



2022. 12. 6.

# Resource Circulation Policy with Citizens



**Jeju Jeju City**



# Contents



1. General status of Jeju Island
2. Waste generation and disposal
3. Resource Recycling System
4. Overview on waste management policies





# 1. General status of Jeju Island

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# 1. General status of Jeju Island



## 1-2 Jeju Special Self-Governing Province

### Overview

#### Position 1

- One of the nine provinces of Korea

#### Position 2

- High level of autonomous province (after July 1, 2006)

#### City

- Two administrative cities (Jeju City, Seogwipo City)

#### Administrative district

- 43 Eup, Myeon, and Dong

#### No. of personnel

- 5,835 ( general position, fire fighting position, local police, etc.)

#### Budget size

- 5,822.9 billion won (2021 annual expenditure budget)

# 1. General status of Jeju Island



## 1-3 Comparison of development trends

### Statistics(1946-2021)

Trend	1946	1970	1980	1990	2000	2015	2021	Units
Population	266	366	463	515	543	641	<b>677</b>	1,000 ppl.
Public officials	384	1,265	2,454	3,802	4,218	5,255	<b>5,835</b>	People
<b>GRDP (Gross regional domestic product)</b>	23	240	3,492	19,237	55,824	138,941	<b>19,532</b>	Billion won (provisional)
	0.0	0.2	3.1	17.0	49.4	123.0	<b>185.3</b>	10 million dollar (\$)
<b>GRDP per capita</b>	8.8	66	743	3,781	10,650	23,911	<b>29,144</b>	Thousand won
		0.1	0.7	3.3	9.4	21.2	<b>29.1</b>	1000 dollar (\$)
Budget size	1	29	406	3,177	15,518	42,593	<b>66,289</b>	100 million KRW
	0.0	0.0	0.4	2.8	13.7	37.7	<b>66.2</b>	10 million dollar (\$)
<b>Tourists</b>		245	260	2,992	4,110	13,664	<b>12,008</b>	1,000 ppl.
Number of vehicles	113	1,340	5,925	43,185	164,360	435,015	<b>658,594</b>	number
Housing supply		70,595	77,095	89,835	129,396	215,813	<b>246,451</b>	housing



## 2. Waste generation and disposal

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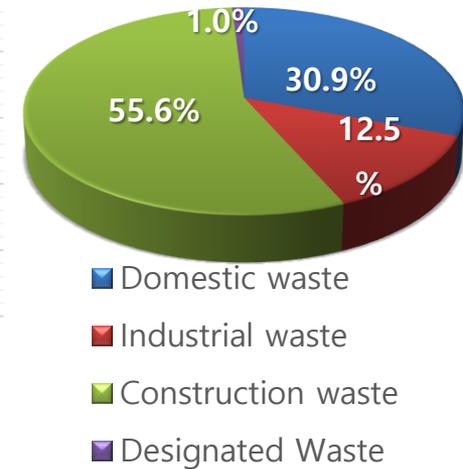
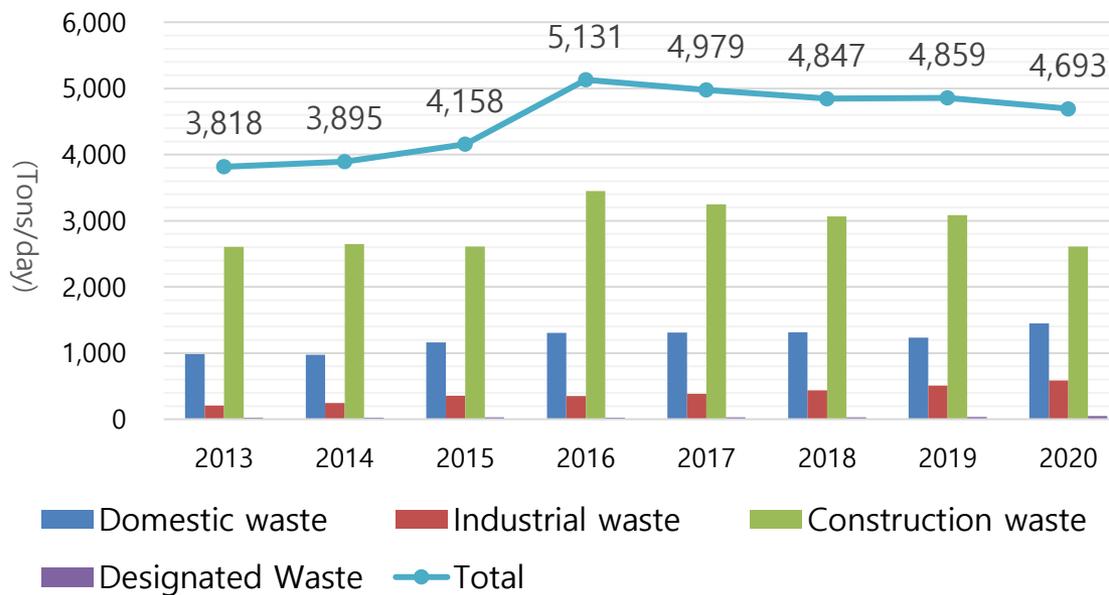


