ALBA
Treasure raw materials.

A World Without Waste
Our Circular Economy Model

Kenny Wong

Director, Business Development & Projects – HK

ALBA Group Asia

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ALBA Timeline

1976

After the first Waste and Recycling Act is passed in Germany in 1972, ALBA develops an innovative approach- the Berlin model, where glass, cardboar<d and paper are collected separately containers before being sent for recycling.

2005

As one of the first companies to do so, ALBA invests in a lightweight packaging system, creating the most modern production facility for raw materials in Europe – the overall investment totals 20.5 million Euros.

2014

Signing of the first Green Fuel project in Guangdong province in Mainland China with President Xi and former Chancellor Angela Merkel.

2020

Singapore gets focus as a hub to develop lighthouse projects for South-east Asia. ALBA wins a tender for Public Waste Collection for the Jurong sector.

2023

ALBA signs cooperation agreements for closing the loop for plastics and building plastics recycling plants with local partners in Vietnam, Indonesia and Thailand.

1968

The company is launched by civil engineer Franz Josef Schweitzer and his wife Ursula on 3rd September 1968 in Berlin and starts with six employees and two trucks.

2004

The yellow container is launched in Leipzig in 2004. In addition to standard packaging, residents can discard old mobile phones, saucepans and similar in this container. It goes on to become a model for recycling throughout Germany and elsewhere.

2006

Together with the Berlin municipal waste authority, ALBA launches the first facility for the production of Green Coal from household waste – on the basis of Mechanical-Physical stabilisation technology

2018

The first ever WEEE treatment facility in Hong Kong: ALBA takes responsibility for the development and operation of a collection and recycling system as well as the construction of a recycling facility for household electronic scrap.

2022

ALBA wins two more projects in Singapore - PWC tender for Woodlands-Yishun sector and the Extended Producer Responsibility scheme for regulated E-Waste. ALBA successfully completes JV acquisition and PT ALBA Tridi Plastics Recycling is born in Indonesia.

2023

ALBA wins an EPD Pilot project to take-back plastic beverage containers via 120 sets of Reverse Vending Machines (RVMs) prior to implementation of PPRS for beverages bottles in Hong Kong

ALBA Group Asia – our vision is **World Without Waste**

We combine the best of both worlds by **localizing solutions in Asia** while **integrating the best practices from Europe**

More than 1,200 employees

5 countries with 11 locations

Over 1,000 customers

More than 15 projects in Asia

Projects and Business Units

PLASTICS RECYCLING

GREEN GAS TECHNOLOGY

GREEN FUEL TECHNOLOGY

HAZARDOUS WASTE RECYCLING & MANAGEMENT

SMART CITY SOLUTIONS

WEEE·PARK

Plastics Recycling
Jiangxi, China

Plastics Recycling
Tangerang, Indonedia

Plastics Recycling
Honk Kong, China

Public Waste Collection for Woodlands-Yishum Sector
Woodlands-Yishun Sector, Singapore

Public Waste Collection for Jurong Sector
Jurong Sector, Singapore

E-Waste PRS Operator
Singapore

RVM Pilot Scheme
Hong Kong, China

Waste Electronics and Electrical Equipment Collection & Treatment
Honk Kong, China

Bio-Waste Treatment Project
Haikou, Hainan, China

Restaurant Waste Collection and Treatment Project
Qingzhen, Guizhou, China

Restaurant Waste Treatment Project
Xuchang, Henan, China

Household Waste Recycling Project
Jieyang, China

Hazardous Waste Disposal and Recycling Project
Kaifeng, China

Hazardous Waste Disposal and Recycling Project
Lianyungang, China

Hazardous Waste Disposal and Recycling Project
Cangzhou, China

ALBA

And our sister company, Interzero - leading European Waste management company

~ 2,000 employees

>1 million t greenhouse gas avoided in 2021

More than 30 years of experience

Sorting >800 kt per year of packaging material

Trading >400 kt per year of raw material

over >20,000 customers

10 countries with 40 locations

>1 Bn. Euro Revenue

Circular Economy Model

Waste Issues

- Waste is a global problem and despite best endeavour, it continues to grow
- Hong Kong, however, has not yet adopted the use of mechanical sorting facilities and continues to depend on low-level separation and sorting, with the bulk of the waste going to landfills, and in the future, very expensive mass-burn energy-from-waste (EfW) facilities

