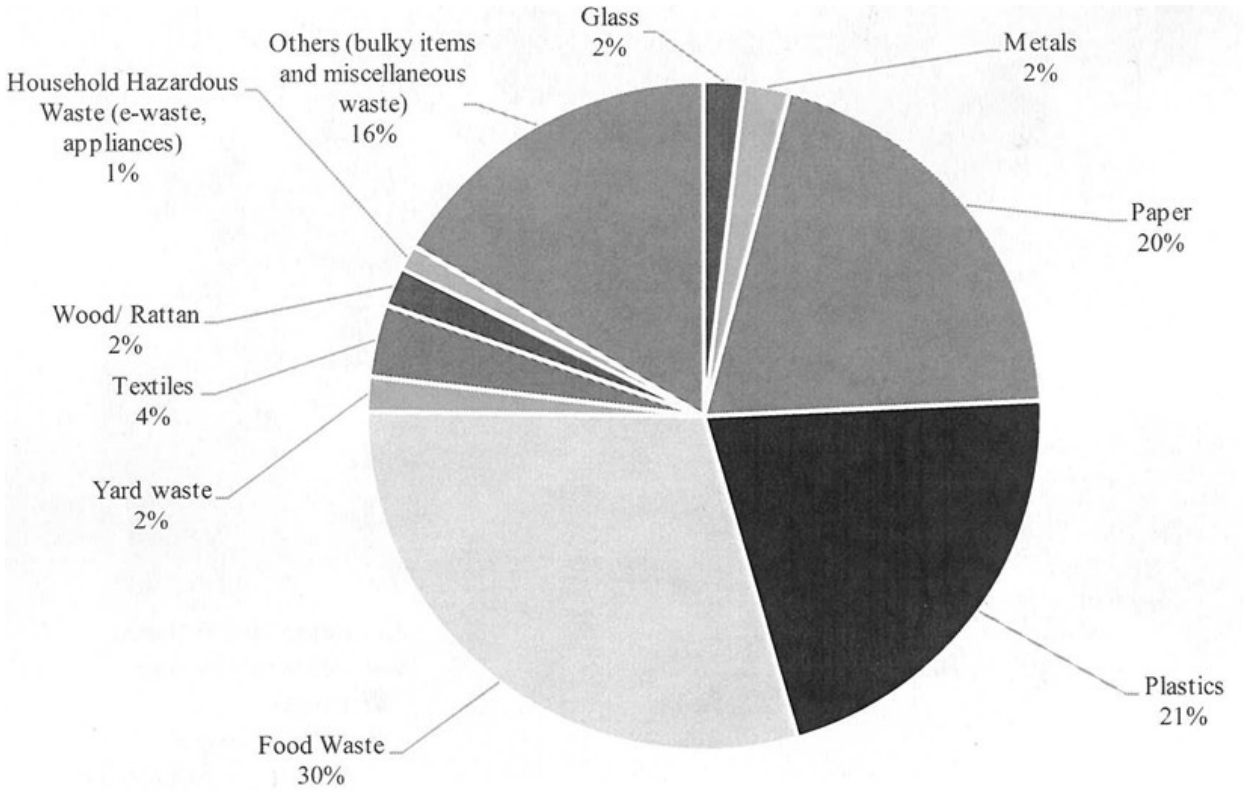


Figure 2: Hong Kong's Landfilled MSW by Waste Type in 2022 (Source: Ancheta, 2025, p. 3, based on HK EPD, 2023).

