BROCHURE

Circulative and Sustainable Waste Treatment System

GOMIX

Machine Model and Explanation

It’s Time to have a next solution for waste.
Convert waste into resources and Maximize Waste Energy.
On-Demand Waste Treatment.Appropriate waste, at Appropriate time.

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Innovative waste technology
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Updated : July. 2024 ／ 500P

Circulative and Sustainable Waste Treatment System

GOMIX Series

GOMIX Series are Circulate Waste Treatment system that uses “Pyrolysis” technology
No oxygen condition by steam and Waste is greatly reduced in volume and converted into resources.
Recovered oil is converted from plastics and resins, and charcoal from organic waste.
The recovered resources can be used for a variety of applications, including our equipment and boilers.
This is a circulate waste treatment system to maximize and utilize the energy of waste and solve waste disposal problems.

Model:GXB-10

Functional Uniquness

GOMIX Series is a remarkable waste treatment system that uses “Pyrolysis” technology.
While incineration or landfill is generally used for waste disposal, the GOMIX Series has the following unique features.

1. Don’t Burn Waste “Pyrolyze”

GOMIX does not incinerate waste. It is pyrolyzed. Since waste is not burned, no CO2 emissions or toxic substances such as dioxin are generated.The gases generated are utilized for the operation with no environmental impact.

2. Recovery Resources from Waste “Waste is the new resource”

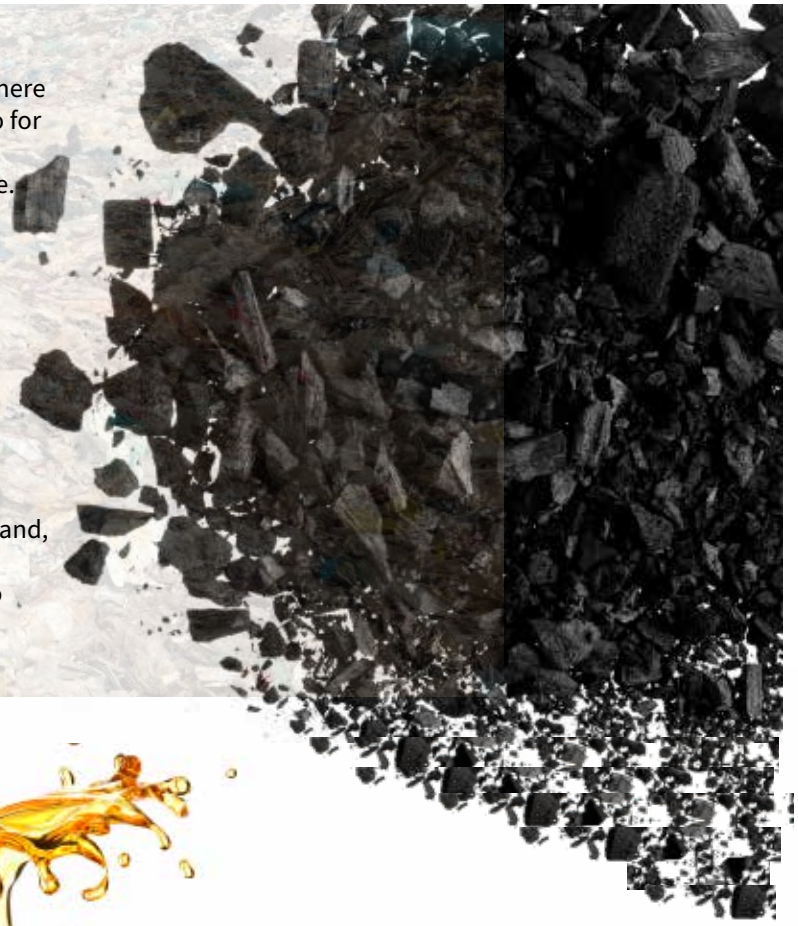
GOMIX recovers resources from waste. The recovered resources vary depending on the input materials.Plastics and resins can be recycled into recycled oil, organic materials into charcoal, and metals can be recovered as they are. These resources can be reused, and waste can be utilized as new energy.Recovered oil and charcoal are also applicable to GOMIX, which can greatly reduce the new energy input and costs associated with waste disposal. In addition, when plastic waste is targeted, more recovered oil is collected, so the energy recovered is **greater than the energy input**, making it possible to store resources while processing waste.

3. Mixed-Waste Acceptable “No Seglegation, Just Throw in”

Waste from all over the world is in a mixed state and is very difficult to sort; **GOMIX can process it without sorting or washing**. This is a great uniquness for waste disposal.

Our Philosophy

As long as we humans exist, our economic, and environmental activities constantly generate waste. In a world where the growth of production and consumption of products have been growing at a rapid pace and will keep doing so for the foreseeable future, it is vital that we find a sustainable solution to treating waste.
Our technology converts waste into energy, recovering more energy than consuming it for the treatment of waste.
We believe that our technology can provide a solution to the world's waste problems and can be catered to the specific needs of every region and contribute to the circularity of resources and carbon neutrality



"It's time to have a next solution for waste"

Traditionally, we have relied on incinerators and landfills, but we off er our technology "Pyrolysis" as a next solution for waste. **Sustainable Waste Treatment and Reduct CO2 Emissions.**

"Convert waste into resources and Maximize Waste Energy."

Waste is the new resource. It is time to convert waste that has been stored in landfi lls for years into a resource.and,
The reality that waste is in a mixed state is a very important factor in solving the waste problem.
Recycling would be possible if the waste could be cleanly sorted and cleaned, but this is practically impossible to solve waste issues. **Let's collect resources from waste and use re-newable energy.**

Mechanical Uniquness

"On-Demand Waste Treatment"

1. Mobility

GOMIX is designed for comfortable transportation. All components, including reactors, can be transported in containers. Also, assembly at the site is simplified.