- Many developed countries, in particular in Europe, have for many years adopted the use of mechanical sorting or material recycling facilities to address these challenges
- Materials recovery is the latest trend in Europe for waste treatment to foster circular economy

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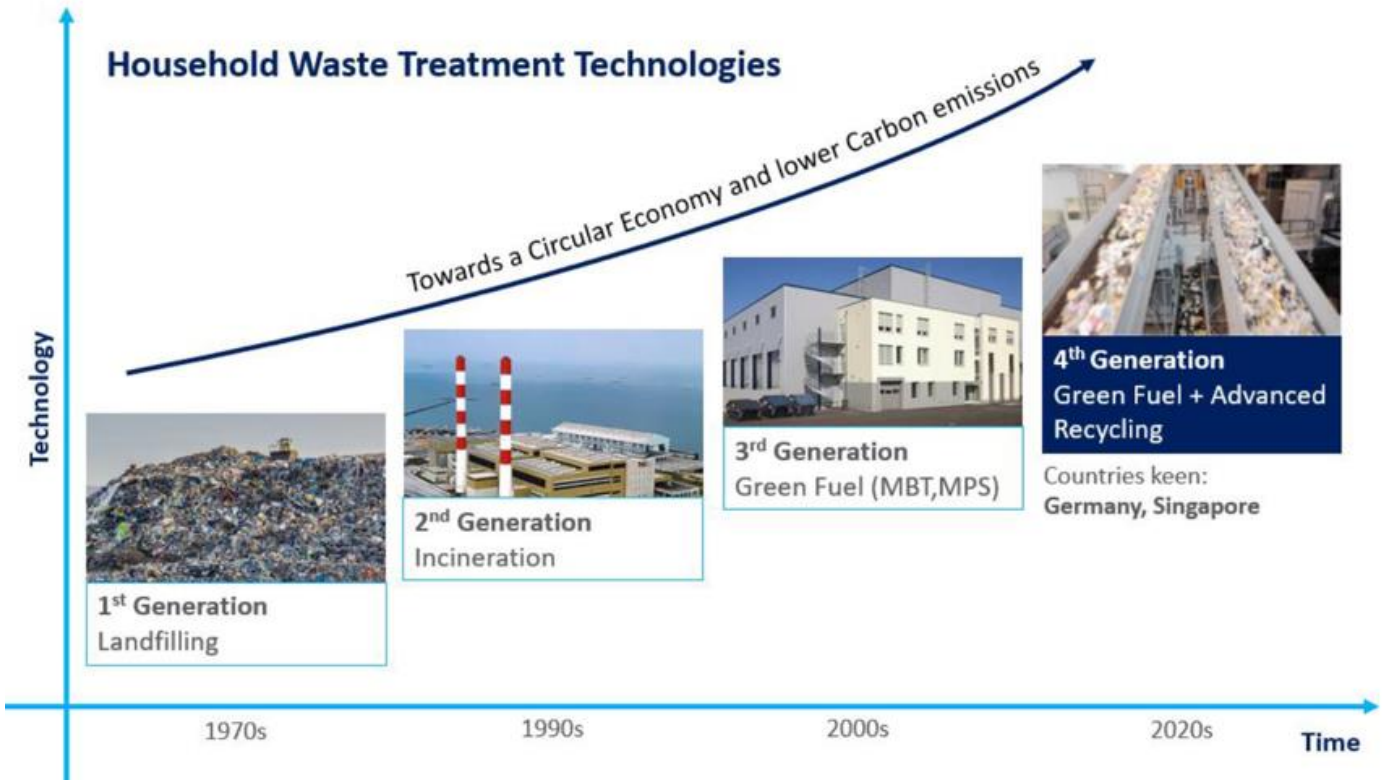
Evolution of Waste Treatment Technologies



1st Gen – Landfilling

- Simple dumping of waste
- Loss of secondary raw materials and energy
- Source of environmental pollution

2nd Gen – Incineration

- Volume reduction of waste sent to landfill
- Recovery of some energy through waste-to-energy
- Still a major loss of raw materials
- Typically, 10-20% bottom ash sent to landfill, 3% fly ash treated as hazardous waste material

3rd Gen – Green Fuel + MRF

- Secondary raw materials recovered for recycling
- Residual waste converted into green fuel
- 95% of waste re-utilized rather than disposed