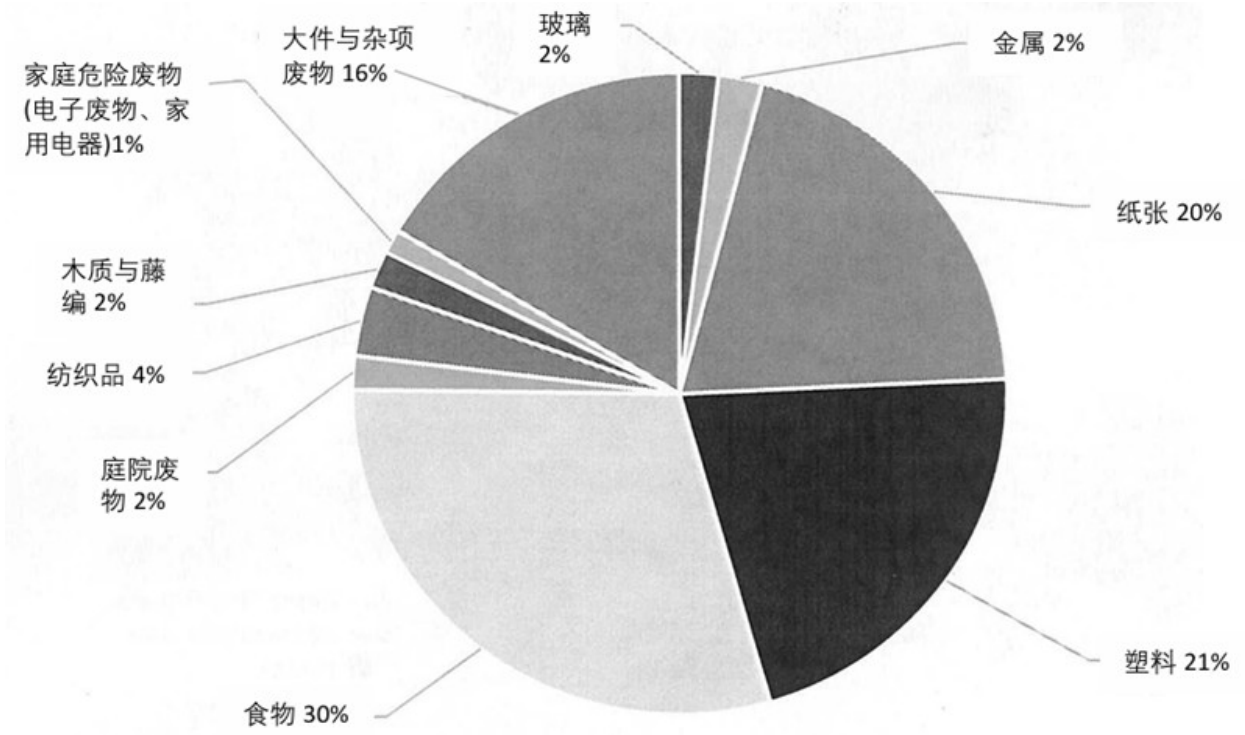


图2：2022年香港按废物类别划分的堆填区都市固体废物（资料来源：Ancheta，2025，第3页，引自香港环保署，2023）。

recovery." (HK EB, 2013, p. 22). Several important Producer Responsibility Schemes (PRS) were established. But it seems, all these efforts have been too little, too late in terms of their impact. "Historical MSW policies have largely failed to achieve their objectives, primarily due to implementation difficulties and the absence of economic policies and market instruments specifically designed for MSW management." (Ancheta, 2025, p. 2).

A slow decrease in MSW can be acknowledged, as in 2023 the MSW per capita per day sank to 1.44 kg and in 2024 further to 1.40 kg. (HK EPD, 2025, p. 2). In 2024 the Recovery Rate improved slightly to 34 % and thus the Disposal Rate reduced to 66 % (HK EPD 2025, p. 27). Food waste in 2024 sank to 3,001 tonnes per day or 29 % of MSW, as some food waste is recovered in the new O-Parks. Domestic food waste disposal rate was 0.27 kg/person/day in 2024. (HK EPD, 2025, p. 2). Paper constituted with 23 % the second largest part of MSW in 2024, and plastics 18 %, that had to be disposed of at landfills, which decreased by 11.1% as compared to 2023. "This reflects the increasing global awareness of 'plastic-free' in recent years and the effectiveness of the Government's active promotion of various related measures, including the implementation of the regulation on disposable plastic products in 2024." (HK EPD, 2025, p. 2).

动。为加强环保教育，香港设立了五个先导"社区环保站"，以推动"公众参与减废回收"（香港环保署，2013，第22页）。此外，多项重要的生产者责任计划（PRS）也相继推行。然而，就实际成效而言，这些努力似乎都显得力度不足、为时已晚。"过往的都市固体废物政策在很大程度上未能实现目标，主要原因是执行困难，以及缺乏专门针对都市固体废物管理的经济政策和市场工具。"（Ancheta，2025，第2页）

都市固体废物的缓慢下降趋势值得肯定。2023年人均日都市固体废物弃置量已降至1.44公斤，2024年进一步降至1.40公斤（香港环保署，2025，第2页）。2024年回收率小幅提升至34%，弃置率相应降至66%（香港环保署，2025，第27页）。2024年厨余弃置量降至每日3,001吨，占都市固体废物的29%，部分厨余已在新建的有机资源回收中心得到回收处理。2024年家居厨余弃置率为人均日0.27公斤（香港环保署，2025，第2页）。2024年废纸以23%的占比成为都市固体废物的第二大类别，废塑胶占18%；送往堆填区处理的废物量较2023年减少了11.1%。"这反映了近年来全球'走塑'意识的日益提升，以及政府积极推动各项相关措施的成效，包括2024年实施管制即弃塑胶产品法例。"（香港环保署，2025，第2页）

