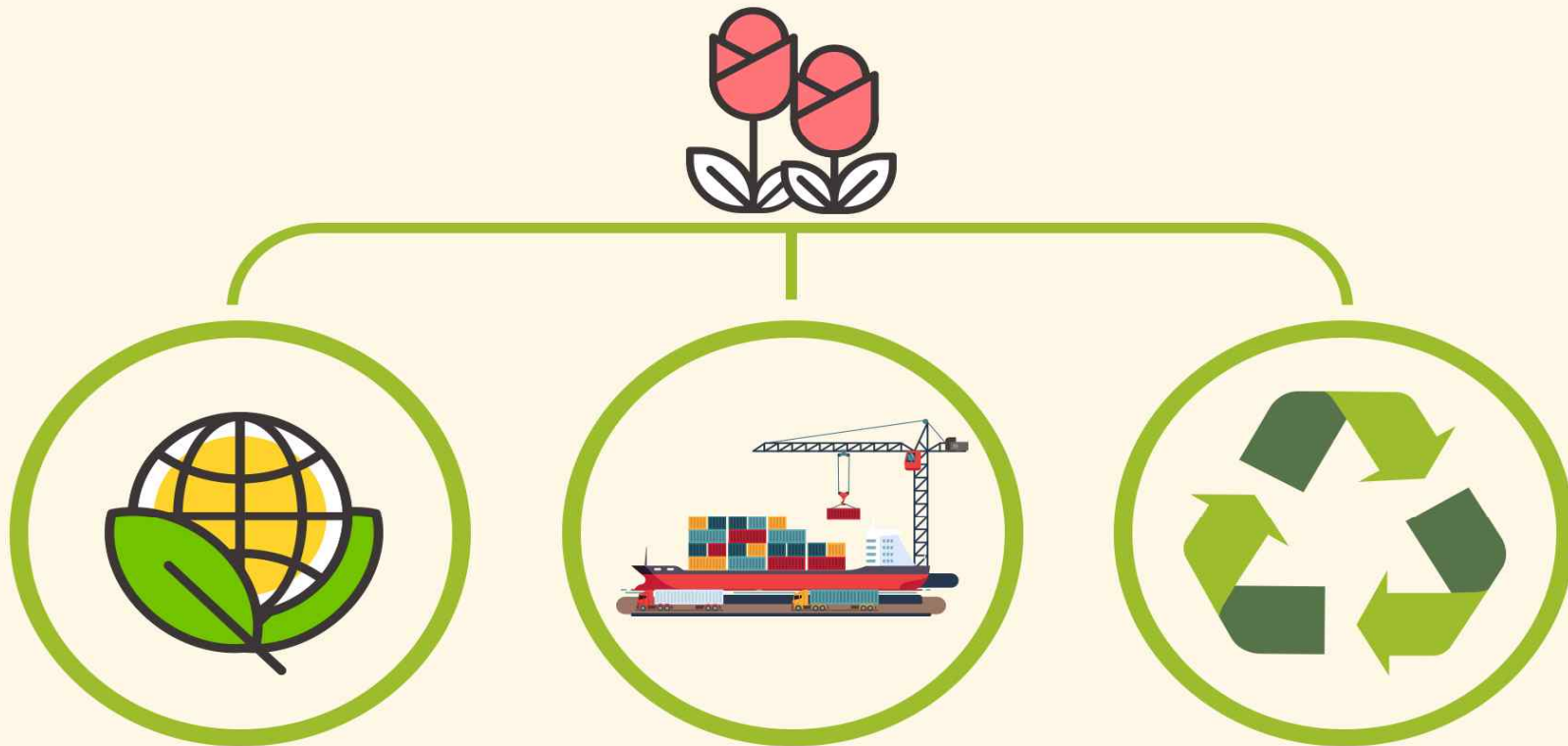


# Recycling of Port's Plastic Waste

Sustainable Green Port





## Sustainability Blossoms at Busan Port (Recycling of Port's Plastic Waste)

### CONTENTS

#### 01 Background Information

- The push to recycle the port's plastic waste
- The problem of plastic incineration and landfill