4th Gen – Green Fuel + MRF + Feedstock Recovery for Advanced Recycling

- Residual waste converted into green fuel + Recovery & Recycling of those plastics for advanced recycling which are not mechanically recyclable

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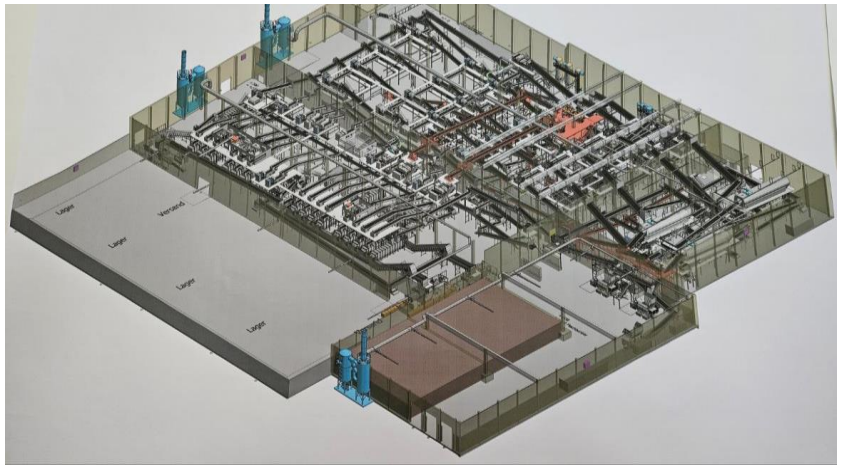
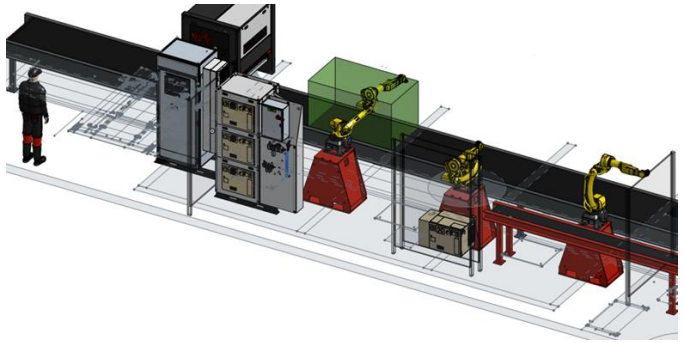
Best “Carbon Reduction” Solution is Recovery of the Waste Before Disposal

- If we can recover waste then the volumes going to landfill or EfW will reduce
- At the same time valuable materials can be recovered by sorting
- Materials unsuitable for EfW can be pulled out

Examples of Sorting Facilities

- Large MRFs may be built in fully enclosed industrial buildings
- Small MRFs may fit inside existing buildings using robots
  - suitable for businesses looking to reduce landfilling costs
- Vertical MRFs to reduce land foot-print
  – example of an integrated waste facility with vertical sorting





