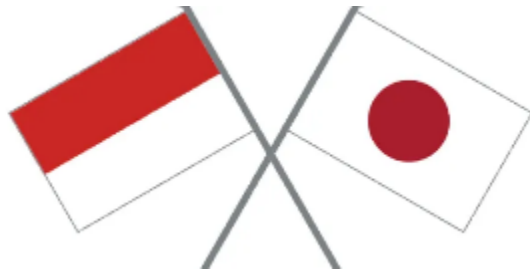


Business Catalog by Japanese Companies Contributing to Indonesia's Decarbonization and Climate Change Adaptation

**“102 Solutions that contribute to
Global Warming Countermeasures”**



October 2026

JETRO Jakarta Office

JETRO

Japan External Trade Organization

**Contacting the listed companies for purposes other than
those stated in the catalog is strictly prohibited.**

This business catalog introduces solutions which can contribute to emission reduction and climate change adaptation measures in Indonesia by Japanese companies.

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1. Renewable Energy (Solar, Hydro, Geothermal, Wind)

- **On-site solar power generation equipment rental**
(PT. Sojitz Indonesia)
- **Integrated Solutions for Solar PV and EV Adoption**
(PT Alam Energy Renewables)
- **On-site Solar PV Leasing**
(Mitsui & Co., Ltd./PT Xurya Daya Indonesia ("Xurya"))
- **Solar System Installer (EPC)** (PT. Quint Solar Indonesia)
- **EBLOX/Triple Hybrid Generation System**
(PT. MHI ENGINE SYSTEM INDONESIA)
- **Hydroelectric Plant IPP Project** (NiX JAPAN GROUP Co., Ltd.)
- **IoT Solution for Reducing Problem at Geothermal Power Plant**
(PT. Toshiba Asia Pacific Indonesia)
- **Comprehensive Service for Geothermal Power Plants**
(TOYO Engineering Corporation)
- **Products for the Renewable Energy Market (Solar and Geothermal)** (PT. Furukawa Electric Indonesia)
- **Off-grid Solar System**
(Daiwa Tech Co., Ltd. Jakarta Representative Office)
- **CMFS (Condition monitoring, Failure avoidance and Availability improvement)** (Nabtesco Corporation)
- **Renewable energy and energy-saving equipment rental service**
(Kansai Electric Power Co., Inc.)

1. Renewable Energy (Solar, Hydro, Geothermal, Wind)

- **Solar Power Plant Leasing and EPC Services**
(PT AWINA RIKUDENKO SOLAR ENGINEERING INDONESIA)
- **Next-Generation Solar + Battery Housing** (Iida Sangyo Co., Ltd.)
- **Solar Hybrid Power System for Construction Site Temporary Office**
(Sumitomo Mitsui Construction Co., Ltd.)

Zero initial investment for clean energy installation

On-site solar power generation equipment rental

PT. Sojitz Indonesia

Overview of Products and Services

- ▶ PT. Surya Nippon Nusantara (SNN) is a joint venture between Sojitz and SUN Energy (SUN), the largest rooftop solar developer in Indonesia. Through SNN, Sojitz provides decarbonization solutions, such as rooftop solar power systems, to industrial and commercial customers in Indonesia.
- ▶ SNN handles the full process, including engineering, procurement, construction, and Operations & Maintenance (O&M), as well as support for obtaining all necessary permits and licenses. SNN manages the entire implementation, enabling customers to reduce CO₂ emissions and lower electricity costs without any initial investment or the need to handle maintenance during operation.
- ▶ Through our involvement in the development of the Deltamas/GIIC industrial park, Sojitz remains committed to supporting Indonesia's long-term industrial advancement. In partnership with SUN, whose rooftop solar PV track record is the most extensive in Indonesia, we provide stable, high-quality services under long-term contractual arrangements.
- ▶ If you are interested in adopting decarbonization solutions such as on-site solar power systems or the use of clean electricity, please contact us using the details below.

Track Record

[Sojitz Group renewable energy project]

Sojitz Group has been involved in the development, construction, and operation of numerous power plants both in Japan and overseas and currently owns approximately 2.0 GW of renewable energy power generation capacity.

[Onsite solar installation track record in Indonesia]

AEON Mall Deltamas	West Java	2,000kWp
AEON Mall BSD	West Java	900kWp
Ajinomoto Indonesia (Mojokerto)	East Java	2,700kWp
Ajinomoto Indonesia (Karawang)	West Java	1,860kWp
Amerta Indah Otsuka	East Java	3,800kWp
Daikin Industries Indonesia	West Java	1,860kWp
NPR Manufacturing Indonesia	East Java	1,010kWp
Cikarang Japanese School	West Java	40kWp

*Implemented in many industrial and commercial facilities other than above.

*SUN Energy has a track record of installing over 285 MWp.



Contact Point

PT. Sojitz Indonesia

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Integrated Solutions for Solar PV and EV Adoption

• • A pioneer since 2020, offering end-to-end support from solar rental, EPC, and leasing to vehicle electrification • •

PT Alam Energy Renewables (Shizen Energy, Alamport, NiX Japan, Enbio Holdings, Kanematsu)

Product and service outline

- ▶ Since our founding in 2020, we have established a strong track record as a pioneer among Japanese companies in Indonesia's renewable energy sector.
- ▶ In addition to our "Solar Rental" model, we now offer "Self Procurement (EPC)" for asset ownership needs and "Finance Lease" options through partnerships with leasing companies.
- ▶ We provide optimal financial schemes ranging from zero-CAPEX to asset ownership. We ensure high-quality design and construction by managing local contractors to meet the technical standards required by our clients' Japanese headquarters.
- ▶ Our comprehensive solutions include the Joint Crediting Mechanism (JCM), resilience enhancement via battery storage, and 100% renewable energy through I-REC.
- ▶ In synergy with our partner company eMotion Fleet, we provide holistic decarbonization support covering both facility power (Solar) and commercial vehicle electrification (EV) to support clients to achieve carbon neutrality across Scope 1 and 2.

Actual result and example

Rooftop Solar

We have a track record of installing solar power systems in West Java, East Java, Bali Island, and Batam Island. Total project achievements: **38.9 MW** (including projects under development as of March 2026).

<Major completed projects>

6.53 MWp	West Java	Daily Necessities (Japanese)
2.75 MWp	West Java	Packaging (Japanese)
1.22 MWp	West Java	Pharmaceutical
1.20 MWp	East Java	Wood processing
0.66 MWp	East Java	Steel pipe
0.47 MWp	Bali Island	Car dealer (several stores)
0.36 MWp	Batam Island	Car dealer (several stores)
etc.		

EV Solutions (eMotion Fleet)

- Comprehensive support for ASKUL LOGIST's plan to electrify its entire delivery fleet by 2030.
- Provided numerous EV operation and energy management systems to major corporations and municipalities, including Shikoku Electric Power, Iyotetsu Bus, and Mitoyo City.
- Currently expanding demonstration projects in Indonesia.

Rooftop Solar Site



eMotionFleet – EV Solution

eMotionFleet



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On-site Solar PV Leasing

Installation of Solar PV System at Zero Initial Cost

Mitsui & Co., Ltd. / PT Xurya Daya Indonesia (“Xurya”)

Product and Service Outline

- ▶ Xurya provides comprehensive power plant system solutions—ranging from feasibility studies, detailed engineering design, and installation to operation and maintenance—for industrial and commercial clients. Xurya offers solar power system installations under a leasing/rental model with no upfront costs.
- ▶ In October 2022, Mitsui invested in Xurya (see [Mitsui Topics](#)). Mitsui, as a shareholder of Xurya, will support and promote Xurya’s rooftop solar power generation business by leveraging its knowledge of rooftop solar power business cultivated in countries around the world and through its network in Indonesia and abroad.
- ▶ If you are interested in installation of rooftop solar power generation to reduce CO2 emissions and electricity cost, please contact us at the contact information below.

Actual Result and Example

Mitsui Group’s Renewable Energy Business

- As of May 2025, Mitsui operates 2.9 GW of renewable energy power plants (at Mitsui’s share).
- Mitsui is involved in solar projects in Japan, the United States, Brazil, Thailand, UAE and etc.

Xurya’s track record in Rooftop Solar Power

- Established in 2018, Xurya is a leading company and a first-mover in Indonesian solar market.
- Xurya has a track record of installing the system in a wide range of sectors, such as office buildings, factories, shopping malls including Japanese companies and plans to continue meeting the needs of industrial and commercial customers in Indonesia, which is continue to grow.

<Project case examples>

- Japanese consumer goods manufacturer / chemical company
- Indonesian ceramics manufacturer / shopping mall
- Indonesian resort
- Indonesian plantation

Rooftop Solar Panel Installations on Commercial and Industrial Buildings in Indonesia



Hybrid Off-Grid Solar Panel System



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PT Mitsui Indonesia

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Solar System Installer (EPC)

Using Original Light Weight Panel Without Bolt and Screw on Your Roof

PT. Quint Solar Indonesia

Product and service outline

- ▶ Rooftop solar system installation work and maintenance service
- ▶ Ground installation solar system installation work and maintenance service
- ▶ Floating solar system installation work and maintenance service
- ▶ Farming type solar system installation work and maintenance service
- ▶ Target area: Entire Indonesia
- ▶ 365 days x 24 hours monitoring service center
- ▶ Utilizes the original solar panel installation method that does not use bolts or screws on the roof

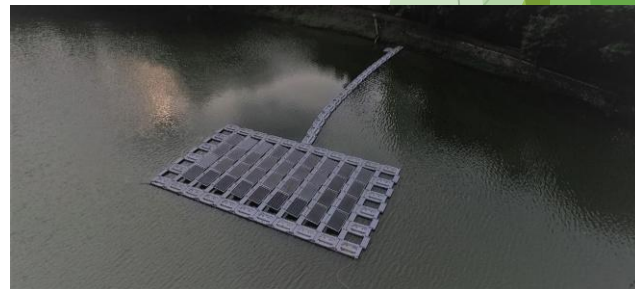
Actual result and example

- PT. Pigeon Indonesia
- Papaya Super Surabaya Darmo
- Papaya Super Surabaya Pakuwon
- Papaya Super Bali Kuta
- Papaya Bekasi
- PT. Meiji Indonesian Pharmaceutical Industries
- PT. Kao Chemical Indonesia
- PT. Yamaha Indonesia Motor Manufacturing
- PT. Katolec Indonesia
- University Indonesia

PT Yamaha Indonesia Motor Manufacturing
(Roof Top 1330KW)



University Indonesia (Floating solar 12KW)



Contact Us:

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EBLOX/Triple Hybrid Generation System

Stable and Maximum Use of Solar

PT. MHI ENGINE SYSTEM INDONESIA

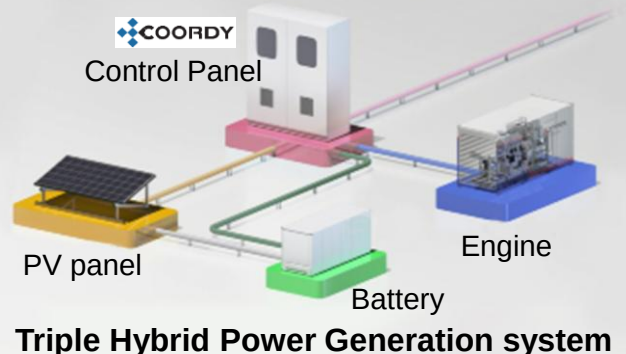
Product and Service Outline

- ▶ Under the circumstances where decarbonization efforts are required worldwide, all companies were being required not only setting their target, but also establishing a practical plan and its verification. Other than short term solution such as Renewable Energy Certificates (REC), we propose you to install EBLOX triple hybrid generation system to stabilize your power generator while your company maximize the utilization of solar power plant that is not stable as a sustainable and developmental solution to achieve low carbon operation in the company.
- ▶ Compared with Japan and other Southeast Asian countries, Indonesian electricity supply is still dependent on low efficient and carbon intensive coal-fired power plants. Therefore, CO₂ reduction by the installation of EBLOX triple hybrid generation system in Indonesia is significantly larger than other countries. Furthermore, there is an opportunity to utilize the Joint Crediting Mechanism (JCM) subsidy by the Ministry of Environment of Japan.
- ▶ EBLOX system can control automatically three kinds of energy sources such as solar power, engine, and storage battery, and aiming for the maximization of the solar power plant. EBLOX engine will stabilize the power electricity supply at bad weather and night. On the other hand, because the voltage frequency of solar power plant is not stable, the storage battery will stabilize it. MHI is also using the technology of VSG (Virtual Synchronous Generator). In the future, through replacing component to hydrogen engine may creates carbon negative. Because the power plant can operate independently, this will contribute to Business Continuity Plan(BCP) of the users.

Achievements and Examples

- EBLOX was awarded by Cogen Award in 2021 in Japan.
- Engine can be either diesel engine or gas engine. Gas engine is expected to contribute to much higher efficiency and CO₂ reduction with cogeneration utilizing waste heat.
- The reliability of Eblox system has been verified through demonstration facility in Japan and overseas. We can provide a simulation test of the factory load in advance.
- Engines are manufactured in Japan. And in the past 30 years we have delivered more than 3,000 units in Indonesia, and we also provide the best after sales service.
- EBLOX is capable for sound operation under both 1) On-grid operation and parallel operation with other generators, and 2) Off-grid operation in remote area or in case of disasters.
- By reflecting weather forecasts and/or factory demand forecasts using MHI AI cloud system, you can expect more efficient battery operation (charge/discharge).
- Remote monitoring is available and make it easy for users to monitor the systems in multiple locations from office and labor saving.
- Depend on our customer demand, site, and their target of CO₂ reduction, we will verify the number of units and the size of each solar power, engine, and storage battery, then we will propose the suitable detail for our customer.

Demonstration & Verification Plant in Japan



Contact point

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Hydro power plant IPP project

NiX JAPAN GROUP Co., Ltd.

Product and service outline

- ▶ Our company is not only in Japan but also carrying out hydro power IPP project in Indonesia, about the Tongar hydro power IPP project, NiX group Indonesia subsidiary corporation PT. NiX Indonesia Consulting (NIC) and NiX JAPAN Co., Ltd. (NiX) are performing below service;
 - Engineering: FS, Planning, Design, Construction management
 - Finance: Fund raising, Investment
 - Commercial: JV partner discover, JV establishment, License
- ▶ Even for the design and construction stage in this place which is a high-risk project, the construction DX such as BIM/CIM technology has taken in actively, while using 3D, 4D model the system is arranged to be able to do construction management on the site where the design and construction performed or even with remote work, such as managing the construction progress from 4 points that are the actual site, Jakarta office, Japan main office, and work from home staff, and by performing EPC management, construction quality management NiX group owners engineering, can measure the project cost reduction, risk reduction, and can manage a high-quality project.
- ▶ Moreover, this project can contribute to greenhouse gas (GHG) emission amount reduction due to application of the Joint Crediting Mechanism (JCM) of the Ministry of the Environment (Japan), offering solutions toward ESG management such as contribution in Japan and Indonesia renewable energy installation and expansion.

Tongar hydro power plant Specification

Location	Padang, Sumatra island
Subject	Tongar river
Power Generation Output	6.2MW
Power Generation Form	Run of river Design flow rate 16m ³ /s Effective fall distance 44.4m
Equipment	3.1MW (horizontal axis Francis turbine) × 2 unit
Selling Electricity Amount for a Year	38.73GWh (equal to 46,000 units standard house in Indonesia)

Actual result and example

- NiX was established in 1979, performing infrastructure engineering service, domestic and overseas IPP business as the mainline project, and taking form as the NiX group with 15 companies domestic and overseas country including the special purpose company. About the power generation project, the small hydro power project initiative started in 2010 in Japan, and at present has owned actual results of more than 50 hydro power equipment designs. As the IPP developer, managing 3 spots of our company's small hydro power plants in Toyama prefecture and Ishikawa prefecture. In April 2019, we are making the best use of experience cultivated in Japan for the overseas project, establishing PT. NiX Indonesia Consulting as the local corporation in Jakarta, for strengthening the overseas hydro power project such as construction management, technology consideration, and development in Indonesia. Tongar hydro power plant, which was developed in West Sumatra Province, has begin commercial operation in November 2023. In order to further expand hydropower business overseas, Ketaun hydro power plant (13,000kW) is currently under development in Lebong Regency, Bengkulu Province. Now we are proceeding to conclude a PPA (power purchase agreement).

< Actual result of power plant in Japan >

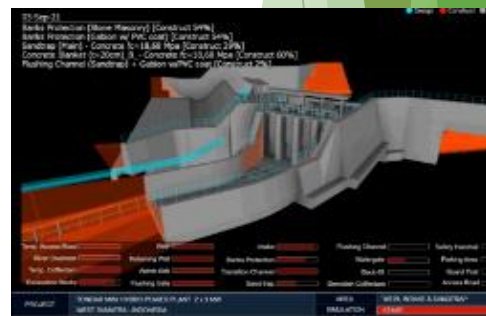
- Hiraso river small hydro power plant 2015 Ishikawa prefecture
- Yudani river small hydro power plant 2018 Toyama prefecture
- Kanazawa yuwaku small hydro power plant 2022 Ishikawa prefecture

<Overseas in-house power plant results>

- Under operation: Tongar hydro power plant 2023 West Sumatra 6,200kW

<Overseas in-house power plant project>

- Under development: Ketaun hydro power plant, Bengkulu Province, 13,000kW



Contact point

NiX JAPAN GROUP Co., Ltd., Oversea project supervision, Yoshio Wataru

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IoT Solution for Reducing Problem at Geothermal Power Plant

Contributes to decarbonization by preventing unexpected troubles with predictive failure diagnosis technology and supports from Toshiba local subsidiary in Indonesia

Toshiba Energy Systems & Solutions Corporation(TESSC) PT. Toshiba Asia Pacific Indonesia(TAPI)

Product and Service Outline

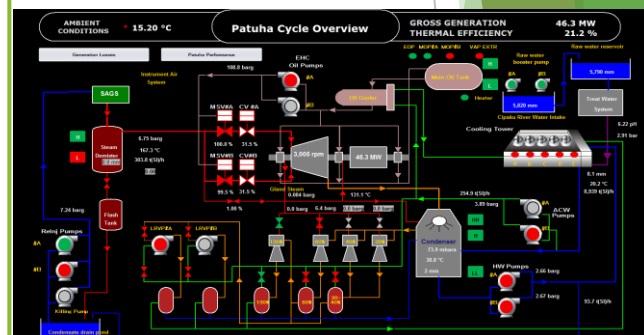
- ▶ We offer IoT service which uses IoT and AI technologies, including predictive failure diagnosis and performance monitoring. This service aims at improving the utilization rate of the power generation facilities at geothermal power plant which is decarbonized power supply.
- ▶ This system is distinguished technologically by its use of AI to analyze real-time power plant operation data obtained from various sensors and detect signs of anomalies that may cause problems during normal operation. In doing so, it reduces the number and duration of power plant shutdowns; a demonstration project conducted by NEDO (New Energy and Industrial Technology Development Organization) showed that it was able to reduce the rate at which problems occurred by over 20%. Another significant feature is the ability to detect signs of anomalies under conditions specific to geothermal power plants, such as the unstable condition of the steam flowing into the turbine, which is not the case with thermal power plants.
- ▶ This system can be used for consideration of preventing problems by analyzing real-time power plant operation data at plant and by sharing analysis results between customer, TESSC and each location in Indonesia through information technology.
- ▶ Engineers of our local subsidiary in Indonesia, PT. Toshiba Asia Pacific Indonesia (TAPI), share the trouble information and support customers with speedy resolution, regular inspection, periodical inspection and daily maintenance.

Actual Result and Example

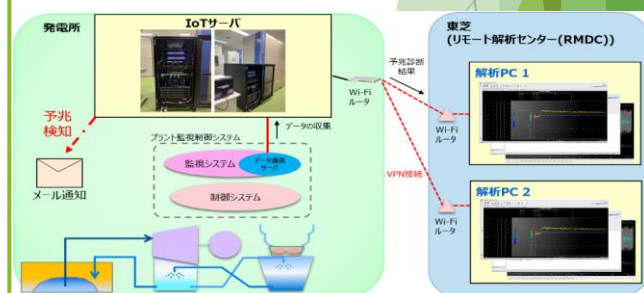
- We have concluded a IoT service contract with Indonesia's PT Geo Dipa Energi (Persero) which includes predictive failure diagnosis and performance monitoring at plant.
- This service represents a commercial version of what has been implemented as a NEDO demonstration project for this power plant in October 2019*. The demonstration project verified the effectiveness of the company's IoT-based predictive failure diagnosis technology and helped with the contract's conclusion. The system provided through this service employs EtaPRO™, a software suite acquired by Toshiba ESS last year.
- EtaPRO™ is a Plant monitoring software for power generation operators that has been installed for more than 30 years at power plants in 60+ countries with an approximate total capacity of 700 GW, including thermal, hydro, wind, and solar plants.
- We will be proactive in proposing the IoT solutions that enable optimal operation that will help to solve issues faced by individual current and future customers.

*: NEDO (New Energy and industrial Technology Development Organization) "Research and Development of Geothermal Energy Generation Technologies"

EtaPRO™ Predictive Failure Diagnosis Overview



Remote monitoring utilizing predictive failure diagnosis



Contact Us:

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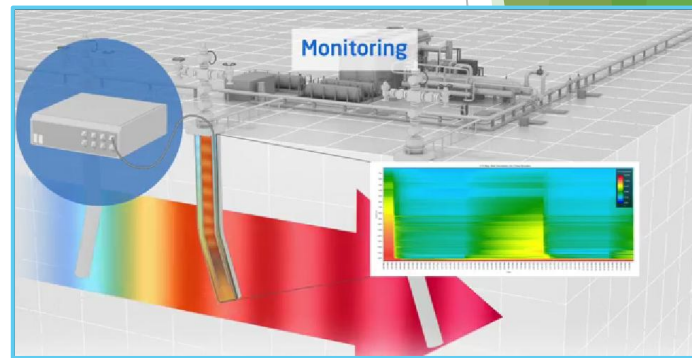
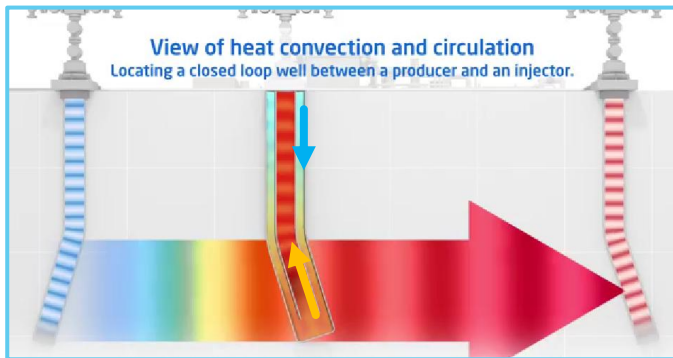
—E-mail address: agung_pratomo_subagio@tasia.toshiba.co.jp

Comprehensive Service for Geothermal Power Plants

TOYO Engineering Corporation

Product and Service Outline

- ▶ TOYO Engineering Corporation provides comprehensive service related to the development, operation and maintenance of geothermal power plants.
- ▶ PT Inti Karya Persada Teknik (IKPT), an Indonesian affiliate, carries out the Engineering, Procurement and Construction (EPC) for geothermal power plants in Indonesia.
- ▶ TOYO provides services for additional geothermal development using "Geothermal Closed Loop". "Geothermal Closed Loop" is the system that circulates fluid from above the ground in pipes installed underground, recovering energy from underground heat sources without taking out fluid from underground. The system enables geothermal development only using a heat source. It has major environmental advantages such as preventing the depletion of hot springs, as well as the cost advantages like repurposing the abated old wells.
- ▶ TOYO provides downhole monitoring by optical fiber, and remote monitoring service that combines its plant operation support service, DX-PLANT®.



Actual Result and Example

- PT Inti Karya Persada Teknik (IKPT) carries out a large number of EPC (Engineering, Procurement and Construction) projects for geothermal power generation facilities.
- TOYO has a track record of operation and maintenance support of downhole monitoring and DX-PLANT® in the oil and gas upstream field and fertilizer plants.
- TOYO and PT Geo Dipa Energi (GDE), Indonesia's state-owned geothermal development company, signed a memorandum of understanding, to conduct a joint study on comprehensive geothermal utilization, including green power generation, geothermal closed-loop technology, mineral recovery from-produced hot water, and green fuel generation.
- TOYO is discussing with multiple geothermal operators in Indonesia toward the demonstration and commercialization of "Geothermal Closed Loops".

Contact Us:

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Carbon Neutral Business Division

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Products for the Renewable Energy Market (Solar and Geothermal)

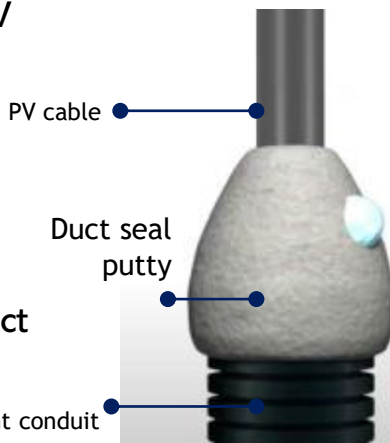
- Easy construction, shortened construction lead time, and reliable quality -

PT. Furukawa Electric Indonesia

Product Overview

► Products for solar and geothermal power generation

- Flexible aluminum cable for LV
- Fiber Optic
- PV cable
- Weather resistant conduit
- Condensation prevention and humidity control sheet
- UL Standards Fire Stop product
- Recycled plastic trough
- EFLEX etc.



Duct seal putty

No melting in high temperature and high humidity

Easy install, Light weight, around half of other products.

Feature

- PT. Furukawa Electric Indonesia deals a range of products aimed at a safe, carbon-free society, including **Copper and Aluminum cables** for the renewable energy market, plastic cable ducts made from recycled materials, and **UL disaster prevention putty**.

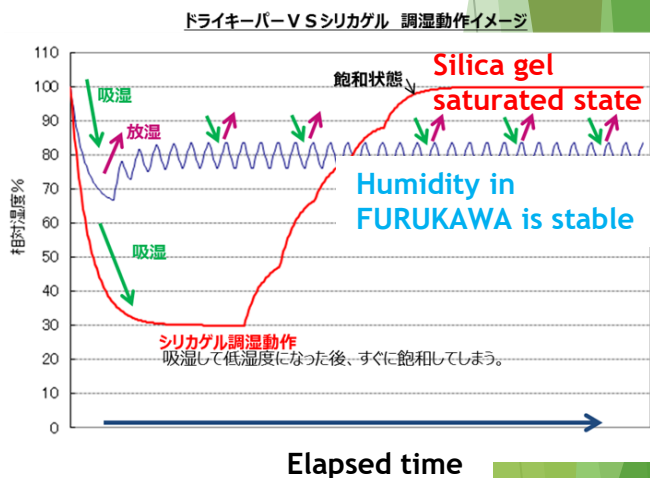
Condensation prevention sheet

Dry Keeper

Absorbs moisture when humidity is high
Releases moisture when humidity is low

- ▷ Repeated long-term use
- ▷ No electricity required

Geothermal/solar power generation, etc.
Reduced maintenance in remote areas



Contact : PT. Furukawa Electric Indonesia

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Off-grid Solar System

- Power Anywhere, Even Off-Grid -

Daiwatech Co., Ltd.

D+Daiwatech
simple + ecology + technology

Product and Service Outline

Container Solar House

An off-grid modular house powered by renewable energy, providing electricity even in areas without access to the power grid. An eco-friendly solution that helps reduce CO₂ emissions.



BLAST RESISTANCE MODULE (BRM)

A modular blast-resistant facility that protects people and equipment in high-risk environments. Equipped with solar power and an Energy Hub for a safer, more sustainable solution.



Actual Result and Example

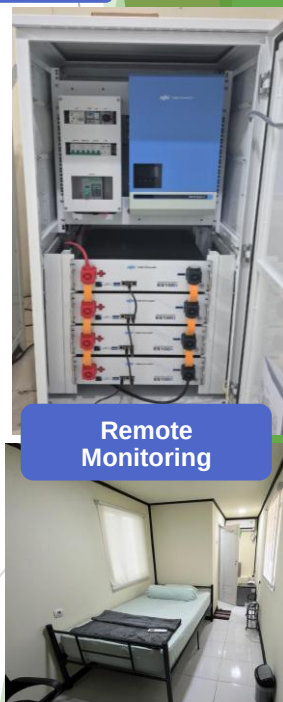
- 2022 - Selected for an international organization's support program.
- 2023 - Signed a joint research MOU with Waseda University and Universitas Padjadjaran.
- 2023 - Our products were adopted for PT. JGC INDONESIA's remote island project (52.8 kWp)
- 2026 - Blast Resistance Module (BRM) project in progress (149 kWp)



ENERGY HUB



Uninterrupted
Power



Remote
Monitoring

Contact Point

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Condition Monitoring system with Fail-Safe for wind turbine yaw section

Nabtesco Corporation

CMFS Business Promotion Department, Innovation Strategy Division

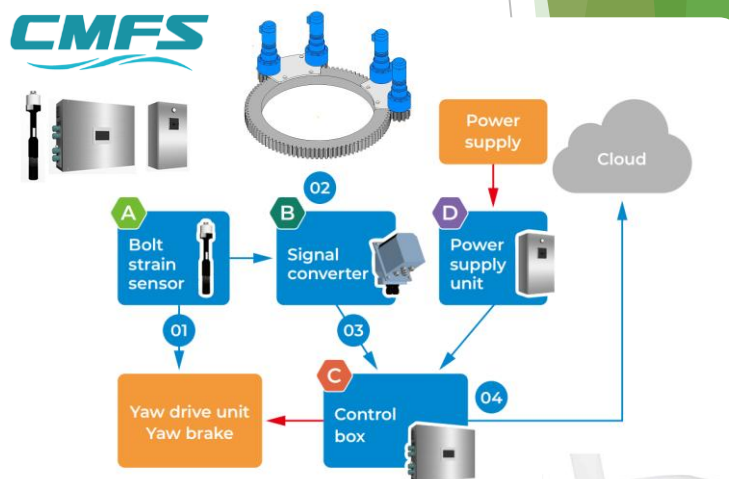
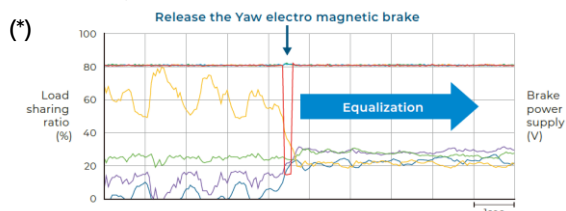
Product and service outline

- ▶ Yaw device controls the nacelle direction of the wind turbine according to the wind direction. The failure of the yaw components not only results in repair costs, but also leads to huge loss of power generation opportunities. CMFS (Condition Monitoring system with Fail-Safe) developed by Nabtesco prevent these losses.
- ▶ CMFS directly measures the load applied to the yaw drives, and when the load exceeds the set threshold, instantaneously releases the brake mounted on the yaw drives to reduce the load. CMFS protects the yaw drives and the yaw ring gear.
- ▶ It is also possible to provide diagnostic service that enables visualizing the real time load analysis data, abnormal condition record and abnormal warning notification, and ring gear tooth surface diagnosis which further develops condition monitoring.

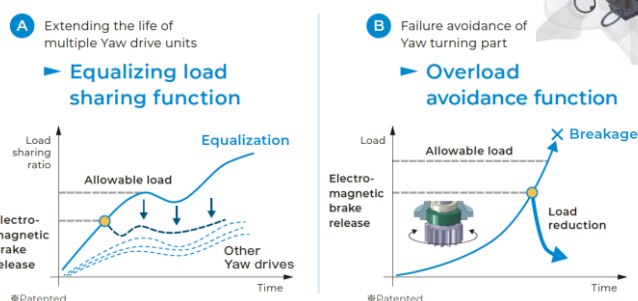
Please see here for details : <https://www.condition-monitor.nabtesco.com/en/products/>

Actual result and example

- In order to verify the effectiveness of CMFS, load measurements on the yaw section of multiple wind turbines were carried out using Condition Monitoring System that have almost same configuration as CMFS. As a result, it was confirmed that there is a strong correlation between load imbalance of the yaw drives and the occurrence of failures.
- As a result of installing CMFS on wind turbines, the load imbalance between multiple yaw drives has been greatly improved by instantaneously releasing the brake of the yaw drive(*).
- It is said that losses due to failure of the yaw section amount from 10 to 28% of total annual losses. The installation of CMFS can be expected to reduce these losses and improve operating availability of wind turbines.



The following can be expected from the introduction of CMFS



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HP : https://www.condition-monitor.nabtesco.com/en/?doing_wp_cron=1729748180.8866429328918457031250

Comprehensive support for Customers' decarbonization

Renewable energy and energy-saving equipment rental service

Kansai Electric Power Co., Inc. (PT. Kansai Energy Solutions Indonesia)

Product and Service Overview

- ▶ Kansai Electric Power has established PT. Kansai Energy Solutions Indonesia (KESI) as a 100% local company to provide decarbonization solutions to manufacturing and commercial facility customers in Indonesia.
- ▶ As decarbonization solutions, we offer a wide range of rental services for renewable energy equipment such as solar and biomass power generation equipment, and energy-saving equipment such as highly efficient boilers and chillers, as well as energy-saving consulting and the sale of renewable energy certificates (I-REC), providing comprehensive support for our customers' decarbonization efforts.
- ▶ Our renewable energy and energy-saving equipment rental service provides one-stop service covering design, procurement, construction, operation and maintenance, with no initial investment required, and is expected to reduce CO2 emissions and energy costs.
- ▶ Based on our extensive track record as an energy company in Japan, we have been highly evaluated for our high-quality services, and have a strong track record of success in Thailand and Vietnam, where we have already expanded.

Achievements and Case Studies

<Achievements in Japan>

- Installation of solar power generation equipment *1
Total power generation capacity: 222MW
Number of projects : 550

<Achievements in Overseas (Thailand, Vietnam, Indonesia)>

- Solar power generation equipment installed, total power generation capacity: approx. 150 MW
- In addition to solar power generation equipment, there are several other projects to introduce the following equipment:
 1. Cogeneration system
 2. Chiller
 3. Steam boiler

Since the establishment of KESI in Indonesia in November 2024, two projects have been selected as subsidy of the Joint Crediting Mechanism (JCM) financial support project*2

*1 This is a proven track record of a service that requires no initial investment and allows customers to pay according to the amount of electricity generated, similar to the rooftop solar rental service being rolled out in Indonesia.

