

## SDG 12.3.1

1. The waste produced by NUK is collected and transported by outsourcing manufacturers, and billed according to the amount of waste produced. Therefore, the amount of waste produced and recycled can be measured. The amount of waste generated by the school is disclosed in the annual sustainability report, and on webpage for the public.

2. Implement smart waste management plan:

In order to improve the waste area of the student dormitory, to promote recycling and environmental protection, and to reduce the amount of waste output, NUK established a new smart waste recycling management system and recycling station in the student dormitory from 2019, using Internet of Things (IoT) to establish an intelligent input port guidance mechanism, full detection devices, and digital recording of the recovery process, which uses statistical results and analyzes user habits to improve waste removal and resource utilization.

3. **See the attached files.**

(1) Waste removal contract in 2021.

(2) The amount of waste generated by the school is disclosed in the annual sustainability report (summary).

Website:[https://sustainability.nuk.edu.tw/#\\_1](https://sustainability.nuk.edu.tw/#_1)

(3) Smart waste management program.

國立高雄大學  
採購 110 年校區一般廢棄物委外清運服務案  
契約書

正本

招標案號 UKA109143

契約編號 UKA109143

國立高雄大學「110年校區一般廢棄物委外清運服務案」(UKA109143)  
招標規範

一、履約地點：機關集中一般廢棄物（生活垃圾）的垃圾暫存場及學生第一宿舍地下室斜坡道入口處。

二、履約期限

（一）履約期限：自民國110年1月1日至110年12月31日止共計12個月。

（二）廠商之廢棄物清除或清理許可證期限於履約期限內屆滿並申請展延者，應將新核發之許可文件影本送機關備查；若於履約期限內，未取得展延，機關得自原許可期限屆滿日起終止契約，並得沒收廠商繳交之履約保證金。

三、工作事項：為有效率執行廢棄物清運工作及考量環境衛生與美化，廠商應於履約始日前，在前述垃圾暫存場及學生第一宿舍地下室各無償放置6及2個垃圾儲存桶（規格1000公升以上），供機關裝納廢棄物之用；學生第一宿舍地下室機關已自備3個1000公升垃圾儲存桶，應一併依本契約規定清除之。

四、廢棄物種類與數量

（一）廢棄物種類：生活垃圾（廢棄物代碼D-1801、適合焚化），為固態廢棄物，未混雜法規規定之有害廢棄物。

（二）可直接進焚化爐的廢棄物數量：約為185公噸。（不包括廢樹枝及落葉）

五、清運次數、週期與動線

（一）開學期間每週一至週六（寒暑假期間每週一、三、五），上午07:30-12:00期間清運完畢，但不能歸責於廠商者，不在此限。清運動線應先清運垃圾暫存場，後清運學生第一宿舍地下室斜坡道入口處。

（二）正常情況下，廠商以一車次未能清運完畢時，應自行增派人員、車次為之，不得藉故拖延，且於星期例假日期間亦同，惟遇有不可抗力之因素，如垃圾焚化場封閉等情況時除外。

（三）如遇天然災害有清運大批垃圾必要時，得由機關通知廠商派專車進行增載垃圾清運，清運完畢後，廠商應憑過磅單計算實送焚化廠規費，再加



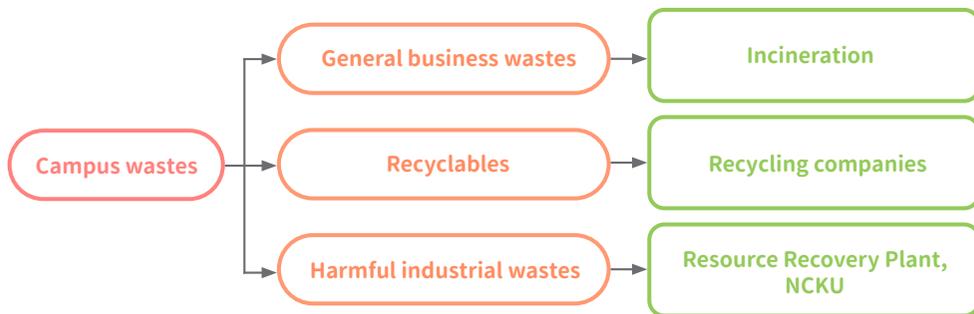
Test results of drinking fountains

Year	2019	2020	2021	Standard
Escherichia coli CFU/100mL	< 1	< 1	< 1	6
Total plate count CFU/mL	< 1	< 1	< 1	Nil

### 4-3.3 Waste Management

KU waste output can be roughly divided into general business waste and recyclables generated in the dormitory and office, and hazardous business waste generated in the laboratory. General business waste is entrusted to the manufacturer to be transported to the incineration plant for incineration; the harmful industrial wastes are cleaned and transported by qualified cleaning and transportation companies to Resource Recovery Plant of Environmental Resources Research and Management Center, National Cheng Kung University for disposal.