ALBA’s
Circular Economy Solutions

E-Waste PRS in Hong Kong

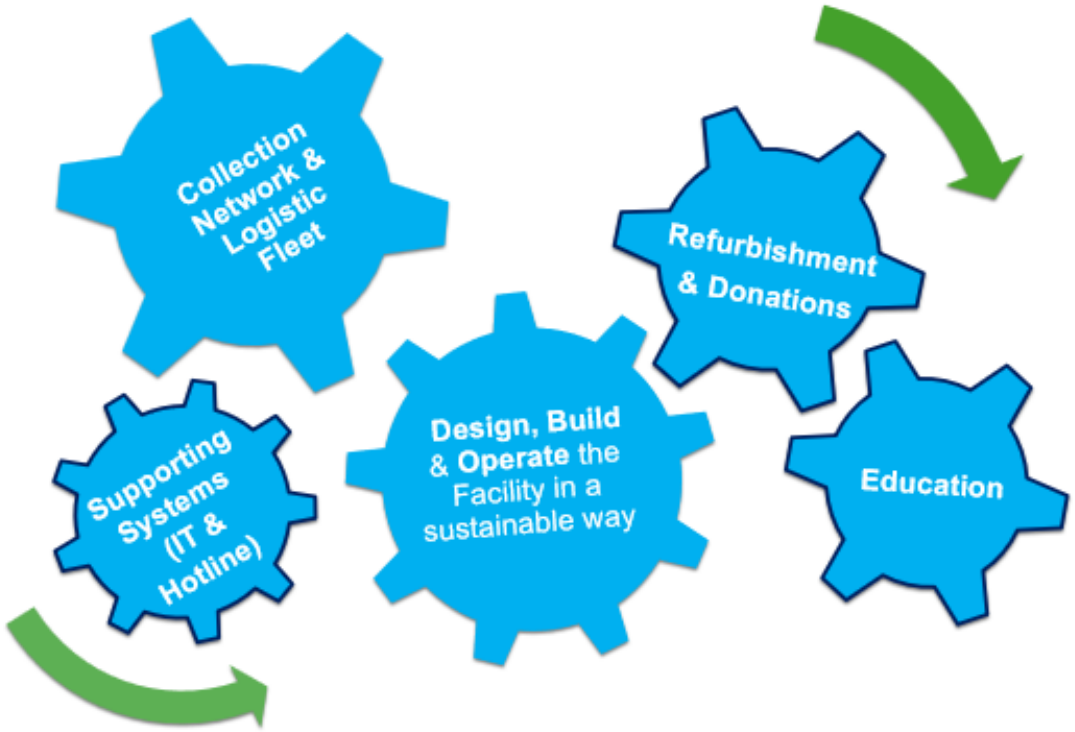
WEEE·PARK

EPD awarded contract to ALBA IWS in March **2015**

The JV developed the **first integrated WEEE treatment** facility in Hong Kong .

“Design-Build-Operate-Transfer”-agreement: asset ownership and financing through Hong Kong Government.

Contract duration: **10 years** after technical completion.



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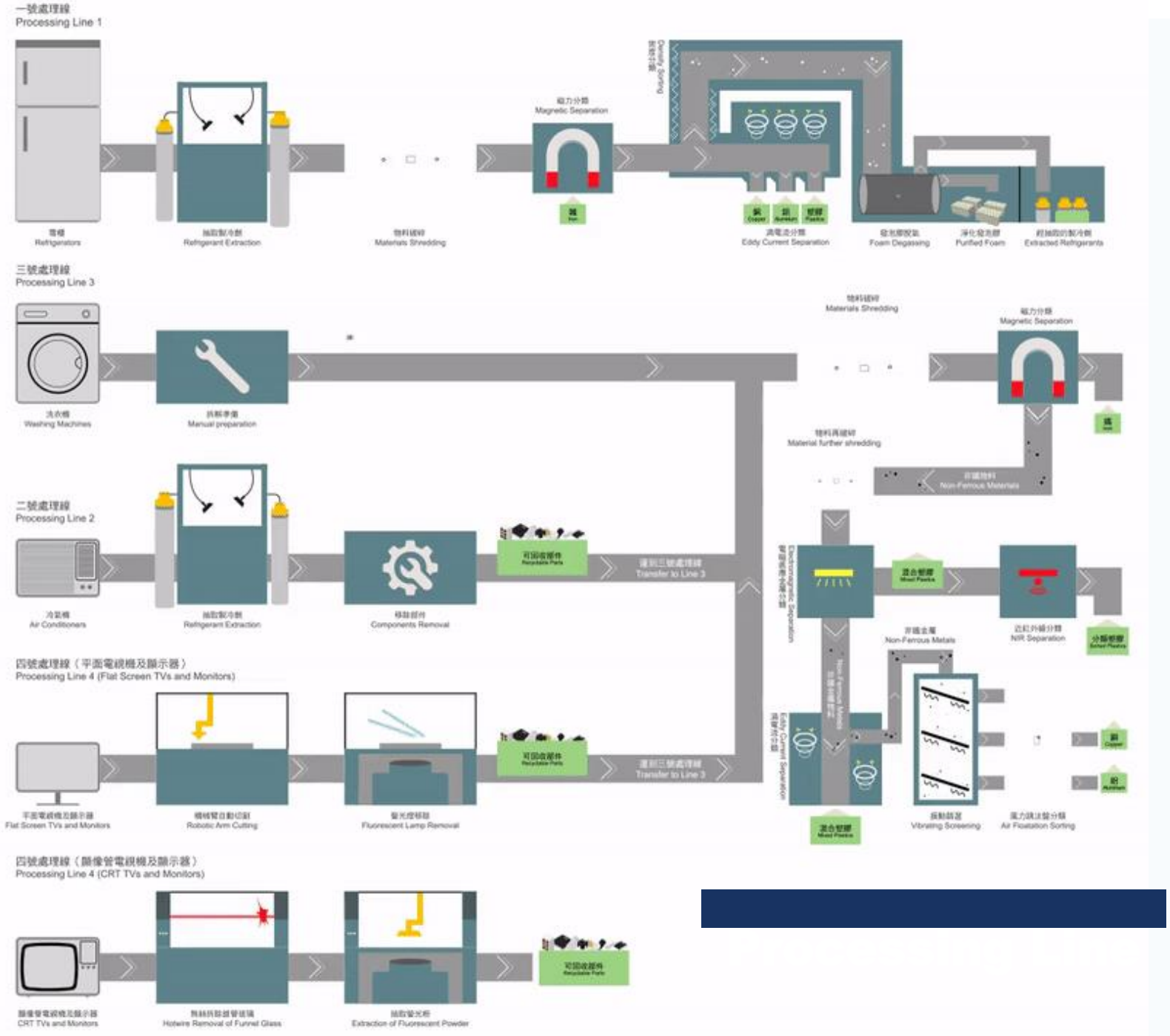