The overall MSW Recovery Rate in 2024 was 34%, which increased from 33% in 2023. Hong Kong made some good moves based on the "Polluter-Pays-Principle" (PPP), like the Producer Responsibility Schemes (PRS) on plastic shopping bags (PSB), on regulated electrical equipment with the Alba-WEEE Park opening in 2019, and on glass beverage containers, which have been passed by the LegCo between 2012 and 2017. But the difficulty of transforming in a substantial way the engrained habits and social-economic systems due to the absence of consistent market and economic instruments remained the biggest obstacle to move towards a higher level of resource responsibility and sustainable development (Ancheta et al., 2025, p.2). The change of MSW per capita and day is so far rather marginal than substantial (Figure 3).

4. WASTE BLUE PRINT FOR HONG KONG 2035: "WASTE REDUCTION-RESOURCES CIRCULATION-ZERO LANDFILL" (2021)

The city's *Blue Print 2013-22* to curb the waste per capita per day did in fact not work out as planned due to past misjudgements to rely mainly on landfills, in combination with letting the throw-away habits and correlated economic and social systems become firmly established over several decades. In 2021 a new attempt was made in the *Waste Blue Print for Hong Kong 2035: 'Waste Reduction – Resources Circulation – Zero Landfill'* (HK EB, 2021). Waste Reduction moved up the priority list as the Secretary of the Environement emphasized:

> Using less, wasting less and facilitating the circulation of our resources form an integral part of waste management […] Waste reduction and recycling is our shared responsibility. Yet, driving behavioural and cultural changes is easier said than done. (Wong, 2021, p. 2).

2024年都市固体废物的整体回收率为34%，较2023年的33%有所提升。香港基于"污染者付费原则"（PPP）采取了一些积极举措，例如针对塑胶购物袋（PSB）的生产者责任计划（PRS）、针对受管制电器电子产品的生产者责任计划（配合2019年启用的WEEE Park废电器电子产品处理及回收设施），以及针对玻璃饮料容器的生产者责任计划，上述计划的相关法例于2012至2017年间经立法会陆续通过。然而，由于缺乏持续一致的市场和经济工具，要实质性地转变根深蒂固的行为习惯和社会经济体系仍然困难重重，这构成了迈向更高层次资源责任和可持续发展的最大障碍（Ancheta等，2025，第2页）。迄今为止，人均日都市固体废物弃置量的变化仍是边际性的，而非实质性的（图3）。

4. 《香港资源循环蓝图2035》："全民减废 • 资源循环 • 零废堆填"（2021年）

香港此前制定的《资源循环蓝图2013－2022》旨在降低人均日废物弃置量，但实际上并未取得预期成效。原因在于错误地过度依赖堆填区（垃圾填埋场）进行废物处置，加之数十年来形成的"用完即弃"消费习惯，以及与之相关的经济和社会体系已根深蒂固。2021年，香港推出了新的尝试——《香港资源循环蓝图2035》："全民减废 • 资源循环 • 零废堆填"（香港环境局，2021）。正如环境局局长所强调的，"减废"被提到优先事项的前列：

> 减少使用、减少浪费、促进资源循环，是废物管理不可或缺的组成部分[……]减废与回收是我们共同的责任。然而，推动日常行为和文化层面的转变，说起来容易做起来难。（黄，2021，第2页）