2. Customizable

GOMIX is available in "batch" and "continuous" basic types and can process a wide range of wastes. However, for more specific waste processing, GOMIX can be customized to a model optimized for a particular type of waste. For example, GOMIX-OC (OCEAN CURE) for marine plastics or GOMIX-CT (Chlorine Terminate) for PVC.

3. Expandable with Efficient Cost Structure

GOMIX is an expandable waste treatment system. In addition, the same modules are mass-produced, which enables cost rationalization.

4. High Safety

GOMIX does not apply high pressure. Every area is almost atmospheric pressure.
Therefore, GOMIX is extremely safety compared to facilities that use high pressure.

GOMIX series Overview

GXC-100

GXC-40

GXB-10

GXB-5

GXB-1

Demonstration Size

Model	Treatment Capacity per day	Weight			Size Length x Width x Height	EPR Energy Profit Ratio		ROI (Year)		
		General Household	Plastic Waste	Industrial Waste		Plastic	General Household	General Household	Plastic Waste	Industrial Waste
GXC-100	100M3	30t	25t	70t	35m x 9m x 3.5m	9.05	3.42	6.2	1.9	less than 1 year
GXC-40	40M3	12t	10t	28t	15m x 9m x 3.5m	8.51	3.22	6.2	1.9	
GXB-10	10M3 (Batch) 2 Batch per day	6t	5t	14t	12m x 9m x 3.5m	3.15	1.43	19.3	4.7	
GXB-5	5M3 (Batch) 2 Batch per day	3t	2.5t	7t	6m x 6m x 3.5m	3.02	1.37	23.1	5.6	
GXB-1	1M3 (Batch) 2 Batch per day	300kg	250kg	700kg	5m x 3m x 2.5m	1.03	0.47	-	26.6	

Specific Gravity : General Housefold waste 0.3 / Plastic Waste 0.25 / Industrial Waste (SUS410 with plastic) 0.7

Circulative Waste System : Demonstration Size

GXB-1

GXB-1 is a small model, yet it is a realization of our technology. It is suitable for demonstration purposes because it does not require a large amount of processing. The GXT-1 model can be mounted on a truck.

Building area	90 m²
	15 m × 6m × 2.5 m
Roof height	3.5 m

■ Function

Process Method	Pyrolysis
Safety	Automatic shutdown in case of abnormality
Automation	Processing is fully automated. Waste is brought in manually.

■ Consumption (Diesel Type)

Water	200 litters
Electricity	15kW / operation
Diesel	120 litters (Recovered Oil can be used)

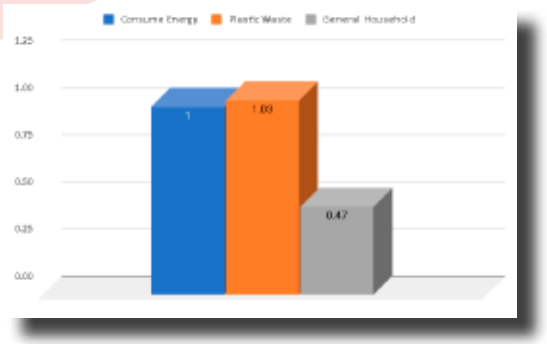
■ Consumption (Electricity type)

Water	200 litters
Electricity	45kW / operation
Diesel	80 litters (Recovered Oil can be used)

■ Specification

Product model name	GXB-1
Throughput / day	1 ㎥ / batch
	2 batch maximum /day
Size	W:5m D:3m H:3.5m
Weight	6 tons
Process System	Batch type
Process Speed	6 - 8 hours (mixed) 5-6 hours (plastic)

■ Energy Profit Ratio



■ Maintenance

Reactor	Daily	Cleaning
Catalyst Tank	Daily	Exchange and cleaning
Whole System	Annual	Inspect system

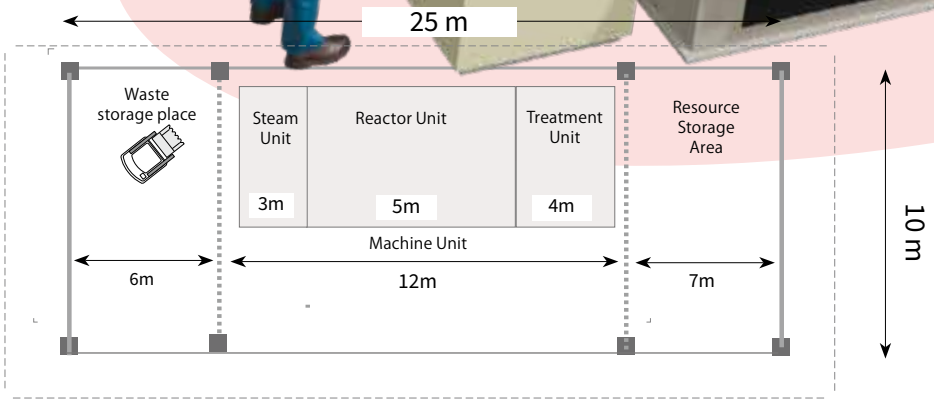
Annual maintenance : Once every three months for the first year, and once every six months thereafter.