一號處理線
Processing Line 1
Refrigerators
Refrigerant Extraction
Materials Shredding
Magnetic Separation
Eddy Current Separation
Foam Degassing
Purified Foam
Extracted Refrigerants
三號處理線
Processing Line 3
Washing Machines
Manual preparation
Materials Shredding
Magnetic Separation
Material further shredding
Non-Ferrous Materials
二號處理線
Processing Line 2
Air Conditioners
Refrigerant Extraction
Components Removal
Transfer to Line 3
Electromagnetic Separation
Mixed Plastics
NIR Separation
Non-Ferrous Metals
Eddy Current Separation
Vibrating Screening
Air Floatation Sorting
四號處理線（平面電視機及顯示器）
Processing Line 4 (Flat Screen TVs and Monitors)
Flat Screen TVs and Monitors
Robotic Arm Cutting
Fluorescent Lamp Removal
四號處理線（顯像管電視機及顯示器）
Processing Line 4 (CRT TVs and Monitors)
CRT TVs and Monitors
Extraction of Fluorescent Powder

WEEE Recycling Rate >86%

Recovered secondary raw material

More than
10,000 tonnes
of Iron

>8500T yearly average

More than
700 tonnes
of Copper

>550T yearly average

More than
900 tonnes
of Aluminum

>800T yearly average

More than
3700 tonnes
of Plastics

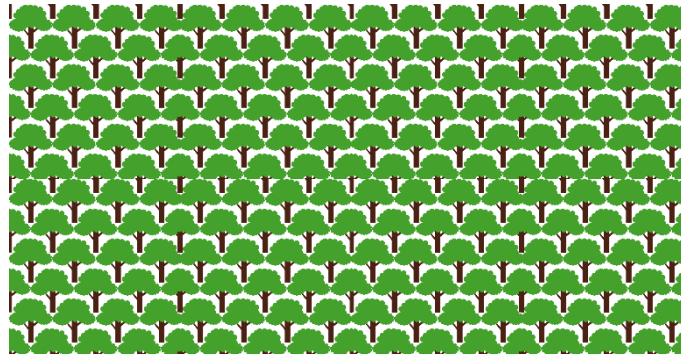
> 3500T yearly average

Environmental Benefits – Carbon Saving

Processed over 750,000 WEEE

Recovered more than 15,000 tonnes recyclable components

Saved more than >80,000 tonnes * of Carbon Emission



CO_2 absorbed by # over 3.5 million trees

CO^2 removed by trees in one year = net number of additional trees planted since the concerned building is constructed x Removal Factor (estimated at 23kg / tree)