## 2. Waste generation and disposa



### 2-1 Total amount of waste generated

Annual amount of waste

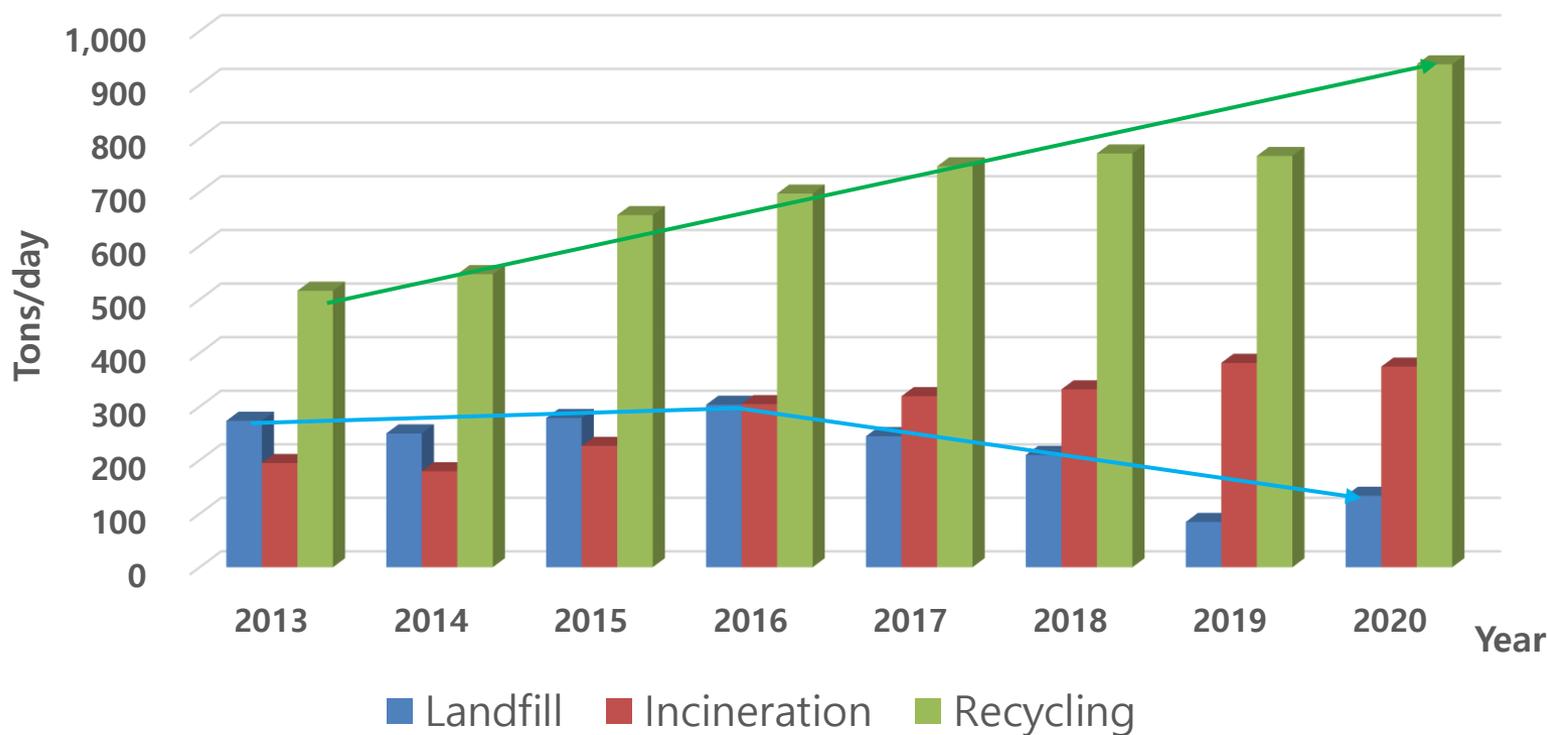


- Construction waste accounts for 56%, domestic waste 31%, industrial waste 13%, and designated waste 1% of the total amount of waste generated (2020).

## 2. Waste generation and disposal



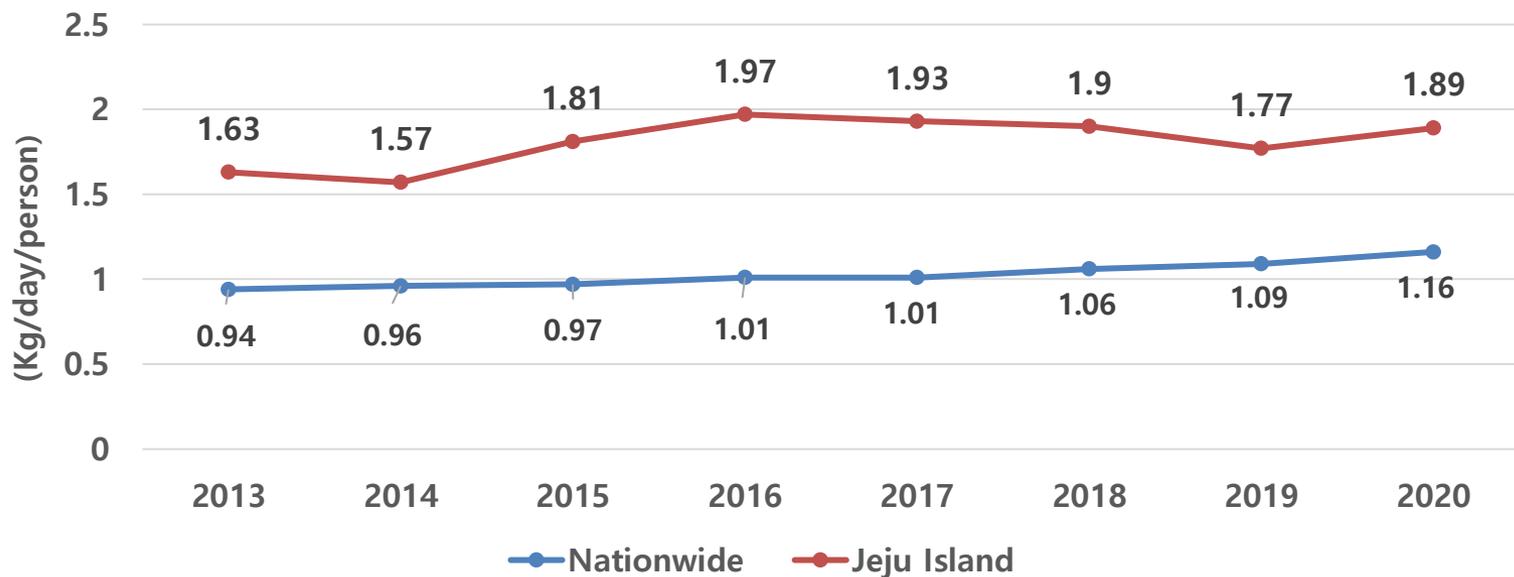
### 2-2 Domestic waste treatment type



## 2. Waste generation and disposal



### 2-3 The amount of waste generated per person



- The amount of waste generated per person in Jeju Island is higher than the national average (1.16 kg/day/person).
- The amount of waste generation is the highest among local governments nationwide (1.89kg/day/person) due to the increase in population and tourists or other reasons.