*2 This is a project that utilizes advanced decarbonization technologies to implement projects to reduce greenhouse gas emissions in developing countries and other regions, and conducts measurement, reporting, and verification (MRV). The aim is to contribute to the achievement of greenhouse gas emission reduction targets in Japan and partner countries through the JCM, as well as to reduce greenhouse gas emissions in developing countries and other regions.



Solar power generation
(example in Thailand)



Cogeneration system
(example in Thailand)

Contact points

PT. Kansai Energy Solutions Indonesia

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Galeb : +62-811-8801-0608, galeb@kes-i.com

PT AWINA RIKUDENKO SOLAR ENGINEERING INDONESIA (ARISE)

- ▶ ARISE inherits the strong tradition and technology of its parent company, Hokuriku Electrical Construction Co., Ltd. (HOKURIKU DENKO), which has over 80 years of history and achievements in electrical construction and the renewable energy field. Based on this proven track record, we have established an integrated system covering not only construction but also design, procurement, installation, operation, and maintenance. In Indonesia, we are expanding our solar power equipment leasing and EPC businesses to meet the diverse needs of our customers.
- ▶ With the know-how developed as an IPP operator in Japan, we provide optimal proposals and facilities. In June 2025, we installed a solar PV showcase project at a long-established four-star hotel in Sanur, Bali, demonstrating our technological strength and construction capabilities.

Officially Approved by the Ministry of Energy and Mineral Resources!

Next-Generation Solar + Battery Housing

- • A high-efficiency power system that achieves both stable operation and cost reduction • •

Iida Sangyo Co., Ltd. (PT Abdiluhur Kawuloalit)

Overview of Products and Services

- ▶ Iida Sangyo has become the first Japanese housing manufacturer to obtain official approval from the Ministry of Energy and Mineral Resources (MEMR) for solar power and battery storage in a residential model house in Indonesia.
- ▶ This milestone opens a new door to the Indonesian housing market, where meeting institutional and technical requirements for solar power is highly challenging and approvals in the housing sector are rare.
- ▶ The system prioritizes self-generated power, supplementing with commercial electricity only when needed, and its grid-friendly design ensures both stable operation and reduced electricity costs, with a standard app enabling real-time remote monitoring and intuitive energy management.

Achievements & Case Studies

- Residential Complex in Depok City, West Java Province
- Two Model Houses
- Capacity: 5 kW-class System – Stand-alone Solar Power + Battery Storage with Commercial Grid Support
- Effect: Estimated 30% reduction in annual electricity costs and approximately 1 ton reduction in annual CO₂ emissions. Power generation and storage can be remotely monitored via the application.



High-Efficiency Power System



Remote Monitoring App



Official License from the Ministry of Energy and Mineral Resources (MEMR) • • •



Residential Development in Depok

PT. Abdiluhur Kawuloalit

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Solar Hybrid Power System for Construction Site Temporary Office

Achieving Stable Power Supply and CO₂ Reduction Before Commercial Power Connection

Sumitomo Mitsui Construction Co., Ltd. (SMCC)

Product and Service Outline

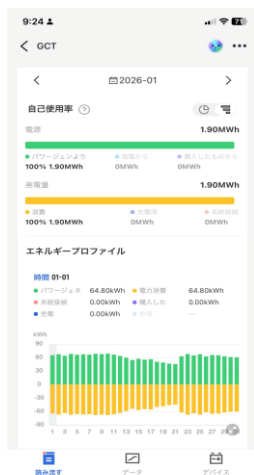
- ▶ Sumitomo Mitsui Construction Co., Ltd. (SMCC) implemented an off-grid hybrid power system at its construction site in Thailand, combining solar panels, batteries, and an inverter for the temporary site office during the early phase of construction.
- ▶ The system provided stable electricity supply before the commercial power connection was established, significantly reducing dependence on diesel generators. Total power generated during the temporary office phase reached approximately 1,500-2,000 kWh per month.
- ▶ After the commercial grid connection was completed, the solar panels and inverter continued to be used at the permanent site office. GO POWER provided technical support for the power system design and installation.
- Additionally, this project included preparations for the future introduction of a V2H (Vehicle to Home) system, in anticipation of expanded use of electric vehicles. By utilizing EV batteries as a power source at the construction site, further CO₂ reductions and greater flexibility in power management are expected.

Actual Result and Example

- Location: Construction site in Thailand (temporary and permanent offices)
- System: Solar panels + batteries + inverter
- Power generated during temporary office phase: approx. 1,500-2,000 kWh/month
- Significant reduction in diesel fuel consumption
- Contribution to CO₂ emission reduction
- System continued in permanent office after commercial power connection
- Recognized as a leading example of low-carbon construction site operations



Solar panels installed on the construction site office rooftop in Thailand



Solar power monitoring
(approx. 1,900 kWh/month)



Power generation data
display (solar power system)



Power system equipment (battery & inverter)



Solar panels on the temporary office rooftop

Contact Point

GO POWER Co., Ltd. (株式会社GOパワー)

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Languages: Japanese / English / Indonesia

2. Biomass/Waste Power Generation

- **NEFS equipment saves energy in liquid fossil fuel combustion engines** (Nanofuel Co., Ltd.)
- **Sustainable Aviation Fuel (SAF) Business** (JGC HOLDINGS CO., LTD.)
- **Biofuel Production: Implementing AI Systems to Optimize Plant Operations** (CHIYODA Corporation)
- **Effective Utilization of Oil Palm Trunks Project** (Green Earth Institute Co., Ltd.)
- **Manufacturing and Selling Biomass Pellet Fuel Made from Palm-Derived Agricultural Residues** (TESS Engineering Co. Ltd./PT PTEC Research and Development)
- **Renewable Natural Gas Production and Distribution Business** (PT. Energasindo Heksa Karya)
- **Biomass Fuel from EFB/Fertilizer Ingredient from Chicken Manure** (Kanadevia Corporation)
- **Technology Development Platform for CO₂ Reduction and Wastewater Purification by Microalgae** (Algal Bio)
- **Dry Anaerobic Digestion Biogas Plant** (Kanadevia Corporation)

2. Biomass/Waste Power Generation

- **Biomass Supply Solution** (PT. Santomo Biomass Indonesia)
- **Biochar Production from Biomass Waste** (Midori Climate Partner Pte. Ltd)
- **CFB & BFB Boilers** (Sumitomo Heavy Industries, Ltd.)
- **Biomass-derived Acrylic Acid, Acrylic Esters and Superabsorbent Polymers** (NIPPON SHOKUBAI CO., LTD)
- **Bio-based (Sugarcane) Plastic Green polyethylene, Green EVA** (PT. Sojitz Indonesia)
- **Development of SAF Import Infrastructure and Domestic Production Capabilities** (PT. Nippon Oil Indonesia)

NEFS equipment saves energy in liquid fossil fuel combustion engines (also possible to convert inedible liquid biomass feedstock, palm oil PAO, by-product glycerin, etc. into fuel)

NANO FUEL Co., Ltd.

Overview of Products and Services

- ▶ Our Nano Emulsion Fuel System (NEFS) reforms liquid fuels and improves their combustion efficiency, thereby reducing fuel consumption and CO2 emissions, and also improves the combustibility of non-flammable liquids such as vegetable oils, enabling them to be used as fuel.
- ▶ Our NEFS will enable us to reduce consumption and CO2 emissions by converting oil used in diesel power plants and plant boilers in Indonesia into Nanoemulsions.
- ▶ The NEFS enables low-cost degumming of CPO. Furthermore, by converting CPO into Nanoemulsion, it can be used as an alternative fuel to heavy oil.
- ▶ Biodiesel derived from palm oil is being promoted in Indonesia. Basically, biodiesel is a methyl esterification of vegetable oil, hence the byproduct glycerin is emitted in its production process.
- ▶ NEFS will be able to produce nano glycerin fuel by mixing this byproduct glycerin with diesel oil.
- ▶ The combination of palm oil diesel power generation and solar power generation will enable a constant supply of electricity from renewable energy sources 24 hours a day.
- ▶ We manufacture and sell NEFS and provide technical support and maintenance for related equipment



NEFS
Nano Emulsion Fuel
production System



Power generation using nanoemulsion
fuels such as palm oil



Solar power
generation

Achievements and Case Studies

- NEFS has been installed at plants in Japan for chemicals, lime, asphalt mixtures, metals, etc. to reduce fuel consumption and CO2 emissions. Overseas, NEFS has been installed in annealing furnaces and kilns of an Indian steel company.
- The conversion of palm oil and other vegetable oils into fuel was developed as a project subsidized by the Ministry of Economy, Trade and Industry's NEDO "New Energy Venture Technology Innovation Project."
- NEFS is certified by Kawasaki City as a "Low CO2 Kawasaki Brand 21" as a CO2 reduction device.
- The Nanoglycerin Fuel Project has been selected by the Ministry of the Environment as a "JCM City-to-City Cooperation Project for FY2024".



4 NEFS installed at an Indian steel company

Contact Us

Please contact us by e-mail (in English).

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Sustainable Aviation Fuel (SAF) Business

JGC HOLDINGS CO., LTD.

Products and Service Outline

- Amid efforts to reduce global CO₂ emissions, the airline industry also set a target (CORSIA) to prevent CO₂ emissions from increasing from 2020 onward in the international airline sector. Significant reductions in effect gas emissions can be expected from the introduction of SAF as a solution. SAFs can reduce CO₂ emissions by about 80% over conventional aviation fuels over the lifecycle from the production and collection of raw materials, such as biomass, waste food oil, and municipal waste, to manufacturing and burning. Existing infrastructure can also be used as is.
- JGC Group established a Japanese SAF manufacturing supply chain in collaboration with a partner for Japan's first large-scale commercial production of SAF. It also conducts FS and technical valuations. Based on the results and knowledge of these SAFs, furthermore, it is possible to provide highly reliable services such as support for commercializing and optimal scheme proposals.

Actual Results and Examples

- JGC Group is working with Levo International Co., Ltd. and Cosmo Oil Co., Ltd. to create a domestically produced SAF manufacturing supply chain by hydrotreatment of Used Cooking Oil(UCO). A SAF production plant with an annual production capacity of approximately 30,000 kL is planned to be put into operation in 2025, with the Cosmo Oil Sakai Refinery as its base, using waste edible oil recovered from restaurants and food factories by Levo International Co., Ltd.
- In addition, in collaboration with Levo International, Inc., All Nippon Airways Co., Ltd., Japan Airlines Co., Ltd., and other companies, we established ACT FOR SKY, a volunteer organization working to commercialize, disseminate, and expand domestic SAFs. In the future, it aims at the development of Japan's aviation network and the industry as well as the realization of a sustainable society.



Business entity	JGC HD (60%), Cosmo Oil (30%), Levo International (10%)
FEED+EPC	JGC
Plant Construction site	Cosmo Oil Sakai Refinery
Start of operation	2025 (planned)

(Record)

Customer	Partner	Country	Scope	Raw materials	Process	Capacity	Completed
A	—	Asia	FEED	Sugar cane	ATJ	100,000 kL/yr	In progress
—	Cosmo Oil, Levo International	Japan	FEED, EPC	UCO	HEFA	25,000 kL/yr	2025 (planned)

Contact Us:

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Biofuel Production: Implementing AI Systems to Optimize Plant Operations

Chiyoda Corporation (PT. Chiyoda International Indonesia)

Product and service outline

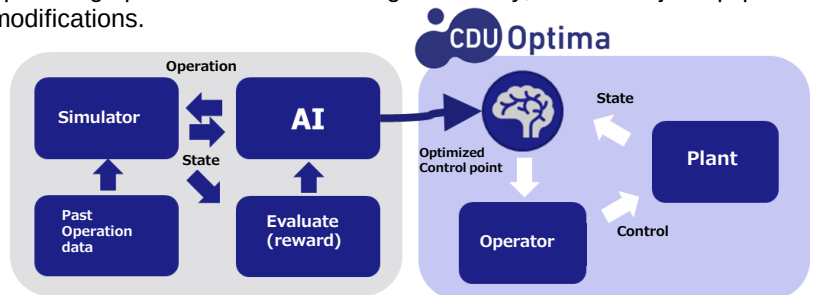
- ▶ To achieve decarbonization, the use of biofuels, including SAF (Sustainable Aviation Fuel), is being promoted.
- ▶ However, biofuels face the issue of significant variability in raw material quality depending on the sourcing.
- ▶ Our AI technology enables optimization of operations in response to fluctuations in renewable feedstock quality, contributing to stable fuel production.

Actual result and example

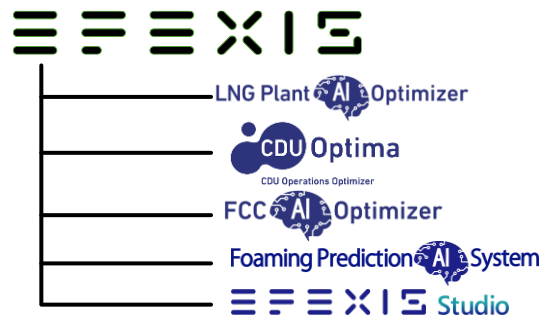
- ▶ The effectiveness of modeling the reaction section and overall optimization in various process plants has been confirmed.
- ▶ The demonstration test for the application of AI to stabilize operations in the conversion of aging existing plants in the United States for biofuel production is underway.
- ▶ By implementing early detection of operational variations due to changes in renewable feedstock properties along with automatic optimization, a reduction in operator workload, safe plant operation, and optimization of cost balance are achieved.

- ▶ Application of CDU Optima (Crude Distillation Unit Operation Optimizer), an AI technology aimed at switching oil types in refineries, to biofuels including SAF (Sustainable Aviation Fuel).
- ▶ Support for operations provided by AI that has learned extensive process simulation knowledge:
 - ✓ Prediction and visualization of product characteristics
 - ✓ Optimized operating parameters
 - ✓ Operating evaluation system

Contributing to environmental impact reduction and energy savings by optimizing operations and enhancing availability, without major equipment modifications.



Through the process digital twin solution suite EFFEXIS®, which includes CDU Optima, optimization of plant operations can be achieved without significant equipment modifications. This leads to improvements in productivity, reductions in operational, maintenance, and safety costs, and a decrease in environmental impact.



Contact point

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[Visit our plantOS™ Introduction Page](#)

[Watch our plantOS™ YouTube Video](#)

Effective Utilization of Oil Palm Trunks Project

Building the Integrated Business of Biofuel and Green Chemical utilizing Oil Palm Trunk

Green Earth Institute Co., Ltd.

Business Outline

- ▶ Palm oil is the most widely used vegetable oil in the world for food, detergents, and cosmetics. The demand and production of palm oil is also increasing year by year. Oil palm trees in plantations that support such enormous global demands are regularly replanted to maintain the yield of palm fruits, and a large amount of OPTs are discarded every year. Until recently, OPT has been shredded and landfilled in plantations, but in recent years, its utilization as a source of biofuel has been attracting attention.
- ▶ Our business is an initiative to integrate the production of OPT pellets and the fermentation and production of bioethanol and other chemicals from the OPT squeezed juice generated during the production of OPT pellets.
- ▶ These new business initiatives are expected to contribute to the healthy development of the palm oil industry as an effective way to utilize OPTs that have been disposed in the past and upcycle them into biofuels and chemicals.
- ▶ Reducing CO₂ emissions in the aviation sector is a global challenge, with the adoption of Sustainable Aviation Fuel (SAF) being promoted as a key solution. We have completed a feasibility study on the production of bioethanol and fuel pellets from oil palm trunks (OPT) sourced in Indonesia, and are currently preparing for a pilot-scale demonstration in Indonesia.

Activity Status

- Currently engaged in preparatory activities for a pilot-scale demonstration in Indonesia.

Bioconversion Technology by **Green Earth Institute**

Palm Plantation

- Palm biomass supply
- Partnership

supply



Oil Palm trunk

Squeezed process



OPT Pellet

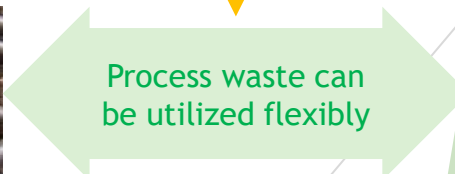
Fermentation



Amino acid
or Chemicals



Process waste can
be utilized flexibly



Bio Gas Power
Generation

Contact Point

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Manufacturing and Selling Biomass Pellet Fuel Made from Palm-Derived Agricultural Residues

TESS Engineering Co. Ltd.
PT PTEC Research and Development



Overview of Products and Services 【BACKGROUND】

- ▶ Palm-derived residues (EFB & OPT) are currently **left unused** and **contribute to the generation of methane gas (25 times more potent than CO₂)**. Reducing the impact of palm-derived residue is an urgent matter.
- ▶ To achieve the goal of a "decarbonized society" set by the Japanese and Indonesian governments, it is crucial for manufacturers to make **transition from fossil fuels to decarbonized alternatives fuel**.

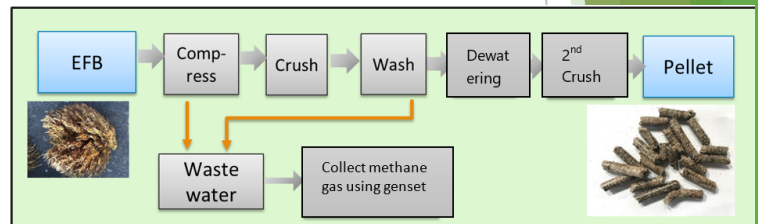
【Business Description】

- ▶ We **manufacture pellet fuel from unused residues (EFB & OPT)** and sell it to thermal power plants in Indonesia and overseas. Switching from fossil fuels to our biomass pellet is **expected to reduce CO₂ effects that is equivalent to 240,000 t-CO₂ per year (**)**.

****including the methane suppression effect resulting from utilizing abandoned EFB**

Achievements/Examples

- ✓ **Test plant** in operation since 2021
- ✓ Construction plan for **commercial plant**.
Production volume: 200,000t/year
Operation commence: year 2025
- ✓ Already conducted **co-firing combustion tests at several coal-fired power plants** in Japan and Indonesia
- ✓ Already conducted **several combustion tests for drying furnace** in Indonesia
- ✓ Established **partnership with PTPN (state owned palm company)** regarding supply of raw materials and land



Contact Information

PT PTEC Research and Development

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PT. Energasindo Heksa Karya (invested 33% by Tokyo Gas)

Business outline

- ▶ PT. Energasindo Heksa Karya (hereinafter referred to as EHK) is a company engaged in the transportation and distribution business of natural gas, and has experience to convert from other fossil fuels to natural gas which is a stable energy and low carbon fuel.
- ▶ This project is to recover methane (CH₄) generated from livestock manure at a farm owned by PT. Pasir Tengah ("PASTE"), a feedstock partner, to produce gas body decarbonized fuel that can be used like natural gas, and supply it as "renewable gas (RNG)" to nearby The project is to supply RNG to nearby factories and other facilities of the partners who use the gas.

Expected effects

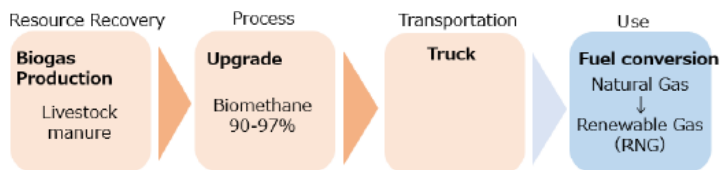
- ▶ Raw material supply partners : It can contribute to reduce and effectively utilize greenhouse gases generated from livestock manure.
- ▶ Gas use partners: Enables decarbonization of energy, clean exhaust gases, and the use of highly efficient and easy-to-maintain gas-fueled equipment.

EHK leverages our know-how of natural gas distribution business to connect Raw material supply partners and Gas use partners to decarbonize and provide a stable energy.

Project Outline

- RNG sales area: West Java Province
- Feedstock Partner: PASTE
- EPC Partner: PT Tripatra Engineering (Tripatra)
- Utilization Partner: PT. Moriuchi Indonesia (MI), etc.

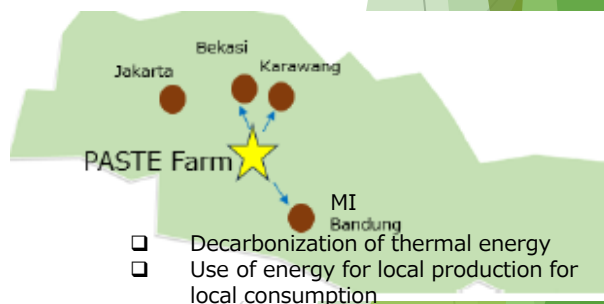
Location	West Java, Cianjur
RNG size	300mmbtu/day~
Target	2026~



Back Ground

- September 2023: Signs a memorandum of understanding with MI for joint development of RNG
- April 2024: Basic agreement signed with PASTE and Tripatra for joint study on RNG production and supply

PASTE, Tripatra and EHK Sign Basic Agreement for Joint Study



Contact point

PT. Energasindo Heksa Karya

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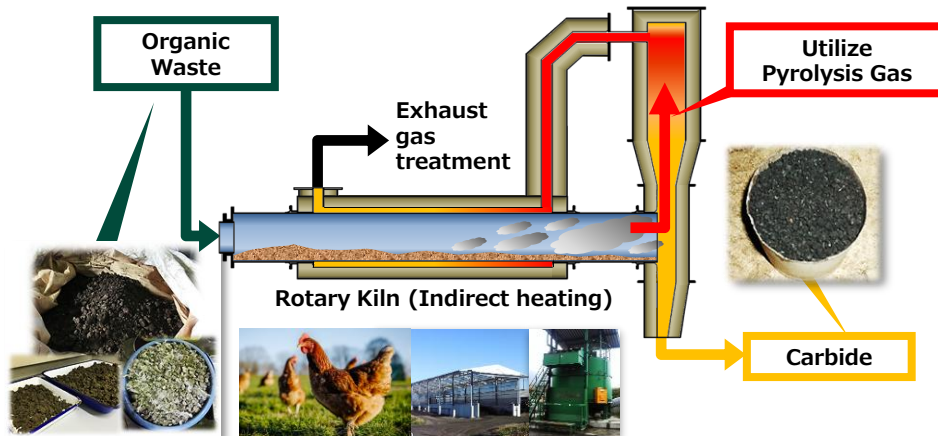
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Biomass Fuel from EFB/ Fertilizer Ingredient from Chicken Manure

Kanadevia Corporation

Product and service outline

- ▶ EFCaR (Energy Free Carbonizing for Resource Recovery) is our technology to convert organic waste into carbide. In Indonesian market, the following organic waste are targeted.
 1. **EFB(Empty Fruits Bunch)**: Carbide from EFB can be utilized **for biomass fuel**.
 2. **Chicken Manure**: Carbide from chicken manure can be utilized **for fertilizer ingredient**.
- ▶ Outline of System:
Throughput: Organic waste like EFB, chicken manure (Water Content 65%): 31tpd
Throughput: Organic waste like chicken manure (Water Content 40%): 18tpd x 1 unit
Carbide Production Ratio: 30% (5.4tpd)
CO₂ Reduction: approx. 1,000tpd (depending on project conditions)
- ▶ Eligible for **JCM** (Joint Crediting Mechanism), a Japanese government financial support.
- ▶ We are pleased to be in contact with the companies below.
 1. Agricultural companies own palm mills and/or chicken farms as a supplier for organic waste
 2. Companies for cement, steel industry, etc. as an off-taker



1. Continuously producing carbides **under uniform temperature without fossil fuel**.
2. Carbide constituents for fertilizer have high solubility so that **they can be absorbed well**.
3. In the process, harmful substances like pesticides, antibiotics etc. **are decomposed and detoxified**.
4. **No unpleasant smell of livestock** remains once it is converted into carbide.

Actual result and example

- Operational demonstration has been successfully conducted. Commercialization in FY2026 is aimed.

Contact point

Kanadevia Corporation, Yasukazu Aono

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Transforming Microalgae into Bio-Solutions

CCUS Solutions Harnessing the Exceptional CO₂ Fixation Capacity of Microalgae

Algal Bio Co., Ltd.

Product and service outline

- ▶ Algal Bio is a research-driven startup committed to unleashing the full potential of microalgae to create a better future for people and the planet. Originating from more than 20 years of research at the University of Tokyo, the company is building one of the world's most advanced microalgae bio-foundry platforms. This platform combines a proprietary microalgae library containing over 1,260 strains from 100 species with deep expertise in strain selection, breeding, and cultivation optimization. It is also equipped with a dedicated pilot plant for scale-up and validation, enabling rapid and precise development of tailored microalgae-based solutions. Through close collaboration with partners across health, food, sustainability, and climate-related industries, Algal Bio brings innovative microalgae-derived products and technologies to market. These solutions are designed to address urgent global challenges such as human health, sustainable food supply, and environmental resilience.
- ▶ Microalgae exhibit a high capacity for CO₂ fixation, enabling the direct capture of carbon dioxide from exhaust gases. In addition, the biomass obtained through cultivation can be utilized as functional ingredients in food and cosmetics, as well as raw materials for bioplastics.

Actual result and example

Advancing microalgae CCUS solutions technology across ASEAN.

- On 4th March 2025, signed a joint research agreement with PLCP Power, a leading IPP in Thailand, to demonstrate the use of microalgae for CO₂ fixation and to prove the commercial viability of microalgae biomass on the premises of BLCF's power plant. Efficiently capture CO₂ emissions directly from processes and leverage Thailand's tropical climate for optimized algae cultivation. POC during 2025 and aim to commercialize in 2026. Conduct feasibility studies to assess market opportunities and demonstrate product applications, including microalgae-derived supplements, cosmetics, livestock feed, fertilizers, and other bioproducts, to develop viable commercial applications for microalgae.

Astaxanthin Innovation Reaches Commercial Scale

- Through joint development with Japan Bio Science Laboratory, the commercial-scale production of pure, domestically produced high-concentration astaxanthin has been achieved.

Bioproducts Development

- We develop and market "Moneru," a rest-support supplement formulated with our proprietary microalgae ingredients. Our bio-based product lineup also includes microalgae-derived colorants and aquaculture feed enriched with Nannochloropsis, known for its high EPA content.

Microalgae CCUS business model



First joint project reaches commercial scale



Bioproduct Development Case Studies



Contact point

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—E-mail address : info@algalbio.co.jp

Kanadevia Corporation

One ton of organic waste can be converted into;

- CNG: 60Nm³
- Compost, Fertilizer: 0.85ton

30



BIOMASS SUPPLY SOLUTION

Transforming to Biomass Energy through Continuous Supply

Specialized in Biomass Business

SOLID BIOMASS FROM AGRICULTURE RESIDUES



PALM KERNEL SHELL

By-product in the production of palm oil & is commonly used for biomass power plants and industrial boilers



EMPTY FRUIT BUNCH

By-product obtained after steaming & threshing fresh palm fruit can be used as industrial biomass fuel



WOOD PELLET

Establish and operate Wood Pellet Factory located at Gresik at mid 2025 & production capacity at 1,000 MT/month



RICE HUSK PELLET

Biofuel made from rice husk or rice hull, which is the outer layer of the paddy grain and used for industry



VARIOUS TYPES BIOMASS

We develop other type of biomass such as: palm frond, palm trunk, palm fiber, corn cob, sugarcane bagasse and various biomass pellets

OTHERS PROJECT



COMMERCIALIZING FAME PRODUCTION FROM POME

On discussion for commercializing FAME production from POME, collaboration with Japanese University.



DEMONSTRATION ON HYDROTHERMAL CARBONIZATION

In collaboration with Hiroshima University on hydrothermal carbonization demonstration supported by Japanese government to develop biomass in Indonesia



F/S FOR REALIZING SAF PRODUCTION THROUGH GASIFICATION

F/S has been initiated for the production of Sustainable Aviation Fuel (SAF) through gasification of solid biomass



LNG SUPPLY PROJECT

Constructing an LNG regasification plant in West Kalimantan, and start supply from October 2025.

OUR EXPERIENCE AND PLANS

- Supplying biomass (palm kernel shells, wood pellets, rice husk pellets) to Japanese factories in Indonesia since 2023.
- Exploring technology to produce FAME from inedible oils such as POME and UCO since 2023.
- Signing an MoU with a listed palm company to explore the usage of OPT (old palm trunks) in 2023.
- Started the operation of our Wood Pellet factory in 2025.
- Supplying Empty Fruit Bunches to a biomass power plant in North Kalimantan starting in 2026.
- Exploring the possibility of producing SAF from solid biomass since 2024.
- Building an LNG regasification plant in West Kalimantan, with supply beginning in October 2025.

CERTIFIED FOR SUSTAINABILITY



FSC® Certified
FSC® C211605 • www.fsc.org

Contact Us

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Biochar Production from Biomass Waste

Monetizing Industrial Waste Management through Carbon Credits
While Contributing to Soil Improvement and Climate Change Mitigation

Midori Climate Partner Pte. Ltd.

Product and service outline

- ▶ By converting biomass waste, which is currently incinerated or left unmanaged, into biochar and using it for soil improvement, we can contribute to both soil enhancement and climate change mitigation. By registering this initiative as a decarbonization project, it can be monetized through carbon credits.
- ▶ As a carbon credit developer, our company provides support in both technical and financial aspects to ensure the creation of high-quality carbon credits. We offer comprehensive support, from selecting carbonization devices and designing the project to registering it and selling the credits.
- ▶ Apart from biochar projects, we are developing projects such as i) agroforestry and ii) mangroves. We also provide project finance and funding support for projects structured by other developers. Please feel free to consult with us regarding the development of ecosystem restoration-based carbon credits.

Model Case

■ Example of Biomass Waste:

- Coconut shells / Woody biomass (wood chips) / Pulp residues / Fruit seeds / Rice husks / Thinning wood from rubber plantations and orchards / Coffee husks / Cacao shells / Chicken manure, etc.

Note: Biomass that is already being used for energy purposes, such as biomass power generation, cannot be handled.

■ Target Audience

- Farm owners, forest owners, food processing plant owners, agricultural organizations, local governments, etc., that are accumulating large quantities of the above biomass materials.

■ Benefits

- Monetization of industrial waste
- Formation of a circular economy
- Contribution to climate change mitigation, sustainable food production, and soil improvement

■ Step 1: Transforming Biomass Waste Into Biochar



■ Step 2: Biochar Utilization for Soil Amendment



■ Developer's Role



Contact point

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Ririko Takano RIRI



CFB & BFB Boilers

The Power of Sustainable Energy Solutions

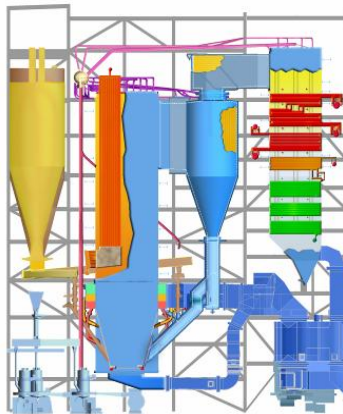


Sumitomo Heavy Industries, Ltd.

Product and Technology Outline

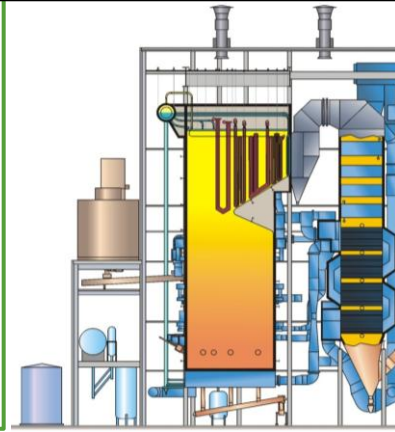
Circulating Fluidized Bed Boilers

Our pioneering CFB boilers have been the backbone of global energy generation for decades. Today they use all kinds of solid fuels, including biomass and refuse-derived fuel (RDF), to produce reliable and efficient clean energy.



Bubbling Fluidized Bed Boilers

Our BFB technologies provide you with a reliable solution for recovering energy from difficult fuels, such as residual biomass and industrial waste. SHI's BFB boilers can handle a wide range of high moisture and high-ash fuels with low emissions and high operational flexibility.



Key Features

1. FUEL FLEXIBILITY

Circulating solids provide high thermal inertia for stable combustion over a wide range of fuels



Coal, lignite



Peat



Wooden chips



RDF



Pellets



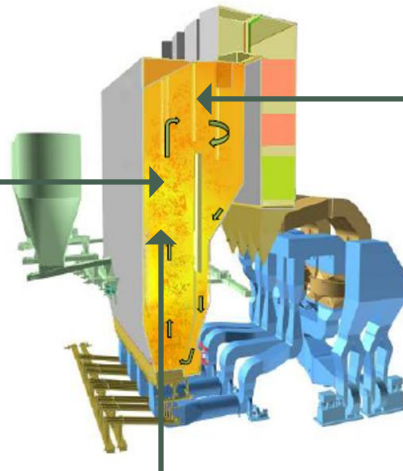
Pet. coke



Agro



Oil shale



2. SIMPLE EMISSION CONTROL

Very Low NOx

- Low Baseline NOx
- Excellent utilization of SNCR due to mixing in solids separator
- Can use slip catalyst for minimizing ammonia slip
- Stringent NOx limits can be achieved with full SCR catalyst

Sulfur Captured in Furnace

- Effective and economical sulfur capture in furnace using limestone

Low CO

- Long burning time, low ash carbon content and low CO emissions

3. HIGH RELIABILITY/ LOW MAINTENANCE

No ash slagging, which minimizes furnace corrosion and fouling

NOx Control

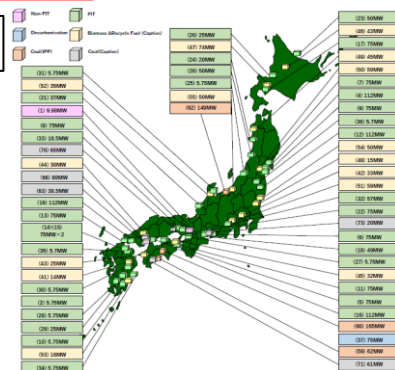
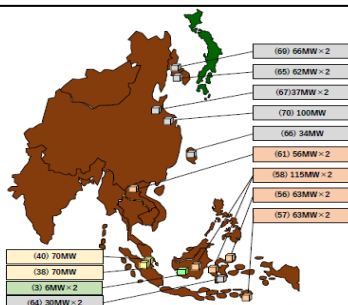
No additional facility > 150 ppm (low-temp two step combustion)
With SNCR > 60 ppm
With SCR > 30 ppm

SOx Control

Limestone injection > 60 ppm
With Wet Scrubber < 30 ppm

Contribution of producing CLEAN POWER

Experience and track record



Contact point:

Sumitomo Heavy Industries, Ltd.