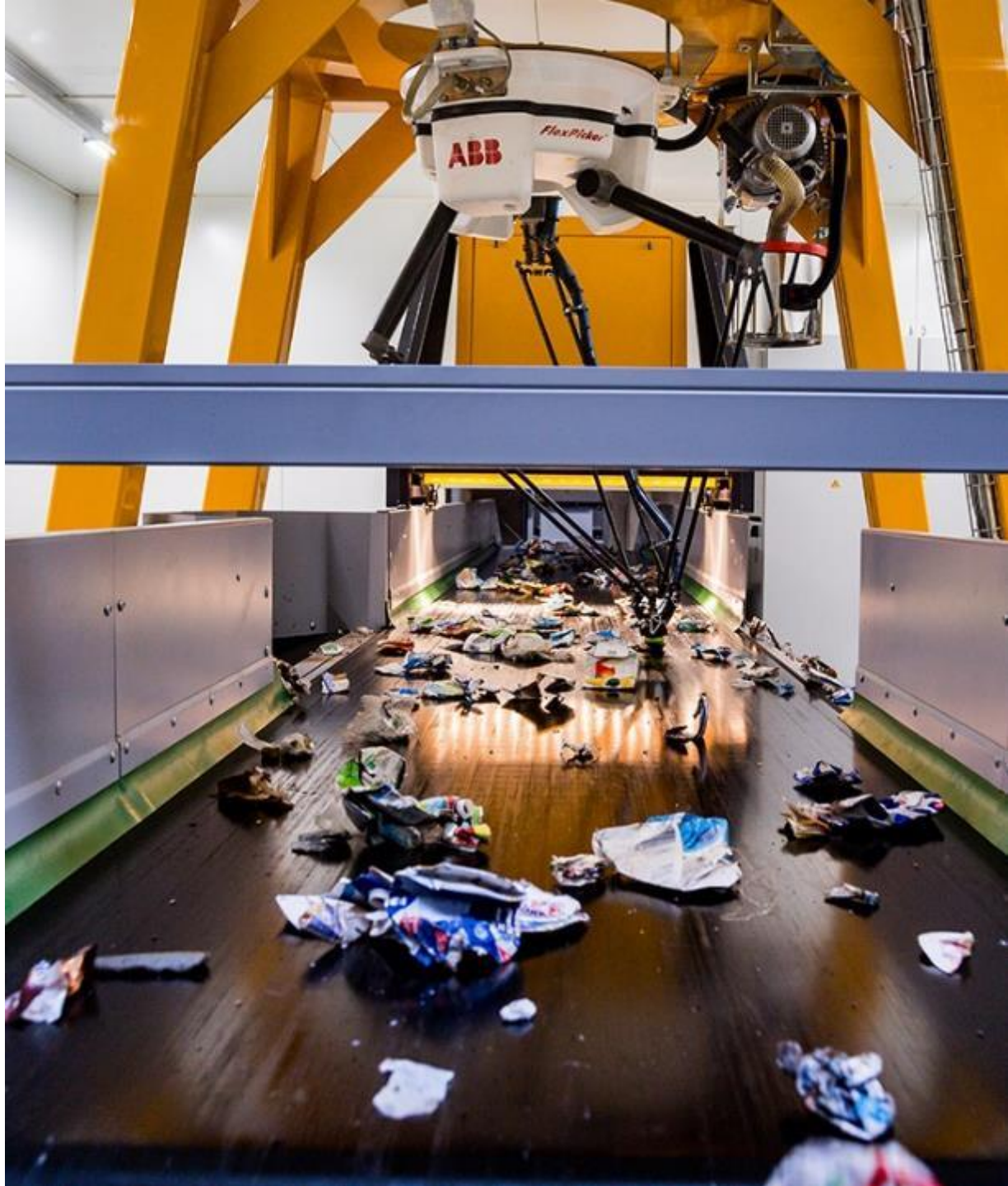
One of Largest Organic Waste Treatment Facilities in China