Circulative Waste System : Standard Size

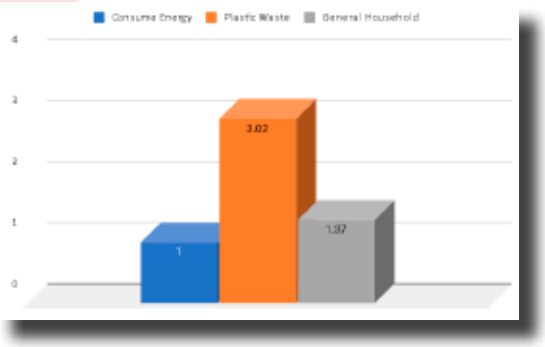
GXB-5

■ Recovered Resource Usage

Charcoal	300 kg/batch
Oil	200 litters



■ Energy Profit Ratio



■ Specification

Product model name	GXB-5
Throughput / day	5 ㎥ / batch 2 batch maximum /day
Size	W:12m D:5m H:4.5m
Weight	8 tons
Process System	Batch type
Process Speed	6 - 8 hours (mixed) 5-6 hours (plastic)

■ Maintenance

Reactor	Daily	Cleaning
Catalyst Tank	Daily	Exchange and cleaning
Whole System	Annual	Inspect system

Annual maintenance : Once every three months for the first year, and once every six months thereafter.

■ Consumption (Electricity type)

Water	200 litters
Electricity	65kW / operation
Diesel	150 litters (Recovered Oil can be used)

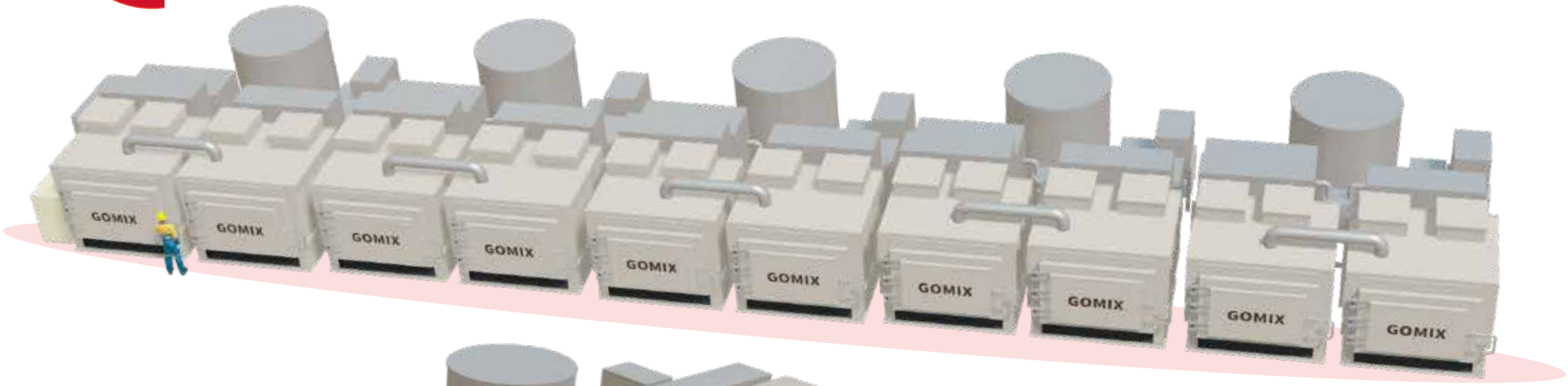
■ Consumption (Diesel Type)

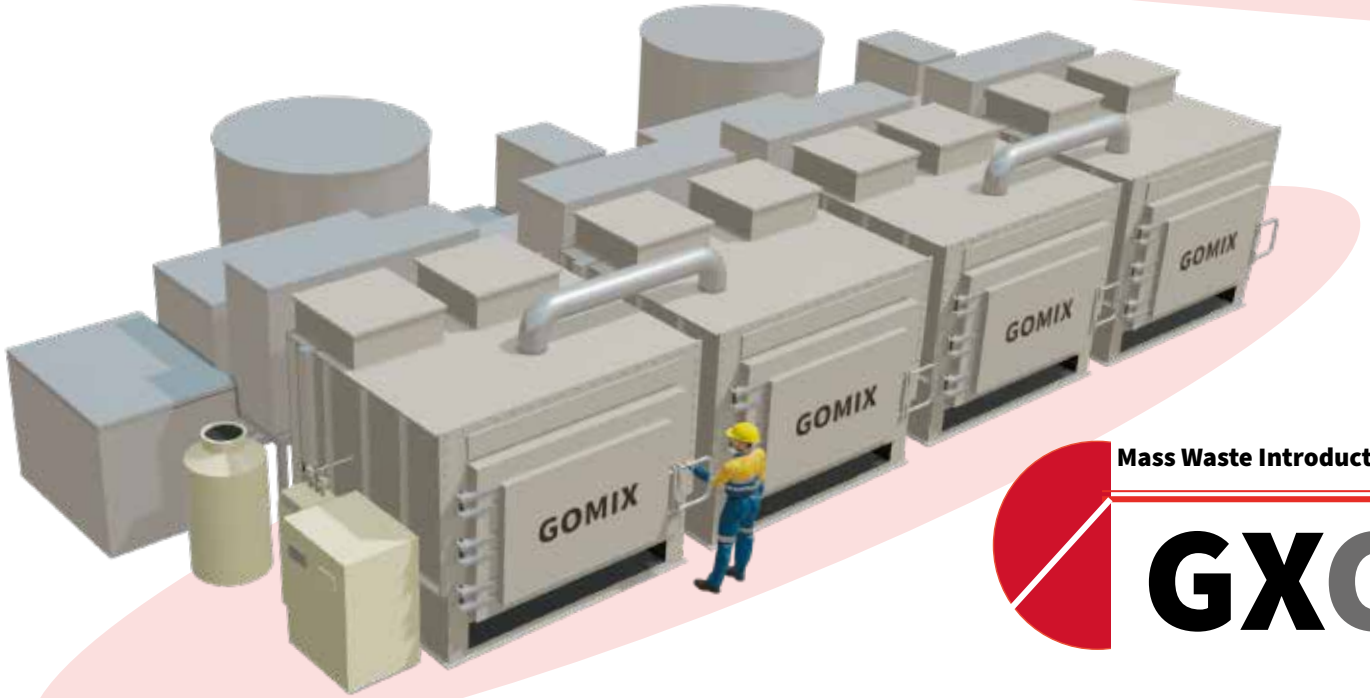
Water	200 litters
Electricity	25kW / operation
Diesel	250 litters (Recovered Oil can be used)

Circulative Waste System : **Mass Waste Size**

GXC-100

GXC-100 and GXC-40 are designed to handle large volumes of waste, operating 24 hours a day to efficiently process waste and recover resources. Recovered resources are used to operate the equipment, and surplus resources are sold to generate profit. It is preferable to set up right next to an intermediate treatment facility or landfill site.