Jakarta Representative Office

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Biomass-derived Acrylic Acid, Acrylic Esters and Superabsorbent Polymers

PT. NIPPON SHOKUBAI INDONESIA
(NIPPON SHOKUBAI CO., LTD.)



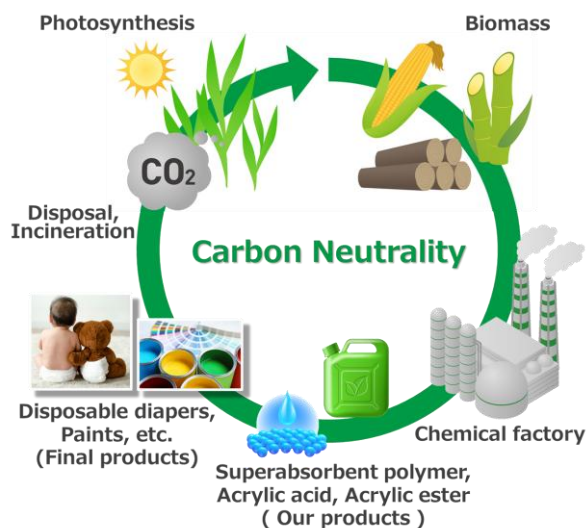
Product and service outline

We have acquired ISCC PLUS certification for Acrylic Acid, Acrylates, and Superabsorbent polymers. And we are manufacturing and marketing these products. **Certified products are allocated biomass-derived raw materials by the mass balance method.** We aim to reduce CO₂ emissions throughout the lifecycles of our customers' final products. These products have been certified by the Indonesian Halal certification authority

Background

Nippon Shokubai is the only one company in Indonesia that manufactures **superabsorbent polymers** (the water absorbing component of disposable diapers), **acrylic esters** (the main raw material paints and adhesives), and **acrylic acid** (raw material for these products). However, the final products—disposable diapers and so on—become a source of CO₂ emissions when disposed and incinerated after use.

Since biomass absorbs and fixes CO₂ in the air through photosynthesis, the CO₂ emitted during incineration can be regarded as **carbon neutral**, leading to a reduction in CO₂ emissions.



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Bio-based (Sugarcane) Plastic

Green polyethylene, Green EVA

PT. Sojitz Indonesia

Product and service outline

- ▶ Green Polyethylene, Green EVA are eco-friendly and easy to recycle plastic resins derived from sugarcane blackstrap molasses, manufactured exclusively by Braskem (located in Brazil).
- ▶ The biggest benefit from using those Green Plastics is the feature of “carbon negative”. Sugarcane absorbs CO₂ in its growing process more than CO₂ emission in subsequent processes such as polymerization, compounding, processing, and logistics. Thus, they contribute to carbon neutrality by serving as an alternative to petrochemical based, without sacrificing the benefits and physical properties of traditional plastics.
- ▶ Sojitz is the “Asia / Oceania Region Distributor” of Green Polyethylene since 2012 and Green EVA since 2023. Sojitz offers stock operation in Vietnam & Thailand from 2024. You can have JIT delivery arrangement in Vietnam & Thailand.

Actual result and example

▪ Green polyethylene
Already used by many global companies (mainly brand owner). Actual used applications are packaging material, shopping bag, garbage bag, bottle, cap, food container, kitchen products, cutlery, artificial grass and non-woven fabric.

▪ Green EVA
Mainly applied to shoe sole (mid sole) of Global brand owner. Other applications are Toy, Yoga-mat, Basketball, Soccer ball, Backpack (cushion material) and Solar panel encapsulant.



Contact point

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Development of SAF Import Infrastructure and Domestic Production Capabilities

PT. Nippon Oil Indonesia

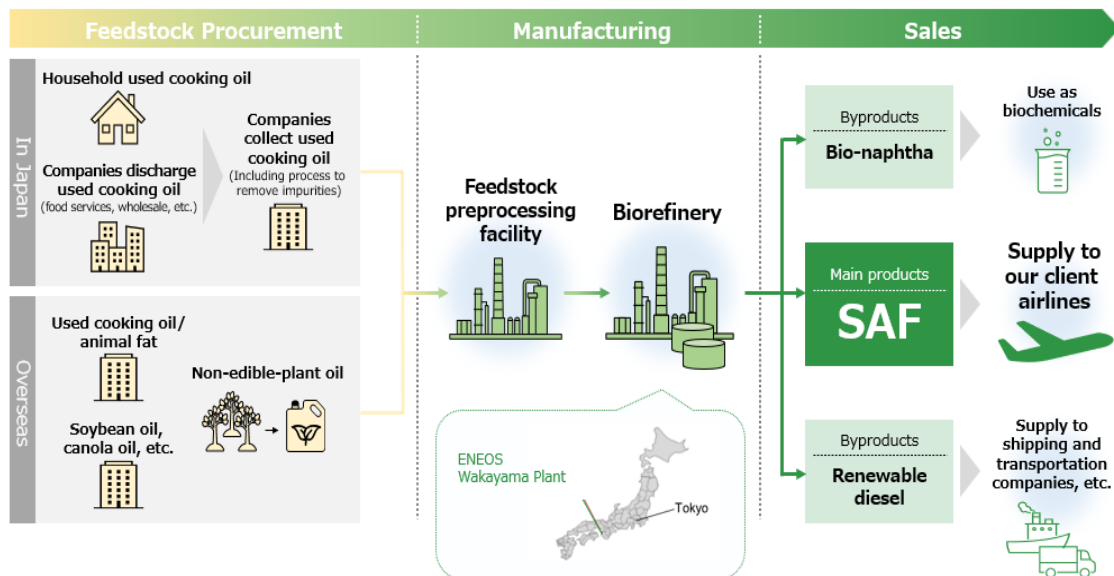
Product and service outline

- ▶ In the aviation industry, where electrification and hydrogen-based solutions remain challenging, Sustainable Aviation Fuel (SAF) is gaining increasing attention as a viable alternative fuel. Adoption is particularly progressing across Europe and North America.
- ▶ To establish a stable supply system for SAF, our company is actively working on both the importation of SAF from overseas in the short term and the development of domestic SAF production capabilities in the medium to long term. In parallel, we are advancing initiatives for feedstock procurement—such as used cooking oil (UCO) and palm-based oils—through partnerships with international stakeholders, including companies in Indonesia.
- ▶ Indonesia possesses abundant resources of SAF feedstocks, including UCO, palm oil byproducts, and non-edible vegetable oils. We expect the country to play a key role in expanding SAF feedstock supply to Japan in the future.

Actual result and example

- In FY2024, we became the first domestic oil refiner in Japan to commence SAF imports and successfully supplied SAF to over 10 airlines.
- We are currently evaluating the construction of a biofuel production facility in Wakayama, with a planned annual SAF production capacity of 400,000 kiloliters. Additionally, we are in the process of securing alliance partners to collaborate on feedstock procurement and logistics.

<The image of our business >



- Discussions have already begun with Indonesian companies regarding the sourcing of key raw materials, such as used cooking oil (UCO, refined UCO), palm-based oils (e.g., PFAD, POME), and non-edible vegetable oils.
- We continue to seek collaborative partners for the supply of SAF feedstocks to Japan (including export via third countries), with flexibility in terms of quality, volume, and other conditions open for discussion.

Contact point / PT. Nippon Oil Indonesia

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3. Decarbonization of Fossil Fuels, CCUS/ Carbon recycling, Hydrogen and Ammonia

- **CCS Technologies Supporting the Transition to a Decarbonization** (JGC HOLDINGS CO., LTD.)
- **Carbon dioxide Capture, Utilization and Storage (CCUS)** (CHIYODA Corporation)
- **LOHC-MCH (SPERA Hydrogen™) System** (CHIYODA Corporation)
- **CT-CO2AR™ CO₂ Reforming Catalyst** (CHIYODA Corporation)
- **CO₂ Reduction with Gas Co-Generation** (PT. MHI ENGINE SYSTEM INDONESIA)
- **CO₂ capture technology to support de/low-carbonization in a wide range of industrial fields** (PT. Toshiba Asia Pacific Indonesia)
- **Hydrogen/Ammonia Regenerative Burner/Air Pollution Control System** (PT. CHUGAI RO INDONESIA)
- **Hydrogen Station, Hydrogen Generation System (PEM)** (Kanadevia Corporation)
- **Pump/Compressor for CCU/S · Ammonia · SAF** (EBARA ELLIOTT ENERGY)
- **Large-scale Electrolysis System** (Chiyoda Corporation)
- **FLUIDIZED BED GASIFIER** (SUMITOMO HEAVY INDUSTRIES)
- **Carbon Capture Technologies** (SUMITOMO HEAVY INDUSTRIES)
- **Technology Modernization and Upgrade** (SUMITOMO HEAVY INDUSTRIES)

CCS Technologies

Supporting the Transition to a Decarbonization

JGC HOLDINGS CO., LTD.

Outline of Services

- ▶ CCS stands for Carbon dioxide Capture and Storage and refers to the collection and storage of CO₂. This technology recovers CO₂ generated in the process of refining fossil fuels or by burning them into the atmosphere, injects them into the ground, and stores them stably over a long period of time. By applying these applications to CO₂ generated during the manufacturing and use of fossil fuels, we can reduce the environmental burden. In recent years, high attention has been paid to it as a trunk card for measures to combat global warming.

Results and Examples

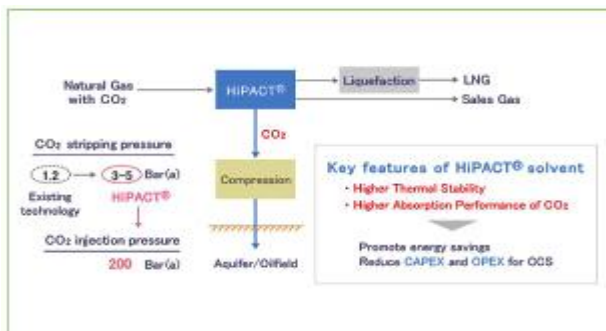
High-Pressure Recycled CO₂ Collection Process "HiPACT®"

HiPACT® has superior high-temperature durability and can separate and recover CO₂ at higher pressures than before, reducing the energy and equipment costs of CCUS's CO₂ compressors. Higher CO₂ absorbency also reduces the volume of amide circulation and reduces the cost of the device itself. We have a result track record of commercial equipment in natural gas plants.

Results and Examples

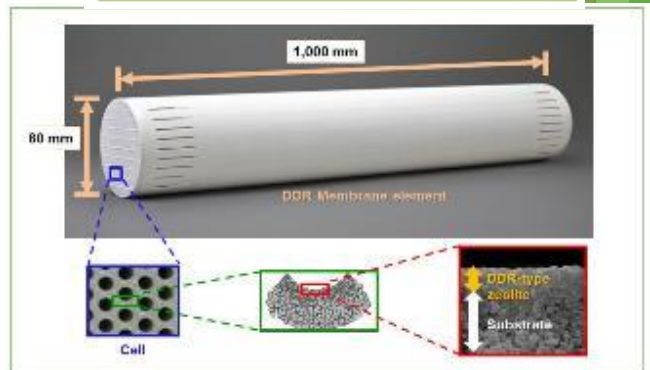
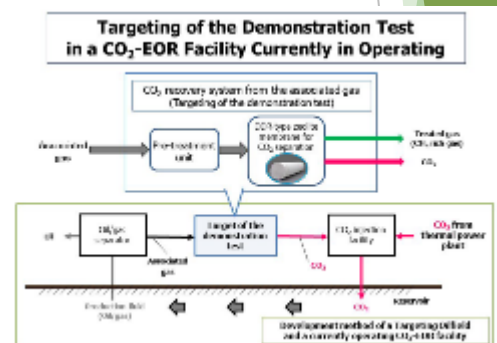
CO₂ Separation Techniques Using DDR Zeolite Membranes

The DDR-type zeolite membrane is one of the largest ceramics CO₂ separators in the world. It allows for precise separation of CO₂ even under harsher conditions with higher pressure and higher CO₂ concentrations than in the past. We are currently conducting demonstration tests to separate CO₂ from associated gases in the U.S. oil field. This technology received the GSC Award Incentive Award in recognition of its past result achievements



HiPACT®プラント
[ナフトナ・インダストリアル・サービス (株) 社・セルビア国]

HiPACT®プラント
MS a.d. Novi Sad (Scriba)



DDR 膜ゼライト管

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PT JGC Indonesia, TANAKA Hideaki, +62 (0)811 958692, tanaka.hide@jgc.com

Carbon dioxide Capture, Utilization and Storage (CCUS)

Contributing to the Realization of a Decarbonized Society

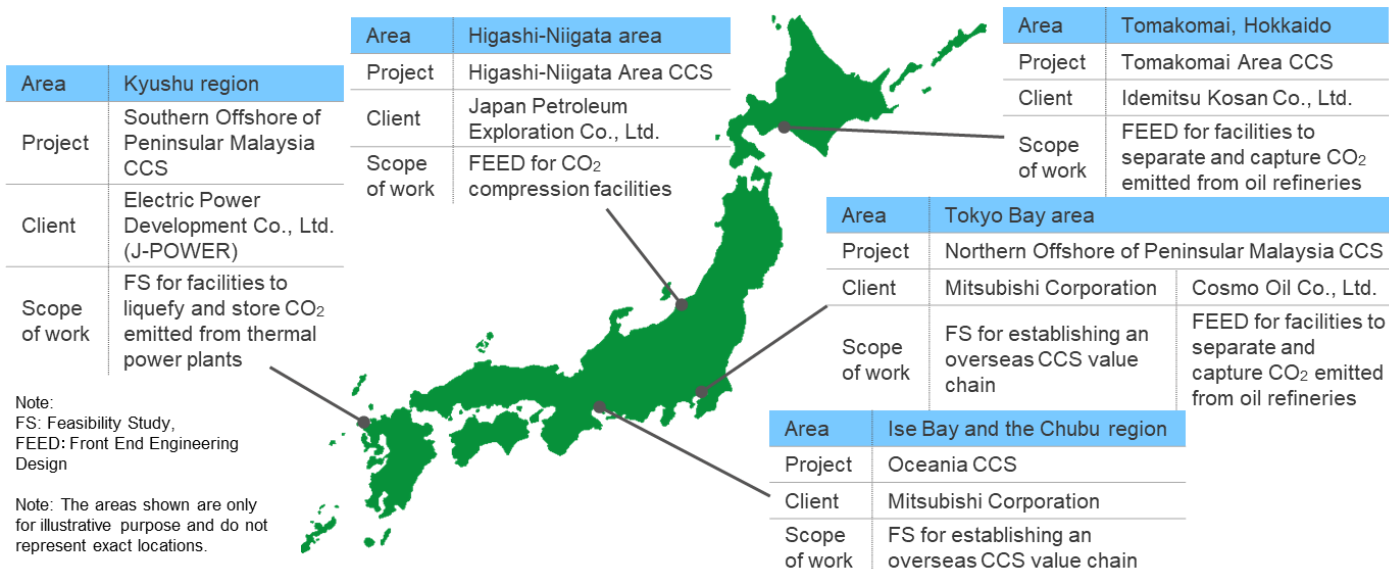
Chiyoda Corporation (PT. Chiyoda International Indonesia)

- ▶ **Integrated CCS Value Chain Solutions:** Chiyoda provides integrated solutions that cover the entire CCS value chain that consists of CO₂ separation, capture, liquefaction, transportation and storage.
- ▶ **CCUS Technology Development:** Chiyoda is actively engaged in technology development and demonstration projects related to CCUS, utilizing our expertise in scale-up technology and engineering expertise in the oil and gas sector and environmental field.

Integrated CCS Value Chain Solutions

1. Advanced CCS Support Projects in Japan

Source: www.chiyodacorp.com/en/ir/assets/2024Q3_Gaiyo_E_r1_1.pdf

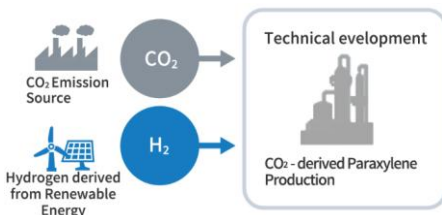


2. EPC for Large Scale CO₂ Capture Demonstration Plant in Japan for Toshiba Energy Systems & Solutions Corporation

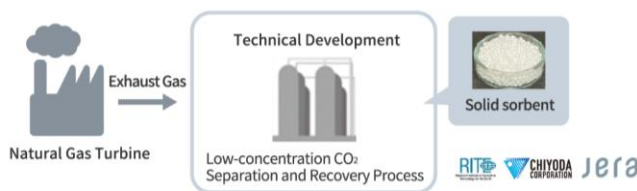
3. Feasibility Study on the large-scale CO₂ capture, transportation and storage in South Sumatra together with PT Pertamina from 2022 to 2023

CCUS Technology Development

1. Para-xylene from CO₂ (CO₂ Utilization)



2. Post Combustion CO₂ Capture using Solid Sorbent from Gas Turbine Fired Exhaust Gas



* Both development projects are supported by NEDO (New Energy and Industrial Technology Development Organization), a Japanese government agency.

Contact point

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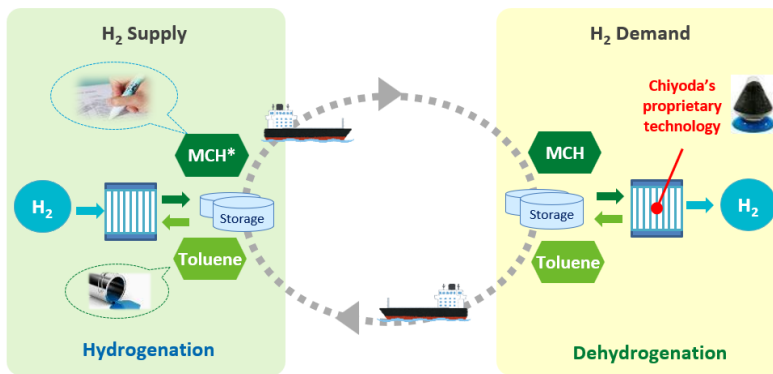
E-mail address : chiyoda-indonesia@cii.co.id

LOHC-MCH (SPERA Hydrogen™) System

Chiyoda Corporation (PT. Chiyoda International Indonesia)

Product and service outline

- ▶ Chiyoda uses methylcyclohexane (MCH) as the hydrogen carrier, enabling the safe, efficient and commercially viable storage and transportation of hydrogen on a global scale.
- ▶ Toluene is initially converted into MCH through hydrogenation in the hydrogen-rich supply country. Following transportation overseas using existing conventional tankers, hydrogen is extracted from the MCH in the consuming country for delivery to consumers, through dehydrogenation using Chiyoda's 'in-house' developed, proprietary catalyst. The toluene is recovered through the dehydrogenation process and transported by tanker back to the supply country in a continuous loop, to be re-used as feedstock for further hydrogenation.



Easy to Handle

Existing Infrastructure

Safe with Lower Risk

Circular System

Actual result and example

Global hydrogen supply chain demonstration project completed in 2020



MCH dehydrogenation at Kawasaki, Japan



MCH production in Brunei Darussalam

Singapore demo project utilizing compacted dehydrogenation package completed in 2025



Contact point

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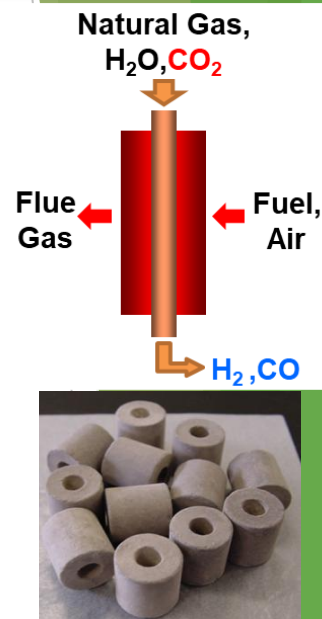
E-mail address : chiyoda-indonesia@cii.co.id

Chiyoda Corporation (PT. Chiyoda International Indonesia)

Product and Service Outline

- ▶ CT-CO2AR™ is a unique & advanced technology utilizing CO₂ as reforming agent to efficiently produce synthetic gases of varying H₂/CO ratios.
- ▶ CT-CO2AR™ enables the monetization of low-calorie, CO₂-containing natural gas fields and can also be applied to the efficient reuse of CO₂ emitted from various industrial processes.
- ▶ Synthesis gases are the feeds for producing various chemicals and liquid fuels (DME, GTL-fuels etc.).
- ▶ The CT-CO2AR™ consumes CO₂ as a reforming agent and in tandem with its unique reforming catalyst, achieves high energy-efficiency. CT-CO2AR™ is thus, an environment-friendly technology due to significant reduction in emissions.

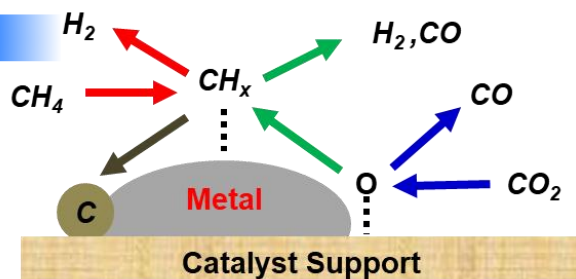
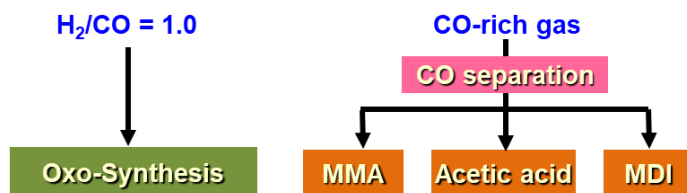
See more on YouTube: https://www.youtube.com/watch?v=f6TtfF_vm-E



Feature

- **Direct production of Synthesis gases with a wide range of H₂/CO ratios**
CT-CO2AR™ enables the efficient production of synthesis gases with a wide range of H₂/CO ratios by varying the feed gas ratios such as steam/carbon ratio and CO₂/carbon ratio.

CT-CO2AR™ (Chiyoda CO₂ Reforming Catalyst)



- **Synthesis gas production under optimum conditions with a novel catalyst**
CT-CO2AR™ has high resistance to carbon formation, and results in significant reductions in the amount of steam and CO₂. Consequently, CT-CO2AR™ produces synthesis gases with high energy efficiency.
- **High energy-efficiency and cost-competitive performance**
Compared to conventional reforming catalysts, CT-CO2AR™ reduces the amount of feed, natural gas fuel and recycled CO₂. This results in improved energy efficiency and a significant reduction in CAPEX, OPEX and CO₂ emissions.
- In the case of H₂/CO=1.0, more than 10% of the total energy input (feed and fuel natural gas + utility consumption), and more than 20% of the CO₂ emissions are reduced compared to conventional catalysts.

Contact Us:

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CO₂ Reduction with Gas Co-Generation

Also Contributing to BCP (Business Continuity Plan)

PT. MHI ENGINE SYSTEM INDONESIA

Product and Service Outline

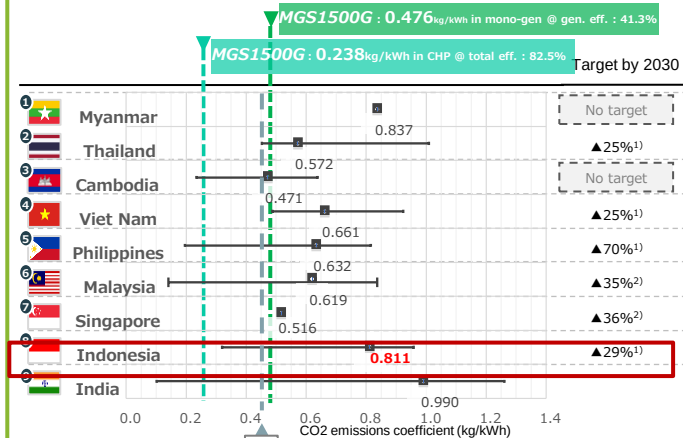
- ▶ Under the circumstances where decarbonization efforts are required worldwide, all companies were being required not only setting their target, but also establishing a practical plan and its verification. Other than short term solution such as Renewable Energy Certificates (REC), we propose Gas Co-generation System as a sustainable and developmental solution to achieve low carbon operation of the companies.
- ▶ Compared with Japan and other Southeast Asian countries, Indonesian electricity supply is still dependent on low efficient and carbon intensive coal-fired power plants. Therefore, CO₂ reduction by the installation of Gas Co-generator System in Indonesia is significantly larger than other countries. Furthermore, there is an opportunity to utilize the Joint Crediting Mechanism (JCM) subsidy by the Ministry of Environment of Japan.
- ▶ Depending on the future development and availability of hydrogen and other carbon-free fuels, users may replace the engine or its components with continuous utilization of existing auxiliary system. Which means, emission reduction in the transition period is compatible with the preparation of zero carbon in the future.
- ▶ In the event of disaster, the Gas Co-generation System can generate electricity independent from the electricity grid. Such resilience contributes to Business Continuity Plan (BCP).

Achievements and Example

- The highly reliable gas engines are developed and produced in Japan accompanied by its service system.
- The Gas Co-generation Systems have been widely installed in Japan such as automotive, food, pharmacy and chemical factories with a good achievement.
- Corresponding to electricity/heat demand and operation mode of each factory, we can propose optimal output and number of units for each factory.
- For more than 30 years of operation in Indonesia, we have supplied more than 3,000 units of engines which is reliable and can be trusted.
- In addition to supply the equipment, we also provide services related to leasing and energy for business operators.
- It is also possible to propose a method of assuming that biogas is used while using pipeline natural gas.

	MGS500G ₋₁	MGS1000G ₋₁	MGS1500G ₋₁
Engine Model	GS6R2	GS16R2	
Output	500kW	1000kW	1500kW
Gen. Eff.	40.2%	44.0%	41.3%
Hot water	19.6%	13.5%	18.9%
Exhaust heat	21.3%	19.6%	22.3%
Total. Eff.	81.1%	77.1%	82.5%
Maximum annual CO2 reduction amount in Indonesia	1500 t/unit	3200 t/unit	4700 t/unit

Power Grid CO₂ Emissions by country



1. Compared with BAU (no additional effort made to reduce emissions); 2. Compared with 2005 (real GDP)
Source: <https://www.iges.or.jp/>, IGES_GRID_EF_v11.0_20221012.xlsx



Contact point

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—Mobile: +62-81119262048

—E-mail address : budi.wibowo.wh@mhi.com & fitria.dina.d7@mhi.com

CO₂ capture technology to support de/low-carbonization in a wide range of industrial fields

PT. Toshiba Asia Pacific Indonesia

Outline of the Products and Service

- ▶ CCS/CCU means Carbon dioxide Capture and Storage, or Utilization technology. In this context, we aim to establish and promote CO₂ capture technology.
- ▶ Toshiba ESS applies post combustion capture technology based on chemical absorption process. Using chemical absorbents which has a characteristic to selectively capture CO₂ within the flue gas at a certain temperature condition in the absorber tower, and to release it at a different temperature condition in the stripper tower, CO₂ is continuously separated from the flue gas of the CO₂ emitting plant.
- ▶ Post combustion capture technology applies not only to coal fired power plants, but also to other CO₂ emitting power plants, such as oil fired, gas fired, gas combined cycle, biomass fired plants. Technology applies not only to new build plants, but also as retrofit to existing plants. The portion of CO₂ emission to be captured from the plant can be customized, giving this technology the flexibility to answer to various needs of the market and industry.

Experience / Case

Environmental-Friendly CCS Demonstration Project (Ministry of the Environment) CO₂ Capture Facility

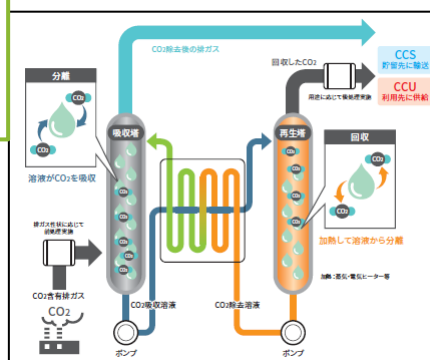
- The facility separates and captures 600 tons of CO₂ per day, which is more than 50% of the CO₂ emitted from the Mikawa Power Station, and started operation in Oct 2020.
- In response to the issue of extremely small amounts of CO₂ capturing liquid being released into the air, a cleaning liquid was installed at this demonstration facility and as a result of comparison with the conventional method*, it was confirmed that the amount of released CO₂ capturing liquid would be reduced to about 10% than the conventional method.* Toshiba's own Mikawa Pilot Plant



Experience / Case

CO₂ capture and utilization (CCU) for Saga City Incineration Plant.

- This facility separates and captures 10 tons of CO₂ per day from the exhaust gas of the Saga City Incineration Plant, and started operation in Sep 2016.
- Field demonstration of a new CO₂ absorbing liquid at the facility began in April 2023. The new CO₂ absorbing liquid will lead to a reduction in equipment maintenance and management costs.



Contact Point

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Hydrogen/Ammonia Regenerative Burner/ Air Pollution Control System

~Leave to decarbonization to Chugai Ro's thermal technology~

PT. CHUGAI RO INDONESIA

Product and service outline

CHUGAI RO INDONESIA was established in 2012 as a local subsidiary of Chugai Ro Co., Ltd.

We sell and provide after-sales service for Industrial furnaces, Combustion equipment, and Industrial machinery. To actualize carbon neutral, we develop combustion technology which is not emitting CO₂, and heat treatment equipment for EVs, rechargeable battery, and semi-conductor component.

We will provide all solution needed by customers related to thermal technology as an effort to create sustainable society.

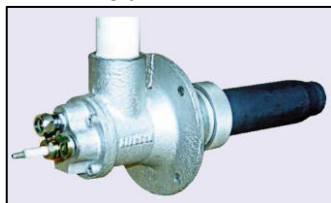
- ▶ Burner and combustion control equipment (hydrogen burner, ammonia burner, regenerative burner, oxygen burner, etc.)
- ▶ Plant for steel/non-steel metals and reheating furnace/heat treatment furnace (SUS-APL/BAL, Cu-APL/BAL, AL-CAL, CGL, H2-BAF, CCL/AL-CCL)
- ▶ Heat treatment furnace for automobiles mechanical parts, batteries, circuit boards, catalysts, magnetic materials, shapes of materials, pipe materials, and wire rod.
- ▶ Air Pollution Control System (RTO), Environmental Equipment (Multi-retort Rotary Kiln, Fluidized Bed Type Heating System)

BROCHURE LIST

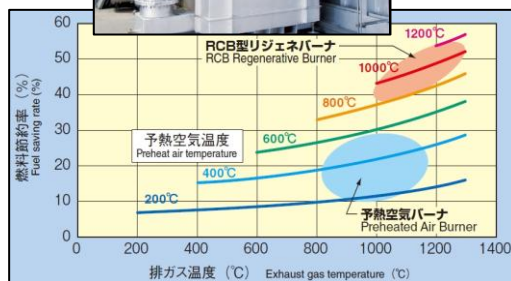


Actual result and example

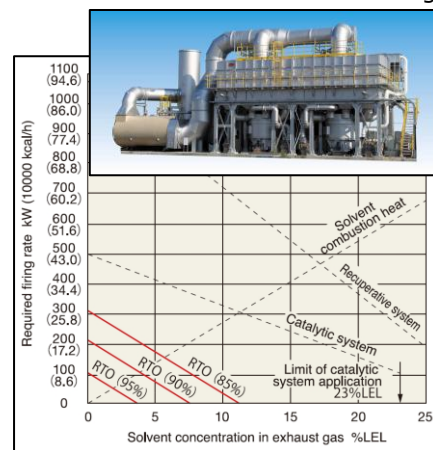
- 1994 Developed and started sales of RTO (No. 1 system in Japan, with over 320 units ordered and delivered)
- 2018 Developed hydrogen burner in the world's first in conjunction with Toyota Motor Corporation
- 2021 Adopted for NEDO "Energy and Environment New Technology Leading Research Program (Decarbonized Industrial Furnace Using Innovative Ammonia Combustion)" and "Ammonia Mixed Firing Thermal Power Generation Technology and Verification Project"
- 2022 Order for Japan's first hydrogen combustion Exhaust gas treatment equipment
- 2023 Participated in the Ministry of the Environment's JCM Project "Decarbonization and Smart City Formation Promotion Project for Sakai city and Vietnam cities"
- 2023 Adopted for NEDO "Green Innovation Fund Project/Decarbonization of Thermal Processes in Manufacturing Field"



Hydrogen Burner



Regenerative Burner



Regenerative Thermal Oxidizer(RTO)

Contact point

PT. CHUGAI RO INDONESIA

Phone number : +62-21-5279652

Japanese/English : Teppei Hagiwara (E-mail : Teppei.Hagiwara@n.chugai.co.jp)

Bahasa Indonesia/English : Zulfikar (E-mail : engineeringengineering01@n-crid.com)



<https://chugai.co.jp>

Hydrogen Station, Hydrogen Generation System (PEM)

Kanadevia Corporation

Product and service outline

We provide;

- ▶ **Hydrogen stations** with our **PEM type** hydrogen generation system;
- ▶ **EPC service** including engineering, procurement, construction;
- ▶ **Remote monitoring system** and maintenance service;
- ▶ **Automatic operation system** which requires no complicated operation management;
- ▶ Functionality to **follow acute fluctuation of photovoltaic power etc.**;
- ▶ Comforts with **no need to treat wastewater** due to no use of alkaline solution;
- ▶ Easy installation at sites and shorter construction period as it is a container type;
- ▶ Several units if H₂ generator's capacity is more than 200 Nm³/h.
- ▶ One unit if H₂ generator's capacity is less than 200Nm³/h.

<Product Specification>

H2 Gas Generation	Nm ³ /h	10	100	200
Generated Pressure	MPaG	Up to 0.85		
H2 Gas Purity	%	Up to 99.999		
Dew Point	°C	-15~-70		
Required Pure Water	L/h	10	100	200
Power Consumption	kWh/Nm ³ -H ₂	5.0 (depending on designs)		
Dimensions	M	2 x 4.8 x 2.5	2.44 x 12.2 x 2.9	

<Image>



Actual result and example

- A total of references is more than **50 projects**. One of them is operating for **15 years**.