# 3. Resource Recycling System Establishment

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# 3. Resource Recycling System Establishment



## 3-1 Operation of "Clean House" system (February 2006~)



☑ Introduction Background: Improve shortcomings of door-to-door discharge methods (Ruined the beauty of the city and public health)

☑ Key features

- Discharge recycling items at the designated day and time per item according to the Recyclable Waste Emission System by Day of the Week
- Install Clean House in parking lots, parks, alleys, etc. by region (1,502 sites)

☑ Operations personnel

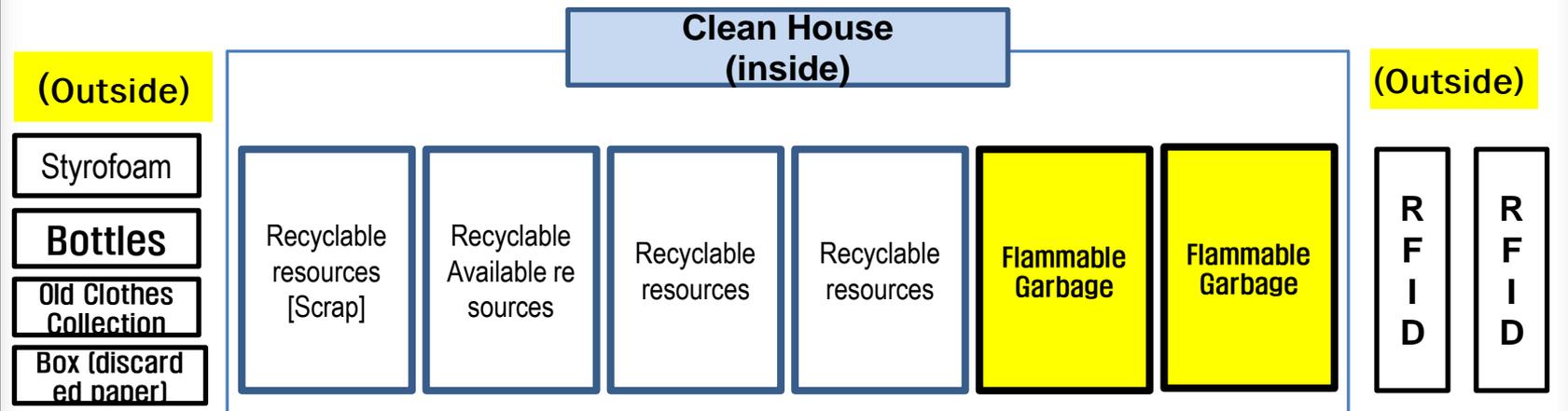
- Assistants(600 ppl.): Provide education at site and select recyclable materials from mixed waste
- Personnel for Clean House and RFID bin cleaners(153 ppl.): Clean the Clean House after discharge time

# 3. Resource Recycling System Establishment



## 3-1 Operation of "Clean House" system (February 2006~)

### A floor plan of Clean House



- ▶ Inside(2 collection containers): ① Flammable waste ② Recyclable resources
- ▶ Outside(4 collection containers): ① Styrofoam ② Food Waste RFID bins ③ Bottles  
④ Old clothes collection box  
(privately owned –collected by private companies)  
⑤ box (Discarded paper)

👉 Dedicated bin is placed based on waste generation area and the amount of waste

# 3. Resource Recycling System Establishment



## 3-2 Guide to separating and putting out trash

Type	Containers that can be discharged
Recyclable resources	Paper or clear plastic bags (excluding black plastic bags)
Non-combustible waste	Standard plastic garbage bags for non-combustible waste (PP bags)
Combustible waste	Standard plastic garbage bags for combustible waste
Food waste	All areas (Eup, myeon, dong) : Food Waste Radio Frequency Identification on Reader(RFID) - Payment by credit card, transportation card



# 3. Resource Recycling System Establishment



## 3-2 Guide to separating and putting out trash

### Recyclable Waste Emission System by Day of the Week (Jan. 2017~)

Mon, Wed, Fri, Sun	Tue, Thu, Sat	Tue, Sat	Thu, Sun	Everyday
Plastic Transparent plastic bottles	Paper	Non-combustible Waste	Vinyl	Combustible Waste Food Waste Styrofoam Bottles Can and scrap

- ☑ Introduction Background: Minimize the amount of waste and maximize the disposal of recyclable materials
- ☑ Main content: Specify recyclable items and discharge time (15:00 - 04:00 the next day) by day of the week
- ☑ Operational effects: Increase the collected amount of recyclable goods and reduce the amount of incineration and landfill by preventing the discharge of mixed wastes

### 3. Resource Recycling System Establishment



#### 3-3 Operation of 'Recycling Help Center' (since 2017~)



☑ **Introduction Background:** Supplement the disadvantage of Recyclable Waste Emission System by Day of the Week and improve recycling rate by discharging recyclable goods at all times

☑ **Key features**

- All types of recyclable materials can be discharged regardless of day and time (helper are always placed)
- Small waste products, paper packs, ice packs, waste oil, and medicine can be discharged
- Utilized as a place to promote various recycling initiatives, such as resource recovery compensation, training on separate discharge, etc.

☑ **Operations personnel**

- Helpers of Recycling Help Center(229 people): On-site training on separate discharge and prevention of the discharge of mixed waste

# 3. Resource Recycling System Establishment



## 3-4 Waste disposal facilities in operation and construction





## 4. Overview on waste management policies

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### 4-1 Quantity[usage] based pricing system

Until Mar. 31, 1994

#### 1 A flat fee for disposal of household waste

1946 .~ 1994. 3. 31.

- Waste disposal fees were charged at a fixed rate through property tax or monthly rent, regardless of the amount of waste discharged.
- It was difficult to reduce the amount of waste discharged or separate recyclable materials with this system.



## 4-1 Volume-based waste fee system(VBWF)

From Apr. 1

### 2 Volume-based waste fee system(VBWF)

#### Key purpose

- Depending on the amount of waste discharged, fees for collecting and disposing waste are charged to each contamination source factor (5, 10, 20, 30, 50, 75, 100 L).
- Distinguish between general(7 types) disposable bags and reusable(2 types) bags
- Free discharge and collection of recyclable materials

#### How to discharge waste

- Households and small businesses purchased and discharged garbage by using standard garbage bags



2016.12.2 HDPE M형

이 신원하는 봉투를 묶는 부분입니다.