#### 02 About the Initiative

- Establishing a system of cooperation
- Establishing a resource recycling network
- Increasing awareness and supporting social enterprise growth

#### 03 Initiative Results

- Quantitative data on performance
- Non-quantitative data on performance, and future plans

## The need to recycle the port's plastic waste

Maritime plastic debris is a danger to both marine life, and human health



**At 84,106 tonnes per year, plastic accounts for 86.1% of Korea's maritime waste**

- Source : Total annual amount of Korea's maritime debris according to the 3rd Master Plan for Maritime Waste Management (2019-2023)



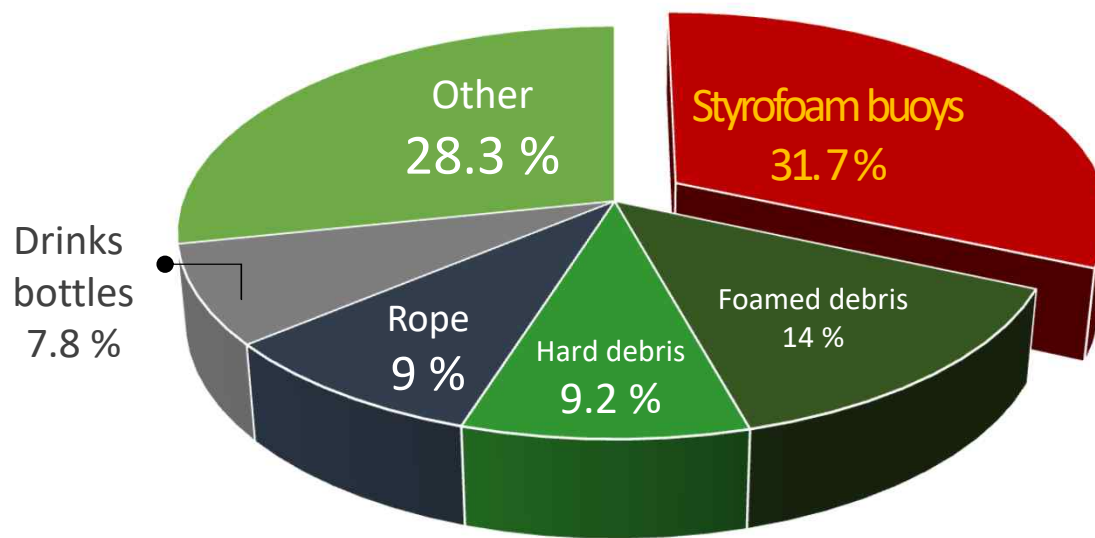
Busan Port Authority, responsible for the operation and management of Busan Port, **determined the need for an earnest establishment of a recycling system for the port's plastic waste**

## The need to recycle the port's plastic waste

Maritime plastic debris is a danger to both marine life, and human health



The **37 types** of maritime plastic debris are not chemically decomposable, and so remain in the ocean, contaminating ocean life and thus **even the food that we eat**