Waste treatment flow chart



List of general industrial waste disposal 2021

Industrial waste component	Hazardous waste		Non-hazardous waste		Note
	On-site	Off-site	On-site	Off-site	
Direct treatment					
Incineration (incl. recycling)	59	-	298.95	-	
Landfill	-	-	-	-	
Others	-	-	14.55	-	Recycling
Subtotal	59	-	313.5	-	
total	59		313.5		
sum	372.5				
Temporary storage	-				
Total waste	372.5				

Note:

1. Waste weights are in metric tons.
2. "On-site" is within the physical boundaries or administrative control of NUK; "off-site" is outside NUK's physical boundaries or administrative control.
3. All industrial wastes are sent to the entrusted manufacturer for disposal.
4. NUK has no transfer during disposal.

### 4-3.4 Occupational Safety and Health Management

#### 1 Occupational Safety and Health Management System

In order to ensure the safety of the faculty and students of NUK, in accordance with the occupational safety and health laws and regulations and the NUK's applicable workplace safety and health code, the laboratory safety and health and campus inspections are regularly implemented, following the authority and the MOE's management and inspections to ensure the safety of all faculty members and reduce the occurrence of disasters. In addition, NUK cooperated with MOE and the Labor Inspection Office of the Kaohsiung City Government to implement the campus safety and health guidelines for the Southern Alliance of Colleges and Universities.





SDG-Driven Sustainable Mobility

**Attachment 3**

# Item II: Smart Waste Management



## General Affairs Division

## 12.3.1

### ◆ Waste recycle collection area in student dorms

- Experiment on student dorms as community recycling area, construct IoT management system and smart model.

#### 1. Improve the site:

- floor
- lightings
- ventilation
- new paint & work space
- planning traffic flow
- Install kitchen waste refrigerator to avoid mix-up with other waste.



Before clean-up

After clean-up



## 12.3.1

### 1. Digitize recycling history:

Integrate student ID to record personal recycling process, use rewards to promote recycling.