**Jeju**

**쓰레기봉투 (10리터)**  
- 일반·재사용(소각대상) -

- 쓰레기는 반드시 규격봉투를 사용하여 뒷부분을 잘 묶은 후 지정된 장소에 방치(50~2000까지 배출해야 합니다).
- 재활용물은 별도로 분리한 후 가까운 클린하우스에 지정요청에 지정용품을 배출하여 주십시오.
- 규격봉투를 사용하지 않거나, 배출시간, 배출요청을 어겨서 소각률 저하를 유발하는 100리터 이하의 과용이 허용됩니다. 문의사항은 서귀포시 생활환경과 ☎ 760-2931~2935나 해당 읍·면·동주민센터로 문의 바랍니다.

**제주특별자치도 서귀포시장**

## 4-1 Volume-based waste fee system(VBWF)

2017. 1. 1

### 2 Volume-based waste fee system

#### Distribution and sale of disposable bags

- Disposable bags can be bought from nearby convenience stores, grocery stores, and local stores.
- Disposable bags with the standard capacity of 5, 10, 20, 30, 50 liters are provided.
- Disposable bags are integrated into regular and reusable bags (9 types → 5 types).



### 4-2 Designated site for discharging waste

Until Jan.

#### 2005 Door-to-door discharge method

From Apr. 4, 1994 to 2005

- Households and small business discarded waste in front of a home, business, or building.
- The entire city was contaminated with waste discharged outside the house.
- The garbage released outside the house was damaged very often by dogs and cats, which can contaminate the surroundings and weakens public health.



## 4-2 Designated site for discharging waste

From 2006

### 2 Introduction of Clean House Waste Discharge System

- From 2006 to 2012, the waste discharge system gradually and completely switched from a door-to-door or discharge system to a clean house system: Total KRW 40 billion was required.
- 2,000 Clean Houses were installed in parking lots, parks and alleys.
- It is possible to discharge all kinds of waste and a mechanical collection system is introduced.

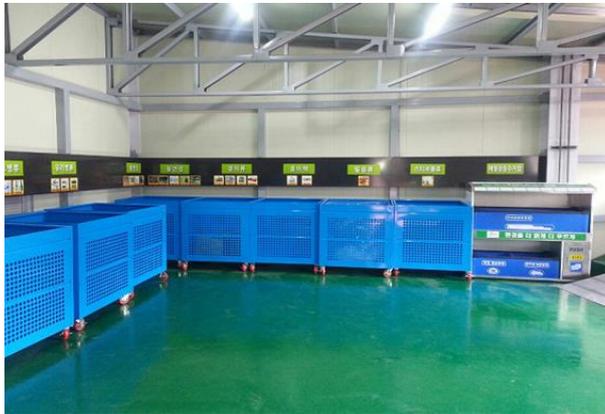


### 4-2 Introduction of recycling help center

From 2017

#### 2 Additional installation of appx. 100 recycling help centers by 2025

- Operation Hours: 6 am to 1 2pm (open 24 hours close to shopping mall)
- Provide incentives for recyclables (cans, PET bottles, paper packs, etc.)
- Operational status: 2 (2017) → 51(2021) → 70(2022) → 100(2025 planned)



2017. 1. 1

### 1 Recyclable Waste Emission System by Day of the Week

#### Primary purpose and operation

- Minimize the amount of waste generated and maximize the incorporation of recyclable resources
- It had a six-month pilot operation from January 1, 2017 to June 30, 2017, and was officially launched on July 1, 2017 (7 types: Plastic, bottle, can, scrap, paper, film, non-flammable, Styrofoam)
- It was improved and implemented from April 1, 2018 (types 4: Plastic, paper, film, non-flammable, Styrofoam)
- Each recyclables shall be released at the specified time of the day of the week. (Excluding non-recyclable items)

#### Effect

- The amount of recyclables collected has increased by 34.5% in 2020 compared to 2016.
- In addition, the total amount of waste incinerated and landfilled has decreased by 16.5%.

## 4-3 Recyclable Waste Emission System by Day of the Week

### 2 Before VS. After the implementation of Recyclable Waste Emission System by Day of the Week

- The amount of recyclables collected has increased by 34.5% in 2020 compared to 2016.
- In addition, the total amount of waste incinerated and landfilled has decreased by 16.5%.



Before



After

# 4. Overview on waste management policies



## 4-4 Distribution of Food Waste Radio Frequency Identification Reader(RFID)

RFID bins



Small restaurants



### Food Waste Collection Support

- ✓ Number of RFID bins installed: 4,170 bins
- Monthly average of 901,141 use cases (as of 2021)
- Monthly average of KRW 58,268,000 collected (as of 2021)
- ✓ Number of small restaurants: 4,732
- Monthly average of 4,686 cases charged (as of 2021)
- Monthly average of KRW 87,759,000 collected (as of 2021)

### ※ Food Waste Disposal Fee

Year	General housing	Small restaurant	Workplace With large emissions
2022	55	95	200
7. 1. ~	KRW/day	KRW/day	KRW/day
2017 ~	30	51	106
2022	KRW/day	KRW/day	KRW/day
2014 ~	22	37	76
2016	KRW/day	KRW/day	KRW/day

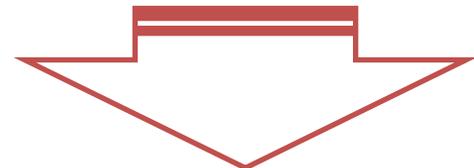
## 4-5 Food waste reduction device installation project in Jeju City

### Food Waste Reduction Device



### Installation and effects of food waste reduction device

- ✓ Target place to install: 1,075 sites
- ✓ Installation Place : 482 sites
- ✓ - Schools, large restaurants, tourist accommodation



- ✓ 2016: 150.4 tons/day
- ✓ 2020: 138.6 tons/day
- ✓ Reduced waste: 11.8 tons/day (31.8 tons/day including Eup/Myeon)

### Expected effect

- ▶ Reduce the amount of waste collected, transported and processed by reducing food waste