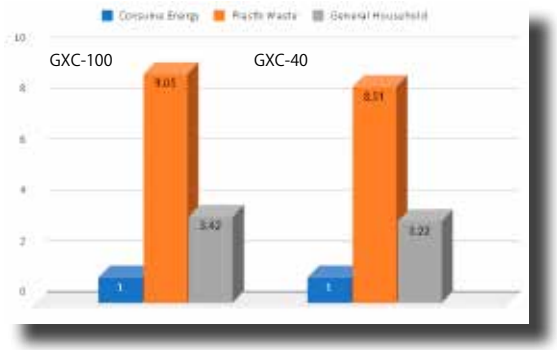
Mass Waste Introduction Model

GXC-40

■ Specification

Product model name	GXC-100	GXC-40
Throughput / day	100 ㎥ / day	40㎥ / day
Size	W:35m D:9m H:3.5m	W:15m D:9m H:3.5m
Weight	50 tons	20 tons

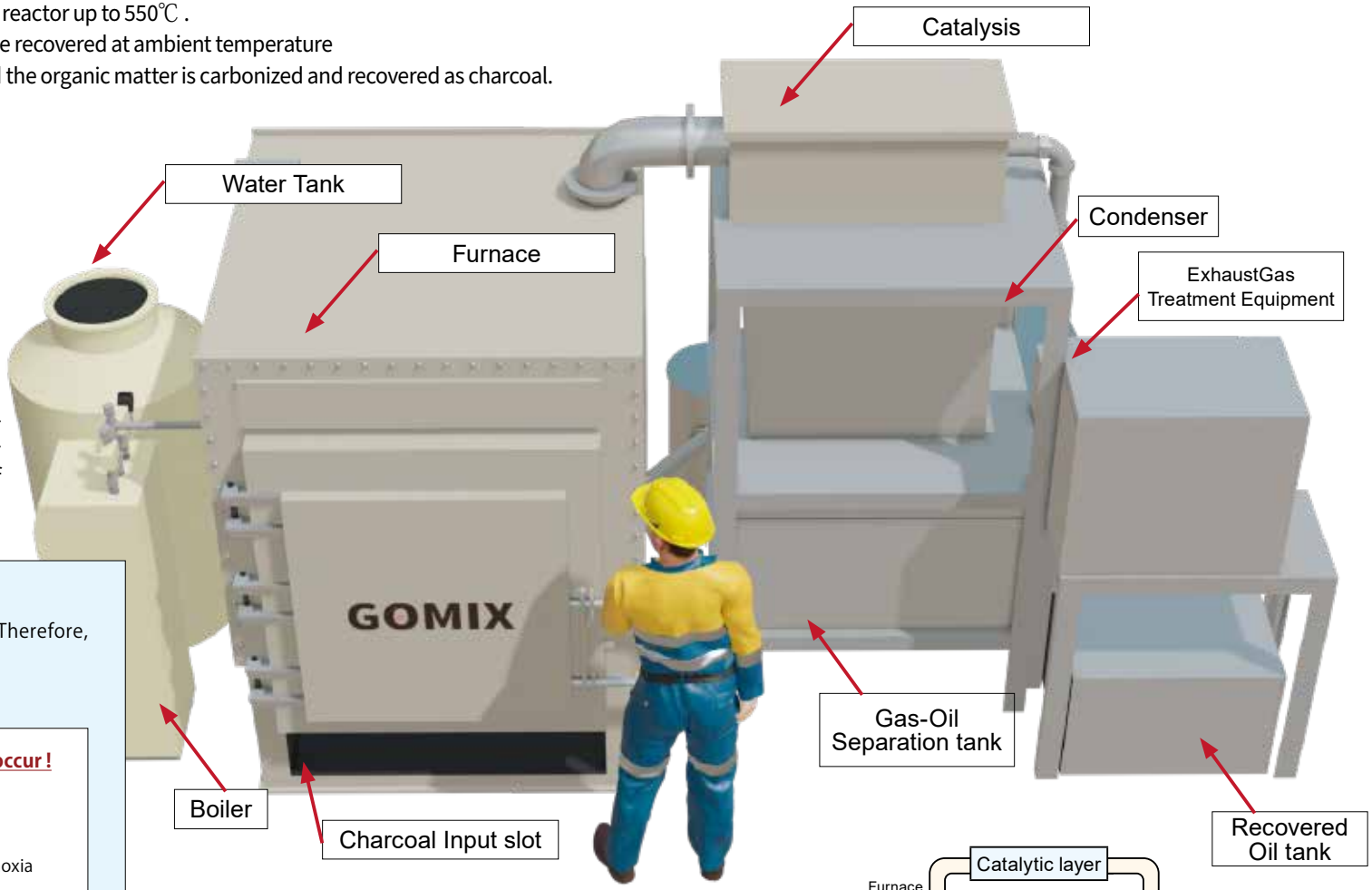
■ Energy Profit Ratio



Pyrolysis Mechanism

1. Steam is used to drive out oxygen in the reactor to create an oxygen-free condition.
2. Distillate and vaporize waste in high temperature reactor up to 550℃ .
3. The vaporized gas is cooled and the gas and oil are recovered at ambient temperature
4. The input waste is greatly reduced in volume, and the organic matter is carbonized and recovered as charcoal.