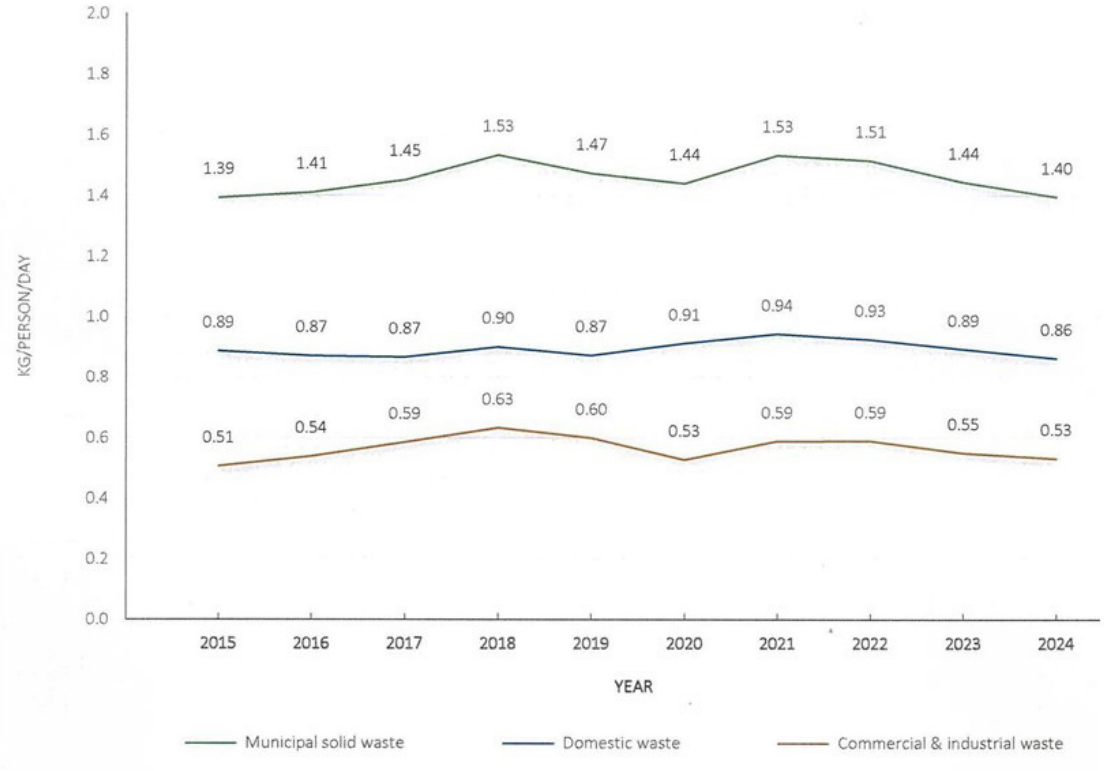


Figure 3: Per capita disposal rates of MSW in Hong Kong from 2015-2024 (Source: HK EPD, 2025, p. 11)

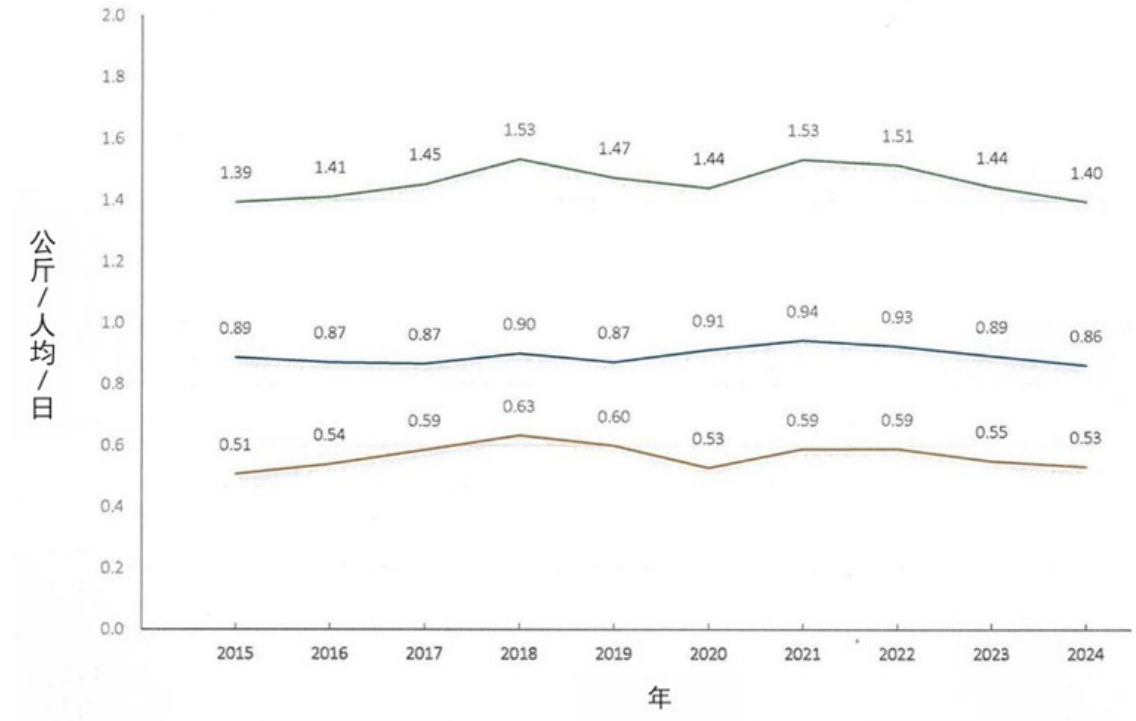


图3：2015－2024年香港人均都市固体废物弃置量（来源：香港环保署，2025年，第11页）

It is indeed extremely challenging to transform an engrained throw-away-culture, habits, and systems. With its *Waste Blueprint 2021*, Hong Kong started the second attempt to implement the WCS as comprehensive incentive for citizens and businesses to "practise waste reduction and recycling." (Wong, 2021, p.2):

> Implementation of a quantity-based waste charging scheme *is indispensable* in facilitating resources circulation in Hong Kong. Such system *is proven successful* in driving social behavioural change in reducing and avoiding waste generation, and providing impetus for waste separation and recycling. (HK EB, 2021, p. 14, emphasis added FG).