# 4. Overview on waste management policies



## 4-6 Separate discharge of transparent PET bottles in Jeju City

### <2022>

- Install PET bottle collection boxes in Clean House of Eup, Myeon, Dong (1,800 sites): Jan. 2022
- Make and supply collection bags for PET bottles (125,000 pieces): 2022. April
- Recycling Help Center promoted direct Sale of Transparent PET bottles to private company: Jul. 2022~
- Proceed with the policy enforcement to encourage collection of transparent PET bottles in cooperation with Saemaeul

Women's Association

- **Duration/participants:** Feb. ~ June, 2022 (Agreement signed: Jan. 28) / Jeju City Saemaeul Women's Association (24 eup, myeon and dong women's associations)

**Key activities:** Jeju City and Saemaeul Women's Association signed an agreement.

(Eup, Myeon, Dong) Saemaeul Women's Association collects and sorts transparent PET bottles from households and businesses in each region, and launches a campaign for separate discharge of PET bottles

- **Results:** 24 groups, 1,500 participants, 148 tons of transparent PET bottles collected

※ **During the agreement period (5 months), the women's association collected 35% of the total amount collected(422.1 tons) in the first half**



### <2021>

- Proceed with "Transparent PET Bottle Day" policy to facilitate the collection of recyclables
- **Period/Location:** 2021. Every Sunday from October to December / Recycling Help Center and Eup, Myeon Office

**Key activities:** When more than 1 kg of PET bottles are collected and discharged, 10 pieces of 10L standard garbage bags are provided.

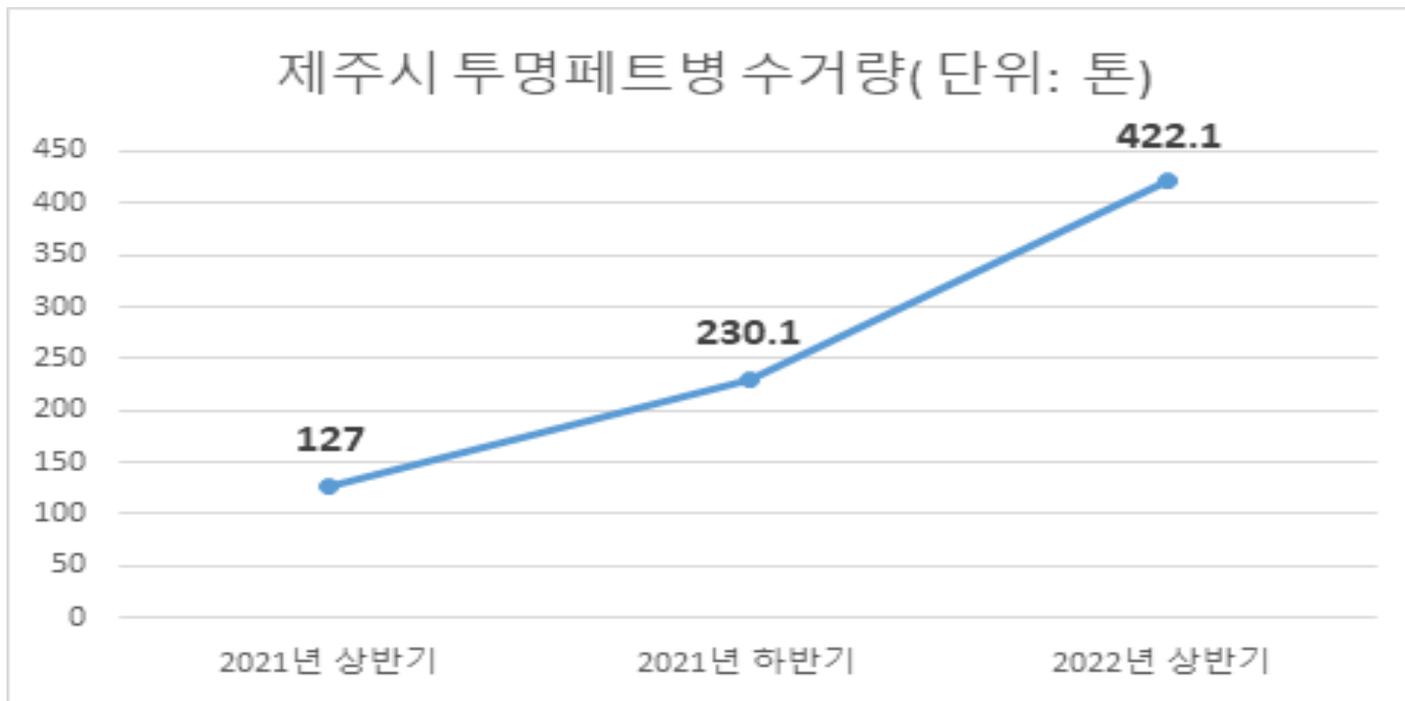
- **Results:** 95,773 citizens participated, significantly increased collection of transparent PET bottle( 83% ) during the period

※ **Average collected amount per day: (September 2021) 1.03 tons → (October 2021) 1.04 tons → (November 2021) 1.83 tons → (December 2021) 1.88 tons**



## 4-6 Separate discharge of transparent PET bottles in Jeju City

### Amount of transparent PET bottles collected in Jeju City



※ Average collected amount per day: (first half of '21) 0.7 ton → (second half of '21) 1.25 ton → (first half of 2022) 2.33 ton

※ In the first half of 2022, 422.1 tons of clear PET bottles were collected, and 246 million won revenue was raised.

## 4. Overview on waste management policies



4-7

### Efforts to build a future-oriented waste disposal system

#### Improvement of Recyclable Waste Emission System by Day of the Week

Current	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Recycling	PET & Plastic	Paper (Box)	PET & Plastic	Paper (Box)	PET & Plastic	Paper (Box)	PET & Plastic
Non-combustible		○				○	
Everyday	Combustible, Styrofoam, bottles, can and scrap, food waste, Large wastes (such as furniture)						



Improvement (proposal)	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Recycling	Combustible	Recyclable	Combustible	Recyclable	Combustible	Combustible	Recyclable
Non-combustible	Discharge as large waste						
Everyday	Food waste, large wastes (e.g., furnitures, etc.)						