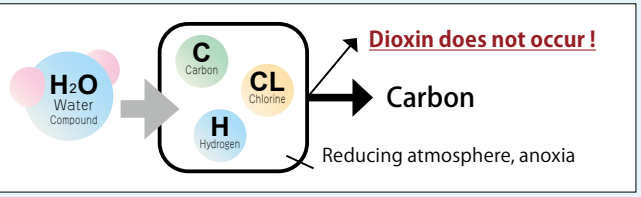
The energy produced from the waste, charcoal, oil and gas, are all utilized for waste treatment and other applications. Our “pyrolisis” is the conversion of waste into energy resources.



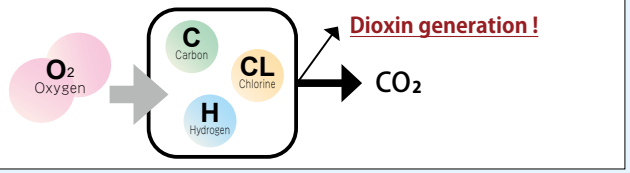
■ Dioxin & carbon dioxide free

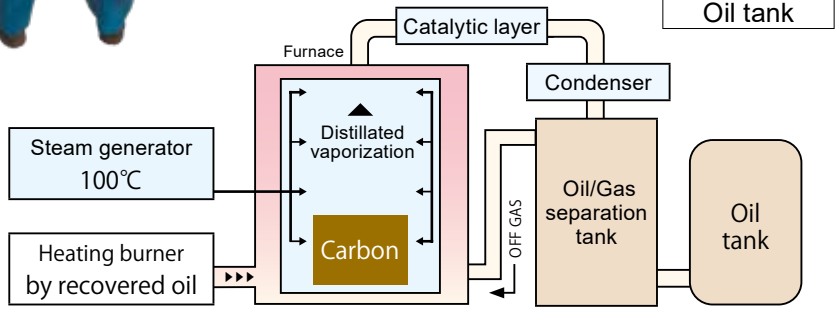
The inside of the reactor is no oxygen reaction occurs. Therefore, **Dioxin and CO_2 are not generated.**

Our mechanism



Incinerator / carbonizing furnace





Waste Delivery

Filling (compressing)

Loading

Preparation

Operation

Completion (extraction)

Operation Flow

15 mins | 15 mins | 6-8 hours | 15 mins

Put the waste into the cage. This can be done while the device is in operation. Depending on the waste, compression may be conducted at this phase.

The waste is fed into the reactor. The waste is brought in using a lift.

Prepare for operation such as closing the reactor. Also, perform routine maintenance.

The process is carried out automatically. During operation, the operator refines the recycled oil, produces briquettes, and prepares for the next operation.

Processed materials are removed from the reactor. After collecting resources such as metals, charcoal briquettes are produced.

Energy of Waste

GOMIX extracts three types of energy from waste: gas, recycled oil, and charcoal.
GOMIX utilizes these as renewable energy sources.
These percentages depend on the waste to be input.

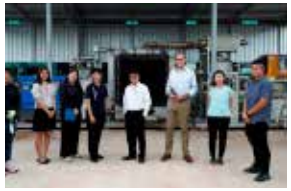
	For example, plastic waste
Gas	**30-40%**
Recovered Oil (Liquid hydrocarbon)	**60-70%**
Charcoal	**0-10%**

GOMIX can use all recovered energy - gas, recovered oil, and charcoal - as energy to heat the reactor. Excess resources can be sold or used for external equipment.
Recovered oil is refined and charcoal is converted to charcoal briquettes.

GOMI Solutions

Island Model

The “Island Model” is a model that allows for complete waste disposal on the island.
Waste generated on the island cannot be disposed of on the island, often transported somewhere for incineration or landfill. Transporting waste can be very costly.
Our technology can install equipment of a size appropriate.In addition, recovered oil, charcoal, and other resources can be recovered from waste and These resources can be utilized for the island and the volume of waste is significantly reduced. then, No need to Carry Waste to mainland anymore.
We are currently working on implementation projects on several Japanese islands, as well as in Thailand, Indonesia, and Palau.

Treat Marine Plastic Waste

No need to Carry Waste
to the mainland anymore

Circulate Economy & Energy from Waste

Island Model

Landfill Model

The “Landfill Model” is a model that allows landfills to be used for a very long time (or forever) by treating the waste in the landfill and turning it into resources, thereby drastically reducing the amount of waste going to the landfill. Landfills around the world are filling up. In this situation, building new landfills is costly and becoming more difficult every year. Our technology can process mixed remainiing plastic waste in the landfill site and these waste is very suitable for us.
We are currently working on implementation projects on some provinces of Cambodia.




Reduce Waste significantly
to landfill site

Generate Resources
from Landfill Waste

Large cost advantages
compared to installing incinerators or new landfill

Landfill Model

Comparison with Incinertor and Landfill

Incinerators and landfills are the most common methods of large-scale waste disposal.
Here is a comparison of these methods and GOMIX.