Contact point

Kanadevia Corporation, Yasukazu Aono

WA&TEL: +62-811-1020-237, Email: aono@kanadevia.com

Pump/Compressor for CCU/S • Ammonia • SAF

EBARA ELLIOTT ENERGY (PT EBARA TURBOMACHINERY SERVICES INDONESIA)

▶ CCU/S

Ebara Elliott Energy has experiences of both compressors and pumps handling gas, liquid and supercritical CO₂. We can offer optimized solution suitable for various application / fluid phase of CO₂ transport and compression.

▶ Ammonia

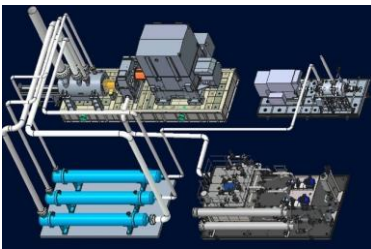
We lineup a Seal-less pump for power generation and shipping/receiving terminal of low temp. liquid ammonia. Our products can cope with both in-tank and out of tank application. We contribute to eco-friendly and safe site operation.

▶ SAF(Sustainable Aviation Fuel)

SAF contributes to the decarbonization of the aviation industry. While conventional fuels are refined from crude oil, SAF is made from biomass materials or waste cooking oil and is expected to contribute to a sustainable world.

▶ CCU/S

CO₂Phase Hybrid Compressor Pump Solution



CO₂ Injection Pump



▶ Ammonia

ACR/VPCC: In-Tank application



VPCC: out of tank application



▶ SAF

We have delivered many compressors and custom pumps to the Oil & GAS customers.

Based on experience, achievements, and technologies, we will contribute to SAF production furthermore a sustainable world.

*We received an order for compressors for a SAF project in Thailand last year. Below is a compressor of the same type as the one ordered.



Contact point

PT. Ebara Turbomachinery Services Indonesia

-Takahisa Sekino:Japanese and English support, Phone:+62-812-7090-3550, E-mail:sekino.takahisa@ebara.com

-Siti Sulaiha:Indonesian and English support, Phone:+62-811-8113-3380, E-mail:ssulaiha@elliott-turbo.com

Large-scale Electrolysis System

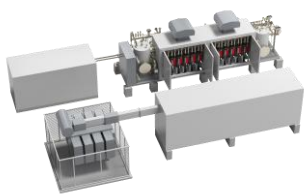
Achieving a Low-Cost, Highly-Efficient, High-Quality Electrolysis System

Chiyoda Corporation (PT. Chiyoda International Indonesia)

Product and service outline

- ▶ Chiyoda and Toyota Motor Corporation have signed a basic agreement on cooperation in December 2023 to jointly develop a large-scale electrolysis system and establish a strategic partnership.
- ▶ Toyota's technology for production and mass production of electrolysis cell stacks using the fuel cells and Chiyoda's technologies in processing plant design and large-scale plant construction will be combined and optimized, allowing such benefits as lower costs, increased production efficiency, quality assurance and wide capacity range for the electrolysis systems required to produce green hydrogen.
- ▶ By 2029, we plan to begin mass production of cell stacks, and introduce 20MW class electrolysis system to go along with 5MW class to meet the hydrogen production demand ranging from small to large scale applications.

Features 5MW Electrolysis System CTXE5000-2A



20MW Electrolysis System CTXE20000-2A



High Reliability

Over 30 years development of fuel cell technology by Toyota

High Efficiency

World-leading high efficiency in power consumption

Compact System

Containerized electrolysis system

Wide Capacity Range

Scalable lineup from small to large capacities according to applications

Maintenance Services Leveraged by Engineering Expertise

Daily Operation/Maintenance

Troubleshooting Support

Periodic Maintenance

Standard Maintenance Services

High-value Services Utilizing Advanced Technologies

Operation Optimization

Failure Prediction

Maintenance Planning Optimization

Contact point

PT. Chiyoda International Indonesia

Phone number : +62 21 2903 9255

E-mail address : chiyoda-indonesia@cii.co.id

FLUIDIZED BED GASIFIER

Gasification of solid waste into syngas, biofuels & chemicals, or plastics recycling

SUMITOMO HEAVY INDUSTRIES, Ltd.



Product and service outline

Gasification is a process that turns solid fuels into gases - called syngas - which can be used for combustion or production of chemicals and synthetic fuels. The main components in the syngas are hydrogen and carbon monoxide, the basic "building blocks" of many valuable chemicals and fuels, such as methanol, diesel and jet fuel.

Features of Air Gasification

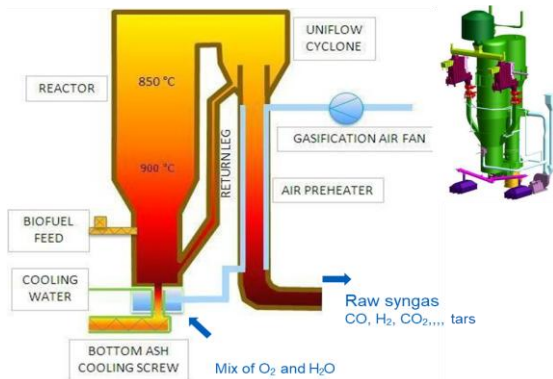
- The most fuel-flexible gasification technology in the market**
Our fluidized bed gasifiers can utilize a wide range of fuels, including waste streams such as refuse-derived fuels (RDF/REF), demolition wood, forest and agriculture residues, sludge, and other non-recyclable wastes.
- Superior fluidized bed technology for high efficiency**
Our gasifiers take advantage of vigorous mixing and long particle residence times to efficiently gasify even the lower quality fuels. Another benefit of low-temperature fluid bed gasification technology is that the residual ash never melts, allowing the use of feedstocks considered too corrosive for other gasifiers.
- Replacing fossil fuels on existing processes**
Fluidized bed gasifiers can be installed next to pulverized coal units to take advantage of local wastes while reducing carbon emissions. It can also be applied in other Integrated Gasification Combined Cycle (IGCC) power plants and can be applied to replace fossil fuels in lime and cement kilns, thereby reducing carbon dioxide emissions.
- Gasification technology for recycling applications**
Air gasification can be used to recover materials and energy from waste streams. And our gasification technology allows the recovery of aluminium while generating heat and power from the non-recyclable plastic stream.

Features of Oxy-Steam Gasification

- The most fuel-flexible gasification technology in the market**
Our technology can utilize a wide range of fuels, including waste streams such as refuse-derived fuels (RDF/REF), demolition wood, forest residues, sludge, and other non-recyclable waste.
- Superior fluidized bed technology for high efficiency**
Our gasifiers take advantage of vigorous mixing and long particle residence times to efficiently gasify even the lower quality fuels. Another benefit of low-temperature fluid bed gasification technology is that the residual ash never melts, allowing the use of feedstocks considered too corrosive for other gasifiers.
- Production of carbon-neutral chemicals and fuels**
The system produces ultra-clean syngas that can be used in the production of renewable diesel from biomass. The oxy-steam gasification technology can also be applied to convert waste to fuels and chemicals.

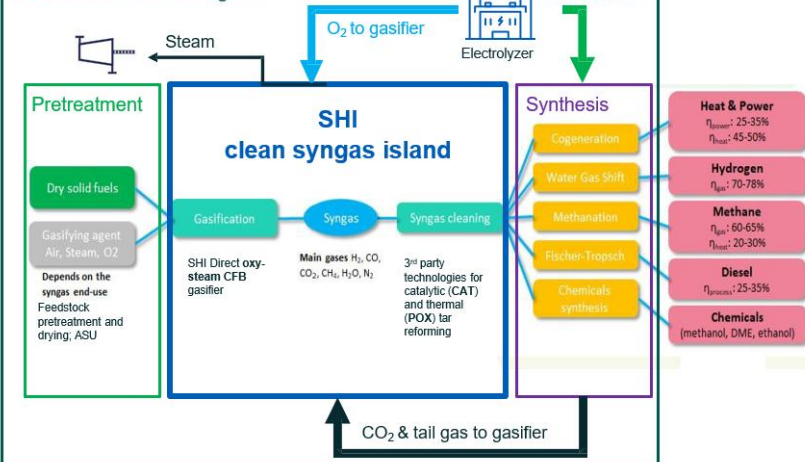
Feedstocks used : Wood based biomass (chips, barks, first felling wood, forest residues); Agrobiomass; Peat; Recycle fuels (REF, RDF, plastics, Al-PE mixture, etc.); Coal; Sludge; Tyres

Fluidized Bed Gasification Technology



- High mass and heat transfer and long residence time
- Diverse bio / waste feedstocks and limited pretreatment
- Limestone for in-situ tar cracking in the gasifier bed
- High carbon conversion into the syngas
- Fluidized bed gasifiers can be easily scaled up
- Atmospheric pressure ensures reliable feedstock feeding
- Oxy-steam ensures simple system without combustor
- Syngas with high CO₂ facilitates CO₂ removal
- Synergy with green H₂ (O₂ and H₂ from electrolysis)

EPC contractor and integrator



Location: Varkaus, Finland
Customer: Stora Enso Oyj & Neste Oil Corporation
Start-Up Year: 2009
Capacity: 12 MWth
Scope: Biomass Gasifier
Fuel: Biomass, Forestry Residues
Gasifier Type: CFB

Contact point

Sumitomo Heavy Industries, Ltd. Jakarta Representative Office
Yukio Yokoi : +62-811-1916-4272 (English / Japanese)
yukio.yokoi@shi-g.com
Titto Dwi Prakarsa (Mr.) : +62-811-1311-0173 (English / Indonesian)
titto.dwiprakarsa@shi-g.com

Technology Modernization and Upgrade (TMU)

Reduced carbon footprint, enhance efficiency & sustainability in your energy production



Sumitomo
Heavy Industries, Ltd.

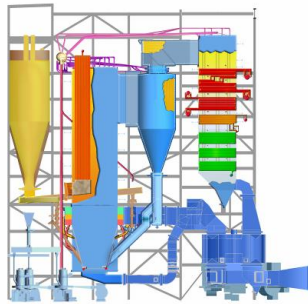
Sumitomo Heavy Industries, Ltd.

Our Services:

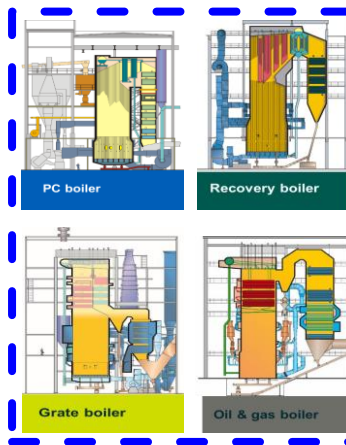
- ▶ **FUEL RANGE EXPANSION** and **CONVERSION** including full combustion technology retrofits
- ▶ Boiler **capacity UPGRADES** and **process IMPROVEMENTS**
- ▶ Boiler Maintenance and operation **OPTIMIZATION**
- ▶ Pressure parts **LIFETIME** evaluation and **EXTENSION**
- ▶ Plant **optimization and STUDIES** (feasibility and engineering)

SHI fuel database covers
totally **more than 1,500** analyses,
200 different types of fuels.

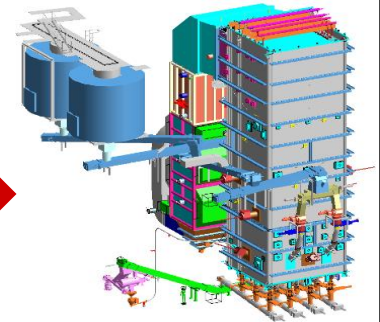
CFB Boiler UPGRADE



Increase biomass and/or
Solid Refused Fuel (SRF) share



BFB or CFB Boiler RETROFIT



Non-CFB / BFB → BFB / CFB

Boiler PROBLEMS

Related biomass utilization

Sintering

Agglomeration

Fouling

Erosion

Corrosion



Our SOLUTIONS

- Fuel Feeding System Upgrade
- Furnace Grid Replacement
- Back Pass Modification
- Air System Modification
- Material Upgrade
- Additive Injection
- And more other solutions

Experience

More than

38

Boiler Retrofit
Projects
Experience

TMU Benefits

- Cost Saving
- Regulatory Compliance
- Sustainable Operation

*“By collaborating with SHI, Ltd., you really can achieve your **net-zero targets** and navigate success in the changing Energy market environment.”*

Contact point: Sumitomo Heavy Industries, Ltd - Jakarta Representative Office

Mr. Yukio Yokoi (English/Japanese) | Phone: +62-811-1916-4272 | Email: yukio.yokoi@shi-g.com

Mr. Titto Dwi Prakarsa (English/Indonesian) | Phone: +62-811-1311-0173 | Email: titto.dwiprakarsa@shi-g.com

4. Electrification of Vehicles, Battery

- **BaaS** (PT. Santomo Green Power Management)
- **DENDO DRIVE HOUSE** (PT. Mitsubishi Motors Krama Yudha Sales Indonesia)
- **Ultra Rapid Charging EV Bus** (Toshiba Corporation (Battery Business Dept.))
- **EV Charging “Terra Charge”** (Terra Charge Corporation)

BaaS (Battery as a Service) and Electric Motorcycle

PT Santomo Green Power Management

Product and service outline

- ▶ Through BaaS (Battery as a Service) project utilizing batteries of electric motorcycle, PT SGPM is trying to contribute to decarbonization and establishing an EV eco-system in Indonesia. Currently PT SGPM is conducting electric motorcycle Sales / Rental, Battery-Sharing Service through Battery Swap Station (BSS).
- ▶ Electric motorcycles which we are providing are battery swappable, so that users can enjoy their rides without the concerns of charging and driving range. Fast swapping process within 10 seconds and approximately 50% fuel cost saving are considered valuable from our users. This solution is suitable to heavy motorcycle users such as logistic companies and online drivers. SGPM is providing electric motorcycles by rental to drivers such as Gojek and Grab who cannot afford to buy motorcycles and/or who cannot pass credit checking by multi-finance services.
- ▶ It is expected to contribute to further decarbonization by utilization of renewable energy for EVs, so that PT SGPM has conducted POC in which we have implemented the small-scale solar PV that connects to BSS to provide 100% green energy for electric motorcycles. Also, battery disposal is considered as an upcoming issue in era of EVs. PT SGPM has conducted POC to utilize used-battery as a power source to use home appliances to reduce the amount of battery waste.



Actual result and example

2022	Executed MOU with PT Swap Energi Indonesia for the exclusive partnership to operate Battery Swap Stations (BSS) and battery sharing service in East Indonesia.
	Executed MOU with Gojek to conduct a POC to try 20 units e-motorcycles for Gojek Drivers in Makassar.
	Executed MOU with PT Smoot Motor Indonesia for the sole-distributor of e-Motorcycle in East Indonesia. Started deployment of BSS units at Alfamart outlets in Makassar.
2023	Opened direct-managed showroom that provides Sales/Service/Spare Parts in Makassar.
	Started deployment of BSS units at outlets of Circle-K. 50 units of BSS were working at this moment.
	Started e-motorcycle rental business to Gojek / Grab drivers.
2024	Conducted POC with Hasannudin University for charging renewable energy utilizing small scale Solar PV.
	Conducted POC to utilized used battery units for home appliances.
	Started deployment of BSS units at outlets of Alfamidi. 65 units of BSS were working at this moment.
2025	Executed MOU with Gojek to conduct a POC to try 20 units e-motorcycles for Gojek Drivers in Surabaya.
	Opened direct-managed showroom that provides Sales/Rental/Service/Spare Parts in Surabaya. Started commercial business of Rental/Service of E-motorcycles and BSS Operation in Surabaya.



Electric Motorcycle Supply more than 800 units



Operating BSS Units 100 units

Contact point

PT. Santomo Green Power Management (Mr. Jafar: English and Bahasa support)

—Phone number : +62-815-9122-224

—E-mail address : jafar.alqudus@gpm-swap.id

DENDO DRIVE HOUSE (DDH)

PT. Mitsubishi Motors Krama Yudha Sales Indonesia (MMKSI)

Product and Service Outline

- ▶ DDH is an eco-system package for home use, consisting of Mitsubishi Motors' electrified vehicle, V2H(*1) bi-directional charger, solar panels, etc. It enables the user to charge their electrified vehicle with solar generated power and conversely supply power from electrified vehicle to their home, saving electricity costs and providing convenience as an emergency power source.
- ▶ The user can save electricity costs by charging the electrified vehicle with the excess power generated by the solar panels and supplying power from the electrified vehicle to their home at night.
- ▶ By using the clean electric power generated by the solar panels to power home appliances or electrified vehicle, the user can contribute to the realization of a low carbon society.
- ▶ Even during urgent situation such as power failure, DDH provides a power source that can supply power generated by the solar panels or power from the electrified vehicle to run appliances in the home.



(*1) Vehicle to Home: A system of supplying homes with electric power stored in electrified vehicle batteries.



Actual Result and Example

- After being exhibited for the first time at Geneva International Motor Show 2019, DDH has been exhibited in various exhibitions such as Tokyo Motor Show.
- In March 2022, DDH was set up and opened for the public at the head office of Mitsubishi Motors Krama Yudha Sales Indonesia (MMKSI), Mitsubishi Motors' sales company in Indonesia.
- Indonesia is the third country after Japan and Thailand where Mitsubishi Motors has set up DDH in its head office-related facility.
- MMKSI's DDH has a co-working space and meeting rooms that can be used by visitors and employees, as well as an energy flow panel that visualizes DDH's flow of electricity and the amount of CO₂ and electricity bill reductions. It is also equipped with a power failure demonstration function, showing how the electric power is supplied from the electrified vehicle in the event of a power failure.
- Starting with the installation at the head office, MMKSI plans to continue to expand the showcase of DDH in Indonesia.

Contact Us:

akiyoshi.fujimori@mitsubishi-motors.co.id (MMKSI: Mr. Fujimori)

guntur.harling@mitsubishi-motors.co.id (MMKSI: Mr. Guntur)

Ultra Rapid Charging EV Bus

EV Bus system that can be realized
only with SCiB™'s safety, long life, and rapid charging

Toshiba Corporation (Battery Business Dept.)

Product/Service Outline

- ▶ SCiB™ is a unique lithium-ion battery provides a rapid charging of over 80% in 6 minutes, a Long life of over 20,000 charge/discharge cycles, and a high level of safety that does not burn when nailed.
- ▶ By using SCiB™, the total number of EV buses can be reduced.
- ▶ Normally, EV buses take more than 3 hours to charge. This standby time does not exist for diesel buses. When replacing diesel buses with EV buses, spare EV buses must be introduced to account for this standby time. The EV bus with SCiB™ can provide a solution to this problem.



Actual Result and Example

Reduction in the number of buses

Unlike diesel buses, EV buses require more than 3 hours of standby time for charging. To compensate for this standby time, you need to introduce spare EV buses. This problem will become more apparent when all one route is replaced with EV buses, so it will become more pronounced as EV buses become more popular in the future. On the other hand, if EV buses are equipped with SCiB™, the number of spare EV buses can be reduced by minimizing the standby time through ultra rapid charging.

Improving electricity consumption

For electric buses, the body weight and the electricity consumption are a trade-off. In order to travel longer distances, they need to carry a lot of batteries. If the amount of batteries is increased, the body weight will increase and the electricity consumption will decrease. On the other hand, if ultra rapid charging is possible, and the operational efficiency of EV buses is improved. They won't need to travel long distance from one charge. As a result, the amount of batteries loaded per EV bus can be reduced and the electricity consumption can be improved.

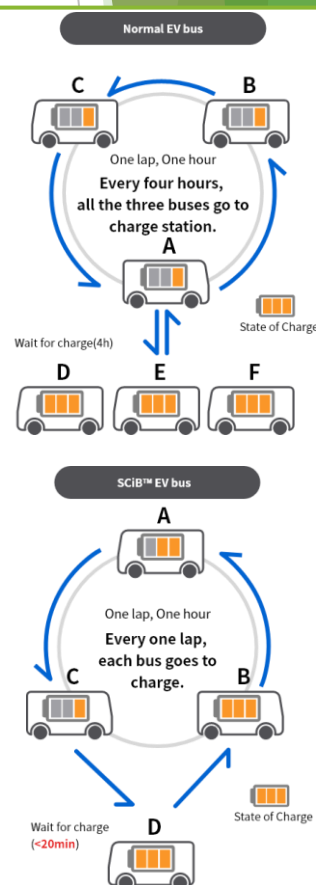
Ultra Rapid Charging

To realize the operation of the Ultra rapid charging EV bus, There are two essential capabilities that a battery should have.

1. Rapid charging 2. Long charge/discharge life. The reason why a longer service life is also needed is that rapid charging improves battery operating rates, resulting in several times more charge/discharge cycles per day than in normal operation. Ultra rapid charging EV bus is a solution that is only possible with SCiB™.

Recruitment Results

More than 2,000 SCiB™-powered ultra-fast charging electric buses are in operation worldwide, mainly in Europe.



Contact point

Toshiba Corporation Battery Business Dept.

Web inquiry form [Inquiry Form](#) | [TOSHIBA Rechargeable battery SCiB™](#)

PT. Toshiba Asia Pacific Indonesia

Mr. Agung Pratomo Subagio : +62 813 1757 1957, agung_pratomo_subagio@tasia.toshiba.co.jp
(English / Japanese / Indonesian)



EV Charging “Terra Charge”

You can use EV Charging Service Everywhere

Terra Charge Corporation

Overview of Product and Service

- Terra Charge was formerly known as Terra Motors Corporation, which is involved in the development and sales of EVs in Japan and other countries and holds the top share of the EV tricycle market in India. We have been consistently involved in the EV business since our establishment in 2010, and have started EV charging business in Japan in 2022 with the aim of becoming the top global EV infrastructure company.
- In 2023, we got the top market share in Japan, and later expanded our business to Indonesia in December 2023.
- Without an increase in charging spots, it's difficult to purchase an EV, and without more EVs, it's challenging to invest in charging infrastructure. To tackle this challenge of EV adoption, we're reducing initial costs and running expenses, lowering the burden on site owners considering installing EV charging facilities. Additionally, we're supporting the introduction of charging facilities in a wide range of facilities, including condominiums with difficult consensus building, commercial facilities, and office towers. Leveraging our expertise in the EV industry, we offer a one-stop solution for everything from the development of EV charging facilities, charging spot deployment, installation works, to providing and managing charging services for end-users, a task that would be difficult without specialized knowledge in EV operations.
- Charging service can be easily used via our mobile app, and site owner management is simplified because we provide EV charging spot search, reservation, charging, and payment all in one place.

Achievements and Examples

- Orders for 25,000 EV charging sites have been received in Japan (as of Jan. 2024)
- We are working extensively with major developers in Indonesia to reduce the hurdles to introducing EV charging facilities.

<Apartment>

Setiabudi Skygarden/Saveria Apartment/Fraser Menteng/Bogor Apartemen Icon/Eksektif Menteng/Mediterrania Boulevard, etc.

<Office>

CEO Building/Mega Plaza/18 Office Park/Kartika Tower/IFC Tower, etc.

<Accommodations>

Marriott Group/Radisson Group/Ra Suites Group/Sheraton Group, etc.

< Commercial facilities, Golf course, etc. >

Pondok Cabe Golf / Chillax / Seavis Park / ACA SUZUKI, etc.



Examples of EV Charging Facilities

Contact

PT. Terra Charge Indonesia

—Phone number— : +62-852-10922491

—E-mail address— : go.suzuki@terra-charge.co.jp

(Mr. Go Suzuki : English • Japanese)

5. Energy Conservation

- **Low Carbon Solution for Industry**
(PT. Mitsubishi Heavy Industries Indonesia)
- **α-ESG(Fluid Stirring Device)** (ESG TECHNOLOGIES CO., LTD)
- **HERO - Hybrid Energy System Re-Optimization**
(Toyo Engineering Co., Ltd)
- ***SUPERHIDIC®*** (Toyo Engineering Co., Ltd)
- **Control Solution for Building Energy Saving (ESCO)**
(PT. Azbil Berca Indonesia)
- **Energy Saving Solution Service : ENEOPT™**
(PT. Azbil Berca Indonesia)
- **Solutions and Products for Productivity and Sustainability**
(SATO HOLDINGS CORPORATION)
- **ENERGY SAVING SOLUTION**
(PT. MITSUBISHI ELECTRIC INDONESIA)
- **Implementation of Energy Conservation and CO2 Emission Reduction by Utilization of LED Lamp**
(PT RECOMM BUSINESS SOLUTIONS INDONESIA)
- **NATRUS^{+e} W Pedestrian Flow Solution**
(Nabtesco Corporation NABCO Automatic Door)
- **Carbon-Neutral Society realization by ECO appliance launches**
(PT Panasonic Gobel Indonesia)
- **“Thermal Insulation Mix” by Win Armor 03 (Heat Insulation Painting Material) for Window Glasses**
(Marugen Takeuchi Gumi Co.,Ltd.)
- **Energy Consumption Reduction on Water Treatment by NH4 & DO monitoring** (PT. HORIBA INDONESIA)
- **Thermal Solution Service using refractory and insulation materials**
(PT SHINAGAWA REFRACTECH PERKASA (Shinagawa Refra))

5. Energy Conservation

- **COKE DRY QUENCHING (CDQ)**
(Nippon Steel Engineering Co., Ltd.)
- **CO2 Reduction and Energy-Saving Solutions with Absorption Chillers**
(PT Panasonic Gobel Indonesia)
- **High-Performance Polymer Solutions Supporting a Decarbonized Society**
(PT. SEKISUI POLYMATECH INDONESIA)
- **Radiative Cooling Material “Radi-Cool”**
(PT.KASHIWABARA ENGINEERING INDONESIA)

Low Carbon Solution for Industry

EMS (Energy Management System), High-Efficiency Power Generator (Gas Engine, Fuel Cell), High-Efficiency Chiller, Waste Heat Power Generator, CO₂ Capture Technology

PT. Mitsubishi Heavy Industries Indonesia

Product and Service Outline

- ▶ Mitsubishi Heavy Industries (MHI) Group offers a wide range of technologies and solutions to realize decarbonization and low carbon society (energy transition, energy saving, electrification, CO₂ capture, etc.), that meet customer needs.
- ▶ CO₂ emission reduction has become an important managerial issue for each industry and factory in Indonesia. Although, Implementation of rooftop PV system is progressing, it is not necessarily effective depending on conditions such as limitation of power generation capacity and output fluctuation.
- ▶ CO₂ emission source is different for each industry and factory; therefore, it is the most important to analyze current conditions by each Scope and select appropriate solutions for CO₂ reduction. MHI Group supports CO₂ emission reduction on each Scope with the following solutions.

Scope-1 (direct emission) CO₂ capture unit

Scope-2 (indirect emission) Energy saving operation by EMS^{※1}, high-efficiency chiller, in-house power generation by gas engine and fuel cell (SOFC^{※2}), and power generation by waste heat recovery with ORC^{※3}

- ▶ Furthermore, MHI Group offers solutions in view of future utilization of hydrogen and ammonia for in-house power generation,.

※1 Energy Management System ※2 Solid Oxide Fuel Cell ※3 Organic Rankine Cycle



EMS (Energy Management System)



High-Efficiency Chiller



Power Generation by Natural Gas / Hydrogen
(Gas Engine, Fuel Cell)



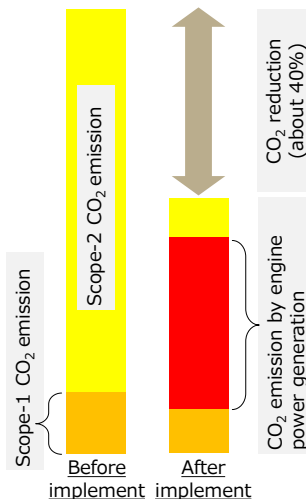
Waste Heat Power Generation



CO₂ Capture Unit

Experience and Example

- MHI Group has been offering low carbon solutions that suit diverse needs of various customers .
- The figure on the right shows an example that our customer achieved around 40% of CO₂ emission reduction by applying our engine power generation.
- In addition to engine power generation, MHI Group can offer established and reliable technologies and solutions shown below. With these technologies, MHI Group realizes CO₂ emission reduction and economical efficiency improvement of customers considering their ICP^{※4} , an increase of electricity consumption and an introduction of PV system in the future.



EMS : Control system used for thermal power plants which MHI Group constructed.

Engine Power Generation/High-Efficiency Chiller : Has a major share in the Japanese market.

CO₂ Capture : Has top market share in the world and has constructed world's largest plant in the US.

ORC : Abundant delivery records such as geothermal power plants, biomass power plants and waste heat recovery from factory furnace, etc.

※4 Internal Carbon Pricing

Contact Person

—Phone number: +62 (0) 21-57974430

—E-mail address:

toru.yoshioka.ta@mhi.com (Japanese/English)

abdul.karim.wp@mhi.com (Japanese/English/Indonesian)

Fluid Agitation Device “α-ESG” (Fluid stirring device)

Lowering Outdoor Machine Operating Rate and Reducing Consumption of Electric Power

ESG TECHNOLOGIES CO.,LTD

Product and Service Outline

- ▶ α-ESG is a fluid stirring device that reduces the flow resistance inside the pipe.
- ▶ By powerful stirring action it proceeds the liquefaction of freezer and refrigerator oil, reduces the flow resistance, and reduces the consumption of electric power by lowering the air conditioning, freezer, and refrigerator's compressor burden, this is also a product that contributes to reducing CO₂. The result will be different due to the environment and function of the equipment used, but the target is to reduce the consumption of electric power by about 10 to 30 %.
- ▶ The installation is just connecting it to the copper pipeline (liquid tube) that comes out from the outdoor machine, it is just a standard pipe construction. Moreover, there is no running cost because it is not using water or power, and the life span is the same as the standard pipe.
- ▶ But it is not possible to reduce the consumption of electric power on all kinds of air conditioning, refrigerator, and freezer.
 - Household and small-scale business purposes will be out of the subject.
 - If it is an air conditioning unit and in the condition of moving in as a tenant, then it will need permission from the management company.
 - Water-cooled, turbo type, and absorption type will be out of the subject.

Actual Result and Example

- ESG technologies is a company that carries out environment, energy-saving, renewable energy-related products, and system planning, construction, and suggestion for companies that are serious about energy-saving and CO₂ reduction strategies.
- 「αESG」 had accepted the authorization as a system product and advanced equipment for advanced energy-saving investment facilitation support business on general incorporated association sustainable open innovation initiative (SII) 2021.

< Actual result conducted within Japan > *some selection

Company name	Industry type	Area	Installation	Device	Air conditioning capacity	Reduction rate
			location			
NG kogyo Co., Ltd	Machine part production	Kanagawa	Production line	Air conditioning unit	28.00 kW	19.30%
Buil system Co., Ltd	Equipment manufacturing	Ibaraki	Examination room	Air conditioning unit	33.50 kW	30.20%
C-west Co., Ltd	Beverage production	Fukuoka	Product storage	Air conditioning unit	28.00 kW	21.30%
S Hospital	Hospital and facility	Shiga	Inside hospital	Air conditioning unit	61.50 kW	23.30%
T buhin kogyo Co., Ltd	Automobile component production	Aichi	Office	Air conditioning unit	45.00 kW	22.10%
K coffee	Restaurant	Fukuoka	Inside store	Air conditioning unit	22.40 kW	22.90%
N foof service Co., Ltd	Frozen food production	Chiba	Product storage	Freezer	56.00 W	21.10%
N group	Amusement center	Osaka	Hall	Air conditioning unit	553.00 kW	27.10%

Contact Us:

Company name : PT. Toyota Tsusho
Mechanical & Engineering Service
Indonesia (TTME)
Location : MM2100 industrial park
Website : <https://www.ttme.co.id/>

—Contact person
(Japanese)

Name: Kenji Tsunoda

E-Mail: kenji_tsunoda@ttme.co.id

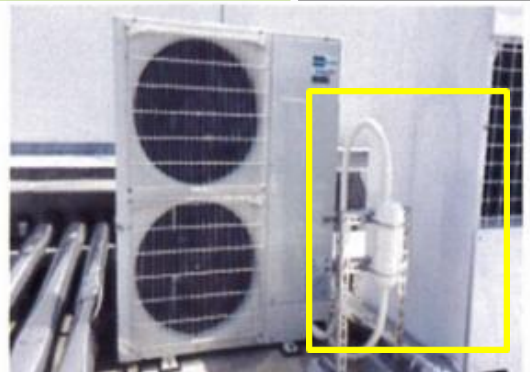
Phone: +62-811-1902-9099

(Indonesian, English)

Name: Intan Wahyu Widianingrum

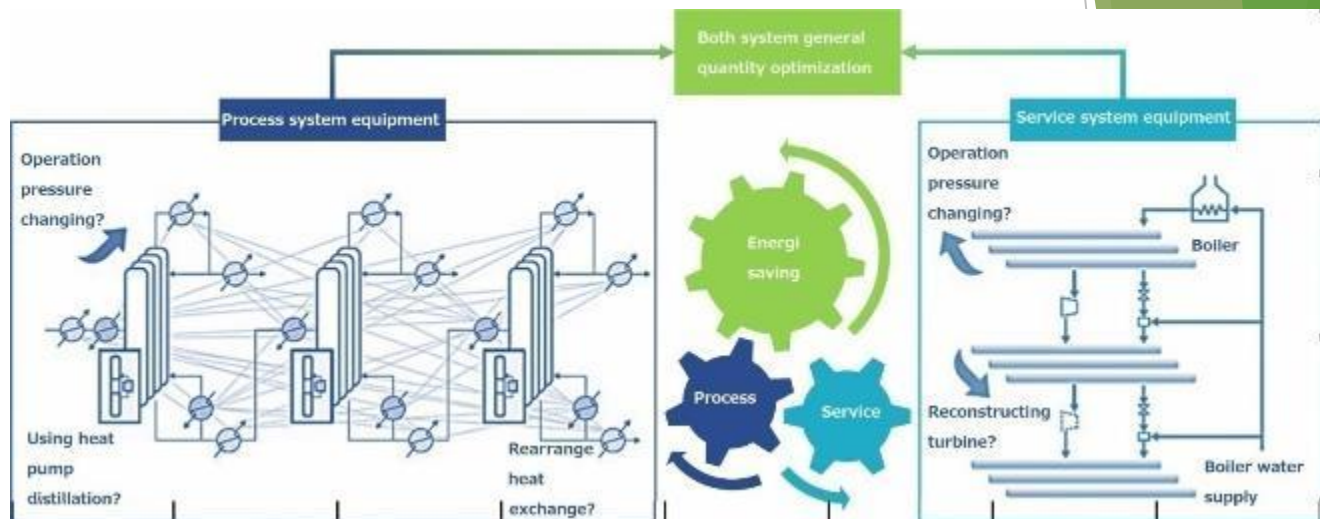
E-Mail: intan.wahyu@ttme.co.id

Phone: +62-811-875-6163



HERO Hybrid Energy system Re-Optimization

TOYO Engineering Co., Ltd



Product and Service Outline

- HERO is a whole plant energy-saving consulting service. Realizing the optimization of service system and process system which has challenging barriers in the existing consideration rule, at the same time, according to quantity optimization technology. Giving the most suitable operation condition and required construction suggestion, following the customer request from the combination of several astronomical operation terms, design terms, and customer's characteristic limitation term. Even for a plant that has already performed high-grade energy-saving measures, a big energy-saving effect can be expected.