Plastics Recycling

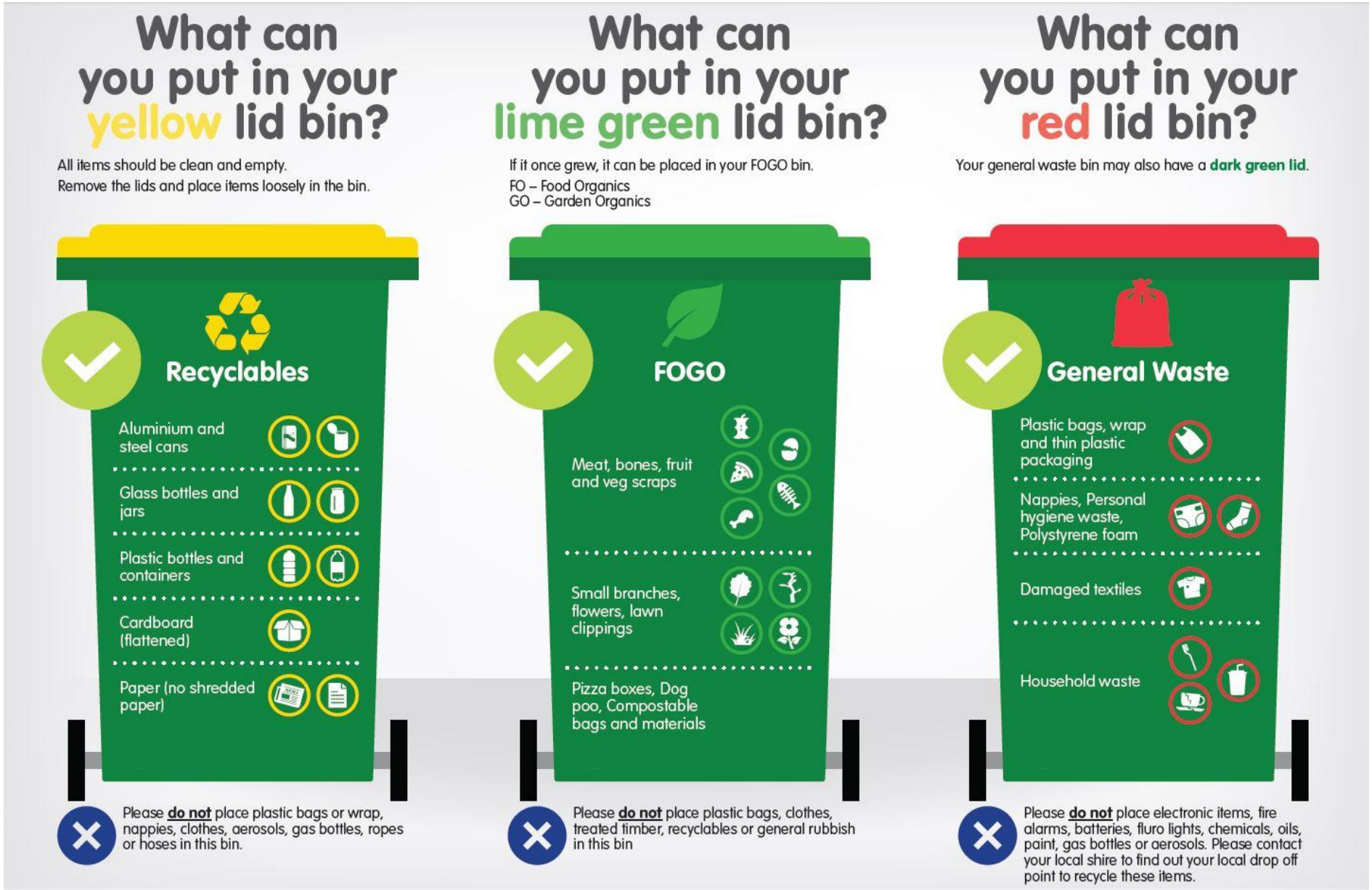
Closing the loop with the collection of plastic waste for treatment using the latest processing technology and manufacturing high-quality raw materials as part of the drive towards a circular economy.

Our services:

- Using innovative processing technologies for plastics processing to achieve high grade output materials
- Ensuring tested and reproducible material quality to create confidence among the customers
- Compliance with world standard environmental requirements for production and output
- Cooperation with leading suppliers of plastic waste, retailers and OEMs to ensure positive markets for their materials
- Making an effective contribution to conserving resources, protecting the environment and climate change



Current Recycling Practices - Germany



Current Recycling Practices – Hong Kong : GREEN@COMMUNITY

Current Recycling Practices – Hong Kong : Territory wide collection

- Metal
- Paper
- Plastics
- Glass
- Food Waste
- Regulated WEEE

WEEE·PARK

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What do we get from separating plastics?

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ALBA’s expertise of Plastics Recovery in Europe and Asia

Experience with Automated Return Points

Standalone RVMs

Experience with
TOMRA, Sielaff and
RVMSystems
With capacities up
to 1,200 bottles
depending on sizes.

Modular RVMs

With a capacity of
6,800 Bottles

Consumer facing Bottle Depots for Bulk Return

80-150 containers / minute
Infeed by consumer in plastic sacks

Return by DPG Collection machines

- Comfortable, automated return
- High safety because of control and validation of beverage packagings at the collection points
- Can be combined with couponing actions

Cash & Go Plus

RVM Pilot Stage 3 in Hong Kong- NEW!