Incinerator

Landfill

	GOMIX	Incinerator	Landfill
Waste Volume Reduction	○	○	×
Energy Recovery	◎ (Oil/Charcoal)	○ (Electricity)	×
GHG Emission	◎	△ (CO2)	△ (Methane)
Cost for installation and operation	◎	×	△
Extensibility	◎	×	×

Optional Equipment for Islands Solution

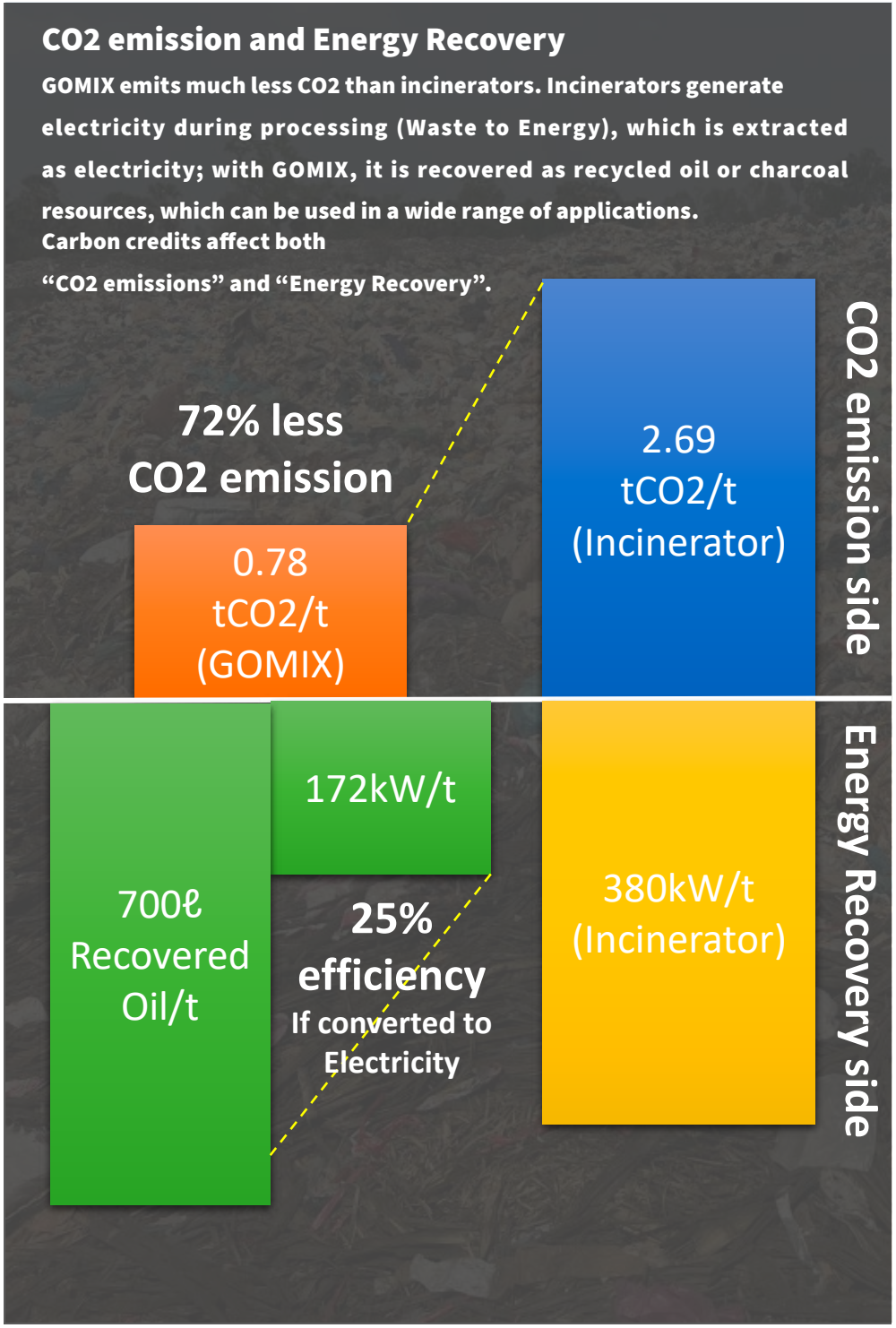
We are collaborating with “Nippon Basic Corporation,” a company with desalination technology. This is particularly useful for the island waste model, where seawater can be desalinated and used for steam. It can also be used as drinking water in emergencies.

RO System for Desalinating Sea and Fresh Water
Desaliclean 9000

Developed by 日本ベーシック株式会社 Nippon Basic Co.,Ltd

CO2 emission and Energy Recovery

GOMIX emits much less CO2 than incinerators. Incinerators generate electricity during processing (Waste to Energy), which is extracted as electricity; with GOMIX, it is recovered as recycled oil or charcoal resources, which can be used in a wide range of applications.
Carbon credits affect both “CO2 emissions” and “Energy Recovery”.



Recovered Resources

Industrial Waste

RECOVERED RESOURCES : **Metals, Recovered oil**

Our technology is very effective for wastes that contain metals and cannot be stripped or separated by hand. Adhered wastes such as plastics are converted to oil as recovered oil, while metals are left as they are. Since it is not an incineration process, the waste is removed in good condition. (Left image: Plastic waste adhering to a piece of SUS)

Mixed plastic

RECOVERED RESOURCES : **Recovered oil**

A wide range of plastics can be converted to oil. Can be fed in a mixed state without the need to separate into single materials. Approximately 60% to 70% of the specific gravity is recovered as recycled oil. Due to its light specific gravity, it is preferable to compress it, and the processing time can be set short because of its easy processing.

Scrap Tire waste

RECOVERED RESOURCES : **Recovered oil,Wire,Charcoal**

Tires are a very good waste material for us. The wire contained in the tire can be recovered as it is, and good quality recycled oil can be recovered. Although it can be processed as it is, it is preferable to cut it into 4 pieces to increase the input volume.