Characteristic

1. Simultaneous optimization of Process and service system based on quantity optimization technology

- Constructing a big-scale model containing the whole plant. According to mixed integer linear programming, by discovering the complicated and huge trade-off relation, both system's same-time optimization can be realized.

2. Offering improvement options which are difficult in the existing consideration technique, along with process system and service system

- <Improvement option example on the processing system>
 - Operation pressure, temperature, and heat burden change
 - Conducting new heat exchange
 - Conducting heat pump technology such as **SUPERHIDIC®**
- <Improvement option example on the service system>
 - Steam supply pressure change
 - Changing the driving force steam of the steam turbine
 - Adding new steam header

3. Flexible suggestions comply with the customer's business environment

- In HERO, a specialized personal optimization model is being constructed for each customer. Because of that, it is possible to offer a line-drawn improvement plan with general purpose technology consideration.
- Not only the equipment special characteristic, by including the most suitable model such as investment requirement, limitation related to improvement and operation idea, the energy saving plan that comply with customer's request can be offered.

Actual Result and Example

There are total of 5 conducted consideration has been carried out inside and outside Japan, mainly for petrochemistry plant. Several projects are in progress toward equipment improvement operation based on the optimization suggestion obtained according to the most suitable consideration

Example (an aromatic plant)

Consideration effect example

- Steam consumption reduction: >25 ton/year (>20 %/year reduction)
- Fuel gas reduction: equivalent to 1.5 MW
- Increase in power generation consumption amount : slight increase (additional pump part)

Contact Us:

TOYO Engineering Corporation
Advanced Technology Business Department

Toshihiro Wakabayashi / General Manager

Tel: +81-50-1735-3546

E-mail: toshihiro.wakabayashi@toyo-eng.com

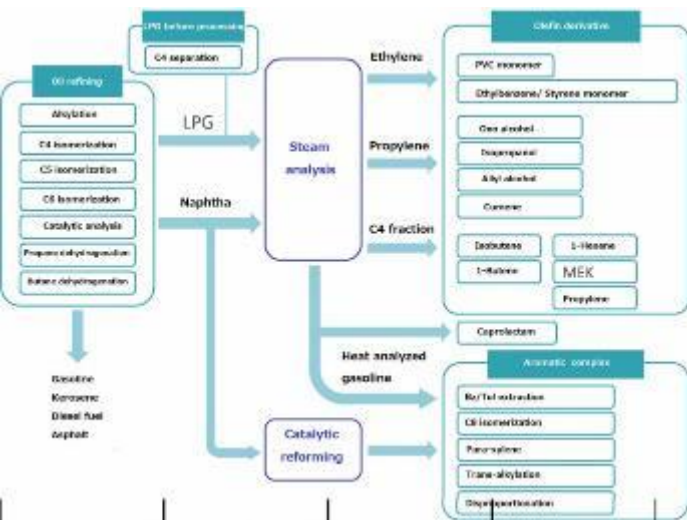
Web site: <http://www.toyo-eng.com/jp/>

- The diagram illustrates the condensation part of a distillation process. It shows a vertical column with a condenser at the bottom. The condenser is connected to a high-pressure tower and a condenser. The condenser is labeled 'Condensation part'. The high-pressure tower is labeled 'High pressure tower'. The condenser is labeled 'Condenser'. The diagram also shows a 'Collecting part' at the top, connected to a 'Low pressure tower' and a 'Reboiler'. The 'Collecting part' is labeled 'Collecting part'. The 'Low pressure tower' is labeled 'Low pressure tower'. The 'Reboiler' is labeled 'Reboiler'. The diagram shows the flow of material from the high-pressure tower through the condenser to the collecting part, and then to the low-pressure tower and reboiler. The condenser is shown with a cooling jacket and a cooling water inlet and outlet. The reboiler is shown with a heating jacket and a heating medium inlet and outlet. The diagram also shows a 'Distillate' outlet from the bottom of the condenser. The diagram is labeled 'Distillation column'.



Applied subject

- The tower top and tower bottom operation temperature is within 80°C
- Using a highly-priced service
- Having a condenser burden, and reboiler burden that can receive the advantage of scale
- Process unit example that can secure a big energy-saving performance, by using ***SUPERHIDIC***®



Actual Result and Example

Established country	Japan
Process unit	Alcohol ketone production equipment
Processing amount	21kL/h (Materials flow amount)
Conventional type distillation tower's energy consumption amount	6.3MW
Energy saving rate	50%+

- 2014 24th Nikkei global environmental technology award, excellence award
- 2018 Energy saving grand prize (Ministry of economy, trade, and industry, Minister's award)
- 2018 Chemical engineering association technology award
- 2022 Certified in advanced equipment and system, at General incorporated association, environmental co-creation initiative advanced energy-saving investment promotion support project cost subsidy. Et cetera

Contact point

TOYO Engineering Corporation
Advanced Technology Business Department
Toshihiro Wakabayashi / General Manager
Tel: +81-50-1735-3546
E-mail: toshihiro.wakabayashi@toyo-eng.com
Web site: <https://www.toyo-eng.com/ip/>

Control solution for building energy saving (ESCO)

Energy saving in building HVAC, with initial investment reduction by ESCO scheme

Azbil Corporation/PT. Azbil Berca Indonesia

ESCO

**Energy Service
Company**

A business that provides comprehensive services to realize energy saving in buildings and receives service-remuneration from the actual energy saving performance.

Site Check

Proposal

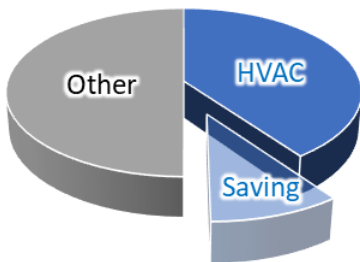
Contract

Installation

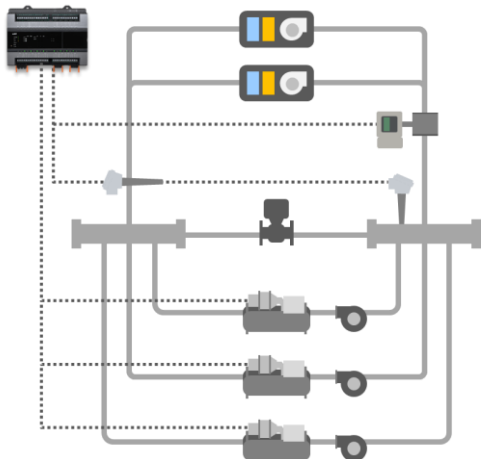
Guarantee



Energy saving in HVAC, which consumes a large amount of energy consumption in Bldg.



Providing unique energy-saving methods with utilizing high-efficiency equipment, optimal operation control or tunings for the entire facility, and monitoring system (BMS).



Product and Service Outline

► Optimization of overall facility operation

- For larger energy savings, we not only install high-efficiency equipment that is common in Bldg. energy savings, but also optimize the overall operation of HVAC equipment with a control & monitoring system (BMS) and tuning service.

► No initial investment with Lease financing

- Initial investment will be unnecessary, if lease financing can apply in ESCO scheme (Depends on the potential of energy saving through site surveying.)

► Energy saving performance guarantee by Azbil

- Azbil guarantees energy saving performance when utilize ESCO scheme
- Azbil will compensate the unachieved amount, if not achieve the saving performance target.

► Long-term Support

- Report quarterly with advices until ESCO term completion.
- No worries regarding BMS system maintenance because that maintenance is packaged in ESCO service scope.

Actual Result

- 250+ ESCO projects in Japan
- 50+ energy-saving projects in Indonesia
- Samples of ESCO result in Indonesia
 - Complex building 1,920 MWh down in annual
 - Shopping mall 1,260 MWh down in annual
 - Machinery factory 630MWh down in annual

Contact point PT.Azbil Berca Indonesia (Building Automation Div.)

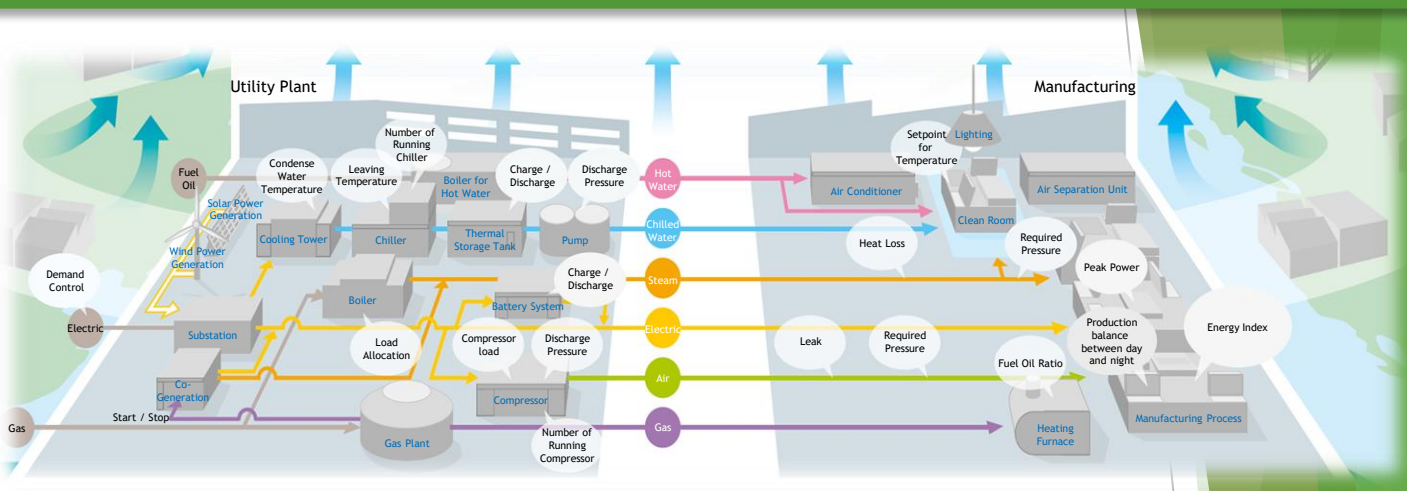
E-Mail : azbil.ba@id.azbil.com Phone : +62-21-230-5538

Inquiry Form : <https://berca.azbil.com/ContactUs/contact.html>

Energy Saving Solution Service : ENEOPT™

for Energy Conservation to Contribute Sustainable CO₂ Reduction

Azbil Corporation/PT. Azbil Berca Indonesia



Product and Service Outline

- ▶ ENEOPT is one of **energy conservation solutions** towards a decarbonized society by Optimization Control.
- ▶ The target applications: ENEOPT is energy-saving improvement support system that minimizes CO₂ emissions and energy costs of **Utility Plant** such as Boiler, Turbine facilities.
- ▶ General step for **ENEOPT solution service**.
 - ✓ **Step1:** Find Opportunity for Energy Saving from Operation Improvement
 - ✓ **Step2:** Feasibility study to estimate CO₂ reduction by using actual operation data
 - ✓ **Step3:** ENEOPT System Installation/Customized and set up to suit customer's plant's need.
 - ✓ **Step4:** Operational support and maintenance services by Azbil to ensure the performance of ENEOPT

Actual Result and Example in Indonesia Oil Refinery

- ◆ This was one of three demonstration projects in Indonesia for the Joint Crediting Mechanism (JCM), organized by Japan's New Energy and Industrial Technology Development Organization (NEDO).
- ◆ Azbil control technology at a power plant to **optimize boiler operation**, and succeeded in reducing CO₂ emissions
 - ✓ Optimized boiler system operation cuts appx. **35,000 tons/year** of CO₂ emissions(Implement at Boiler-Utilities Plant in PT Kilang Pertamina International-Pertamina RU IV Cilacap)

ENEOPT is a trademark of Azbil Corporation.

Contact point

PT. Azbi Berca Indonesia (Industrial Automation Dept. Team)

—E-mail address : Info_IA@id.azbil.com

SATO HOLDINGS CORPORATION

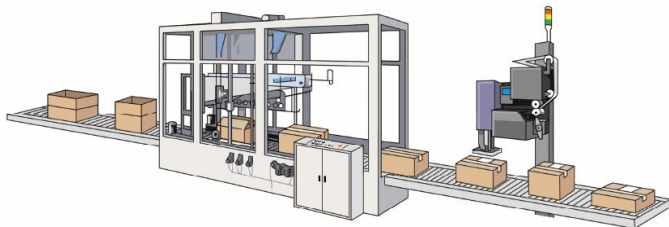
Product and Service Outline

- ▶ SATO is a global auto-ID solutions provider for various industries. We tag every 'thing' using RFID and barcode technologies, make the most of data and derive the best solution for each unique site. SATO has 82 years of expertise with 5,600+ employees across the globe (as of Mar 2022).
- ▶ SATO has business presence in over 90 countries/regions. We engineer and produce hardware (label/tag printers) and consumables (labels and stickers), develop and integrate solutions, and provide maintenance services.
- ▶ Our mission is to "contribute towards a better and more sustainable world." We resolve societal challenges by offering solutions for accuracy, labor- and resource-savings, safety and reassurance, sustainability and emotional connections.

Example I Automation of shipping processes

We offer a full range of products that support shipping processes: barcoded shipping labels, label printers and barcode scanners, and software to control these devices.

Our auto-labeling systems in particular apply labels faster and with greater precision compared to manual labeling. Operation efficiency leads to labor savings and reduction of carbon emissions.



Sample case

Expected benefits*¹ from automating carton sealing & measuring and label printing & application:

- ✓ **Productivity: Up 2.2 folds**
- ✓ **Labor saved: 40%**
- ✓ **CO₂ emissions cut: 14 tons/year*²**

*¹ Estimations are derived by multiplying worker-hour savings by an emission factor associated with the customer's industry, and **do not guarantee the amount of actual reduction.**

*² Calculation method was developed under supervision of relevant authorities and experts.

Example II Linerless labels



We develop products addressing environmental concerns. Linerless labels are an example.

Linerless labels save wood pulp material and energy consumption in production, while reducing liner waste.



As a single roll comes with about 40% more labels than standard rolls, it reduces shipping and storing costs.

We have a selection of label printers that are compatible with linerless labels.

Sample case

Expected benefits*³ from replacing 200,000 labels of 4 x 7 cm with linerless labels:

- ✓ **Waste reduced: 78 kg**
- ✓ **CO₂ emissions cut: 196 kg**

*³ Estimations are calculated with certain conditions set by SATO.

SATO Official YouTube page



ENERGY SAVING SOLUTION

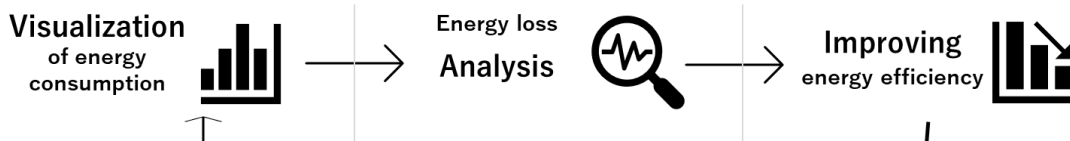
Solutions that contribute to decarbonization by discovering and reducing wasteful energy

PT. MITSUBISHI ELECTRIC INDONESIA

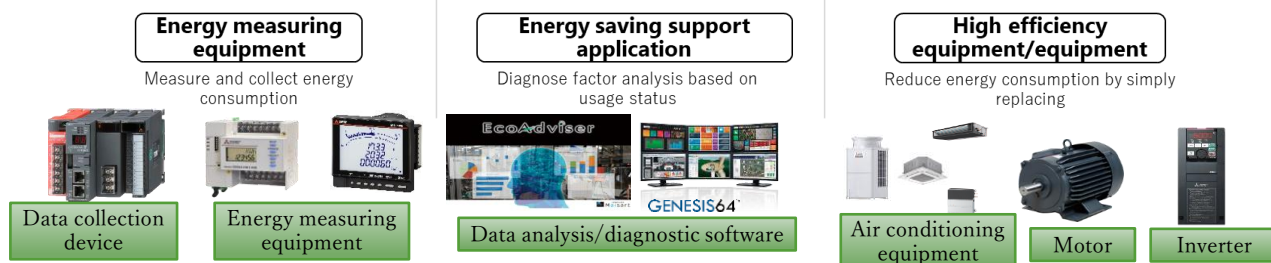
Product and service outline

- ▶ We support the reduction of CO₂ emissions by promoting energy conservation in buildings, factories, etc. We have a variety of equipment and applications necessary for this purpose.

<PDCA process for factory energy saving>



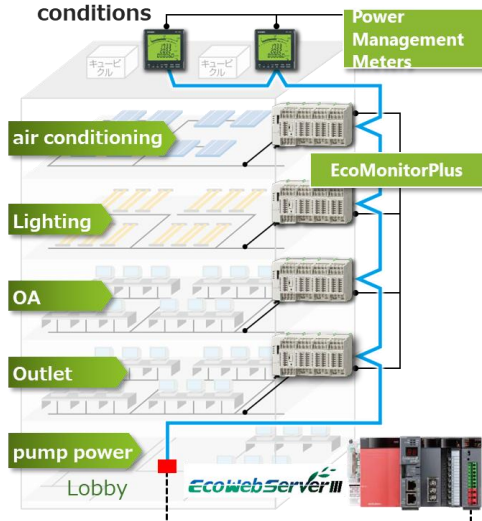
< Main equipment used for factory energy saving and operational improvement >



<Ex. Energy saving management system configuration>

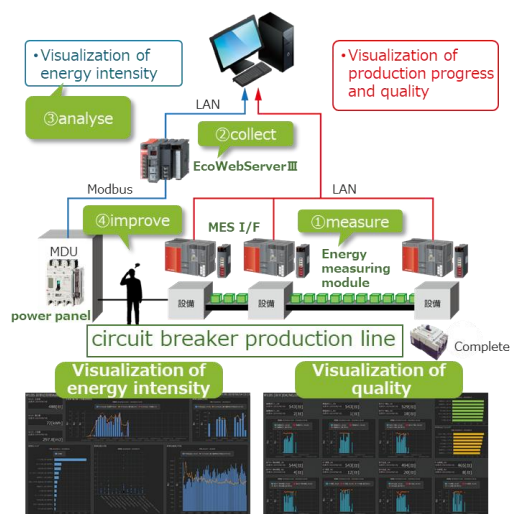
Ex. For office buildings

- Easy management with EcoWebServer
- Automatic control according to usage conditions



Ex. For production line

- Collect detailed production and energy information



Contact point

PT. MITSUBISHI ELECTRIC INDONESIA

— Phone number : +62-21-31926461 (English/Indonesian available)

— E-mail address : MEIN.FAID@asia.meap.com (Japanese/English/Indonesian available)

Implementation of Energy Conservation and CO2 Emission Reduction by Utilization of LED Lamp

PT. RECOMM BUSINESS SOLUTIONS INDONESIA

Product and service outline

Since July 2019, our company has been developing solutions for customers that have carbon neutral program mainly with following solutions :

- ▶ **New LED Lighting**※Rentia Sales • Installation • Maintenance
Potentially more energy and CO2 reduction around 20%-50% than traditional LED Lamp
※With our original LED brand : Rentia (with long-term warranty)
- ▶ **Radiative Cooling Material : Space Cool**
Utilizing the thermal insulation and radiative cooling, potentially of reducing energy consumption and CO2 emission. Improving working environment with sunlight heat counter-measure.
- ▶ **Low Energy Consumption Product Sales • Installation • Maintenance (AC • Air Compressor • Chiller)**

Carbon Neutral Solutions Further Implementation

Actual result and example

- **【LED】** Our original LED Product : Rentia (long-term warranty)
Potentially more energy and CO2 reduction around 20%-50% than traditional LED lamp.
520 Japanese companies in Indonesia have been using our products.

Low Energy Consumption Devices

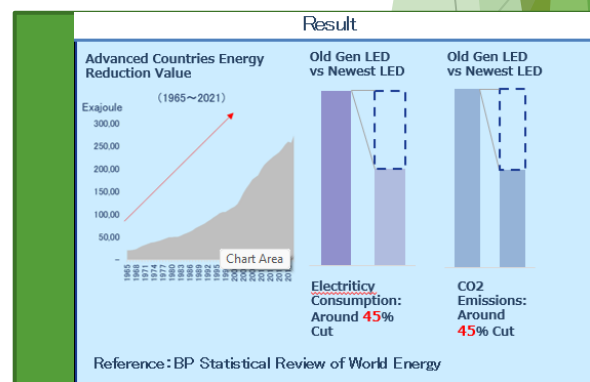


Low Energy Consumption

- Limited variety of mass-produced original brand products
- Wide variety of national brand around 50,000 items

Eco-friendly

- Low energy consumption and large CO2 emission reduction
- Providing products that match the area and installation environment of factories and offices



Contact point

PT. Recomm Business Solutions Indonesia (Mr. Ota Sadatoshi)

—Phone number : +62-811-8373-000

—E-mail address : sa.oota@recomm.co.jp

NATRUS⁺ W Pedestrian Flow Solution

Latest Technology Automatic Door Sensor for Energy Loss Reduction

Nabtesco Corporation NABCO Automatic Door

Product and service outline

- NATRUS⁺ W is equipped with two sensors (infrared ray sensor and image sensor) for detection. By utilizing these two types of sensors, the pedestrian flow detection area has been made around four times larger than the conventional one, making it possible to reliably detect the pedestrian flow in a wider area. This allows the automatic doors to open precisely at the right time for smooth entry and exit.
- Detecting the movement of both people and objects (wheelchairs, baby chairs, carts, etc.), makes it very suitable for barrier-free facilities such as stations, commercial facilities and educational institutions.
- Reducing unnecessary automatic door openings helps to minimize energy loss and improve the indoor environment of buildings.

More information: https://nabco.nabtesco.com/en/nabco-select/natrus_ew/

Actual Result and Example

- To verify the effectiveness of this product, we conducted a demonstration installation at the entrance of the "NEOPASA Suruga Bay Numazu" service area on the Shin-Tomei Expressway.
- Previously, there were frequent unnecessary door openings due to high pedestrian traffic. However, after the installation, the door's opening time was reduced by approximately 21% compared to our conventional sensor-equipped automatic doors ^{*1}, and there was also an improvement in pedestrian flow of about 20% ^{*2} (according to our research).

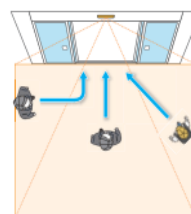
^{*1} Sensor that detects the entry of objects into the sensor area and signals the door to open.

^{*2} The percentage of doors opening faster than with conventional sensors, based on pedestrian flow.

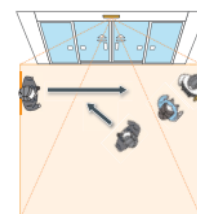


Pedestrian flow detection to determine if the doors will open or not.

Image Sensing W



The doors will open.



The doors will not open.

Contact Point

Nabtesco Corporation Marketing & Sales DEPT. Yuchun Deng

Mail : Yuchun_Deng@nabtesco.com Tel: +81 3-5213-1156

HP : <https://nabco.nabtesco.com/en/>

Carbon-Neutral Society realization by ECO appliance launches

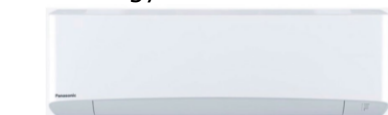
- Introduction of Energy saving Aircon and Refrigerators -

PT Panasonic Gobel Indonesia

Product and service outline

- ▶ We will support realization of Carbon Neutral Society in Indonesia by introducing energy saving inverter air conditioners and the ones with R32 with low burden to global warming.
- ▶ Our refrigerators can realize energy saving by introducing inverter functions as well as Panasonic unique technology of Econavi.

Panasonic



INVERTER

R32
REFRIGERANT

INVERTER
ECONAVI



Actual result and example

▪ Aircon Inverter Technology

- In one day usage (16hrs) non-inverter needs Rp18,000 of electricity, but inverter only requires Rp5,500. (70% down)
- 1st 1hr requires 670W of electricity but the remaining 15hrs needs only 190W.

▪ Usage of new refrigerant R32

- R32 is HFC(Hydrofluorocarbon) and it is considered not to break the Ozone layer. (Ozone breakage 0, Global warming rate 675)
- R32 is well balanced refrigerant, which is effective to be cooled and which can save the usage of electricity.

Out of 19 lineups, inverter models are 16 and we use R32 for all models

▪ Inverter & Econavi Refrigerators

- We are realizing energy saving of 40% with inverter technology.
- At the same time, with Econavi function we can detect the food volume inside fridge and realize 10% of energy saving.

Can save energy by 70% after 16hr usage of Aircon



Other energy saving technology



Panasonic Aircon has air purification function as well.

Upper-class fridge has Prime Fresh function, which can keep the compartment at -3°C. By this there is no need to use MWO for unfreezing purpose.



Contact Point

PT. Panasonic Gobel Indonesia

- Telephone— : +62-811-1069-3805 (Mr. Yasunobu Matsumoto: Japanese and English support)
+62-815-1416-6981 (Mr. Yuzuru Isozaki: Japanese and English support)
- E-mail address— : Yasunobu.matsumoto@id.panasonic.com, yuzuru.isoizaki@id.panasonic.com

"Thermal Insulation Mix" by Win Armor 03 (Heat Insulation Painting Material) for Window Glasses

Marugen Takeuchi Gumi Co.,Ltd.

Overview of Products and Services

- ▶ Simply applying "Win armor 03" to window glass can completely change the indoor temperature environment.
- ▶ The air conditioner will work better, which can significantly reduce the electricity bill of the air conditioner.
- ▶ Thermal barrier paint for window glass that lets light in but blocks heat, something that has never been done before.
- ▶ Can be applied to tempered glass, film, molded glass, and plastic panels.
- ▶ We can help companies that want to stand out from the competition by saving electricity, going carbon neutral, and being SDGs compliant.
- ▶ Agency recruitment in Indonesia.
- ▶ The physical sensation is solid, so it is easy to understand the sales PR.
- ▶ Raising the air conditioner temperature setting by 1°C can reduce power consumption by 10%.
- ▶ Reducing indoor temperature by 1°C increases productivity by 2%.

Target: Reduce electricity bill for air conditioners by 50%

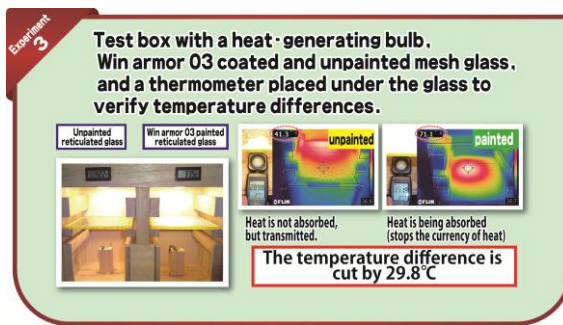
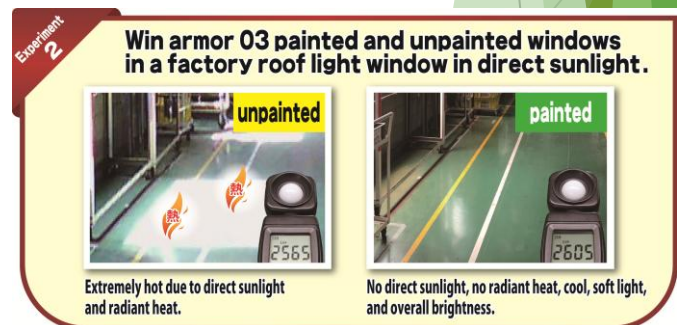
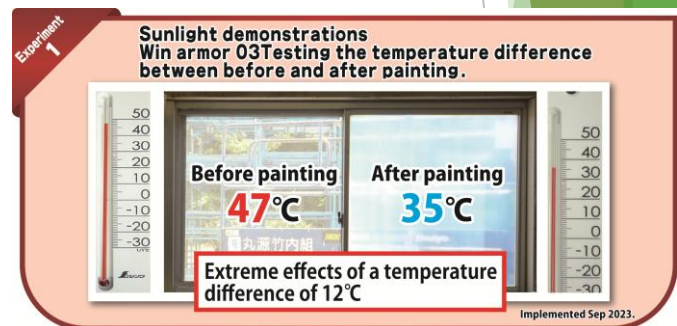
- ◆ Room temperature of -8°C or higher (max. -12°C) under a window coated with "Win armor 03".

Achievements and Case Studies

- Suzuki Motor Corporation.
- Bellsonica Co.,Ltd
- TOYOTSU RECYCLE CORPORATION
- SAKURAI LTD.
- SUZUKI MUSICAL INSTRUMENT MFG. CO., LTD.
- SAHARA INDUSTRY CO.,LTD.
- SYSTEC Corporation.
- KOYAMA SEIKI Co.,Ltd
- GOSHI GIKEN CO.,LTD.
- NTN Corporation Iwata Works
- INOAC CORPORATION



Four TV stations also came to interview us.



Contact point

Marugen Takeuchi Gumi Co.,Ltd.

—Phone number : +81-53-452-7450 (Mr. RYUSUKE TAKEUCHI)

—Contact Form : <https://marugen-tg.co.jp/contact/>



Energy Consumption Reduction on Water Treatment by NH_4 & DO monitoring

PT. HORIBA INDONESIA

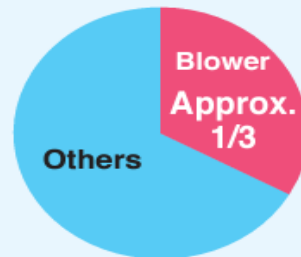
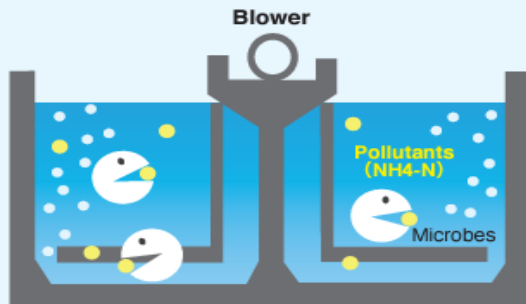
HORIBA

Product and service outline

Power consumption in a biological reactor

Microbes are activated to decompose the pollutants by providing air supply.

The power consumption of the blowers accounts for approximately one-third of the total energy consumption of the wastewater treatment facility.



In-house study conducted in 2017

Energy consumption of wastewater treatment plant (Estimate based on customer survey)

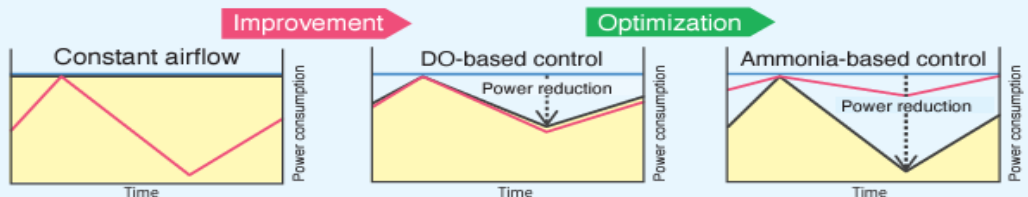
Reduction of energy consumption through ammonia-based aeration control

Aeration control method

Ammonia Nitrogen Treatment Target

Ammonia Nitrogen Concentration

Power consumption



In constant air volume control, the air volume is regulated to a constant level in accordance with the maximum load caused by ammonia. As such, during periods of low load, excessive aeration occurs, resulting in wastage of power.

Controlling based on the DO value could help achieve control closer to the target ammonia nitrogen treatment value. However, since DO is an indirect indicator of pollutants, there is a possibility of excessive aeration when the load is low.

By implementing airflow control based on ammonia nitrogen measurement, it is possible to achieve optimal control that brings the system closer to the target value in accordance with the load, thereby contributing to reduced power consumption.

In some cases, the results of demonstration experiments show that power consumption can be reduced by **at least 10%** when compared to constant airflow control.

Depending on the control method and operating conditions, the power reduction effect may vary.



HC-200NH

Ammonia Nitrogen
Meter

+

DO sensor

Our strengths

- Low TCO by product robustness & **NO reagent, NO pre-heating** required
- Premium support by local engineers

Reference sites

- Jakarta, Bogor

Contact point

PT HORIBA INDONESIA

Jl. Jalur Sutera No.16-17 Blok 20A, RT.002/RW.015,

Panunggangan Tim., Kec. Pinang, Kota Tangerang, Banten 15144

PIC: Arif Satrio (WA 0823-1127-5126, arif.satrio@horiba.com)



PIC WA



Website

Thermal Solution Service using refractory and insulation materials

For any issues in high-temperature environments, please consult Shinagawa Refra.

PT SHINAGAWA REFRA TECH PERKASA (Shinagawa Refra)

Product and service outline

Shinagawa Refra entered Indonesia in 2015 and invested in a local refractory manufacturer in 2024 and established PT SHINAGAWA REFRA TECH PERKASA. As a local manufacturing and sales company, we provide solution services for refractories and insulation materials. We serve to all requests, including improving thermal efficiency in high-temperature environments, in order to achieve carbon neutrality.

- ▶ Supply refractory and insulation materials to improve thermal efficiency for steel and non-ferrous heating furnaces and also for aluminum melting furnace and holding furnace.
- ▶ Improve thermal efficiency through the installation of burner combustion control equipment.

We contribute to solving problems based on the customer's operating conditions.

Actual result and example

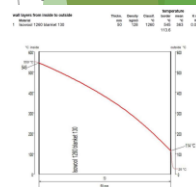
- Modify refractory lining design in the furnace to achieve longer lifetime.
- Improvement of thermal efficiency by changing the insulating design of the door area in the aluminum melting furnace.
- Energy Cost Reduction by installing high-efficient burners in the aluminum melting furnace.
- Improvement in thermal efficiency by replacing refractory bricks to ceramic fiber in the heat treatment furnace. (app.59%)
- Productivity improvement through thermal conduction control by changing the heating furnace design. (app.15%)
- Lifetime extension of the skid of reheating furnace by the change of insulation material (reduced maintenance frequency)
- Reduce electricity consumption by replacing insulation material (ceramic fiber) in zinc melting furnace. (app. 27%)

Example of Solution Service in High Temperature

High-Efficient Burner System



Temp. in furnace



Skid of RHF



Heat efficiency improve in RHF

Image of Partition wall in Reheating Furnace



Heat Treatment (Brick→Ceramic Fiber)

Old fashion type of heating facility Using Fire Brick.