#### Expected effect

- ▶ Relieve fatigue and provide convenience due to daily release of recyclables
- ▶ All collection boxes in the Clean House are jointly used and cleaning vehicles (combustible/recyclable) are utilized regardless of the type.
- ▶ Maximize administrative efficiency by establishing 5-day work week at the recycling sorting facility

## 4-7 Efforts to build a future-oriented waste disposal system

### From Standard Garbage Ba

#### 자동압축컨테이너 운영현황



##### 자동압축컨테이너란?

가연성 폐기물 압축기, 배출물 중량에 따라 신용결제 가능한 수거장치

##### 설치목적

- ✓ 폐기물로 인한 도심오염 방지와 도심미관 저해요인 제거
- ✓ 종량제봉투 비용절감 및 가연성폐기물의 우수오염 방지
- ✓ 조류 및 동물에 의한 폐기물의 도심 산파 방지
- ✓ 선결제에 의한 폐기물 수거의 공정한 과세

##### 자동압축컨테이너 운영현황

#### 총 4개소 운영

그림 상 : 제주시 조천체육관 주차장내  
그림 하 : 제주시 압축폐기물 운송 중



선결제형 가연성 폐기물 수거시스템 및 운영시스템 설치로 환경선진 제주 구현

#### Expected effect

- ▶ Reduce 1.2 billion garbage bags, reduce KRW 90.8 billion production costs (reduce CO2 emission by 19,200 tons)

## 4-7 Efforts to build a future-oriented waste disposal system

### From Standard Garbage Ba



### Smart green city development project

- Location: Yongdamil-dong, Jeju City
- Duration: 2022 ~
- Scale: Installation of 14 recycling collection systems
- Installed equipment per set
  - 2 RFID bins
  - 1 bin for can
  - 3 bins for plastic
  - 1 bin for PET bottle
  - 1 bin for paper package

### 4-7 Efforts to build a future-oriented waste disposal system

#### Upcycle Center in Jeju City



#### Overview on Project

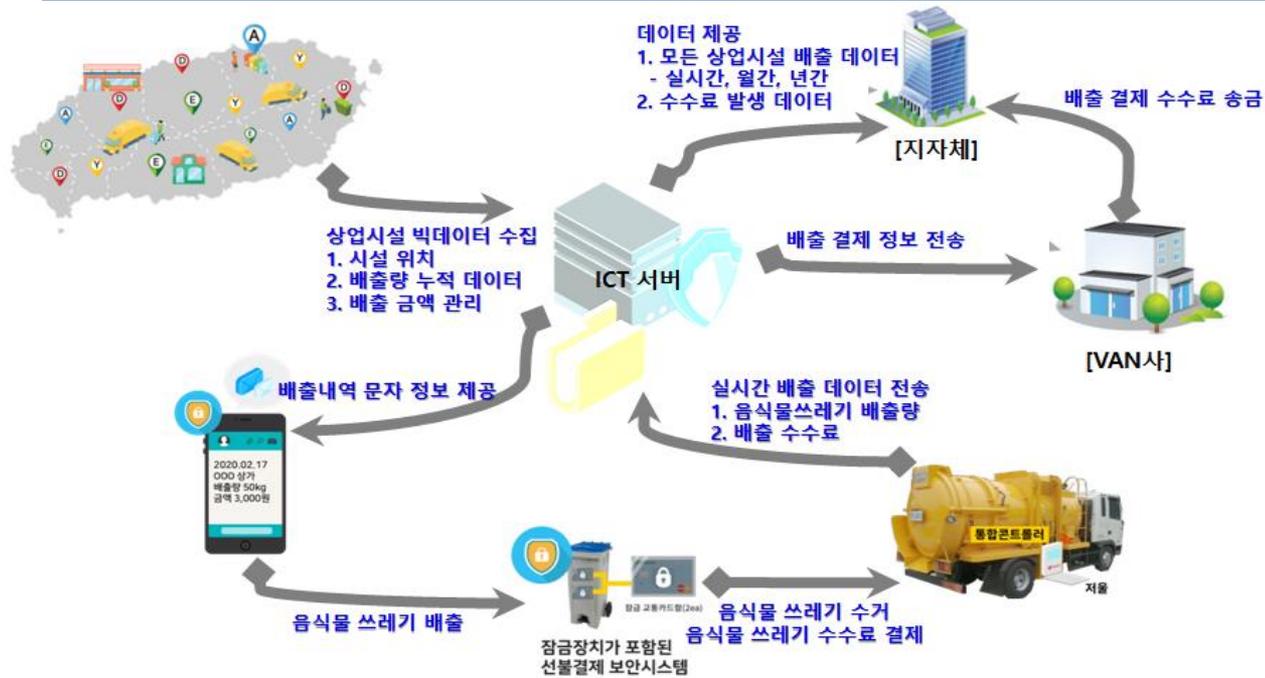
- Location: 1069 Odeung-dong, Jeju city
- Project period: Jan. 2020 ~ Mar. 23
- Scale: Total floor area 1,413m<sup>2</sup>  
(1 building, 3rd floor)
- Main facilities.
  - Facilities for upcycling artist and companies
    - Reusable items display and sales room
  - Waste-related experiential training facilities
    - Large-scale waste repair and sales facilities

#### Expected effect

- ▶ Develop renewal products that can improve the added value of resources, contribute to job creation, facilitate the upcycling industry, nurture professional youth through the establishment of infrastructure
- ▶ Encourage citizens to participate in recycling by reforming furniture discarded, turning it into a reusable resource, selling it to citizens at a lower price and donating all profits