General household

RECOVERED RESOURCES : **Recovered oil,Charcoal**

We are studying the treatment of general household waste in Thailand, Cambodia, and India. Mixed household waste is mostly organic waste, and most of the recovered resources are charcoal and oil. Since the volume can be significantly reduced.

Landfill waste

RECOVERED RESOURCES : **Recovered oil,Charcoal**

Landfill waste is similar to general household waste, but landfills that have been in place for years may no longer have organic waste and are composed mostly of plastics, allowing for the recovery of more recycled oil. In many areas, it is difficult to create new landfills and we offer our equipment as a solution.

Marine Platic

RECOVERED RESOURCES : **Recovered oil**

Marine plastic waste is a type of waste that is not suitable for disposal in incinerators or landfills, but our technology can handle it. The marine plastic problem has become apparent in many parts of the world, and we are developing a model that can be introduced to small islands as well.

intertek
Total Quality. Assured.

TEST REPORT

Customer : ENLUBE TECHNOLOGY CO., LTD.
Test report no. : MTP2022/05068
Revision no. : 0
Report date : 04-07-2022
Sample received date : 24-06-2022
Sample tested date : 24-06-2022
Test completed date : 03-07-2022
Contact person : K. Tanyong W.
Sample description
Sample no. : MTP2022/05068-01
Sample submitted by : Customer
Customer information
Sample name : Pyrolysis

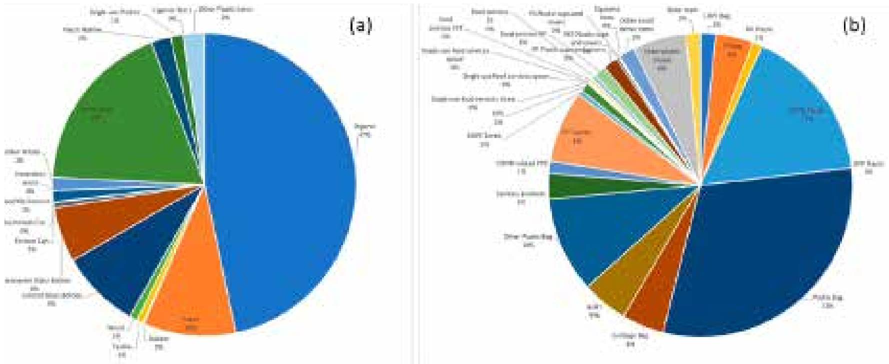
Test Parameter	Test Method	Unit	Results
Specific Gravity at 15.56/15.56 deg. C	ASTM D 4052-22	-	0.8317
Cetane Index, Calculation	ASTM D 976-06(R16)	-	58.4
Viscosity at 40 deg. C	ASTM D 445-19a	mm2/s	3.858
Pour Point	ASTM D 97-17b	deg. C	+3
Sulfur	ASTM D 4294-16e1	%wt	0.0088
Carbon Residue, Micro Method	ASTM D 4530-15	%wt	0.04
Water content	EN 12937:2000	%wt	0.020
Ash	ASTM D 482-19	%wt	0.004
Flash Point	ASTM D 93-19a	deg. C	28.0
Distillation	ASTM D 86-20b	-	
- IBP		deg. C	107.0
- 5% recovered at		deg. C	152.3
- 10% recovered at		deg. C	182.4
- 20% recovered at		deg. C	213.6
- 30% recovered at		deg. C	239.4
- 40% recovered at		deg. C	261.2
- 50% recovered at		deg. C	281.3
- 60% recovered at		deg. C	301.2
- 70% recovered at		deg. C	321.3
- 80% recovered at		deg. C	342.8
- 90% recovered at		deg. C	371.5
- 95% recovered at		deg. C	385.9
- FBP		deg. C	386.1
- Residue		%vol	1.1
- Loss		%vol	0.3
Organic Chloride	ASTM D 5808-20	mg/kg	61
Calorific Value, Gross	ASTM D 240-19	cal/g	10,774

Laboratory Manager

Page 1 of 1

Intertek Testing Services (Thailand) Ltd.

The type of resource recovered depends on the input waste. Plastics have a high oil content (60-70%), and about 10% of organics are recovered as charcoal. As mentioned above, a wide variety of waste types are targeted.



The following are the results of a compositional analysis in our project. The plastic content of General Waste is assumed to be between 15% and 30%.

Collected charcoal and oil are reused through a refining process.