The WCS is judged to be the "main driving force" and "cornerstone" (Wong, 2021, p.2) to reduce the waste of households and businesses. It became the *Medium-term Target 1* within the *Blue Print 2021* also in view to achieve carbon neutrality by 2050:

> By implementing charging for disposal of MSW, to gradually reduce the per capita MSW disposal by 40-45% and increase the recovery rate to about 55%. […] MSW charging is the cornerstone for promoting waste reduction and recycling. The Government is determined to take the MSW Charging Bill through the legislative process. (HK EB, 2021, p. 17).

Preparatory periods and implementation phases of the WCS were planned for different stakeholders and sectors of the public, but it turned out to be too difficult to implement the WCS effectively in Hong Kong at this late stage, as the people and social systems (including business) have become too accustomed to the "throw-away-culture" for decades. The WCS had to be postponed three times, indefinitely finally in 2024.

要改变根深蒂固的"用完即弃"文化、习惯和制度体系，确实极具挑战性。香港2021年通过的《资源循环蓝图》(2035)，开启了第二轮尝试，将废物收费制度（WCS）作为一项综合性激励措施，推动市民和企业"践行减废回收"（黄，2021，第2页）。

> 实施按量收费的废物征费制度，对于推动香港的资源循环而言*不可或缺。实践证明，此类制度能够有效推动*社会行为的转变，促进减少和避免废物的产生，并为废物分类和回收提供动力。（香港环境局，2021，第14页，强调部分为本文作者所加）

废物收费制度（WCS）被视为减少家庭和商户废物产生的"主要推动力"和"基石"（黄，2021，第2页）。在2021年的蓝图中，它被列为"中期目标1"，同时也是为了实现2050年碳中和的目标：

> 通过实施都市固体废物收费，逐步将人均都市固体废物弃置量减少40%至45%，并将回收率提升至约55%。……都市固体废物收费是推动减废回收的基石。政府决心推动《都市固体废物收费条例草案》完成立法程序。（香港环境局，2021，第17页）

废物收费制度（WCS）原本为不同的利益相关方和公众群体分别规划了准备期和推行阶段，但事实证明，制度建立过晚导致在香港有效推行十分困难，因为市民和社会体系（包括商界）数十年来已过于习惯"用完即弃"的文化。废物收费制度先后三次延期，最终于2024年无限期搁置。

But the three main goals of the *Waste Blueprint 2021* remain nevertheless recommendable as goals: "Waste Reduction - Resources Circulation - Zero Landfill", with a promotion of low carbon lifestyle and achieving carbon neutrality. These goals result from scientific research (Robertson, 2014) and international experiences. The Second Medium Target in the *Waste Blueprint 2021* is *To Instill a Green Living Culture in HK* through public education campaigns, and the Third Target is *Support of the Recycling Trade in HK (Recycling Fund; Green Tech Fund; EcoPark)*. (HK EB, 2021, p. 17). There are two long-term targets in the *Waste Blue Print For Hong Kong 2035*: to develop adequate *Waste-to-energy facilities*, moving away from the reliance on landfills, and the target of *Zero-Landfills in 2035*. But the question remains, how these targets can be practically achieved given the dominance of the prevailing habits and social systems in Hong Kong.

5. PARTICIPATION OF ALL AND GBA COOPERATION FOR DEEP CARBONISATION AND SUSTAINABLE USE OF RESOURCES

It is commendable that the HK Government in its Climate Action Plan 2021 sets the goal to achieve carbon neutrality before 2050, which requires "deep carbonization" involving the whole S.A.R. community with all its stakeholders. "The Government, business sectors, schools and non-governmental organisations must work together and set an example by promoting and encouraging the public to adopt and practise a low-carbon lifestyle." (HK S.A.R. Gov, 2021, p.23). For developing consistent and coherent local, regional, and national policies and practices, it is necessary to listen to and align policies to global scientific voices, results and data. The experts of the Intergovernmental Panel on Climate Change (IPCC), found out that "21–37% of total greenhouse gas (GHG) emissions are attributable to the food system," originating from "land use, storage, transport, packaging, processing, retail, and consumption." (Mbow et al., 2019, p. 439). As food consumption and food waste takes on a