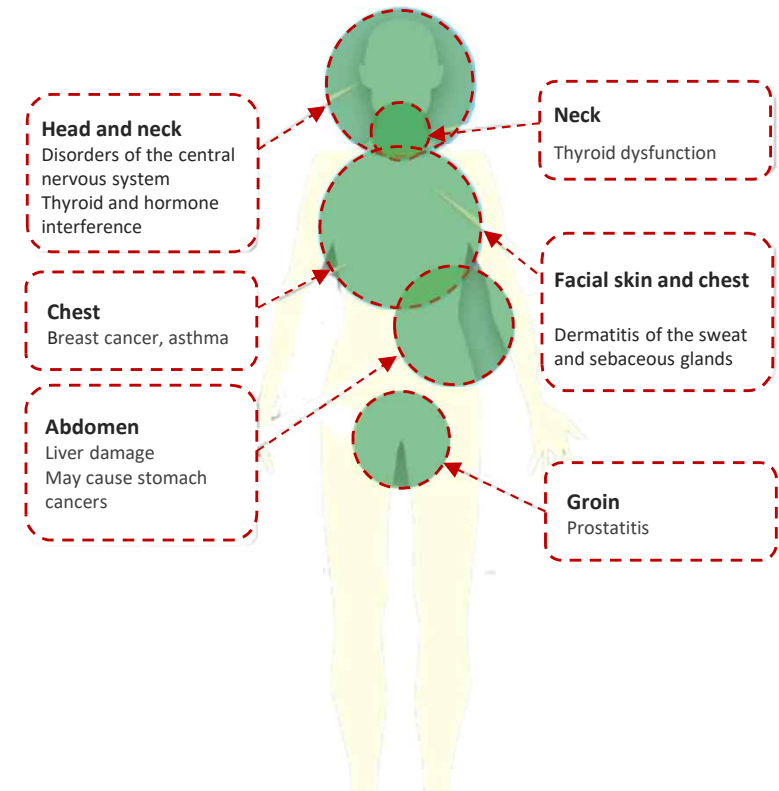


Plastics collide and split into microplastics less than 5mm in size.

**This is an ongoing ocean crisis.**

### Microplastics and the threat to human health

Source: Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP), Korea Consumer Agency





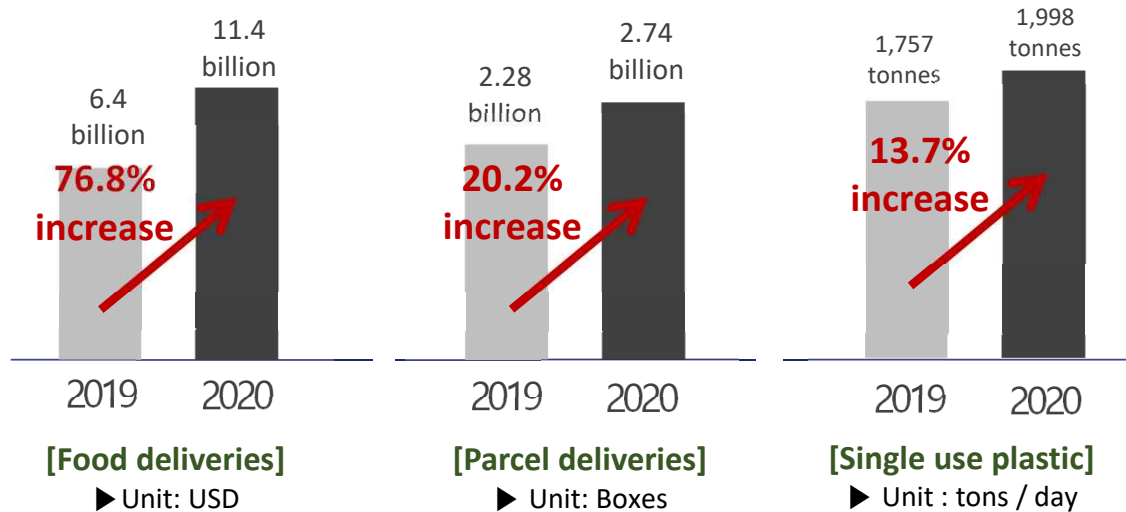
# The need to recycle the port's plastic waste

Maritime plastic debris is a danger to both marine life, and human health



## COVID waste spilling into the sea

Source: Statistics Korea, Korea Integrated Logistics Association, Ministry of Environment



## Marine life killed each year by plastic waste



**1,000,000**  
sea birds



**100,000**  
sea mammals

## The increased use of plastic due to the pandemic has resulted in an increase in damage to marine life



(1) video shows the shocking reality of "ocean waste"