## 4-7 Efforts to build a future-oriented waste disposal system

### Introduction of pre-payment method to drive food waste reduction



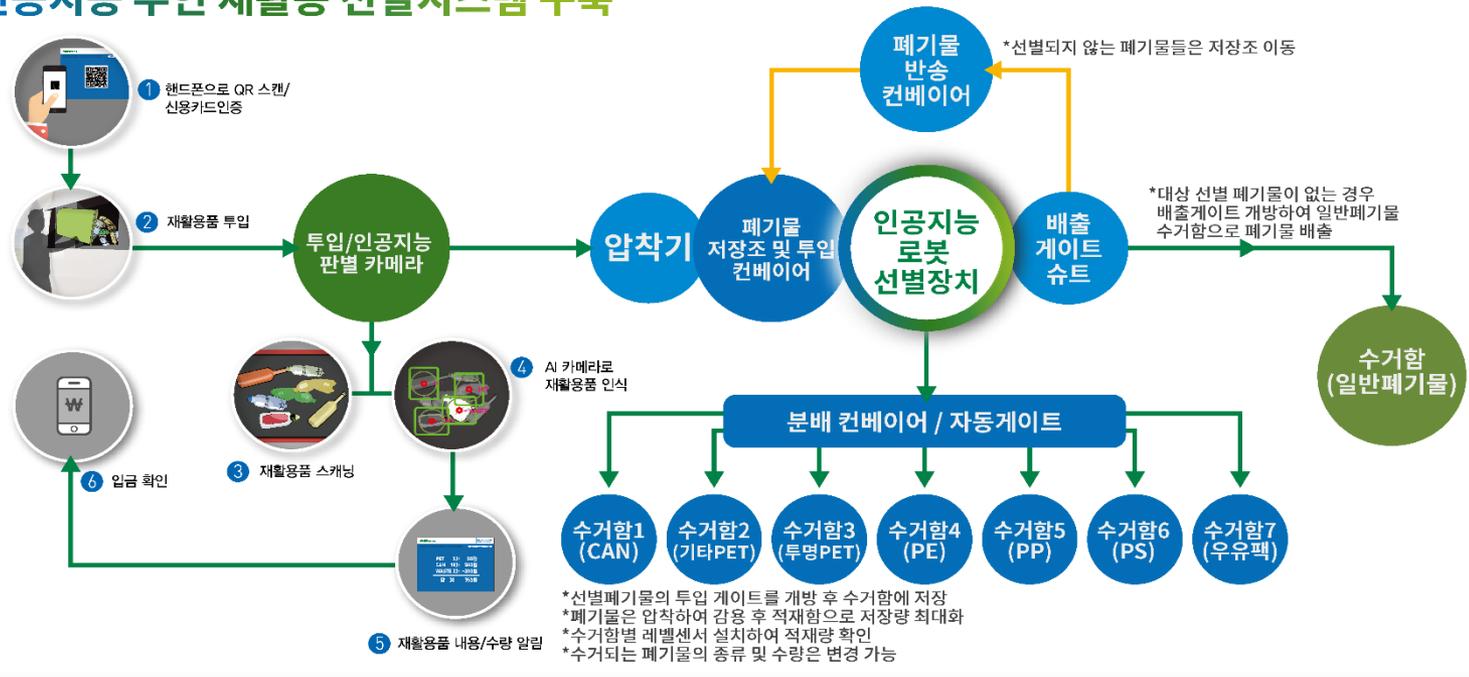
### Expected effect

- ▶ Pursue accurate policy for reduction and management of transportation costs by analyzing food waste by region and business (supplementing the shortcomings of the deferred payment system)
- ▶ Reduce emissions by sending the amount of waste discharge and fees to users in real time

## 4-7 Efforts to build a future-oriented waste disposal system

### Operation of an unmanned recycling help center with robots

#### 인공지능 무인 재활용 선별시스템 구축



### Expected effect

- ▶ Reduce operating costs due to regular employment of workers at recycling help center (90 million won/site)
- ▶ Raise the waste recycling rate through accurate separation

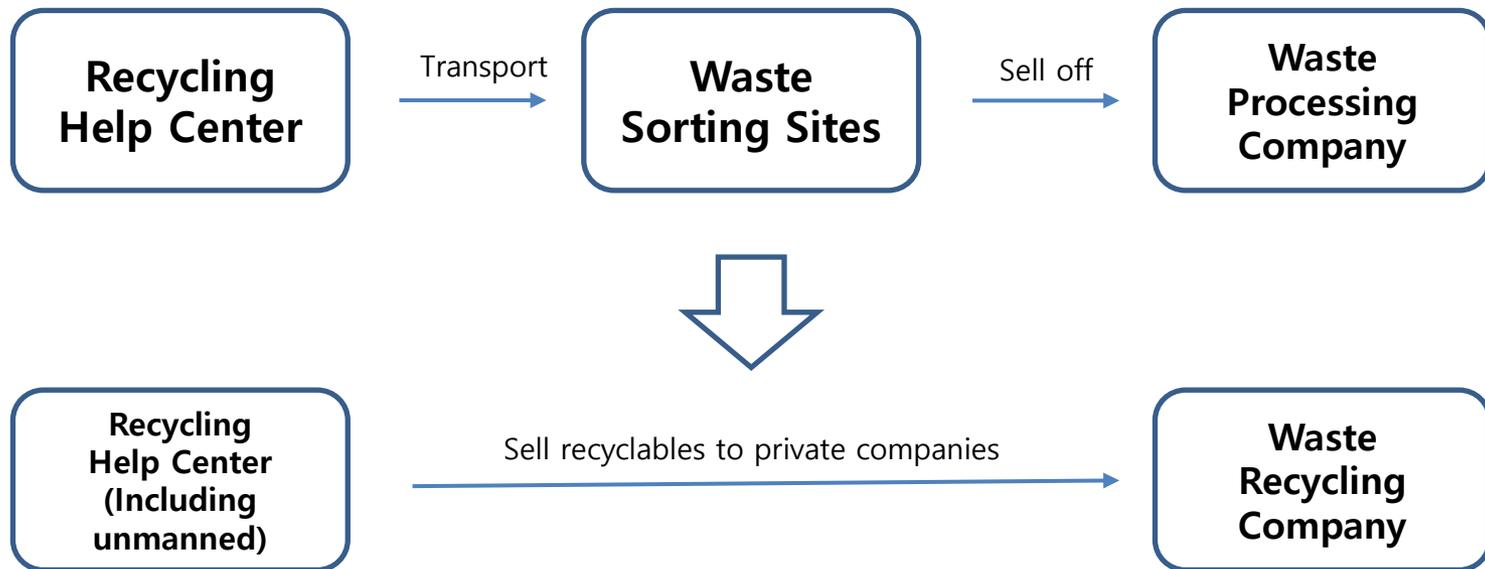
## 4. Overview on waste management policies



4-7

### Efforts to build a future-oriented waste disposal system

The recycling help center sells waste to the private sector.