Smart Waste Management System

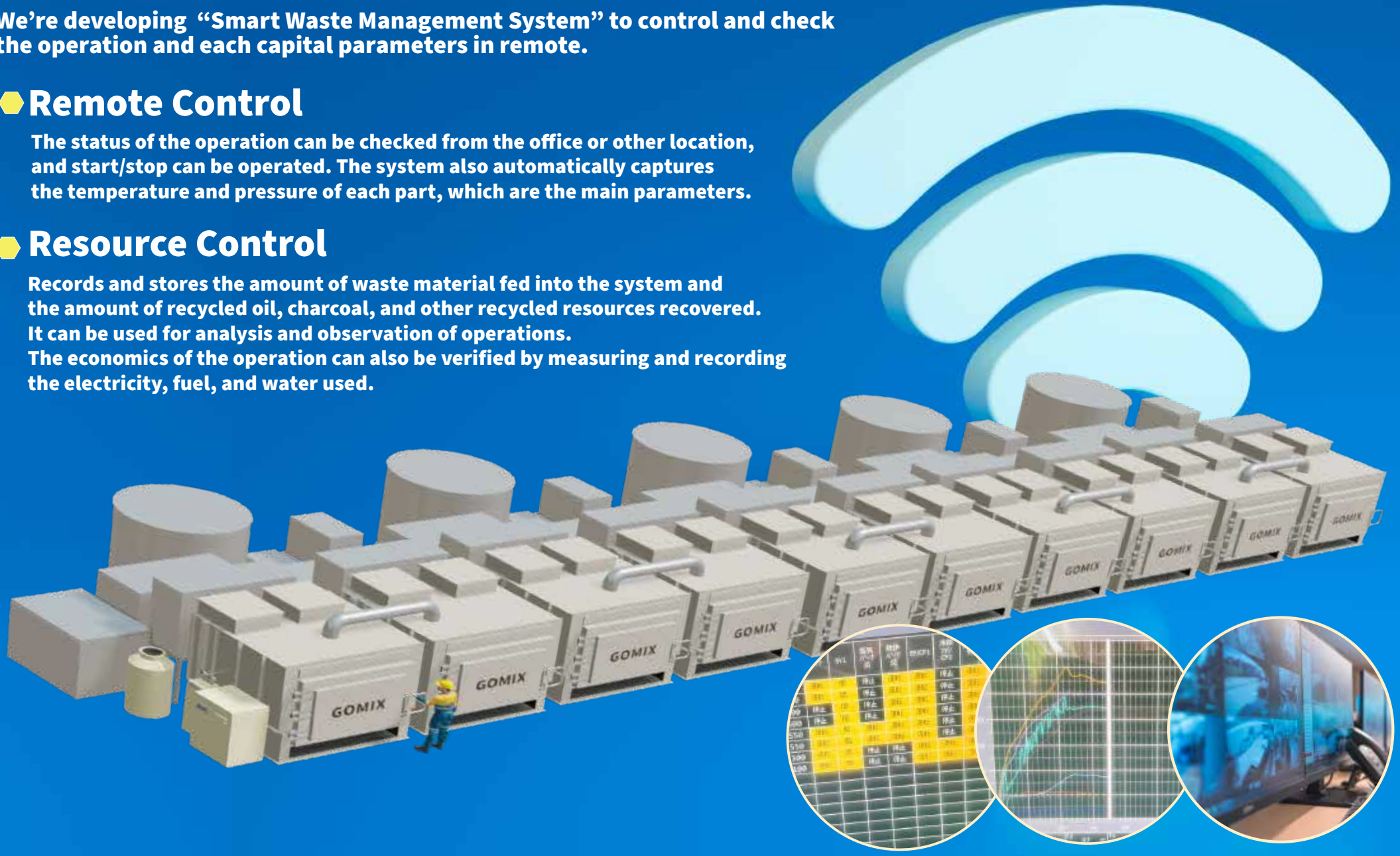
We're developing "Smart Waste Management System" to control and check the operation and each capital parameters in remote.

Remote Control

The status of the operation can be checked from the office or other location, and start/stop can be operated. The system also automatically captures the temperature and pressure of each part, which are the main parameters.

Resource Control

Records and stores the amount of waste material fed into the system and the amount of recycled oil, charcoal, and other recycled resources recovered. It can be used for analysis and observation of operations.
The economics of the operation can also be verified by measuring and recording the electricity, fuel, and water used.



World Projects Map

- Japan (Headquarter)
- Thailand (Rayong/Ubon Ratchathani)
- Cambodia (Siem Reap/Phnom Penh/Battam Bang)
- Laos (Pakse)
- Palau
- Fiji
- India
- Ukraine
- Tuvalu
- Saudi Arabia

FAQ

Q: If oil extracted from GOMIX is used as fuel, how is the benefit calculation for fuel comparison? is there a merit calculation sheet?

A:We have an ROI calculation sheet for our customers. If the extracted oil is used as fuel, a cost-benefit comparison with the fuel that was originally intended to be used and a comparison of carbon dioxide emissions with the waste combustion are also calculated at the same time.

Q: What is the construction process (schedule) and duration from contract to handover?

A: As soon as we receive the deposit from the customer, we start manufacturing. It takes about 3 months for a small model and up to 6 months for a large model. After that, we will carry out the transportation procedures to the site and bring in the product. Assembly at the site takes about one week.

Q: What kind of construction work (e.g., electrical, foundation, etc.) is required? Also, how much land area is required?

A: Our equipment requires water and electricity, so the respective supply work is necessary.
(Electricity supply can be substituted with a generator.)
Even the smallest model weighs about 10 tons at total.
It requires concrete or other foundation work and a level ground. The equipment can also be installed outdoors, but in that case, a roof should be installed.
The equipment itself requires only a small area of land, but it is necessary to secure a separate space for storing waste stacks.

Q: Which recycling is it classified as?

A: Categorized into chemical recycling and thermal recycling.

Q:Does GOMIX emit odor or noise?

A:No odor or noise is generated due to the specifications of GOMIX, which treats waste without burning and has no moving parts.There is also no heat dissipation to the outside.

Q:Do you have any materials to explain the equipment to clients when it is installed?
A:We have equipment operation manuals and maintenance manuals.

Q: How long is the coverage period?
A: In case of failure, we will repair it at our expense for 1 year.
Warranty period up to 3 years.

Q: Can hazardous waste be disposed of?

A: Please share specific waste and toxic information with us so that we can consider whether it is possible to dispose of them. We have an another solution for PCBs. if you have PCB waste proble,. Please consult with us separately.

Company Information

Name: GOMI Solutions Co.,Ltd.

GOMI Innovative waste technology Solutions

Location

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Kitakyushu Kokurakita-ku, Fukuoka, JAPAN.

Thai Office GPSC Rayong Power Plant

Main Bank Sumitomo Mitsui Bank
(Kita Kyusyu Branch)

Related Organizations

avpn JETRO IGES 北九州市 JICA 環境省 経済産業省

Capital 43,300,000 JPY

CEO Kazuta Sekiyama

Contact k.sekiyama@gomi-solutions.com

Web https://gomi-solutions.com/

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