(2) The ocean waste that is torturing marine life



(3) 6kg of plastic found in stomach of dead whale

# The need to recycle the port's plastic waste

Maritime plastic debris is a danger to both marine life, and human health



## Landfill



Environmental pollution + resource wastage

Waste takes over **100 years** to decompose underground

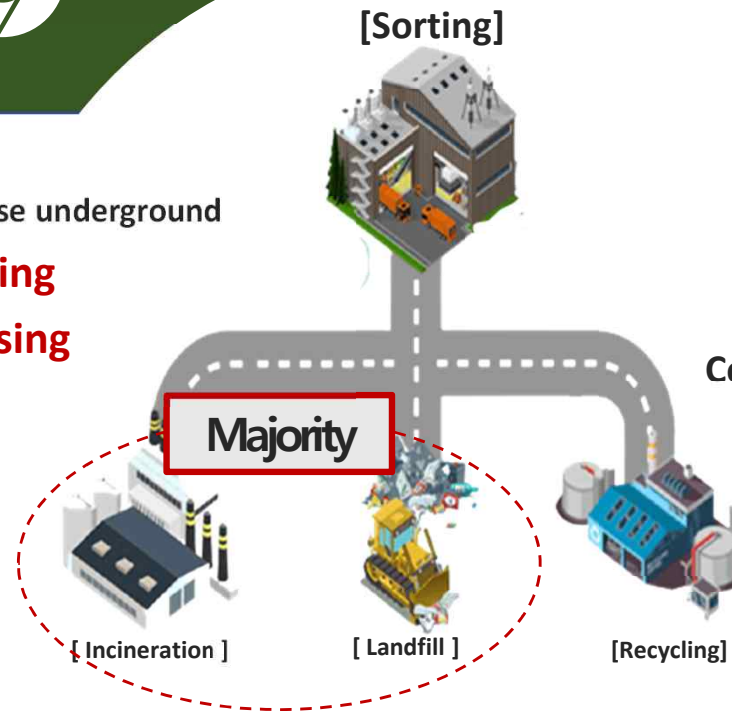
The life expectancy of landfills is **decreasing**

The amount of waste for landfill is **increasing**

Illegal waste generation (2017 – 2021)

100,000 tons

1.6 million tons  
(Total 327 landfills  
nationwide)



Combustion of plastic emits **black carbon**

Estimated **1 million** human casualties due to  
climate change and air pollution



## Incineration

The incineration of waste plastic and PET  
causes emissions of harmful air pollutants

# ① Establishing a system of cooperation

Establishment of a network of cooperation to together create a PET waste recycling system



## MOU signing with related companies and organizations

SK종합화학, 6개 기관과 '부산항 더 착한 자원순환 사업 MOU'

기사승인 2021. 04. 06. 16:18



(왼쪽부터) 세이브더칠드런 정태영 사무총장, 부산관광공사 정희준 사장, 부산항만공사 남기찬 사장, SK종합화학 이종혁 담당, 우시산 변의현 대표, 이노비스 장진영 대표가 '부산항 더 착한 자원순환 사업' 업무협약식 기념촬영을 하고 있다. /제공 = SK종합화학

SK종합화학은 부산항만공사, 부산관광공사, 우시산, 이노비스, 세이브더칠드런과 함께 '부산항 더 착한 자원순환사업 업무협약'을 체결했다고 6일 밝혔다. 이번 협약은 민간이 협력해 페플라스틱 문제를 해결하고, 지속가능한 해양 환경보존 사업모델을 구축하는 것이 목적이다.

이번 협약에 참여하는 6개 기관은 부산항에 입항하는 선박 및 부산지역 주요 관광지에서 수거한 페플라스틱으로 업사이클링 제품을 생산해 판매하고 취약계층에 기부까지 되는 자원순환 모델을 만들기로 했다. 부산항은 국내 1위, 세계 항만 순위 6위의 글로벌 허브항만이다.

SK종합화학은 이번 협약을 통해 플라스틱 자원순환 기반을 조성하고, 캠페인을 진행해 시민들의 인식 제고에 나선다. 이 협약에는 SK이노베이션이 육성 및 지원하는 사회적 기업 이노비스와 우시산이 참여해 사회적 가치 창출 의미를 더한다.