尽管如此，2021年资源循环蓝图的三大核心目标——“全民减废 • 资源循环 • 零废堆填”，以及倡导低碳生活方式，实现碳中和仍值得作为努力方向加以推荐。这些目标源于科学研究（Robertson, 2014）和国际实践经验。资源循环蓝图的第二项中期目标是“通过公众教育活动，在香港培育绿色生活文化”；第三项目标是“支持香港的回收行业”（回收基金、绿色科技基金、环保园）（香港环境局, 2021, 第17页）。资源循环蓝图还设定了两项长远目标：建设充足的废物转化设施，摆脱对堆填区的依赖，以及在2035年实现零废堆填。但问题依然存在——鉴于香港占主导地位的习惯和社会体系仍然存在，这些目标究竟怎样才能通过实践加以实现？

5. 全民参与及粤港澳大湾区合作，推动深度脱碳与资源可持续利用

香港特区政府在《气候行动蓝图2021》中设定2050年前实现碳中和目标，这一目标值得肯定，它需要“深度脱碳”，并要求整个特别行政区社会及各利益相关方的共同参与。“政府、商界、学校及非政府组织必须携手合作，以身作则，推广和鼓励公众采纳并践行低碳生活方式。”（香港特别行政区政府, 2021, 第23页）为制定连贯一致的地方、区域和国家层面的政策与实践，有必要倾听全球科学界的声音，并使政策与全球科学成果和数据保持一致。政府间气候变化专门委员会（IPCC）的专家指出，“全球温室气体（GHG）排放总量的21%至37%可归因于食物系统”，其来源涵盖“土地使用、储存、运输、包装、加工、零售及消费”（Mbow et al., 2019, 第439页）。鉴于食物消费和食物浪费在香港社会中占据突出地位，这一问题亟需进一步深入反思并纳入政策考量——尤其是在食物浪费预防及其对减缓气候变化的潜力方面。“2010年至2016年间，全球食物损

Three main goals of the Waste Blueprint 2021 remain nevertheless recommendable as goals: "Waste Reduction - Resources Circulation - Zero Landfill", with a promotion of low carbon lifestyle and achieving carbon neutrality.

《2021年废物蓝图》的三大目标——"减废·资源循环·零堆填"——作为目标仍然值得倡导，同时要推广低碳生活方式，实现碳中和。

prominent role in the society of Hong Kong, this needs further urgent reflections and inclusion, especially in regard to food waste prevention and its potential for climate change mitigation. "During 2010–2016, global food loss and waste equalled 8–10% of total anthropogenic GHG emissions." (Mbow et al., 2019, p. 440). Prevention of food waste must top the governmental climate mitigation priorities in Hong Kong, which includes also decarbonization of diets:

> Demand-side measures (shifting to sustainable healthy diets and reducing food loss/waste) and sustainable agricultural intensification can reduce ecosystem conversion, and methane and nitrous oxide emissions, and free up land for reforestation and ecosystem restoration. (IPCC, 2023, p. 29).

This is of relevance for the Hong Kong society and government, which will be affected by the global emissions of food production and the resulting extreme weather events due to global warming. Food waste prevention must be in future included as top priority in any kind of Climate Action Plan.

It is highly relevant that faith-based communities participate as societal stakeholders in the search for a path to sustainable development, like churches with their schools and parish communities in view of setting good examples, but also other religious communities. Pope Francis' Encyclical Letter *Laudato Si'* (Francis, 2015) offers an inspirational framework to boost integral human development based on prophetic and contemplative lifestyles (LS 222), calling even for a "bold cultural

失和浪费所产生的温室气体排放量占人为温室气体排放总量的8%至10%。"（Mbow et al., 2019, 第440页）预防食物浪费必须成为香港政府应对气候变化的首要优先事项，其中还应包括饮食脱碳：

> 需求侧措施（转向可持续健康饮食、减少食物损失和浪费）以及可持续农业集约化，能够减少生态系统转化以及甲烷和氧化亚氮的排放，并释放土地用于植树造林和生态系统修复。（IPCC, 2023, 第29页）

这与香港社会和特区政府密切相关，因为香港将受到全球食物生产所产生的温室气体排放，以及由此引发的全球变暖导致的极端天气事件的影响。预防食物浪费必须作为未来各类气候行动计划的最高优先事项。