Inside of heating facility
Brick design: Slow heating up / Quick heating down

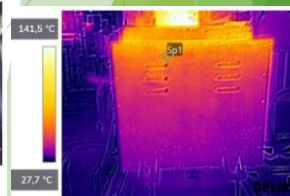
Shinagawa and Isolite replace to Ceramic Fiber design.



Inside of heating facility Door portion
Ceramic Fiber Design : Quick Heating Up / Slow Heating down

Achieve better heat efficiency

Melting Furnace outside temp.



Contact point

PT. Shinagawa Refratech Perkasa

Yuuichi Takakura (Japanese) /Tel:+62-811-9630-8941/Email: info@shinagawarefratech.co.id

Christian Haryadi (English/Bahasa) /Tel: +62-851-2124-1455/Email: info@shinagawarefratech.co.id

COKE DRY QUENCHING (CDQ)

Effectively Utilizing the Red-Hot Coke's Sensible Heat to Contribute to Decarbonization in the Steel and Coke Industries

Nippon Steel Engineering Co., Ltd.

Product and service outline

- ▶ Coke Dry Quenching (CDQ) is a dry cooling system that uses inert gas to cool red-hot coke discharged from coke ovens. This process can recover the coke's sensible heat and uses it to generate steam in a waste heat recovery boiler. The steam generated can be used for industrial processes or power generation.
- ▶ In Indonesia, red-hot coke is typically cooled by Coke Wet Quenching (CWQ), in which water is sprayed directly onto the coke. While CWQ releases the coke's sensible heat into the atmosphere and generates visible white smoke containing dust during the cooling process, CDQ enables the heat recovery and prevents the emission of such smoke. As a result, CDQ contributes to both decarbonization and environmental improvement at the factory.
- ▶ Nippon Steel Engineering has successfully developed the world's largest CDQ system, with a processing capacity of 280 t/h. We are the only global supplier capable of providing a full range of CDQ systems – from 56 t/h to 280 t/h – tailored to meet the specific needs of each customer.

Actual result and example

◆ Significant CO₂ Emissions Reduction through CDQ Implementation

CDQ with capacity of 200 t/h can generate 35 MW of electricity, resulting in an annual reduction of 150,000 tons of CO₂ emissions.

<CO₂ reduction calculation formula>

(CDQ-generated electricity - CDQ's own power consumption) × 0.67 t-CO₂/MWh*

*CO₂ conversion factor by the Institute for Global Environmental Strategies (IGES) (Reference: <https://www.iges.or.jp/en>)

◆ Global Delivery Record

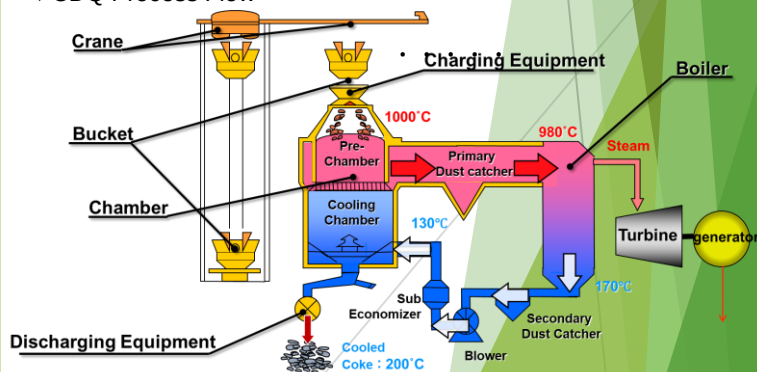
Our integrated CDQ solutions cover all phases – from design and procurement, to construction. As of today, we have delivered a total of 177 CDQ units across 8 countries.

China:	111 units
Japan:	26 units
India:	14 units
South Korea:	13 units
Taiwan:	5 units
Brazil:	5 units
Vietnam:	2 units
Germany:	1 unit
Total:	177 units (as of June 2025)

▼ For Shougang Jingtang United Iron & Steel Co., Ltd. (China)
World's Largest CDQ (Capacity: 260 t/h)



▼ CDQ Process Flow



Contact point

Nippon Steel Engineering Co., Ltd. Jakarta Representative Office

Mr. Masashi Miyahara : +62-811-88095090, miyahara.masashi.ny5@eng.nipponsteel.com (English, Japanese)

Mr. Erwin Nasution : +62-811-9702341, erwin@ina.eng.nipponsteel.com (Indonesian, English)

“Turning Waste Heat into Cooling”

~ CO₂ Reduction and Energy-Saving Solutions with Absorption Chillers ~

PT Panasonic Gobel Indonesia

Product and service outline

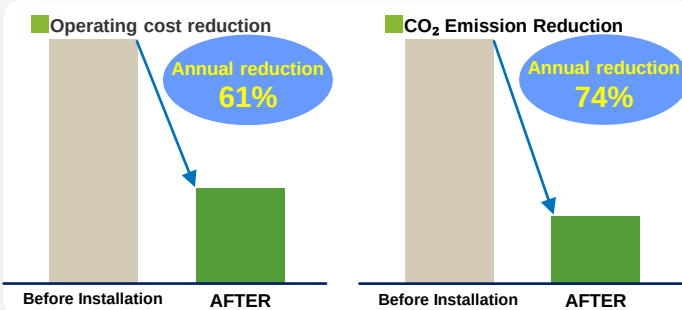
- ▶ Convert waste heat released from factories into chilled water for air conditioning or process use.
- ▶ Drastically reduce electricity consumption by letting waste-heat absorption chillers take over the load of existing electric chillers.
- ▶ Reduce operating costs and CO₂ emissions by over 60%^{*1} annually, contributing to a decarbonized future.
- ▶ Panasonic Absorption chillers are trusted in Japan with years of proven reliability and extensive installations.
- ▶ Supports a wide range of heat sources: low-pressure steam ($\geq 0.5\text{barG}$), steam-condensate hot water ($\geq 80^\circ\text{C}$), solar hot water ($\geq 75^\circ\text{C}$), and biogas.
- ▶ Panasonic conducts on-site surveys to tailor the optimal waste-heat utilization solution for each factory.

■ Example Proposal: Die-Casting Factory

Waste-Heat Utilization with Absorption Chillers

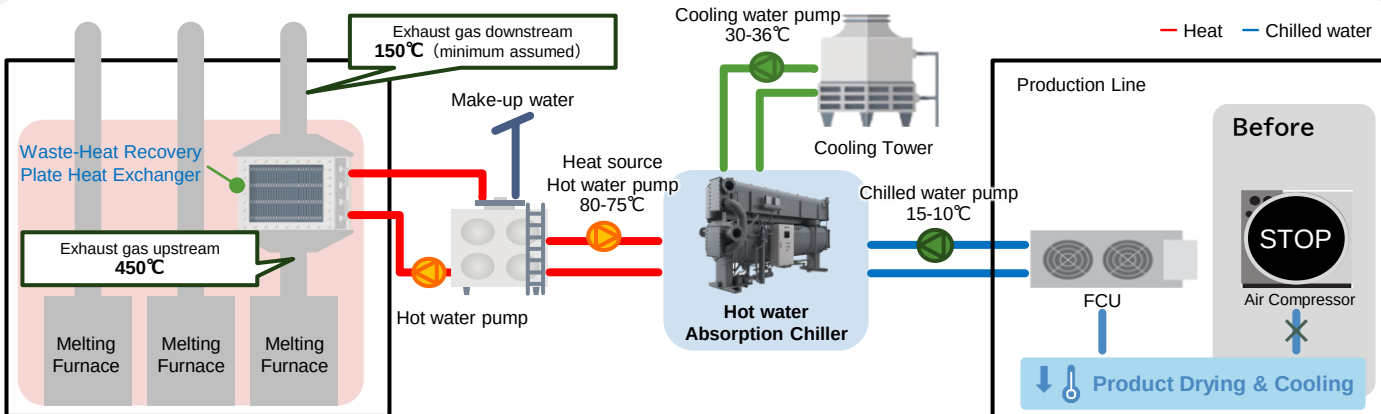
- Utilize exhaust gas from furnaces for the cooling process.
- Replace conventional well-water cooling and compressor-based drying.
- Significantly reduce electricity consumption, achieving energy savings and CO₂ reduction.
- Shorten the cooling process → Improve production efficiency.
- Expected Benefits:
 - Operating costs reduced by 61%^{*2}
 - CO₂ emissions reduced by 74%^{*2}
- Payback Period: Approximately 5-7 years^{*2}

Cut annual costs and CO₂ emissions by ~60% with Exhaust gas recovery + Waste Heat Absorption chillers



^{*1} Performance and reduction rates depends on the quantity and temperature of available waste heat at each facility.

^{*2} Savings may vary depending on available waste heat condition and installation costs.



Actual result and example

- Panasonic has over 50 years of experience in manufacturing absorption chillers, with 48 units installed, totaling more than 20,000 RT in Indonesia.

Panasonic



Contact Point

PT. Panasonic Gobel Indonesia

—Telephone— : +62-811-1069-3805 (Mr. Yasunobu Matsumoto: Japanese and English support)
 : +62-815-1416-6981 (Mr. Yuzuru Isozaki: Japanese and English support)
 —E-mail address— : Yasunobu.matsumoto@id.panasonic.com, yuzuru.isoizaki@id.panasonic.com

High-Performance Polymer Solutions Supporting a Decarbonized Society

Providing integrated support for thermal management challenges in EV and electrification fields, from optimal material selection to mass production and local supply

PT. SEKISUI POLYMATECH INDONESIA

Product and Service Overview

PT. SEKISUI POLYMATECH INDONESIA provides high-performance polymer components globally for EV, electrification, and electronic device fields.

We have been primarily supplying functional components including **composite materials and molded products** (mainly rubber products). We have now established a supply system for our **high-performance Thermal Interface Material (TIM)** products to support domestic and international customers in achieving the following:

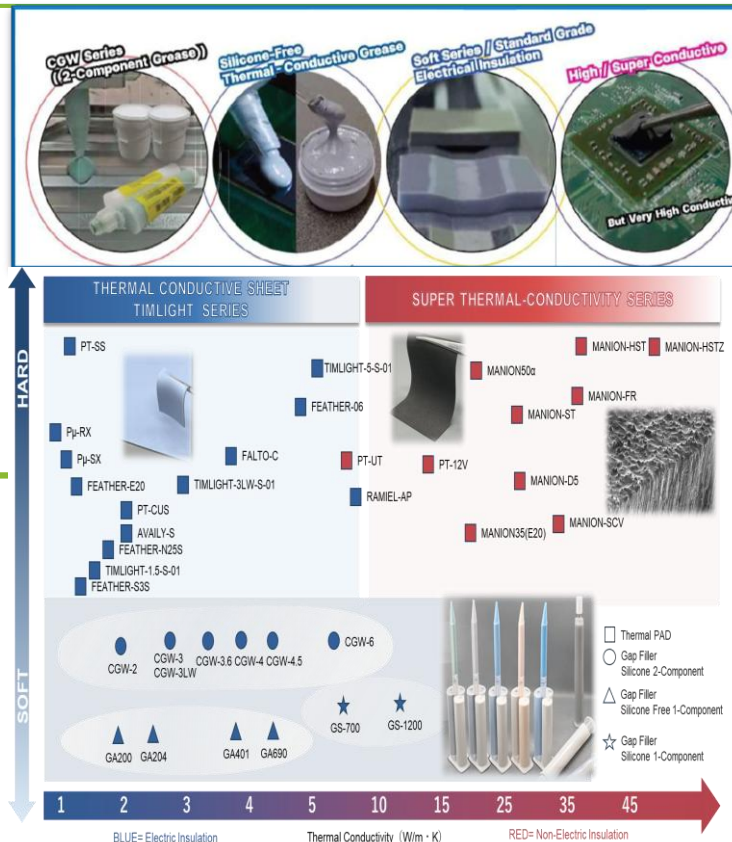
- **High-efficiency heat dissipation** for batteries and power semiconductors
- **Improved power efficiency** through reduced energy loss
- **Life cycle CO₂ reduction** through maximized product lifespan
- **Reduced environmental impact** through weight reduction and fewer components

Contributions to Decarbonization

- Mass production and supply track record of TIM for EV/PHEV batteries, Battery Management Systems, and On-Board Chargers
- High reliability and long-life design (3000-hour durability, over 10 years of supply track record for OEMs)
- Improved vehicle energy efficiency through lightweight, high-performance materials
- Stable supply and optimal location production through a global production system

Supply Record and Case Studies

- Gap filler and sheet TIM supply for EV batteries/powertrains
- High heat dissipation and insulating thermal materials for 5G base stations, AI data centers, and semiconductors
- Numerous mass production applications for automotive OEMs and Tier 1 suppliers of electrical components



Contact Point

Technical wises : PT. SEKISUI POLYMATECH INDONESIA: Sales General Manager Ms. Herawaty (English/Indonesian/Japanese)

TEL/Email: +62-21 8980 170 / herawaty@polymatech.co.id

Procurement wises : PT. TOKOKOSEN INDONESIA: Sales Manager Ms. Fitri Wijaya (English/Indonesian/Chinese)

TEL/Email: +62-812 1161 9166/ fitri-w@tokokosen.com

Radiative Cooling Material "Radi-Cool"

Stay Cool, Save Energy — Reflect Sunlight and Radiate Heat Away.

PT.KASHIWABARA ENGINEERING INDONESIA / Japan Airport Terminal Co., Ltd.

Product and service outline

- ▶ Product: Paint, Transparent Film (for Window Glass)
- ▶ This product combines technology that reflects high solar radiation and high heat dissipation technology to reduce heat storage on the surface while efficiently radiating absorbed heat (radiative cooling), making it possible to cool objects without using energy.
- ▶ In particular, by concentrating radiation in a wavelength range called the "atmospheric window", it is possible to exchange heat with space even during the day without being affected by the atmosphere, and it has a high temperature rise control effect. This makes it a product that is expected to be a countermeasure against global warming.



Actual result and example

[Implementation results in Japan]

(1) Paint

- Manufacturing Plant Roof
- Prefabricated hut
- Guardsman Box
- Poultry coop roof
- Receiving tank
- Boarding bridge

(2) Transparent film (for window glass)

- 15 domestic airports in Japan
- Office
- Resort Hotel, Cottage
- Restaurants
- Aquarium
- School

Prefabricated hut



Boarding bridge
Manufactured at the Bukaka factory



Haneda Airport Connecting
Bridge Window Glass



Luxury Cottage Window Glass



Contact point

PT. KASHIWABARA ENGINEERING INDONESIA (Mr.Sakimura : Japanese support)

—Phone number : +62-21-3882-0139 (Mr.Alif or Mr. Hilmy : English and Bahasa support)

—E-mail address : nanda.a@kashiwabara.co.jp (Mr.Alif : English and Bahasa support)

6. Utilization of digital technology

- **Plant Operations Digital Transformation Solution** **EFEXIS®**
(CHIYODA Corporation)
- **CO2 Emissions Visualization, Reduction, and Reporting Cloud Service**
(ASUENE Inc.)
- **GHG Emission Calculation Cloud Service**
(Zeroboard Inc.)
- **IT Solution for Transport Management**
(Zenmov Inc.)
- **Digital Twin System for Chiller Plant (CPDT)**
(Azbil Corporation/PT. Azbil Berca Indonesia)
- **Power Usage Visualization Solution**
(PT. KDDI INDONESIA)
- **“KANNA Service” Contributes to Decarbonization by Improving Productivity in the Construction and Manufacturing Sector**
(Aldagram Inc.)
- **Air Side Digital Twin (ASDT)**
(PT. Azbil Berca Indonesia)
- **Improving Maintenance Efficiency: Deployment of Advanced Smart O&M Services** **NEW**
(System JD Co., Ltd.)

Revolutionary Process Digital Twin Solution for Transforming Plant Operations

“EFEXIS®”

Chiyoda Corporation (PT. Chiyoda International Indonesia)

Product and service outline

- ▶ EFEXIS® is an innovative suite of process digital twin solutions that merges Chiyoda Corporation's engineering expertise with advanced digital and AI technologies.
- ▶ Chiyoda Corporation provides solutions to optimize, stabilize, and secure plant operations and maintenance. Without major equipment changes, we boost productivity and lower costs while reducing environmental impact.

Actual result and example

PLANT AI Optimizer

- Implemented at LNG production facilities and oil refineries

Abnormal detection AI

- Implemented at LNG production facilities and Oil Refineries

Automation & autonomy operation system

- Proven at Oil Refineries

Confirmed with Donggi-Senoro LNG (DSLNG) in Indonesia that the LNG Plant AI Optimizer® was implemented, resulting in increased production through improved efficiency.

- ▶ Potential revenue increase of up to 5% in annual LNG production volume.
- ▶ Contribution to fuel gas savings and reduction of CO2 emissions by up to 5%.

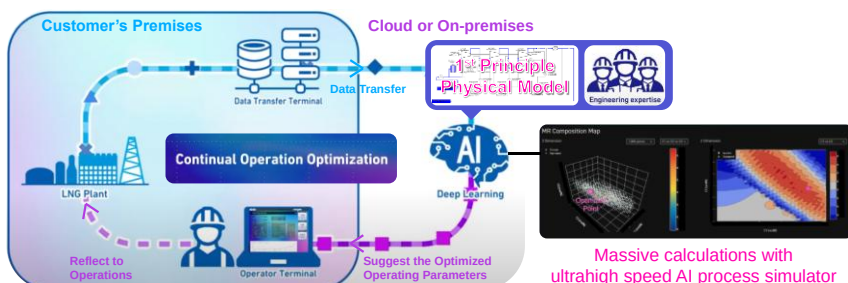
$$\text{EFEXIS} = \text{EFFICIENCY} \times \text{EXPERTISE}$$



- ▶ Robust and Comprehensive Deep Learning Model
- ▶ Optimization and Real-Time Visualization under Multiple Constraints
- ▶ Ownership of In-House Developed Simulator



Contributing to environmental impact reduction and energy savings by optimizing operations and enhancing availability, without major equipment modifications.



Contact point

PT. Chiyoda International Indonesia

—Phone number : +62 21 2903 9255

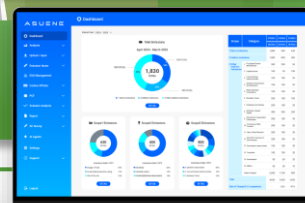
—E-mail address : chiyoda-Indonesia@cii.co.id

Visit our plantOS™ Introduction Page

Watch our plantOS™ YouTube Video

CO2 Emissions Visualization, Reduction, and Reporting Cloud Service

A S U E N E



ASUENE Inc.

Product and Service Overview

- ▶ With the mission of "Changing the world for the next generation," ASUENE is the No.1 cloud service in Japan and Asia that comprehensively solves corporate decarbonization and ESG challenges.
- ▶ By leveraging AI-OCR and linking with ERP and accounting systems, we automate complex data collection and input tasks, reducing calculation man-hours by up to 70%. We enable the centralized management of environmental indicators—from Scope 1-3 to water and waste—and automatically generate reports compliant with various international standards such as RE100, SBTi, CDP, and CSRD.
- ▶ In July 2026, we raised a total of 25 billion JPY (approx. US\$161 million) in a major funding round led by BlackRock. Furthermore, we were selected as one of the "Best 100" in TIME magazine's "World's TOP Green Tech Companies 2025," earning top-tier global recognition. With bases in six countries including Japan, the US, the UK, and the ASEAN region, we are a trusted partner providing hands-on support for sustainability promotion backed by our overwhelming capital and expertise.
- ▶ Service Website: <https://asuene.com>

Track Record & Case Study

- CO2 visualization service installation: **No.1**
- Adoptions in the TSE Prime Market: **No.1**
- Total group adoptions: **64,000+ companies**
- Total funding raised: **US\$161 million (£120m)**
- Alliance partners: **200+ companies**
- Locations: **Japan, USA, UK, Singapore, Thailand, Philippines**
- Service retention rate: **99%**
- Patent application requests: **300+**
- Reduction rate of man-hours for decarbonization management: **Up to 70%**

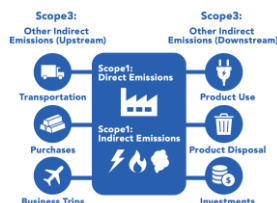
One-Stop Solution

Beyond providing a CO2 emissions calculation cloud, we deliver comprehensive, one-stop support for supply chain decarbonization—ranging from reduction roadmap formulation and consulting, to carbon offsetting using non-fossil certificates, and information disclosure compliant with international initiatives.



Enterprise Visualization

Fully compliant with the international GHG Protocol. Converts corporate greenhouse gas emissions (Scope 1-3) into CO2 equivalents for accurate visualization.



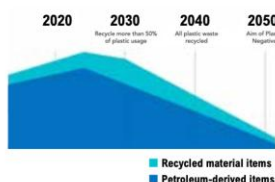
Product CFP

Supports ISO14040-compliant product CFP calculations. Visualizes lifecycle CO2 emissions from procurement and manufacturing to usage and disposal.



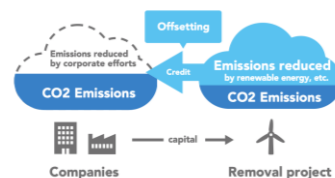
Reduction Roadmaps

Manages reduction roadmaps by Scope, business, country, or location. Tracks performance progress against specific targets and clarifies potential environmental risks.



Credit Procurement

Provides end-to-end support for planning and executing carbon offsets (credit procurement) to compensate for unavoidable residual emissions, based on calculated corporate or product-level CO2.



Contact
Point

ASUENE Inc.

Email: youskeh.suzuki@asuene.com (Mr. Suzuki: English & Japanese support)

Sustainability AI Platform ASUENE: <https://asuene.com>

GHG Emissions Calculation & Visualization Solution

Transforming the world with clarity

~Committed to tackling the shared global challenge of climate change with sincerity and determination~

Zeroboard Inc.

Product and service outline

Calculating and visualizing greenhouse gas (GHG) emissions across the entire supply chain not only contributes to enhancing corporate value but also helps reduce costs. Zeroboard provides a service that enables calculation in accordance with the internationally recognized GHG Protocol for emission reporting, as well as management of initiatives aimed at reduction.

▶ Reliability

System validity verified in compliance with ISO 14064-3.

Zeroboard Inc. certified under ISMS (ISO 27001).

▶ Network Effect

Equipped with functions for obtaining primary data from suppliers and linking data with customers.

Promotes the development of a highly effective ecosystem through strong network effects.

Actual result and example

- Implemented by over 15,000 companies worldwide, including group companies, with more than 400 cases in ASEAN.
- As part of JETRO's ADX Project, a pilot implementation of GHG emissions visualization at the industrial park level was carried out at the MM2100 Industrial Park in Indonesia.
- Signed an MOU with the Indonesian Ministry of Industry (MOI) to support the development of GHG emissions reporting infrastructure and engaged as an external advisor in collaboration with WRI Indonesia.



Joint MOU signing ceremony with four companies at MM2100 Industrial Park



MOU signing ceremony for collaboration with the Indonesian Ministry of Industry

Contact Point

Zeroboard (Thailand) Co., Ltd.

—E-mail : shintaro.suzuki@zeroboard.jp (Mr. Suzuki : Japanese • English)

Zeroboard Inc.

—E-mail : remi.wysyznski@zeroboard.jp (Mr. Remi : English)

IT Solution for Transport Management

Bringing order to traffic with our cloud-based fleet management system “SMOC”

Zenmov Inc.

Product and service outline

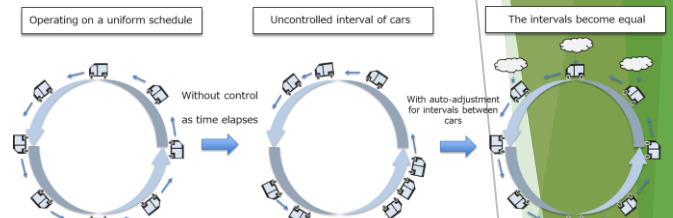
Our proprietary cloud-based fleet management system “SMOC” transforms chaotic traffic into organized and disciplined traffic

1. The system allows for monitoring vehicle operation status and management of vehicle dispatch according to the situation. (solving the demand-supply imbalance)
2. The vehicle interval adjustment function enables keeping intervals in equal moments. (optimal allocation of vehicles according to travel demand and environment in the area)
3. The system automatically creates drivers' schedules and visualizes each driver's performance, enabling the operators to have the most efficient transport management.
4. Low vehicle utilization rates can be solved by implementing management of operational modes tailored to the transportation demand.
5. The complexity of equipment management can be simplified by incorporating device management and fleet management functionalities

(1) Schedules automatically generated by the data collected



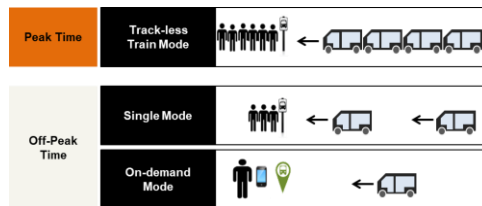
(2) Adjust the intervals which would be inevitable without our system



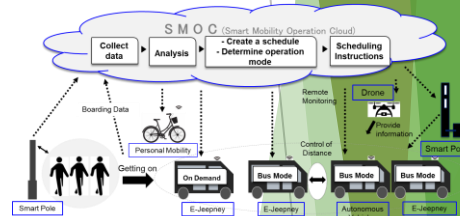
(3) Discrepancy of actual work hours and scheduled hours is visible



(4) Different Operation modes according to the demand



(5) One system manages all vehicles



Achievements

- Providing the service to the transport operator (Jeepney Operator) in the Philippines
- “Demonstration Project for Smart Mobility for New Clark City and the entire Clark Economic Zone” Philippine, Clark Area, funded by NEDO
- “Creation and dissemination of low-carbon emission technologies through co-innovation” at Pasay City, Philippines, funded by the Ministry of the Environment, Japan
- “FY2022 Smart JAMP Research and Study for the Realization of Smart Cities in Bandar Seri Begawan, Brunei Darussalam,” funded by the Ministry of Land Infrastructure Transport and Tourism Japan



In-vehicle monitor for passengers



Passengers waiting for the buses in Brunei



Monitor installed at the doorway of the Ministry of Transport and Infocommunications in Brunei

Contact point

Zenmov Inc. (Masayuki Tokuda : English and Japanese)

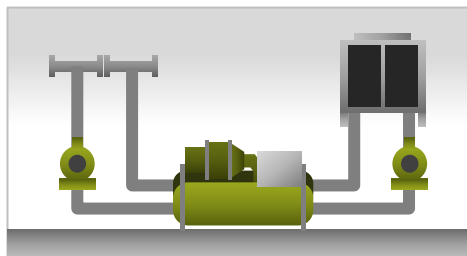
—Phone number : +81-90-3012-5457

—E-mail address : info@zenmov.com (English and Japanese)

Digital Twin System for Chiller Plant (CPDT)

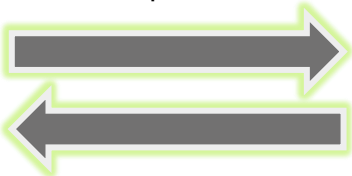
AI adaptive-cooling and machine-learning actionable insights redefine smart building management and characterize the initiatives of Green Building Masterplan.

Azbil Corporation/PT. Azbil Berca Indonesia

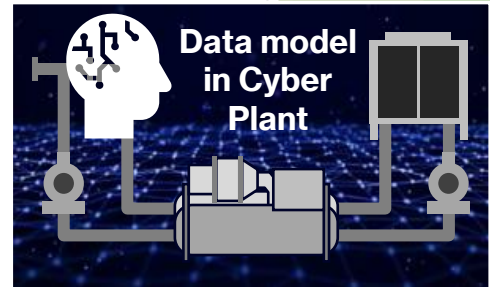


Physical Chiller Plant

Machine learning using real-time operational data.



Incorporating AI-driven analytical results.



Data model in Cyber Plant

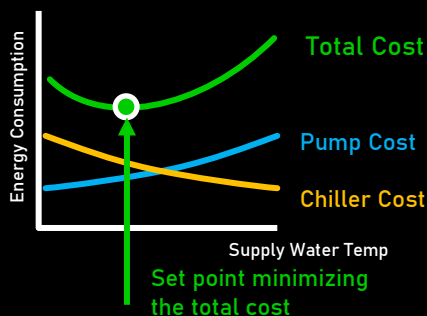
Product and service outline

The CPDT digital simulator is a valuable tool for optimizing the operation of building chilled water systems and achieving energy savings.

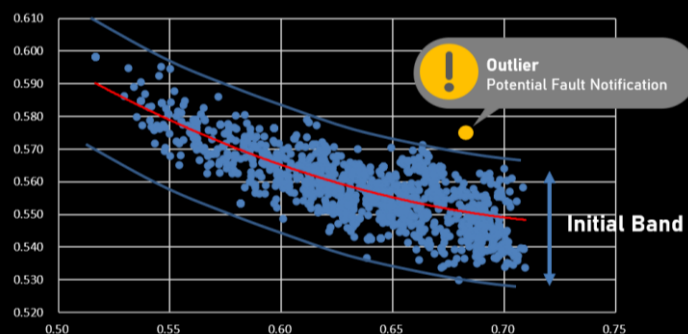
CPDT AI engine creates an accurate virtual space that adjusts to changing conditions and degradation using machine learning. By utilizing this virtual space, users receive optimal operating plans that align with their facility management strategies, leading to optimal operation of the chiller plant.

- ▶ **Data Visualization**
 - ▶ Identify current usage status with various Dash Boards
- ▶ **Optimization & Evaluation**
 - ▶ Trial & Error in the cyber space for Energy-saving operation
- ▶ **Judgement Enhancement**
 - ▶ Operational fault detection by Comparison with ideal status
- ▶ **Operation Enhancement**
 - ▶ Actionable insights, Operational Advice

Searching Optimized point



Early detection of failure signs



Contact point PT.Azbil Berca Indonesia (Building Automation Div.)

- ▶ E-Mail : azbil.ba@id.azbil.com Phone : +62-21-230-5538
- ▶ Inquiry Form : <https://berca.azbil.com/ContactUs/contact.html>

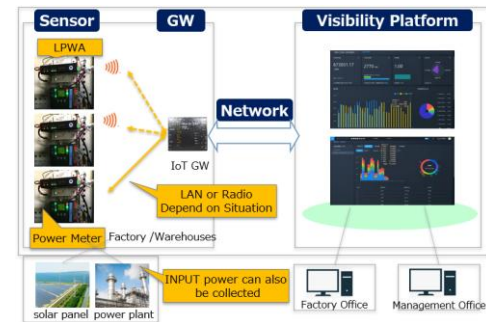
Power Usage Visualization Solution

First Step to Decarbonization

PT. KDDI INDONESIA

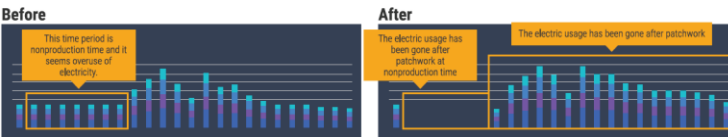
Product and service outline

- ▶ First and most important initiative to achieve decarbonization is to understand the current situation. Even if we can grasp the amount of electricity used in our entire office/factory/warehouse, almost many companies do not know the detailed consumption amount at the actual production site.
- ▶ Visualizing power usage is a very useful action for not only understanding the current position, but also for checking the status of equipment and improving energy consumption efficiency. We KDDI Indonesia uses ICT to support the visualization of electricity usage in offices and factories as a first step toward decarbonization.
- ▶ By utilizing both wired and wireless networks, we can collect data from any location and build a flexible "visualization platform" tailored according to size and environment of offices, factories, warehouses, etc.
- ▶ Visualization dashboards are available in both the versatile cloud-based SaaS format or on-premises format with flexible customization.
- ▶ We provide an all-in-one service, from sensor selection, sensor procurement, until installation network construction, and providing the dashboard.



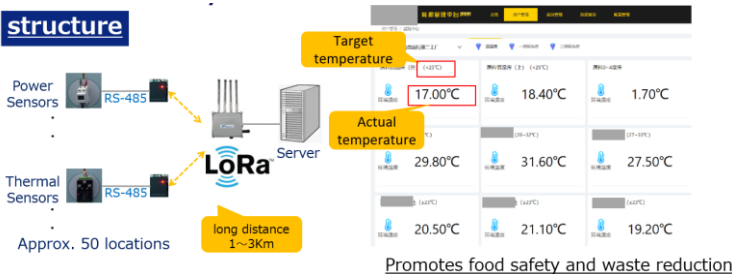
Actual result and example

Electric visibility help to detect compressor air leak



Analyzing power consumption of each equipment and time period. In the example above, 3% of power consumption was reduced by saving power.

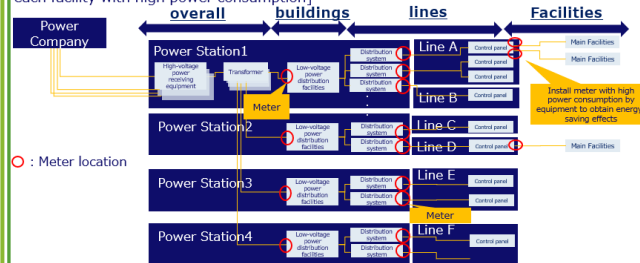
Visualization of temperature and electricity power, and control refrigerator temperatures



In a food factory, identifying inefficiency such as overcooling, and reducing electricity costs and carbon emissions by optimization of refrigerator temperature.

Select installation locations according to purpose

Generally, the process is conducted [overall consumption → each building → each line → each facility with high power consumption]



Contact point

PT. KDDI INDONESIA (English and Bahasa support)

—Phone number : +62-21-570-6303

—E-mail address : sales@kddi.co.id

“KANNA Service” Contributes to Decarbonization by Improving Productivity in the Construction and Manufacturing Sector

Aldagram Inc.