이노비스는 국내 최초로 개발한 플라스틱 컵 분리배출기 '쓰샘'을 활용해 페플라스틱 수거를 담당한다. '쓰샘'은 수거된 플라스틱 컵의 상태를 측정해 자동 세척되는 사물인터넷 기술(IoT)이 탑재됐다. 이노비스와 함께 이노비스는 페플라스틱 분리배출 가이드를 제공하는 등 올바른 분리수거 문화를 조성할 방침으로 했다.

## Roles of members

Public-private partnership formed to address the problem of plastic waste and establish a sustainable conservation model for our maritime environment

Collaborating institutions	Role of each institution
Busan Port Authority	Establishment and operation of the Busan Port Resource Recycling Network
Inobus	Development, installation, and regional dissemination of IoT waste sorting equipment
Usisan	Manufacturing and sales of upcycled goods
Busan Tourism Organization	Production support for upcycled plastic goods
SK Geocentric	Public campaigns and PR, marketing support
Save The Children	Education on the conservation of marine environments, and efforts to change perceptions on the global climate change response

"We will continue to help reduce marine debris in the port area via this model of cooperation for the recycling of discarded PET bottles."



BPA Representative

"We're not just creating social value by solving the problem of waste plastic, but also strengthening our ESG management via cooperation from throughout the plastic recycling industry's value chain."



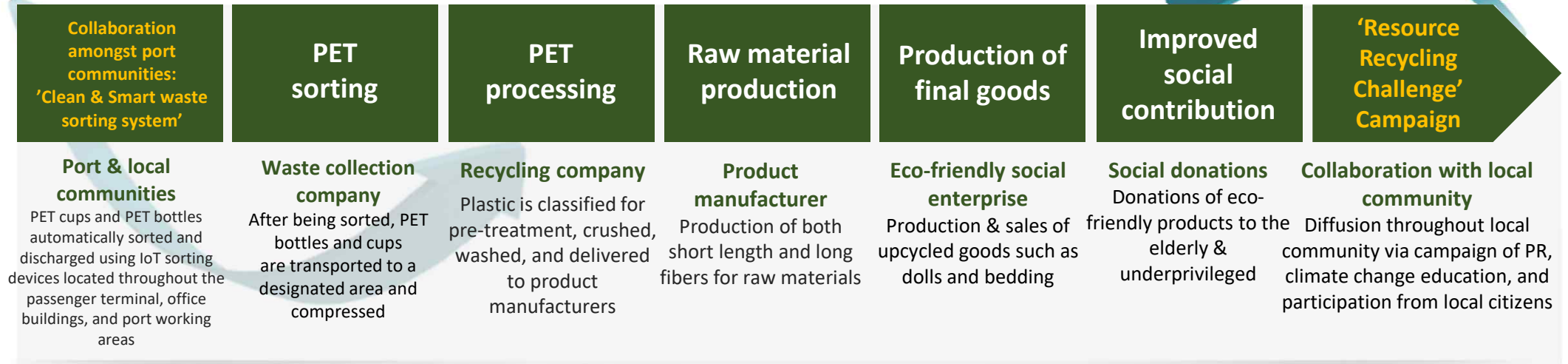
## ② Establishing a resource recycling network

Establishment of PET waste recycling system at BPA facilities (waste collection → goods production → charitable donation)



### The BPA resource recycling network

Establishment of resource recycling network alongside partner institutions for the recycling and upcycling of PET plastic



## For tomorrow: Better action from BPA

### Implementation of plastic recycling campaign

Awareness of the BPA's improved network model for resource recycling spread with the help of local, public institutions and governments, port operators, and shipping companies in the Busan area, via the 'Resource Recycling Challenge' and the Busan Port Festival





## ② Establishing a resource recycling network

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### ➤ BPA's unique PET waste recycling and donation system throughout BPA facilities

#### STEP 1 / Establishment of PET collection infrastructure

PET bottles collected and discharged via the installation in April 2021 of **8 PET IoT collection devices** that can both collect and clean bottles on-site, throughout the BPA facilities – **a first in Busan**