#### Expected effect

- Recyclables separated and sorted from discharge at the recycling center are directly sold to waste recycling companies, minimizing the amount brought in to the sorting site (transportation cost reduction)

## 4-8 Encourage citizen engagement

### ○ Operation of recyclable resource recovery compensation (Jan. (2021~))

- **Background:** Raise awareness of resource recycling and improve recyclable resource collection rates
- **Key activities:** If users collect recyclable resources and exchange them to Recycling Help Center, standard garbage bags are provided.
- **Items eligible for reward:** Waste batteries, paper packs, beverage cans, PET bottles
- **Compensation criteria**

Type	Compensation criteria (standard garbage bags 10L=240 won)				
	1 kg or more Less than 2 kg	2 kg or more Less than 3 kg	3 kg or more Less than 4 kg	4 kg or more Less than 5 kg	5 kg or more
Recycling Day*	2 pieces	4 pieces	6 pieces		
Resource recovery compensation system (Every day)	1 pieces	2 pieces	3 pieces	4 pieces	5 pieces

Recycling Day\*: Every Sunday, Earth Day (April 22), Environmental Day (June 5)

- **Results:**

☞(2021) 245,053 participants, 2,056,949 standard garbage bags, 3,948 tons of recyclable resources

☞(June 2022) 124,732 participants, 443,186 standard garbage bags, 2,221 tons of recyclable resources

※ Increase in the amount of recyclables brought in by Recycling Help Center after the implementation of the resource recovery compensation system

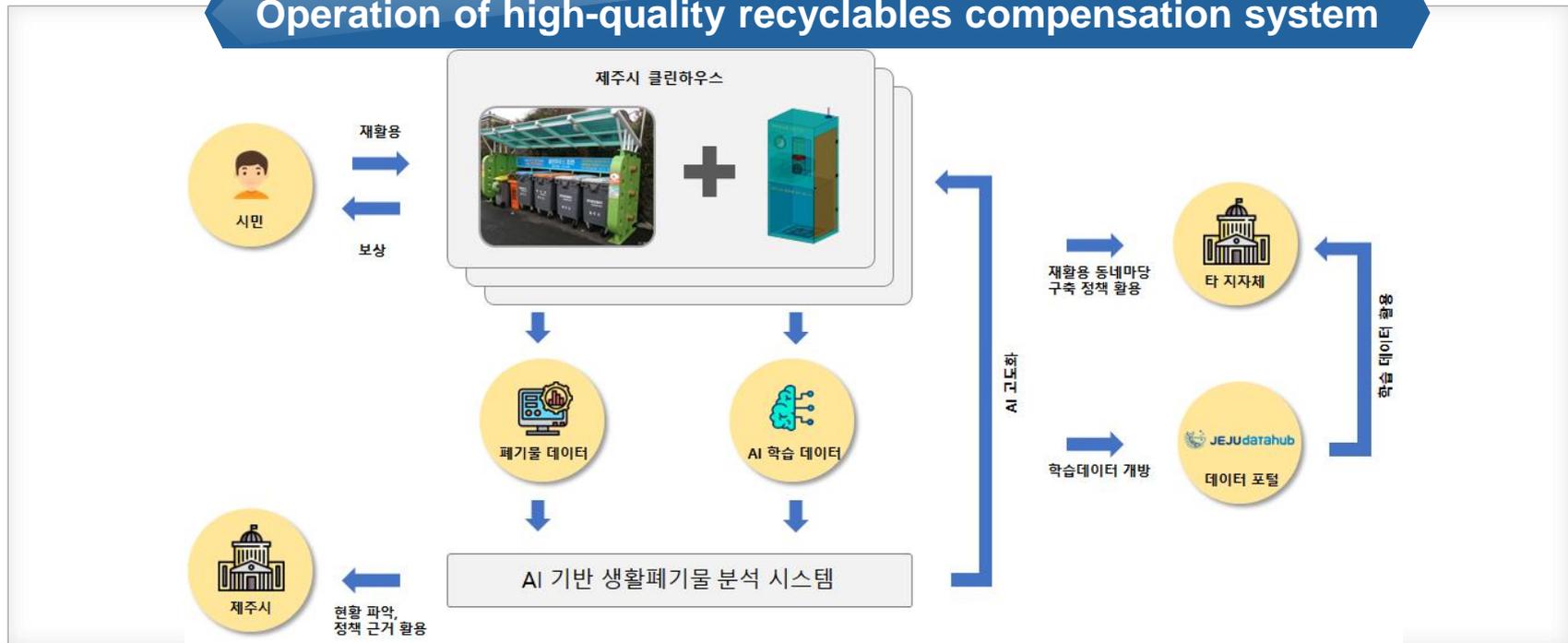
- (2020) 3670 tons → (2021) 3948 tons → (June 2022) 2221 tons (estimated 4,500 tons in total per year)

## 4. Overview on waste management policies



### 4-7 Efforts to build a future-oriented waste disposal system

#### Operation of high-quality recyclables compensation system



#### Expected effect

- ▶ Improve the recycling rate of waste by reducing the amount of waste brought in to the recycling sorting site and the amount of waste incinerated as disused.
- ▶ Satisfy global low-carbon trend with the unlimited and repeated use of transparent PET bottles
- ▶ Utilize data on collection facility introduction by carefully measuring waste discharge status

# 4. Overview on waste management



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## 4-8 Encourage citizen engagement

### ○ Hold Jeju recycling sharing festival in 2022 ('22.9.17. (Sat)/Tamla Cultural Plaza)

- **Background:** Provide a place for citizens to share, exchange and sell reusable used items  
Create an atmosphere for reducing waste and building a resource recycling society
- **Key activities:** Reuse furniture sales corner, child and youth flea market, environmental experience program, etc.
- **Results:** Donate all revenues from the sale of Reuse furniture, a used goods market, and an environmental experience program



# 4. Overview on waste management



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## 4-8 Encourage citizen engagement



Volunteer activities

Children's experience



Clean House Cleaning

Experience a recyclables sorting area



Thank you