Product and service outline

- ▶ **KANNA Project:** KANNA Project is a digitalization service that improves productivity of non-desk working industries such as construction, real estate, manufacturing, etc. KANNA Project allows you to visualize the progress of projects that are running concurrently and manage them all in a single centralized platform.
- ▶ **KANNA Report:** KANNA REPORT is a customized digital reporting tool that drastically improves work efficiency by digitalizing paper reports. You can upload the reports/forms that you normally use to KANNA and fill them out using mobile devices and PCs. You can save, edit, and download these reports. Various data formats such as numbers, dates, radio buttons, photos, and hand-written signatures could be used in the report.

Project Digitalization



KANNA



Actual result and example

(A) Electrical Engineering Company

Before: CEO runs the company alone. He moves to all the construction sites by his car, takes photos, and then comes back to the office to write reports.

After: Using KANNA, he can take photos on-site, create reports, and share them with the client so that the client can check them right away, eliminating the need to go back and forth to the site to fix reports. As a result, more than 50km of transportation was eliminated.

50 km by car (normal van for 4-6 passengers) = 9 kg of CO₂ (Worth a volume of 900 soccer balls.)

(B) Construction Company

Before: All documents were created in Excel, printed out in advance of work, and stored on paper.

After: Most of the documents, which used to be about 800 sheets per month, are now stored on PCs. Monthly paper consumption was reduced to about 80 sheets, resulting in a 90% paper reduction.

Upload files to
create template



Contact point

Aldagram Inc. (Mr. Shinji Ito: English and Japanese support)

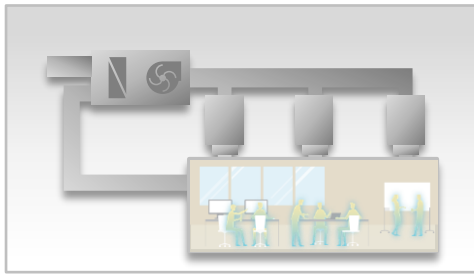
—Phone number : +66-81-151-6990

—E-mail address : shinjiito@aldagram.com

Air Side Digital Twin (ASDT)

AI adaptive-cooling and machine-learning actionable insights redefine smart building management and characterize the initiatives of Green Building Masterplan.

Azbil Corporation/PT. Azbil Berca Indonesia

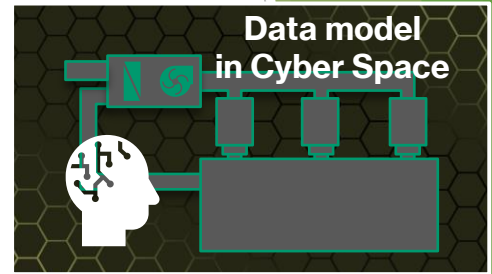


Physical AC System

Machine Learning using real-time operational data



Incorporating AI-driven analytical results.



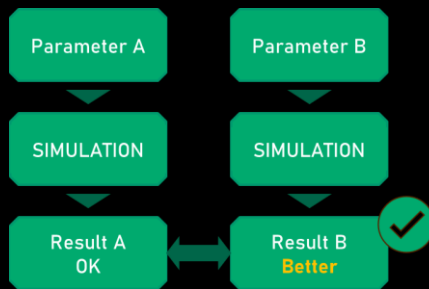
Product and service outline

ASDT digital simulator is a valuable analytical tool for optimizing the operation of building's air handling unit system and maximizing energy efficiency.

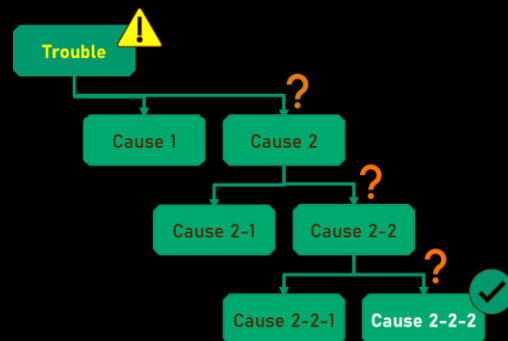
ASDT cutting-edge AI engine creates an accurate Digital Copy of air handling unit in the Cyber World by utilizing changing information in the Physical World with Machine Learning. User can receive tailored operating plans that seamlessly align with your facility management strategies, ensuring optimal performance and efficiency for your air handling units.

- ▶ **Data Visualization**
 - ▶ Identify current usage status with various Dash Boards
- ▶ **Simulation & Evaluation**
 - ▶ Trial & Error in the cyber space for Energy-saving operation
- ▶ **Judgement Enhancement**
 - ▶ Operational fault detection by Comparison with ideal status
- ▶ **Operation Enhancement**
 - ▶ Actionable insights, Operational Advice

Simulation and Evaluation



Early Detection of Operational Fault



Contact point PT.Azbil Berca Indonesia (Building Automation Div.)

- ▶ E-Mail : azbil.ba@id.azbil.com Phone : +62-21-230-5538
- ▶ Inquiry Form : <https://berca.azbil.com/ContactUs/contact.html>

Improving Maintenance Efficiency: Deployment of Advanced Smart O&M Services

Integrated PV diagnostics using drones, AI, SOKODES GF and cloud services



System JD Co., Ltd.

Product and service outline

- ▶ Improve inspection efficiency and sustain PV performance. Our advanced Smart O&M approach connects wide-area imaging with on-site electrical testing, supporting the process from anomaly detection to repair decisions.
- ▶ Wide-area screening: Drone visual and thermal images, supported by AI, locate suspected faults and focus field inspections where they are needed.
- ▶ Electrical verification: SOKODES GF estimates open-circuit and ground-fault locations from the combiner box, supporting investigation of faults that images alone cannot confirm.
- ▶ Data and decarbonization: Linking images, measurements and inspection history supports work priorities and reporting. Early detection and appropriate repairs help reduce generation losses and support long-term operation.

Actual result and example

- 2017: Detected faulty PV modules with SOKODES GF on Sumba Island, Indonesia.
- 2024–2025: Supported O&M guideline development and technician training through an AOTS program.
- 2025: Signed a joint PV maintenance business agreement with Adyawinsa Solar.
- 2026: Signed an MoU with Indonesia's National Research and Innovation Agency BRIN on advanced maintenance technology.
- **2026: Signed a Letter of Intent (LOI) with the Indonesian Solar Energy Association AESI on PV inspection and maintenance.**

Target benefits

Less inspection effort: focus on suspected faults.

Better decisions: combine images with electrical evidence.

Ongoing maintenance: use records for repairs and follow-up inspections.

Smart Solar O&M



Inspection, AI, expert review and reporting (Source: IRUAV materials)



Sumba field inspection (2017)



SOKODES GF

Contact point

System JD Co., Ltd. (Mr. Hiroshi Date: English)

Phone: +81-92-832-5276

E-mail: sokodes@system-jd.co.jp Web: www.system-jd.co.jp

Discuss an inspection approach tailored to your rooftop or ground-mounted PV plant

7. Effective Use/Conservation of Resources

- **Waste Plastics and Waste Textile Recycling Technology**
(JGC HOLDINGS CO., LTD.)
- **LIMEX An Innovative New Material Made with Limestone**
(PT.SODANIKKA INDONESIA/TBM Co., Ltd.)
- **Eco-friendly Asphalt Modifier 「NEWTLAC」**
(PT. Kao Indonesia Chemicals)
- **Recycling Coal Ash and Reducing CO₂** (FKG Corporation)
- **Granulated blast-furnace slag (GBFS)**
(JFE Steel Corporation)
- **Inplace Cold Recycling Method**
(PT SAKAI INDONESIA, PT SAKAI SALES AND SERVICES ASIA)
- **Manufacturing of Fuel and Raw Materials by Utilizing Waste as an Alternative to Natural Resources**
(AMITA HOLDINGS CO.,LTD.)

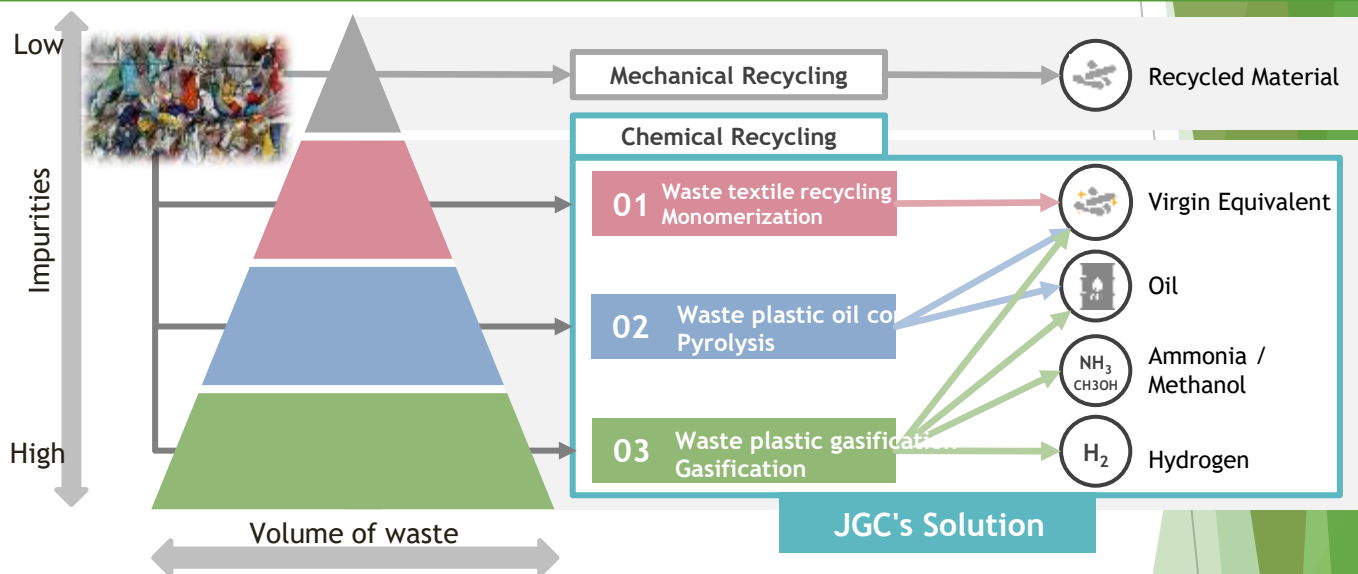
Waste Plastics and Waste Textile Recycling Technology

- JGC Group's Chemical Recycling Technologies to Contribute to the Realization of a Recycling-Oriented Society-

JGC HOLDINGS CO., LTD.

Outline of Products and Services

- Recently, there is a need to establish effective solutions for global social issues such as marine pollution by waste plastics, proper disposal of waste, and reduction of GHG emissions. The JGC Group aims to realize a low-carbon society by providing chemical recycling technologies for waste plastics and waste fibers.
- The JGC Group has three chemical recycling technologies: waste fiber recycling, waste plastic oiling, and waste plastic gasification. Considering the degree of impurities contained in waste plastics, which are raw materials, product needs, economic efficiency, and CO₂ emissions, we propose optimal solutions that meet the needs of customers and society.



	Waste textile recycling Monomerization	Waste plastic oil conversion Pyrolysis	Waste plastic gasification Gasification
Characteristics	✓ Textile-to-Textile Recycling ✓ Excellent in eliminating dyestuffs and impurities compared to material recycling	✓ Process of obtaining heat decomposition oil derived from waste plastics ✓ Waste plastics containing PVC and PET can be processed without separating them.	✓ Converted plastic containing mixed plastics and impurities into recycled products via synthetic gas ✓ Contributing to the Manufacture of Local Production and Consumption Hydrogen
Results and examples	✓ Only technology with a proven track record of decolorization, impurities removal, and commercial operations	✓ 10-year commercial operation record	✓ Long-term commercial track record (only in gasification)

Contact Us:

JGC Holdings Corporation, Kenji Kawabata, +81-45-682-8333, kawabata.kenji@jgc.com
PT JGC Indonesia, TANAKA Hideaki, +62 (0)811 958692, tanaka.hide@jgc.com

PT.SODANIKKA INDONESIA/TBM Co., Ltd.

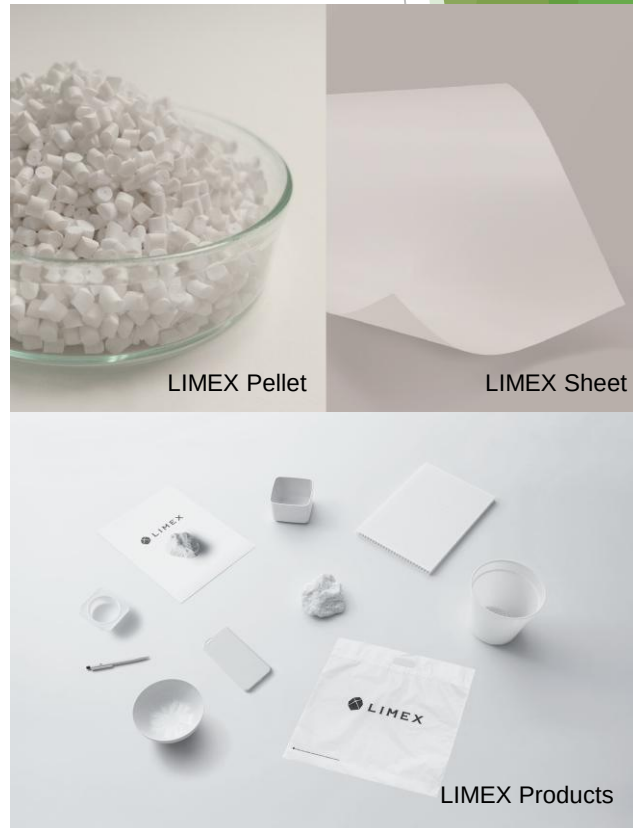
Product and Service Outline

- ▶ LIMEX is an inorganic filler-dispersion composite material containing more than 50% inorganic materials such as calcium carbonate. LIMEX is developed, and manufactured by TBM Co., Ltd. with its patent in over 40 countries.
- ▶ LIMEX uses limestone as its main raw material. It can be molded into plastic and paper alternative products and can also be recycled.
- ▶ LIMEX Pellet can be processed into items such as packing material, containers, and daily products with existing molding machines, and LIMEX Sheet can be printed and bound with existing printers and binding machines.
- ▶ LIMEX Pellet can reduce plastic usage and greenhouse gas emissions compared to petroleum-based plastics, and LIMEX Sheet can reduce water consumption by approximately 97% compared to plain paper, and since it does not use any wood pulp, it can conserve natural resources at risk of depletion.
- ▶ LIMEX was introduced at international conferences such as COP and G20, and the technology has been registered with UNIDO's Sustainable Technology Promotion Platform "STePP".

Actual Result and Example

More than 10,000 companies have adopted LIMEX.

- TBM Co., Ltd. and Indonesia's largest cosmetic container molding manufacturer, which handles products for major cosmetic manufacturers around the world, has concluded a sales agreement for LIMEX Pellet (injection molding grade only) for cosmetic containers. We are collaborating closely to deliver LIMEX cosmetic containers to the global market.
- Bio LIMEX Bag made of limestone and plant-based resin is used for shopping bags at stores in Haneda Airport.
- ※Bio LIMEX Bag is not biodegradable.
- LIMEX Sheet is used for the table menu of the Japanese branch of 添好運 (Tim Ho Wan), a Michelin-starred dim sum specialty restaurant in Hong Kong operated by WDI Co.
- LIMEX is used in a Gundam series plastic model and a dinosaur skeleton plastic model produced by BANDAI SPIRITS Co.
- LIMEX Sheet is used for the store displays of POLA INC. and the in-store illuminated menus of MOS BURGER.



Contact point: PT.SODANIKKA INDONESIA,SODANIKKA CO.,LTD, Jakarta Rep.

Japanese、 English : Kentaro Shibahara :+62-813-8998-9215 : k-shibahara@sodanikka.co.jp

Japanese、 English、 Bahasa : Alex :+62-812-1359-9922 : a-liga@sodanikka-jktrep.com

English 、 Bahasa : Sodik :+62-813-1300-0800 : nursodik@sodanikka.co.id

Eco-friendly Asphalt Modifier 「NEWTLAC」

Next-generation road pavement that is friendly to the environment and people

PT. Kao Indonesia Chemicals

Product and service outline

- ▶ The Kao Group's corporate slogan is "Cleanliness in our hearts, in our future,". To achieve this goal, the Chemical Business Division promotes research and development that contributes to the construction of social infrastructure. In December 2020, we launched NEWTLAC, a modifier that uses waste PET as part of the raw material and improves durability by adding it to asphalt pavement. It is already being used for paving public roads, store parking lots, distribution centers, and factories.
- ▶ Rather than mixing waste PET as is, we use our proprietary technology to transform it into a new modifier.
- ▶ Increases the durability of added asphalt pavement by up to 3 times.
- ▶ By making asphalt pavement more durable, it is possible to reduce road surface damage and reduce CO₂ emissions associated with repair work. It also helps provide safe and secure roads for users over a long period of time without incurring large costs.

Actual result and example (As of February 2024)

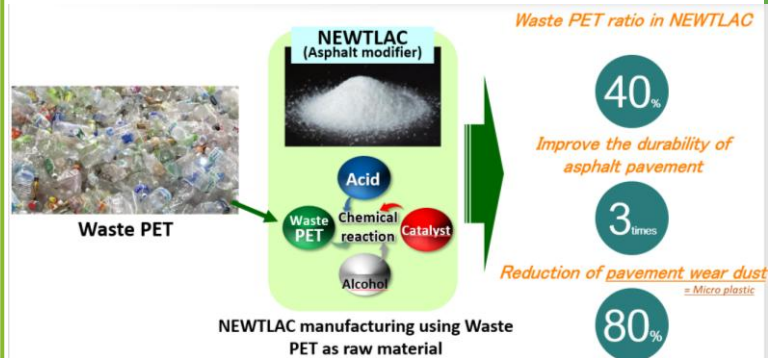
<Achievements in Japan>

- From 2020, full-scale rollout begins
⇒ Over 90 records ; Retail store parking lots, highway parking areas, Logistics company bases, prefectural roads, city roads, etc.
- Japan Resilience Award, Resilience Award ;
Received the semi-grand prize and gold prize (2022)
- Received the Minister of the Environment Award at the 50th Environmental Awards (2023)
- 22nd Green Sustainable Chemistry Award
Received the Minister of the Environment Award (2023)

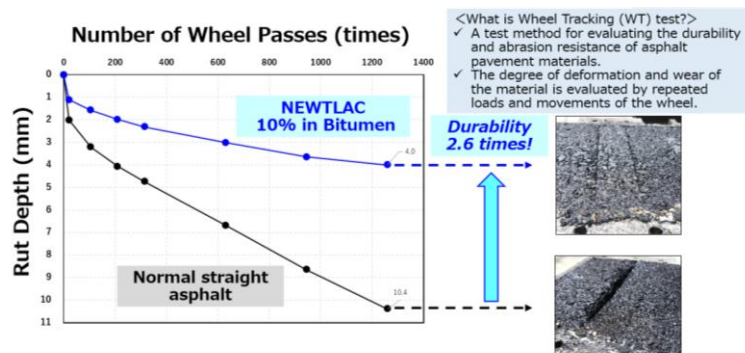
<Overseas expansion>

- United States, Thailand, Taiwan etc.
- Indonesia expansion 2022
Confirmed the compatibility of NEWTLAC with Indonesian materials (asphalt and gravel) in an official evaluation organization
- Indonesia expansion 2023
 - Trial construction on our premises
 - Test construction on private land outside the company
 - Adopted in a private project

Positive recycling : From waste PET to highly durable asphalt



Wheel tracking test in Indonesian public institutions (Using Indonesian asphalt raw materials)



Contact point

PT. Kao Indonesia Chemicals (Bambang : Japanese, English and Bahasa support)

—Phone number : +62-811-1085-198

—E-mail address : bambang@kaochem.co.id

Recycling Coal Ash and Reducing CO₂

- Realizing Carbon Neutral Society and Prevent of Disaster -

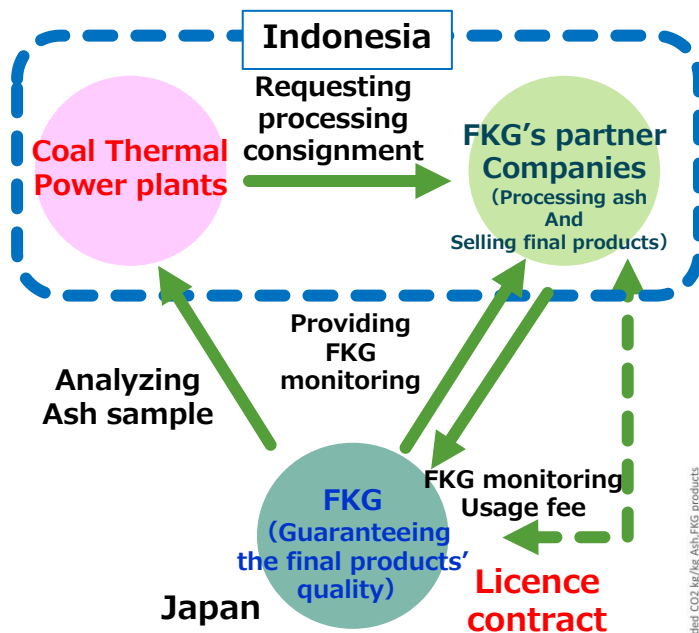
FKG Corporation

Product and service outline

FKG developed a system which can be processing coal ash(included the environmentally-hazardous substances) safely. FKG named this system "FKG monitoring". We can process coal ash safely in Indonesia when Indonesian company adopts it. The final products which is processed using FKG technology can be used crashed stones or embankment. Moreover, these products have significant advantages and its contribute our sustainable society.

- ▶ FKG monitoring : Ash analysis system using FKG's ash processing technologies. It helps us with processing coal ash in Indonesia.
- ▶ Advantages : High performance against earthquakes、 Disaster prevention and risk reduction、 Purification of water、 Reducing CO₂、 Highly absorbent etc.

【Scheme e.g.】

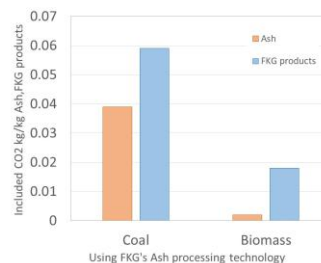


【Case1.】 Protecting our lives



FKG's products were not washed away, but maintained their integrity.

【Case2.】 Reduction of CO₂



**16kg~
20kg/ton**

※per 1 ton of FKG products
※when using FKG's ash processing technologies

Actual result and example

In Japan : Ash processing plants using FKG monitoring 2 plants : FKG HQ and a partner company)
Under consideration who wants to use FKG monitoring : Many companies

Contact Point

FKG Corporation

—Tel— : +81-70-1949-4121 (Mr. Kourogi: JP/ EN)

—E-mail:address— : kourogi@w-fkg.jp (Mr. Kourogi : JP/EN)

Granulated blast-furnace slag (GBFS)

JFE Steel Corporation / PT JFE Steel Indonesia

Product and service outline

Granulated blast-furnace slag (GBFS) improves the durability of concrete structures as a raw material for Portland blast-furnace slag cement and as a ready-mixed concrete admixture.

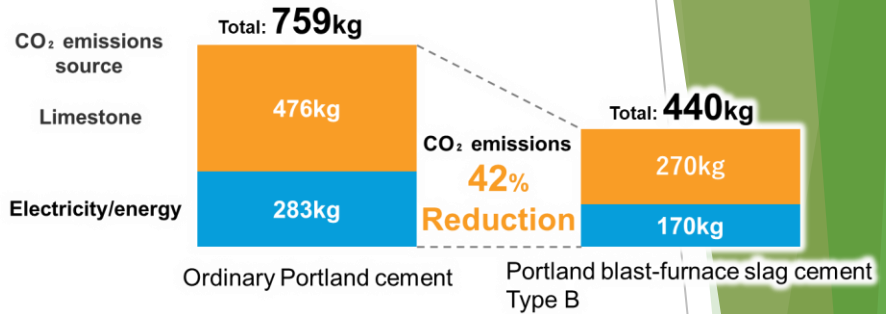
For Portland blast-furnace slag cement Type B, it also contributes to decarbonization, reducing CO₂ emissions by 42% per ton of cement.

* Portland blast-furnace slag cement Type B is a category of cement defined in Japanese Industrial Standards (JIS)



Granulated blast-furnace slag (GBFS)

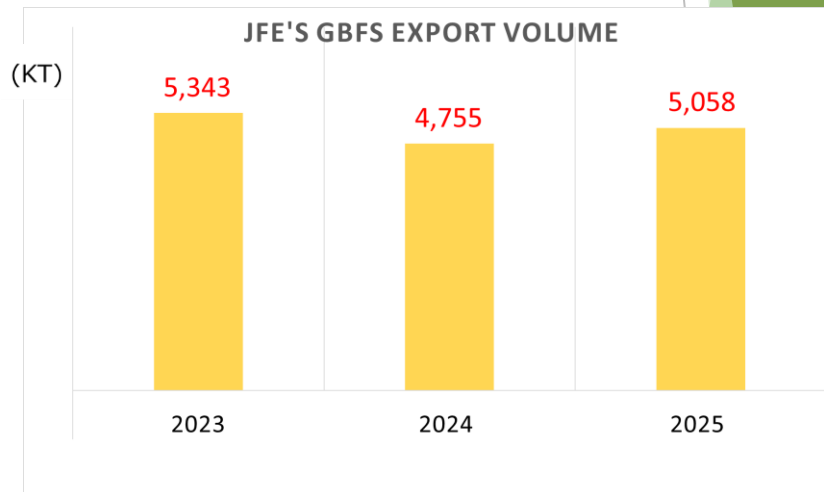
CO₂ emissions for every one ton of cement



Source: Nippon Slag Association "Steel Slag Environmental Material"

Actual result and example

Each year, JFE exports about 5 million tons of GBFS as raw material for cement.



Contact point

JFE Steel Corporation

(Mr. Kodai Matsumura: English support)

—E-mail address : t-jfes-slag@jfe-steel.co.jp

PT JFE Steel Indonesia

(Mr. Ricko Sidabalok: English and Bahasa support)

—E-mail address : ricko001@jfe-steel.co.jp



Inplace Cold Recycling Method

A construction method that pulverizes damaged asphalt on-site and reconstructs a recycled base course by adding stabilizing agents

PT SAKAI INDONESIA, PT SAKAI SALES AND SERVICES ASIA

Product and service outline

► Inplace Cold Recycling Method: CAE (Cement & Asphalt Emulsion) Method

This method pulverizes deteriorated asphalt pavement in place and mixes it with cement and asphalt emulsion to construct a stabilized recycle base course. The method provides the following advantages:

1. Improves the strength and durability of the base course, reducing cracking and rutting, thereby extending the service life of roads. This results in longer repair cycles and contributes to CO₂ reduction. At the same time, the improved road surface smoothness enhances vehicle fuel consumption efficiency, further reducing CO₂ emissions.
2. Contributes to resource conservation by reusing existing pavement materials.
3. Compared to the conventional base course replacement method, construction period can be shortened by 30%, leading to additional CO₂ reduction.

► Road Stabilizer (PM550-s, PM560-s)

Specialized machines used for the above-mentioned CAE pavement recycling method.

The "PM550-s" series is manufactured locally in Indonesia by PT. Sakai Indonesia.

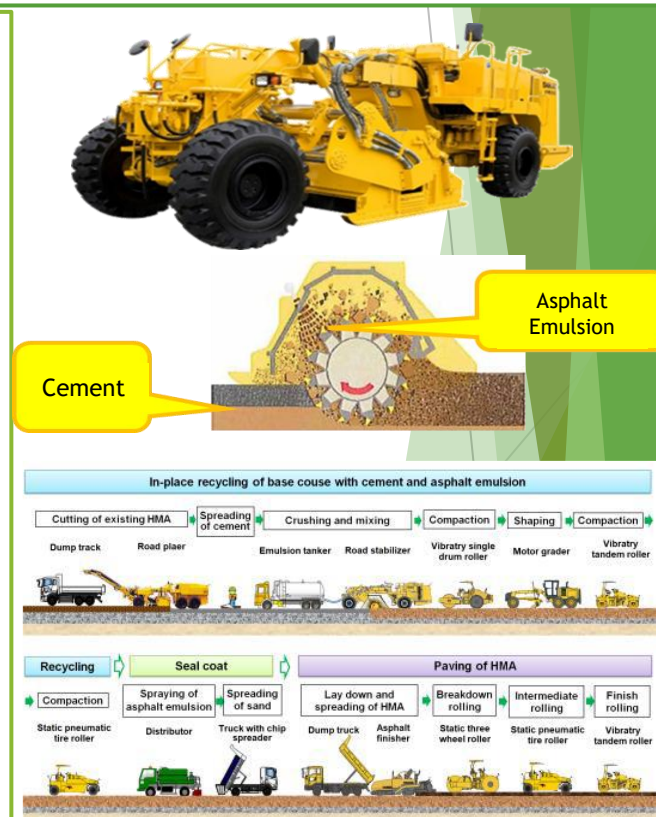
Actual result and example

① Promotion of the CAE Method

- * Incorporation into national specifications (standardization)
 - 2016: Vietnam
 - 2025: Indonesia
- * Adopted for JICA's SDGs Business Validation Survey Project
 - 2022-2023: Indonesia
- * METI Global South Subsidy Project
 - 2025: Kenya
- * Registered with UNIDO (United Nations Industrial Development Organization)
 - 2025: STePP program

② Road Stabilizer (PM550-s, PM560-s)

- * Delivered to 17 countries under ODA (Official Development Assistance) by the Sakai Group
- * Local production launched by Sakai Indonesia
 - 2021: Completion of the first unit manufactured in Indonesia
 - 2022: First shipment for domestic use in Indonesia
 - 2023: Shipment to India
 - 2024: ODA shipment to Ukraine



Contact point

PT. SAKAI SALES AND SERVICES ASIA

— Tel — : +62-21-897-0374 Mr. Arief Priyanto (English and Bahasa support)

— E-mail — : product-support@sakaiindonesia.co.id (English and Bahasa support)

Manufacturing of Fuel and Raw Materials by Utilizing Waste as an Alternative to Natural Resources

- reducing CO2 emissions through less resource usage •

AMITA HOLDINGS CO.,LTD.

Products and services outline

▶ Simplified Recycling Assessment Service

We analyze the volume and characteristics of the generated waste and propose appropriate treatment and recycling methods from the perspective of cost efficiency and CO2 reduction.

▶ 100% Recycling Service

By blending waste that is difficult to process, we recycle it into fuel and raw materials necessary for cement production. (※ scheduled to commence in 2027)

PT. Amita Prakarsa Hijau was established as a joint venture with a local company, leveraging expertise cultivated in Japan and Malaysia. Rather than merely disposing of waste or partial recovery, our proprietary technology converts designated waste into Alternative Raw Material (ARM) and Alternative Fuel (AF). These serve as substitutes for natural raw materials and fossil fuels in cement manufacturing, enabling 100% recycling with no residual waste.

Actual results and examples

▪ Seminars on “Risks and Countermeasures in Waste Management”

Held at 5 industrial parks in 2025

▪ On-site Verification of Waste Treatment Contractors

For manufacturing companies: Visualization of transport and disposal routes, verification of permits and licenses

▪ Simplified Recycling Assessment Service

Evaluates recyclability of waste generated within industrial parks and proposes improvement methods

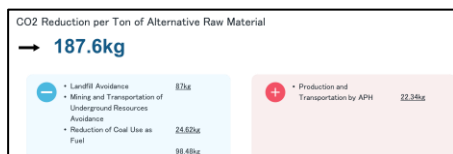
▪ Recycling Business Achievements in Malaysia

Annual production volume from alternative material/fuel recycling:

→33,574 tons

Projected CO2 emissions reduction from providing recycled products (substituting natural resources):

→5,036 tons



Seminar on Risks and Countermeasures

• • • • •



Malaysia Plant

Contact point

PT. Amita Prakarsa Hijau

—Phone number— : +81-80-5951-4100 (Ms. Yasuda : 英語・インドネシア語対応)

—E-mail address— : myasuda@amita-net.co.jp

8. Agriculture and Forestry Sector

- **One Stop Carbon Credit Solution Provider** (Green Carbon Inc.)
- **Mangrove Planting and Forest Conservation Project**
(YL Forest Co., Ltd. (PT. Yamamoto Asri))
- **Supporting the Creation of Reliable Nature-Based Carbon Credits Using Satellite Data** (Archeda, Inc.)
- **Eco-Friendly Soap-Based Fire Extinguishing Agent**
(SHABONDAMA SOAP Co., Ltd.)
- **AWD-Based JCM Carbon Credits & Climate Adaptation** **NEW**
(Faeger Co., Ltd.)

One Stop Carbon Credit Solution Provider

Through agriculture-based decarbonization projects, We reduce GHG emissions as well as increase Indonesian farmers' income

Green Carbon Inc.

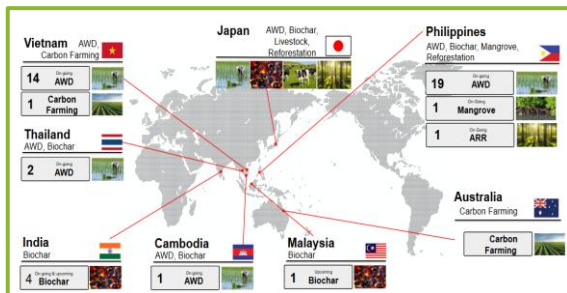
Product and service outline

➤ Innovative Nature Based Solutions (NbS) Carbon Credit Developer.

- ▶ We offer a transformative approach to carbon credit development that not only drives environmental impact but also empowers communities:
- ▶ **Integrated Carbon Credit Development & Trading:** We design and manage high-integrity, verifiable carbon credit projects, from Inciting to trading, ensuring transparency, quality, and long-term value.
- ▶ **Empowering Farmers with Financial & Technical Support:** Through inclusive programs for capacity building, we equip local farmers with the resources, tools and knowledge to adopt sustainable practices that reduce emissions and regenerate ecosystems.
- ▶ **Nature-Based Project Innovation:** We specialize in the registration and third-party certification (S&P) of carbon credits through flagship NbS projects, including:
 - ➔ **Alternate Wetting and Drying (AWD) Rice Paddy Project**- a water-saving technique that reduces methane emissions and improves yield production by periodically drying the rice field;
 - ➔ **Mangrove Restoration** - enhancing biodiversity, protecting coastlines, and sequestering carbon;
 - ➔ **Biochar Production** - converting agricultural waste into stable carbon sinks, improving soil fertility
- ▶ **Agreen Platform:** A digital measurement, reporting, verification (MRV) and farmer empowerment platform that combines satellite data, modeling tools, and farmer logbooks to verify emission reductions, ensure transparency & traceability and enable farmers to access premium markets for verified low-emission rice and carbon credits.