To pave way for the future Producer Responsibility Scheme on Plastic Beverage Containers (PPRS), the Environmental Protection Department (EPD) rolling out a pilot scheme for the 3rd time to test out the application of RVMs in Hong Kong for collecting plastic beverage containers.

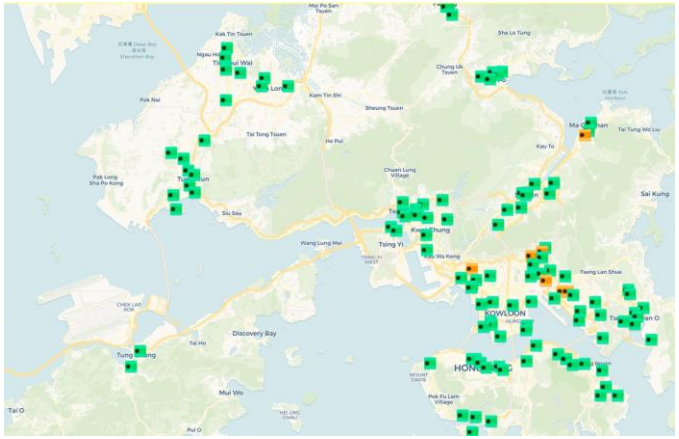
Highlights

A comprehensive solution including

- Purchase & Rolling out of 120 RVMs
- IT Backend Management
- Dedicated Customer Service
- Maintenance of the RVMs
- Collection of plastic beverage containers
- Track & Trace of material flow
- Ensuring recycling of collected material
- Incorporation of Innovative Solutions
- Education and Marketing and Ambassador Services

New features of RVM

Our 120 RVMs were launched from Dec 2023



Auto Detection & Record of bottles

→ **TranRot™**：360 degree rotation for barcode detection

→ Shape, barcode, bottle weight (full), metal weight

→ **Auto capture** of new barcode info.

High Processing Speed

→ Up to **25 bottles/min**

Industrial Compressor

→ Powerful compaction module

TOMRA Sure Return™

→ Fraud prevention

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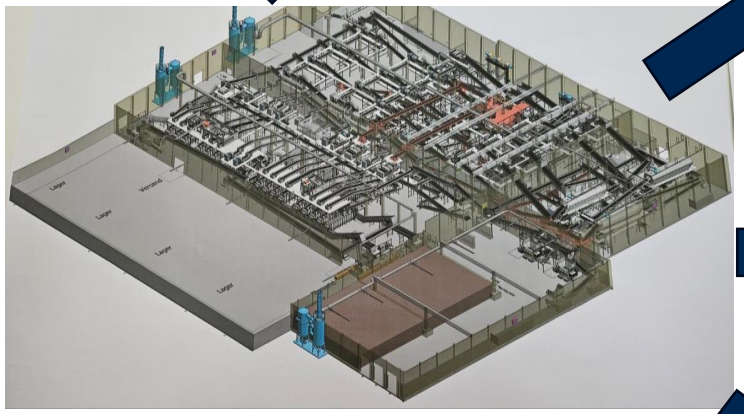
ALBA's Plastics Recovery Flow Chart



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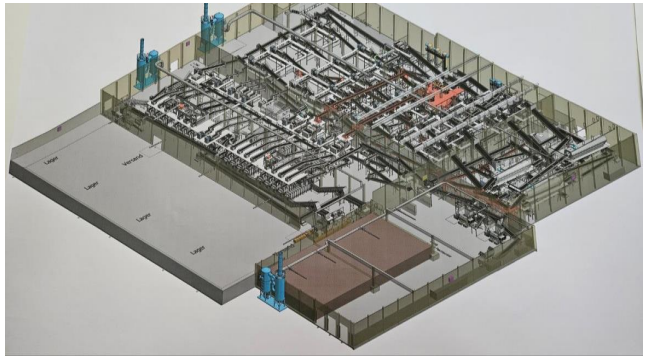
ALBA's Plastic Bottle to Bottle Initiative



Conclusion

- The concept and use of advanced waste sorting facilities, or MRFs, is widespread throughout developed counties across the globe
- The strategic use of MRFs in Hong Kong will help address these problems of waste disposal, especially after the implementation of MSW charging
- Reverse Vending Machines (RVMs) would be another means to raise public awareness and improve materials recovery rate in prominent locations
- The above measures meet the HKSAR government's ambitions for new-industrialisation, innovation, circular economy and carbon neutrality

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