信仰团体作为社会相关利益方参与探索可持续发展路径，具有高度的现实意义——例如教会通过其学校和堂区社群树立良好榜样，其他宗教团体亦应如此。教宗方济各的通谕《愿祢受赞颂》（Francis, 2015）提供了一个富有启发性的框架，以推动基于先知性和默观性生活方式的全人发展（LS 222），甚至呼吁发起一场"勇敢的文化革命"，以克服破坏性的"用完即弃文化"，并赢得公民和社会选择更加公正和可持续的生活方式，以及"明智而有益的再利用、翻新和回收方式"（LS 192）。"出于正确的

revolution" to overcome devastating "throw-away-cultures", and win over citizens and societies choose more just and sustainable life-styles, "sensible and profitable ways of reusing, revamping, and recycling" (LS 192). "Reusing something instead of immediately discarding it, when done for the right reasons, can be an act of love which expresses our own dignity" (LS 211). In business this needs leaders and actors to serve the common good of the society. (Deignan Award, 2026). Of relevance is also to deepen the collaboration within the Greater Bay Area, e.g., in the development of "zero waste cities", following the plan of the Central Government 2018, announcing 16 pilot cities and regions for this goal:

> "Zero waste city" refers to an urban development model that aims at reducing solid waste generation at source, promoting transformation of waste into resources, reducing landfilling as far as possible, and minimising the environmental impact of solid waste by advocating the principles of innovation, collaboration, green, openness and share use. The Government will strengthen exchanges and training with cities in the Greater Bay Area which are implementing pilot projects for "zero waste city" (such as Shenzhen), and jointly promote management models of advanced green city. (HK EB, 2021, p. 23).

Developing a regional and consistent model of a "Zero-Waste-City" based on "Circular Economy" within the GBA can become a promising inspiration to *re-think* and *re-do* current practices, with a "innovative, green and low-carbon development model", like a "plastic-free" society and "adopting an innovative, green and low-carbon development model" (HK EB, 2021, p. 23-24; HK S.A.R. Gov, 2021, p. 31).

理由，以重复使用取代即时丢弃，可以是一种表达我们自身尊严的爱的行为"（LS 211）。在商业领域，这需要领导者和参与者服务于社会公益。（Deignan Award, 2026）。深化粤港澳大湾区内的合作同样具有重要意义，例如按照中央政府2018年的规划，在"无废城市"建设方面开展合作，该规划宣布了16个试点城市和地区以实现这一目标：

> "无废城市"是一种城市发展模式，以创新、协调、绿色、开放、共享的发展理念为引领，旨在从源头减少固体废物的产生，推动废物向资源的转化，最大限度地减少填埋量，并将固体废物对环境的影响降至最低。特区政府将加强与粤港澳大湾区内正在推行"无废城市"试点项目的城市（如深圳）的交流与培训，共同推广先进绿色城市的管理模式。（HK EB, 2021, 第23页）

在粤港澳大湾区内，基于"循环经济"理念构建区域性、协调一致的"无废城市"模式，有望为重新审视和改进现有做法提供富有前景的启示，推动形成"创新、绿色、低碳的发展模式"，例如建设"无塑"社会，以及"推行创新、绿色、低碳的发展模式"。（香港环境局, 2021, 第23-24页；香港特区政府, 2021, 第31页）

CONCLUSION

Hong Kong developed important plans for Resource and Waste Management, but also Climate Action, and made steps and moves to accomplish waste reduction and raising resource responsibility in the S.A.R. But there is still a long way to go to reach the important envisioned goal of Zero-Landfill in 2035, and a truly sustainable form of resource use. One of the biggest obstacles seems to be the over decades developed engrained habits and inert social systems based on a prevailing "throw-away-culture". A deep transformation and decarbonisation need systematic, consistent, and accountable approaches on the local, regional, and national level, with the inclusion of all stakeholders in the society, also religious institutions and churches, rooted in a new eco-social contract. The Encyclical Letter *Laudato' Si* of Pope Francis can help to build such a new eco-social contract and framework in view of deep decarbonatization and a more responsible use of resources. The promising path of the development of Zero-Waste-Cities as role models in the regional GBA, as well as the transformative tide of the international call for deep decarbonization can help to journey together towards more resource responsible life-styles and sustainable societies.

结语

香港已制定了重要的资源与废物管理规划，以及气候行动计划，并采取了一系列措施和步骤，以在特别行政区实现减废和提升资源责任意识。但要实现2035年零废堆填这一重要目标，以及真正可持续的资源利用方式，仍有很长的路要走。最大的障碍之一，似乎是数十年来根深蒂固的习惯，以及建立在盛行"用完即弃文化"基础上的惰性社会体系。深度转型和脱碳需要在地方、区域和国家层面采取系统性、连贯且可问责的方法，并纳入社会各相关利益方的参与，包括宗教机构和教会，以建立一种新的生态社会契约。教宗方济各的通谕《愿祢受赞颂》有助于构建这样一种新的生态社会契约和框架，以推动深度脱碳和更加负责任的资源利用。粤港澳大湾区"无废城市"作为区域典范的发展前景，以及国际社会呼吁深度脱碳的变革浪潮，将有助于我们携手迈向更加珍惜资源的生活方式和可持续社会。