- ▲ Contents of plastic emptied
- ▲ Inside of cup automatically cleaned and then discharged
- ▲ **New device** which does everything, at once



#### STEP 2 / Production of recycled and upcycled products

After PET bottles collected through IoT devices are **transferred in person** to upcycling organizations, **recycled products (duvets, eco-bags, etc) are produced**

- ▲ Enough material provided for 1,000 eco-bags

14,000 500ml PET bottles

=

1,000 eco-bags

#### STEP 3 / Donation of recycled and upcycled goods

Goods are donated via an **upcycling donation initiative**, creating an **eco-friendly recycling system** which benefits foster families in Busan

- ▲ Pre-emptive response to the issue of climate change and the national mission toward carbon neutrality by 2050, while donating upcycled bedding to children in need



- ▲ Busan Port Authority supports 50 foster families

### ③ Spreading awareness and supporting social enterprise growth

Raising of awareness of maritime conservation efforts, creation of jobs for elderly, supporting of regional SMEs



## Boosting the local economy via the creation of a 'sustainable ecosystem'

#### 01. Launch of national clean up efforts

- 13 organizations, including public institutions in Busan, held a joint **maritime debris collection effort** on International Coastal Clean-Up Day (September 18th)
- 137 people took part** from the port area (Yeongdo, Mipo, Oryukdo)
- Participants used eco-friendly, biodegradable bags and wore t-shirts made from recycled PET bottles to celebrate the event



#### 02. Creation of green jobs

Mutual cooperation for  
local coexistence

- Collaboration with the Busan Dong-gu District Office's **job creation scheme** → Creation of **green and elderly jobs within upcycling**
- Scheme to create jobs for senior citizens funded by National (50%) and Local (50%) Governments
- Promotion of BPA's unique ESG approach** by linking it to local, mutually beneficial initiatives



#### 03. Support of business growth

- Pro-active use of upcycled products in events and campaigns
- Encouraging market development** by supporting sales growth and promoting resource recycling initiatives in the Busan region

## Quantitative data on performance

Creation of social value and results



### Direct effects of **recycling plastic waste**

#### Reduction of greenhouse gasses

**526kg reduction in CO2 greenhouse gas emissions** (as of October 2021)  
via the collection & recycling of 220kg of PET waste from Busan Port

※ Source: US EPA publication: Documentation for Greenhouse Gas 'Reduction Model'

#### Creation of jobs

Creation of **80 green jobs and jobs for elderly** alongside  
local government job creation projects

※ MOU signed on 9th November 2021 to boost jobs for elderly

#### Social welfare support

**USD 8,400 worth of support via the sales of upcycled goods**

	Donations of upcycled bedding to vulnerable	Distributing resource recycling campaign kit	Incentives to encourage resource recycling campaign	Total
Sales	USD 2,900 (3.4 million KRW)	USD 3,800 (4.5 million KRW)	USD 1,800 (2.2 million KRW)	<b>USD 8,400</b>

## Non-quantitative data on performance, and future plans

Implementation of sustainable, eco-friendly port processes, and promotion of BPA's unique ESG



### Non-quantitative results

Implementation of  
eco-friendly port  
processes  
BPA's ESG  
management strategy  
leading the  
environmental sector

"PET plastic recycling  
business"  
Selected as part of  
Korea New Deal  
October 2021

Expansion of  
partner sales  
channels

### Future plans

Provisional expansion of resource  
recycling system  
within the port area

2<sup>nd</sup> quarter 2022

Collaboration with related organizations (coastguard, maritime and fisheries administrations) to expand the resource recycling system to port operators and shipping companies

Increase in creation of green jobs

3<sup>rd</sup> quarter 2022

Allocation of human resources to assist in waste sorting, in collaboration with the senior citizen job creation projects of each district

Establishment of regular marine  
debris collection efforts

4<sup>th</sup> quarter 2022

Permanent implementation as a sustainable, maritime environment conservation campaign, alongside Busan's public institutions