### 2. Smart input guide:

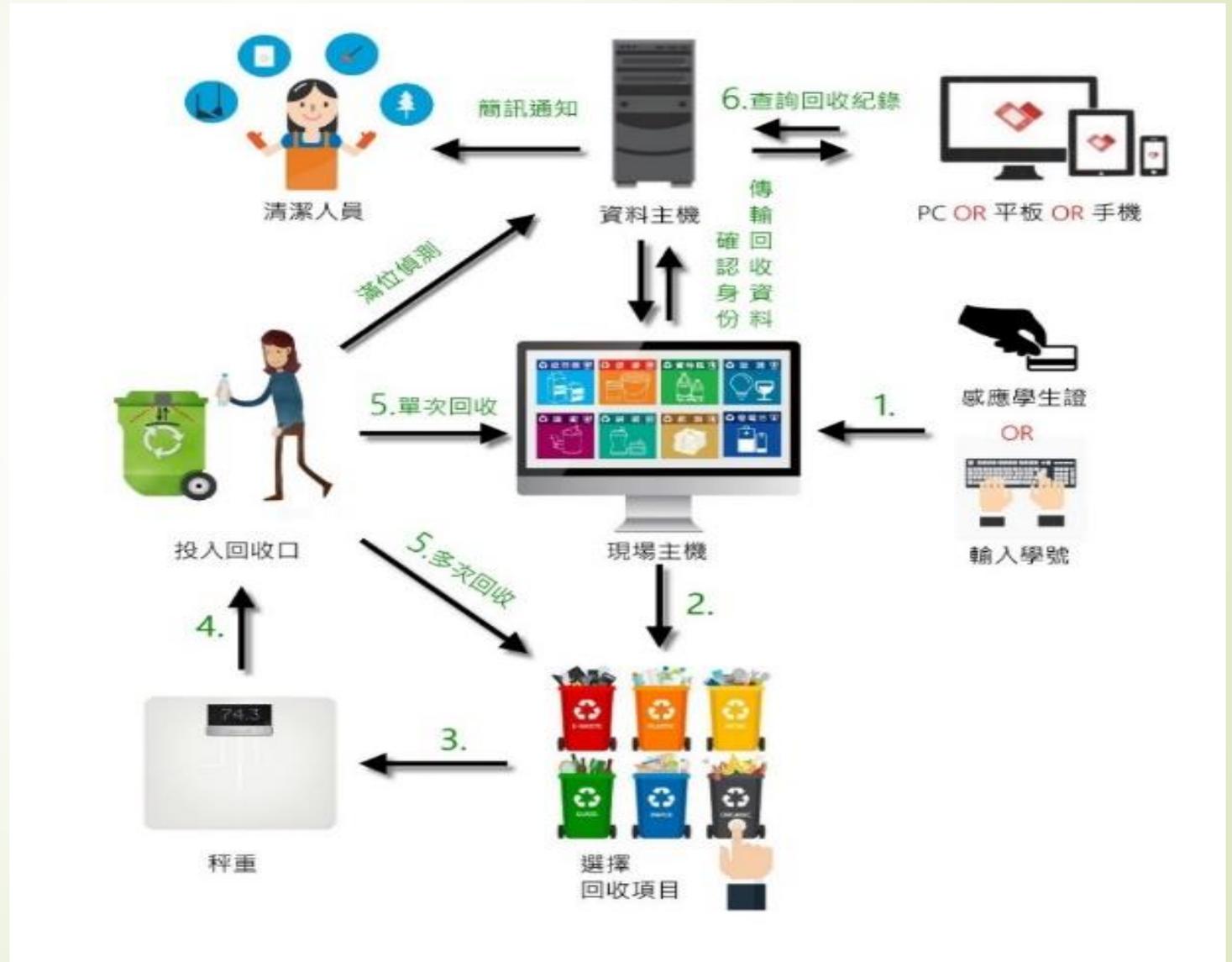
Use touch screen to select recycling category (in 8, e.g. plastic, bottles, batteries) for correct input port.

### 3. Smart full detection dumpster:

When the dumpster is nearly full, it informs the cleaner to handle the waste.

### 4. Efficient clearing management:

Use statistics and analysis of user habits to improve clearing strategy.



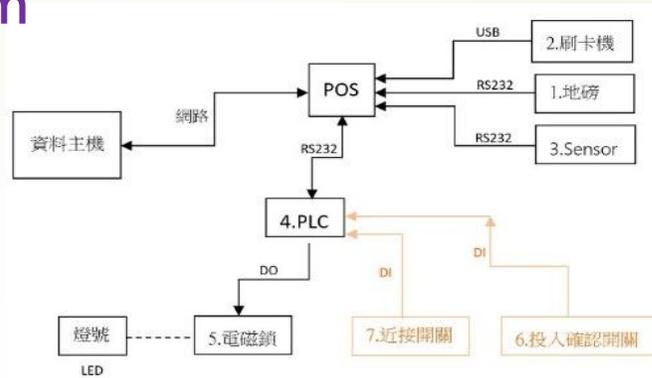
### 12.3.1

#### ◆ Smart recycling management system

<http://gbrecycle.nuk.edu.tw/>

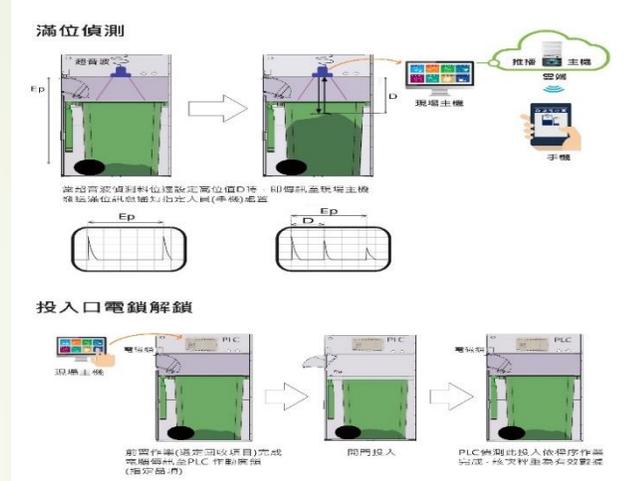


#### ◆ Electric lock for input port



guiding signal, input port control & input sensor

#### ◆ Full detection dumpster



1. Install full detection device and use the iot for systematic management.
2. The device informs the cleaner when full, to save time and manpower and increase efficiency.