References 参考资料

- Ancheta, E. D. W., Cambaliza, M. O. L., & Delina, L.L. (2025). Towards Net Zero and a Zero Landfill Future: Leveraging Hong Kong's Municipal Solid Waste Charging Scheme for Sustainable Waste Management and Carbon Neutrality. *Journal of Sustainability*, Volume 1, Issue 2. https://doi.org/10.55845/jos-2025-128
- Deignan Award. (2026). The Deignan Award for Responsible Entrepreneurship. https://www.deignanaward.org/ (accessed July 5th 2026).
- HK EPD. (2023). Monitoring of Solid Waste in Hong Kong Waste Statistics 2022. https://www.wastereduction.gov.hk/sites/default/files/resources_centre/waste_statistics/msw2022_eng.pdf
- HK EB. (2021). *Waste Blue Print for Hong Kong 2035: Waste Reduction-Resources Circulation-Zero Landfill*. Hong Kong: Environment Bureau.
- HK S.A.R. Gov. (2021). Hong Kong Special Administrative Region Government. *Hong Kong's Climate Action Plan 2050*. Hong Kong. https://cnsd.gov.hk/wp-content/uploads/2023/05/Climate-Target-of-HK_en.pdf
- HK EPD. (2015). Environmental Protection Department of Hong Kong. *Monitoring of Solid Waste in Hong Kong: Waste Statistics for 2024*. Hong Kong: EPD, December 2025.
- HK EB. (2013). *Hong Kong Blue Print for Sustainable Use of Resources 2013-2022*. Hong Kong.
- Fabian, N., and Lou, LIT. (2019). The Struggle for Sustainable Waste Management in Hong Kong: 1950s–2010s. *Worldwide Waste: Journal of Interdisciplinary Studies*, 2(1): 10, 1–12. DOI: https://doi.org/10.5334/wwwj.40
- Francis. (2020). *Fratelli Tutti*. http://www.vatican.va
- Francis. (2015). Encyclical Letter *Laudato Si'*: Care for Our Common Home, Vatican 2015; At the Holy See: https://www.vatican.va/
- Francis. (2013a). Message at the General Audience, June 5th 2013. https://www.vatican.va/
- Francis. (2013b). Pope's Video Message to Recycling Workers of Argentina, Vatican City, December 20th 2013, see: http://www.zenit.org/en/articles/pope-s-video-message-to-recycling-workers-of-argentina
- IPCC. (2023). Summary for Policymakers. In: *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC: Geneva, Switzerland, pp. 1-34, doi: 10.59327/IPCC/AR6-9789291691647.001
- *Laudatu Si'Movement*. (2026). https://laudatosimovement.org/
- Mbow, C., C. Rosenzweig, L.G. Barioni, T.G. Benton, M. Herrero, M. Krishnapillai, E. Liwenga, P. Pradhan, M.G. Rivera-Ferre, T. Sapkota, F.N. Tubiello, Y. Xu. (2019). Food Security. In *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*. [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D.C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold,

References 参考资料

J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)]. Geneva: IPCC. https://doi.org/10.1017/9781009157988.007

- Robertson, Margaret. (2014). *Sustainability: Principles and Practice*, London-New York.
- Rotondi, Valentina, & Santori, Paolo. (2023). *Rethinking Economics Starting from the Commons: Towards an Economics of Francesco* (Contributions to Economics). Cham, Swiss: Springer, 2023.
- *The Macau Manifesto*. (2020). The Macau Manifesto for The Economy of Francesco, Assisi, November 2020. Website: https://www.deignanaward.org/
- Tornielli, Andrea, & Galeazii, Giacomo. (2015). *This Economy Kills: Pope Francis on Capitalism and Social Justice*. Collegeville, Minnesota, 2015.
- Turkson, Cardinal Peter. (2019). Message of the Prefect of the Dicastery for Promoting Integral Human Development to the scientific community on the occasion of the fourth anniversary of Pope Francis' Encyclical *Laudato si'*, Rome, 24th May 2019. At the Holy See: www.vatican.va
- Wong, Kam-sing. (2021). Preface. In: Environment Bureau Hong Kong. *Waste Blue Print for Hong Kong 2035: Waste Reduction-Resources Circulation-Zero Landfill*. Hong Kong: Environment Bureau.
- Wong, Kam-sing. (2013). Preface. In: Environment Bureau. 2013. *Hong Kong Blue Print for Sustainable Use of Resources 2013-2022*. Hong Kong: Environment Bureau, 2013.
- Zero Waste Europe. (2015). Pope Francis Embraces Zero Waste. *Zero Waste Europe News*, June 18th 2015. https://zerowasteeurope.eu/