Actual result and example

Project Pipeline (More than 40 Projects across Southeast Asia countries)



- **AWD Rice Paddy Project - Indonesia**
 - 2027: Initiating pilot AWD projects across Java Island as the starting point of our Indonesia operations.
 - Long-term plan to expand to 100,000 hectares over 10 years, including additional provinces.
- **Biochar Project - Indonesia**
 - Utilizing oil palm residues (PKS, EFB, palm oil tree trunks) and other agricultural wastes such as bamboo.
 - Certified pyrolysis plant from India will be deployed in Indonesia.
- **ARR / Blue Carbon Project - Indonesia**
 - Planning a mangrove restoration project in Sumatra Island in partnership with the YAGASU & PT.PIL.
 - Dual focus: strengthening local fishermen's livelihoods and ensuring ecosystem sustainability.



Partnership of Green Carbon Inc. & BRIN



Contact Point

Green Carbon Inc. (Farah Zribi: English)

—Phone No. : +81-80-7307-8597

—E-mail address : f.zribi@green-carbon.inc

Green Carbon Inc. (Erwin Baba: English)

—Phone No. : +62 812-6969-6996

—E-mail address : a.erwin@green-carbon.inc

Mangrove Planting and Forest Conservation Project

Toward The Realization of CO₂ Absorption and Fixation through Blue Carbon and Sustainable Aquaculture

YL Forest Co., Ltd. (PT. Yamamoto Asri)

Product and service outline

In 2006, we established a local subsidiary in Batam City and started mangrove planting and forest conservation projects. We are developing 1) afforestation projects in tidal flats (new afforestation), 2) Silvofishery-type mangrove afforestation projects (forest regeneration), and 3) REDD+ projects (forest conservation). Additionally, as part of "Corporate Forest Development" project, we undertake the entire process from site selection to site negotiations, tree planting, and cultivation management for Silvofishery-type mangrove plantations.

Overview of Silvofishery ("Corporate Forest Development" with Silvofishery)

Silvofishery is a system that combines "Silviculture" and "Fishery". Mangroves are planted on the site of aquaculture ponds or in aquaculture ponds where productivity has declined, and aquaculture is carried out around them. By utilizing the mangrove ecosystem, it is possible to carry out aquaculture at low cost while preserving the natural environment without polluting the environment. It also leads to a stable livelihood for locals.

Actual result and example

➤ Mangrove plantations at Batam Botanical Garden and other places @ Batam City

Since 2006, we have concluded MoU with the Batam government and developed new mangrove plantation project for 1,500 ha.

➤ OKI-REDD+Project

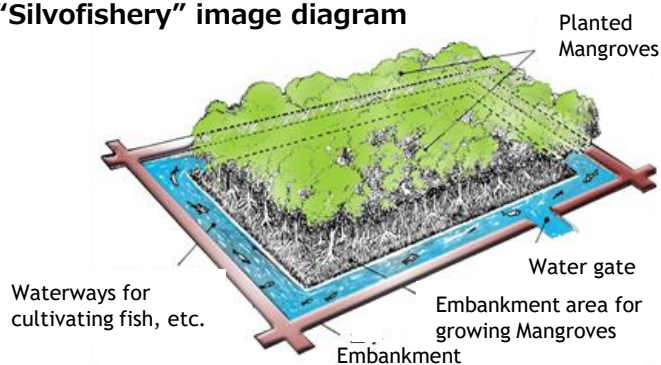
Since 2013, we have obtained Indonesia's first "Environmental Service Utilization Business Permit in Protected Forests" in the coastal area of Ogan Komering Ilir Regency in South Sumatra Province, and now in progress of afforestation and conservation mangroves in 23,500 ha. We aim to reduce and absorb 11 million tons of CO₂ over 30 years.

Joint developer: Mitsui O.S.K. Lines, Ltd.

➤ Corporate Forest Development (Silvofishery)

- Ricoh Bintan Forest
- Paramount Bed Mangrove Forest
- Honda Cars Saitama Kita Forest etc.

"Silvofishery" image diagram



- **Measures against Global Warming:** Attract attention as blue carbon, and is known to have a high ability to accumulate carbon not only in trees but also in the soil.
- **Green Infrastructure (Eco-DRR,F-DRR):** Acts as a natural breakwater and seawall, contributing to disaster prevention resilience.
- **Ecosystem Conservation / Environmental Maintenance:** Mangroves form a unique ecosystem called the "cradle of life in the sea."
- **Realizing a Sustainable Society:** By coexisting and co-prospering with nature, we will achieve both sustainable forest management and aquaculture, contributing to the stability of local residents' lives.



Contact point

YL Forest Co., Ltd.

—E-mail address : info@ylforest.co.jp (Japanese/English/Indonesian support)

Website : <https://ylforest.co.jp/>



Supporting the Creation of Reliable Nature-Based Carbon Credits Using Satellite Data (dMRV Solution)

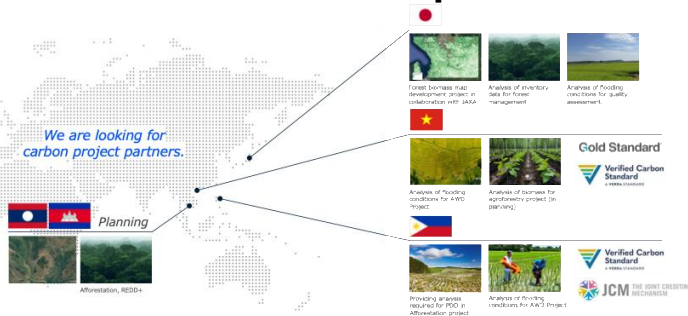
Archeda, Inc.



Product and service outline

We are a startup that supports the creation of reliable nature-based carbon credits using satellite data and AI. We provide comprehensive project development support through technology utilization, covering forests (ARR•REDD+), rice paddies, mangroves, and other areas, from feasibility studies (FS) to project design document (PDD) creation and monitoring. We also support international carbon certification standards such as Joint Crediting Mechanism (JCM), Verified Carbon Standard (VCS), and Gold Standard.

Actual result and example



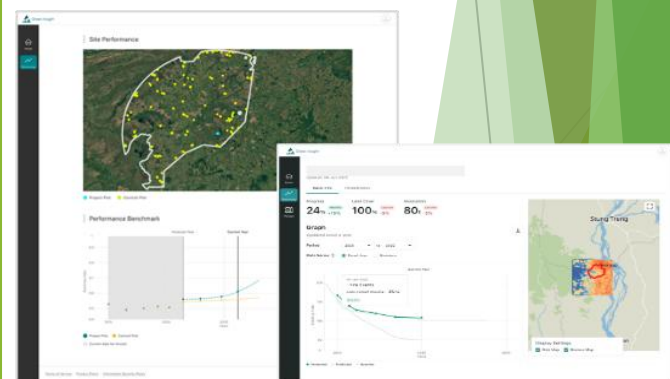
Rice paddy project monitoring ©Archeda

Support for Forestry Projects

- Monitoring support for ARR (Afforestation/Reforestation) PDD in the Philippines
- REDD+ survey and analysis in Cambodia
- Historical and environmental assessment for SAF projects in Cambodia
- R&D of forest biomass estimation methods with JAXA in Japan and Cambodia
- Signed MOU with Indonesian companies (ARR and Mangrove)

Support for Agricultural Projects

- Demonstration of AWD (Alternate Wetting and Drying) water evaluation in the Philippines
- Development of field plot data for AWD in the Philippines and Vietnam
- Feasibility study support for ALM (Agricultural Land Management) in Vietnam
- Signed MOU with BrMP (AWD)



Forest project monitoring ©Archeda

Contact point

Archeda, Inc. (English and Japanese support)

E-mail address : takamasa_ogasawara@archeda.inc

Eco-Friendly Soap-Based Fire Extinguishing Agent

Efficiently extinguishes peat and forest fires while helping reduce carbon emissions

SHABONDAMA SOAP Co., Ltd.



Product Overview: Shabondama Natural Foam

100% biodegradable environmentally friendly Class A fire extinguishing agent.

- ▶ Reduces the surface tension of water, improving adhesion to burning materials and penetration into peat layers deeper below.
- ▶ Natural soap components also help support the regeneration of burned forests.
- ▶ Readily foams during spray or drop application, allowing treated areas to be easily identified.
- ▶ Supplied in 20L containers and typically used at dilution ratio of 1% to 3% with fresh water.

Eco-friendly soap based fire extinguishing agent
Patented in 8 countries around the world

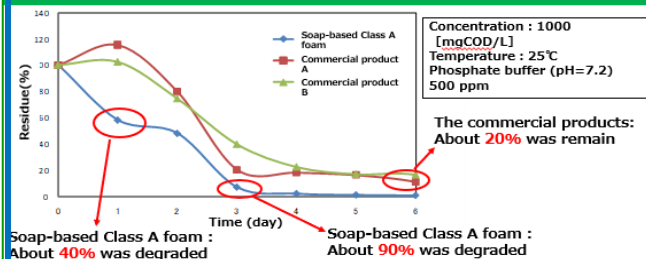


History / Case Studies

- 2007: Passed certification test of the Japan Fire Equipment Inspection Institute as Japan's first domestically produced Class A fire extinguishing agent
- 2007–2026: Used by fire departments across Japan for general fire suppression
- 2013–2015: Provided training and practical drills in fire suppression techniques using this fire extinguishing agent for firefighting and disaster response personnel in Central and East Kalimantan (JICA Grassroots Technical Cooperation Project).
- 2016–2017: Investigated fire extinguishing performance and ecosystem impact when using peatland water (JICA Feasibility Study).
- 2018–2025: Demonstrated effectiveness in extinguishing peat fires, impact on ecosystems, and environmental compatibility, with results published in academic papers (JICA SDGs Business Model Verification Project).
- Listed in the e-Katalog, exclusive importer for Indonesia market, sales agent in Central Kalimantan Province.
- 2025–2026: Continuing work on Indonesian standards application (UPR), DX for more effective firefighting capability, and surveys of OEM production facilities (METI GS Future-Oriented Co-Creation Program).

Environmental Performance

Biodegradability test



Low impact on the ecosystem

Test Laboratory: Research and Development Center of Fire and Environmental Safety, The University of Kitakyushu

Fire Extinguishing Performance Test and Demonstration



CONTACT

Inquiries in Japanese, English, and Indonesian are welcome.

Hisayoshi Tsuchida (Mr.) – Department Manager, Environmental Disaster Prevention Research & Development HQ, Shabondama Soap Co., Ltd.

Riverwalk Kitakyushu 5F, 1-1-1 Muromachi, Kokurakita-ku, Kitakyushu City, Fukuoka 803-0812, Japan

Tel: +81-93-791-8400 | Fax: +81-93-791-4814 | Mobile: +81-90-9283-5841 | Email: hisayoshi-tsuchida@shabon.com

Reducing GHG emissions and strengthening climate resilience through Alternate Wetting and Drying (AWD) in rice paddies

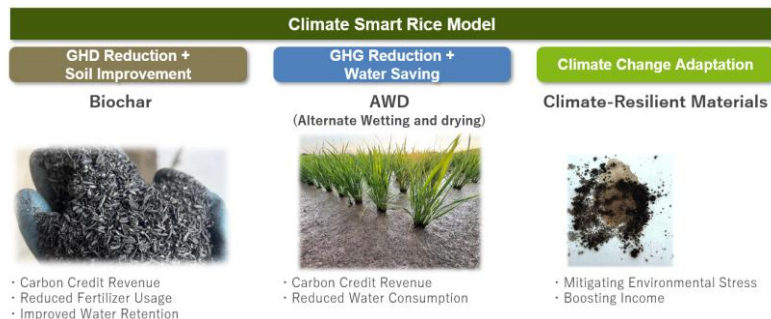
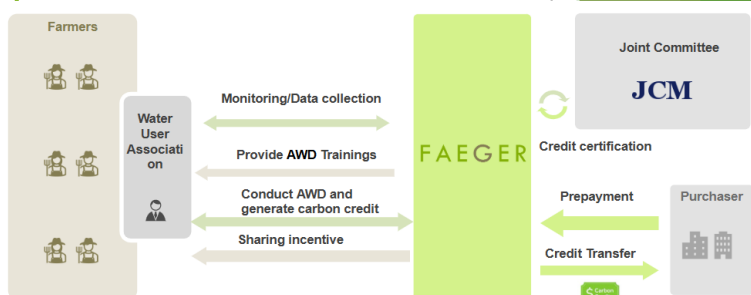
Faeger Co., Ltd.

Product and service outline

- ▶ Generates JCM carbon credits from rice paddies using Alternate Wetting and Drying (AWD), operating across the Philippines, Thailand, and Indonesia.
- ▶ Provides end-to-end support from farmer water-management guidance to credit certification, powered by Faeger's proprietary Digital MRV tools.
- ▶ Water savings and yield stabilization from AWD directly strengthen resilience to climate risks such as drought and erratic rainfall — contributing to both mitigation and adaptation.

Actual result and example

- Japan: Certified 225,735 t-CO₂ of J-Credits (extended mid-season drainage in rice cultivation) in March 2026 — over 70% of Japan's cumulative agricultural-sector issuance.
- Philippines: Running a large-scale JCM AWD project jointly with the Yanmar Group.
- Indonesia: Running an AWD pilot in West Java. Signed MOUs with BBWS (irrigation authority under the Ministry of Public Works) and Indonesia's Center for Agricultural Extension (ICAE), building a partnership network with local government and research institutions. Also signed MOUs with IPB University (Bogor Agricultural University) and local Indonesian foundation Yayasan Agathis Dammara Karbon (YADK), exploring the biochar business.



Contact point

Faeger Co., Ltd.

- Contact: Kazuki Sakamoto, Director, Southeast Asia Business

- WhatsApp: +81-70-4332-2474

- E-mail address: kazuki.sakamoto@faeger.co

9. Finance/Insurance

- **Drone Survey**

(PT Asuransi MSIG Indonesia)

Drone Survey

Contributing to decarbonization through a free inspection service for roofs and solar panels.

PT Asuransi MSIG Indonesia

Product and service outline

We utilize drones equipped with high-performance cameras to efficiently and accurately inspect roofs, structures, and solar panels. Even areas that are difficult to check visually—such as high places or wide areas—can be assessed safely and quickly to understand the extent of damage.



Safety Inspection with High-Performance Drone



4 Inspection Services

- Damage & Deterioration Check**
 - Roof cracking / tile splits
 - Bolt loosening / warping
- Rust & Corrosion Progress**
 - Metal roof rust / vent deterioration
 - Corrosion risk assessment
- Water Leak & Flood Risk Check**
 - Puddle detection / sheet deformation
 - Gutter & drain blockage check
- Solar Panel Inspection**
 - Soiling & damage detection
 - Hot-spot detection

CO₂削減
脱炭素化・温暖化対応に貢献

Step 1 Request & Scheduling

We schedule inspections to suit your requirements.

Step 2 Site Survey & Preparation

We visit the site, secure flight permits, and handle all preparations.

Step 3 Drone Survey Execution

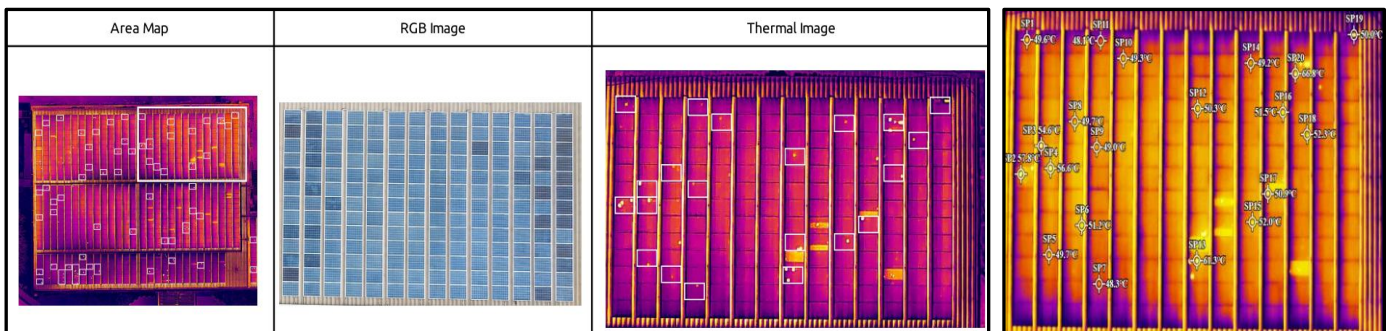
A certified pilot performs the drone survey on-site.

Step 4 Report & Closing

We deliver a survey report and provide a full explanation.

Actual result and example

We use thermal imaging cameras to quickly and non-invasively visualize heat distribution in rooftop solar panels, enabling early detection of issues such as abnormal cells, connection degradation, and bypass circuit faults. Regular drone-based thermal inspections help maximize efficiency, reduce fire risk, and support the reliable use of solar energy toward a carbon-neutral society.



Contact point

PT. Asuransi MSIG Indonesia

—Phone number— : +62-811-9003-4879 (Sasaki : English and Japanese support)

—E-mail address— : Motonari_Sasaki@id.msig-asia.com (Sasaki : English, Bahasa and Japanese support)

10. Transportation

- **Rail Transport as an alternative to Truck Transportation**
(PT YUSEN LOGISTICS INDONESIA)
- **“K” Line’s Activity to Transport Liquefied CO₂**
(Kawasaki Kisen Kaisha, Ltd. (“K” Line))
- **Creating Carbon Credits in the Transportation Domain**
(Spatial Pleasure Co., Ltd.)
- **1st EV truck NEW “eCanter” in Indonesian Logistics Sector**
(PT YUSEN LOGISTICS INDONESIA)

Rail Transport as an alternative to Truck Transportation

~ Why don't you consider it as one of the contributions to reducing CO₂ emissions ? ~

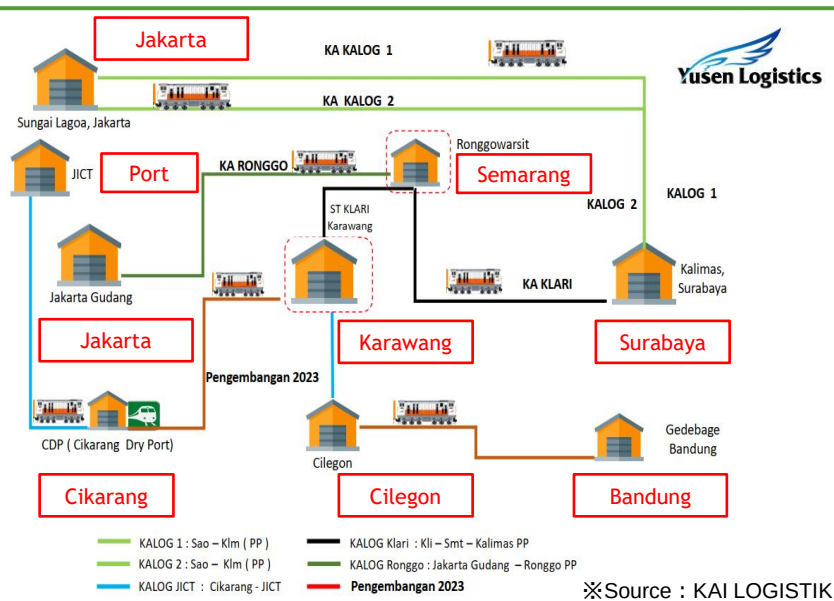
PT YUSEN LOGISTICS INDONESIA

Product and Service Outline

- ▶ Trucking is essential transportation for your business continuity. However, the general image of truck transportation in Indonesia is that there are many old vehicles, and it emit a lot of CO₂.
- ▶ In order to respond the request **"we would like to consider decarbonization measures little by little because we can do it"**, Yusen Logistics is proposing **rail transportation** as an alternative to truck transportation in Java Island. We estimate that CO₂ emissions can be reduced by approximately 80% (by own calculation) when using rail transportation compared to truck transportation.
- ▶ Rail transportation can be used in a wide range of requirements, such as full container transportation loaded in factories/warehouses, less than container load (LCL) services, and domestic transportation or as a hub for international transportation.
- ▶ Please inform us what is your preference and consideration. On the other hand, we installed fast (battery) chargers in our company's facility outside Jakarta areas to facilitates trial operation for EV trucks.

< Rail Route Map >

< Loading on Rail for Full Container / Less than Container Load >



Actual Result & Example

- Full Container : Loading cargo in Cikarang factory and deliver it by train from Cikarang to Surabaya. Then the container will be unloaded in Factory in Surabaya.
- Consolidation : Pick up cargo from Surabaya factory and deliver it by train from Surabaya to Jakarta, then continue the delivery process through Export Air Freight.
 - : Pick up cargo from Semarang factory and deliver it by train from Semarang to Jakarta, then deliver it to factory in Tangerang.

Depend on the consultation subject, we also coordinate rail transport and pre- / post- rail transport arrangement.

Contact point
PT Yusen logistics
Indonesia

- ◆ Departure from Jakarta or Other Area
Jakarta Head Office (ID/EN) : YLID.ML.IFF.BD@id.yusen-logistics.com
- ◆ Departure from Surabaya Area
Surabaya Branch (ID/EN) : YLID.ML.SUB.BD@id.yusen-logistics.com
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Contact Person : Mr. NAKAGAWA / 0811-1991-1729

Creating Carbon Credits in the Transportation Domain

Digital Measurement Reporting Verification Software

Spatial Pleasure Co., Ltd.

Product and service outline

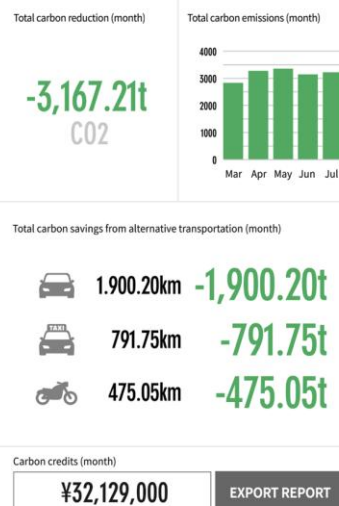
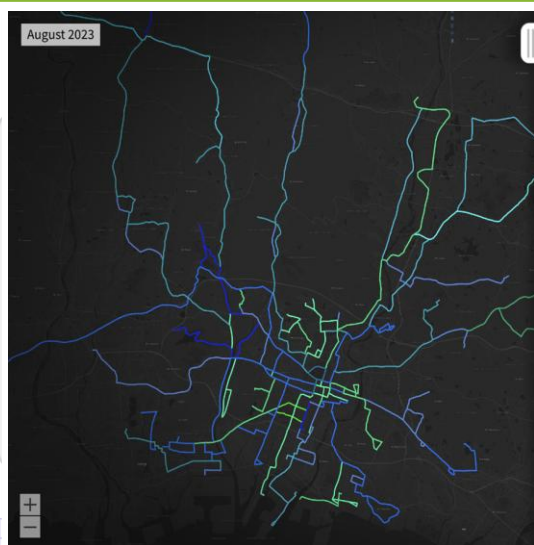
- ▶ Spatial Pleasure is developing DMRV (Digital, Measurement, Reporting, Verification) software to certify and measure carbon credits for transportation operators contributing to the decarbonization of an area.
- ▶ Through collaboration with bus and bicycle-sharing operators, our aim is to decarbonize the entire region by quantifying the environmental benefits of each transportation operator and issuing carbon credits.

Actual result and example

- Spatial Pleasure has agreed to conclude a partnership with Sinar Mas Land, part of the major conglomerate Sinar Mas Group, and its corporate venture capital firm, Living Lab Ventures, to promote decarbonization in urban transportation domain in Indonesia.
- The above-mentioned initiative was supported by JETRO (Japan External Trade Organization), aiming at promoting decarbonization of urban transportation, with BSD City at its center.
- BSD City is one of Indonesia's largest urban development projects, with approximately 400,000 people living on an approximately 6,000 hectare site. As the operating company of BSD City, Sinar Mas Land has been actively promoting measures to reduce transportation-related carbon dioxide emissions. These efforts include a variety of projects such as shuttle bus networks and sidewalk improvements.



Data platform for
Decarbonizing
the transportation
sector in City.



Contact point

Spatial Pleasure Co., Ltd. (Mr. Soma Suzuki, CEO)

—Phone number : +81-80-9530-4903

—E-mail address : soma@spatial-pleasure.xyz

1st EV truck NEW “eCanter” in Indonesian Logistics Sector

~ Why don't you consider it as one of the contributions to reducing CO2 emissions ? ~

PT YUSEN LOGISTICS INDONESIA

Product and Service Outline

- ▶ At the GIIAS-2024 in July, we received the NEW “eCanter” which is the 1st EV commercial truck in Indonesian logistics sector, and began operation in Sep between the Greater Jakarta and Karawang District.
- ▶ The NEW “eCanter” has a max payload of about 3 tons, a cruising range of about 140 km on a full charge. We installed two quick chargers in own facility.
- ▶ Our trucks and warehouses fulfill “HALAL certified” and “GDP-Pharma certified”.
- ▶ We can handle a small quantities, small volumes of **refrigerated and frozen cargo with less than one truck** by below equipment.
 - * Original refrigerated freezer box with battery-powered engine, named “YU-REF”
(Capacity 327L , Temp +2°C ~ +8°C) (Capacity: 109L, Temp -20°C ~ +8°C)
 - * Vacuum insulation box , named “va-Q-tec”
(Various capacity **from 10L**, Temp -25°C ~ 25°C, for about 4 ~ 7 days. Non-Dangerous Goods.)
- ▶ CO2 emissions **calculation tool “e-Calculator”** is available on our website (free of charge).
Website : [Yusen Logistics | Japan: Global Logistics & Supply Chain Management \(yusen-logistics.com\)](https://yusen-logistics.com)
- ▶ We will expand our environmentally-friendly logistics services by introducing Rail transportation and EV trucks.

EV Truck, NEW “eCanter”



“ YU-REF ” 327L



“ va-Q-tec ”



Actual Result & Example

- “We run normal-fueled trucks every day, but don't have any ideas for decarbonization in the logistics field.”
Why don't you consider turning half a day's, a part of a day's worth of multiple delivery routes, into an EV truck?
We accept various consultations about your company's decarbonization efforts based on the current situation.
- “It's inefficient to charter a refrigerated truck just for a small amount of refrigerated goods.”
By using our equipment that meet the specified temperatures, we can handle consolidation rather than chartering trucks. CO2 emissions can be expected to be reduced from “one truck unit” to “box unit”.
- We have received a lot of interest from various fields such as Food, Pharma, Healthcare, Automobiles and so on.

Contact point

PT Yusen logistics
Indonesia

- ◆ Jakarta or Other Area : Jakarta Head Office (ID/EN) : YLID.ML.IFF.BD@id.yusen-logistics.com
 - ◆ Surabaya Area : Surabaya Branch (ID/EN) : YLID.ML.SUB.BD@id.yusen-logistics.com
 - ◆ For support in Japanese Language (JP) : YLID.ML.JAPANESE.SALES.TA@id.yusen-logistics.com
- Contact Person : Mr. NAKAGAWA / 0811-1991-1729

11. Strategy Formulation and Consulting for Decarbonization

- **Strategic Consulting for Decarbonization**
(Qunie Corporation)
- **CMP WAY**
(CM PLUS GROUP CORPORATION)
- **GX Management Cycle Actualization Service**
(ABeam Consulting Ltd.)
- **Decarbonization Solution Advisory Services**
(Enel X Advisory Services Japan G.K.)
- **Building Trust with Sustainability**
(PwC Indonesia)
- **Comprehensive GX Solutions for Our Customers**
(PT. Kanematsu Trading Indonesia)

Strategic Consulting for Decarbonization

From Strategy Formulation to Implementation in High-tech, Electricity and energy, and Mobility

Qunie Corporation

Product and Service Outline

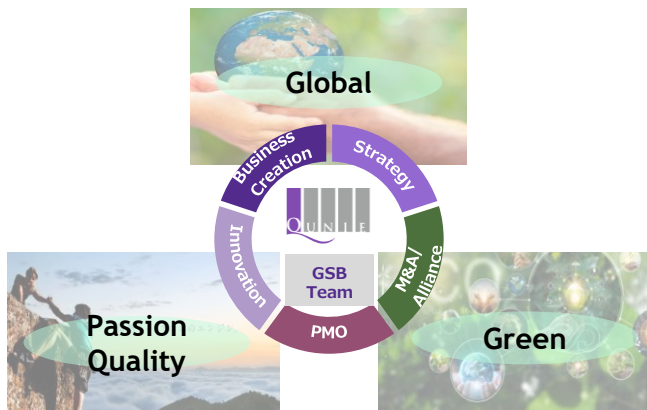
- ▶ Qunie Corp. is a consulting company in the NTT DATA Group, providing consulting services in Japan and globally, from management strategy formulation to implementation to achieve corp. innovation.
- ▶ In the decarbonization area, our GSB team offers consulting to assist Japanese corps in establishing new businesses and management strategies in Japan and abroad in high-tech, electricity and energy, and mobility areas. We can also provide support in collaboration with our other teams and NTT DATA.

(GSB Team) Decarbonization Consulting Service



GSB team Service line

- Support covers from Macro-environmental understanding and Strategy formulation to Implementation in global perspectives.



About GSB Team

- The GSB team specializes in global consulting projects. The team consists of members who are fluent in a third languages other than Japanese or English, as well as from major global companies and consulting firms, and is capable of handling various global projects.

Actual result・Example

■ Global Decarbonization Strategy Development Support

Support for building a global organization consisting of the client's Japan HQ and global offices to establish a global decarbonization strategy, and conduct marketing research and client capability research in APAC related to decarbonization and sustainability.

■ Basic research on LCA methodology

Research on LCA-related policies and rules, calculation methods, and case studies of advanced companies in Europe, China, which is a major EV country, and California, where strict environmental regulations are in progress.

■ Decarbonization Business Discovery & Market Research

Research on the latest decarbonization-macro environment, identifying use cases and techs of European and US firms in non-energy areas (food, etc.), and examining main solution based on the results of the research.

■ VPP Build via Portable Batteries

Support to develop and verify a new business model for VPP that links power generators using portable batteries and electricity users such as firms and households in Japan.

Contact Point

—Phone Number—

+62 811 1077 870 (Hironori Matsubara(Mr.))

+81 80 8455 4980 (Tomoya Sakai(Mr.) : English Support)

—E-mail Address— : sakait@qunie.com (Tomoya Sakai(Mr.) : English Support)

Product and service outline

- ▶ Engineering
- ▶ GMP Consulting
- ▶ Matching
- ▶ Training Support

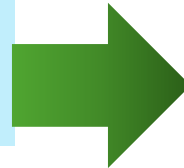


**Energy
Solution**

CMP Way[®]

CMP is the unique professional Engineering/ Consulting service company with project management Skill. For the solutions of carbon neutral, CMP provides the clients with services such as FS with gap analysis, solution implementation management and advisory services. We call it as 'CMP Way'.

- ✓ **Process oriented Energy Reduction**
- ✓ **Utility oriented Energy reduction**
- ✓ **Continuous Optimization**



**Comprehensive
Energy Solution**

Stages: ① Feasibility Study

To Propose Comprehensive energy saving solutions and road map to achieve the target from the GAP analysis from the viewpoint of production side and facility utility side

Stages: ② Solution Implementation

To perform engineering such as Conceptual Design and Request for Quotation for the various solutions to achieve the CARBON NEUTRAL reduction

Stages: ③ Advisory Stage

To monitor the achievement of target baseline/Roadmap and make advise for the continuous further improvement

Procedure → Initial Gap analysis (walkthrough) is *FREE*

Implementation menu with Items:
Productivity Improvement, Energy Saving & ROI

"CMP is free from Vendors, free from contractors. We work for the clients only."

With CMP ways method, the client will get not only the right person/company which are suitable to execute the project but also the client will get a PLUS on how to improve the existing production process with provision of the future planning, in others word, the client will get double benefit, improvement and efficiency.

Please contact us if you have any questions or concerns about your facility construction project.

Contact point : PT. CM Plus Consulting Indonesia

(Mr. Shandy : English and Bahasa support)

—Phone number : +62-811-1358-088

—E-mail address: shandy@cm-plus.com

- <https://cm-plus.com/>
- <https://cm-plus.co.jp/>
- <https://www.cm-plus.co.id/>

GX Management Cycle Actualization Service

ABeam Consulting Ltd.

Product and Service Overview

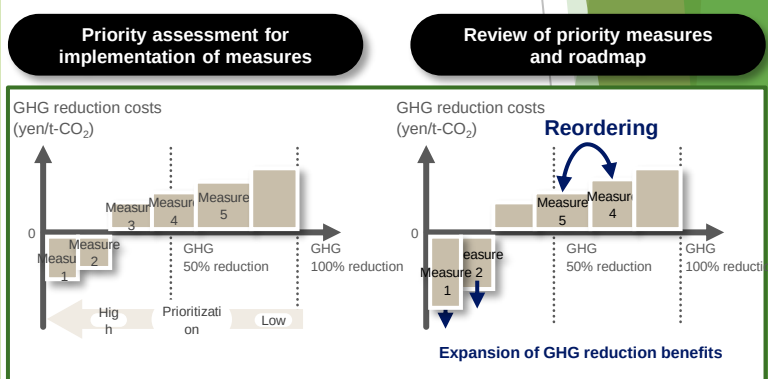
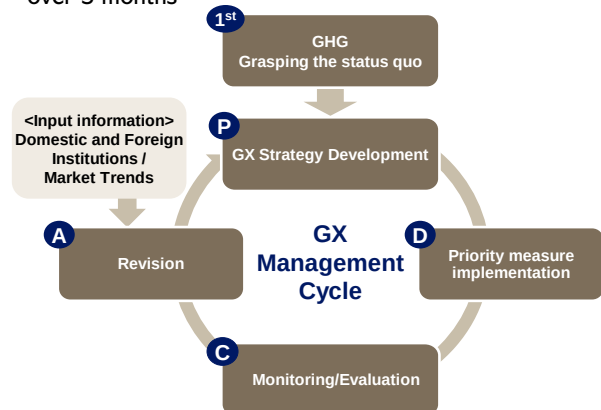
We provide one-stop support that includes not only the development of long-term GX strategy and a GHG reduction roadmap, but also the following services to help actualize a GX management cycle for evaluating and revising plans.

- ▶ **GHG status discovery service**
Determining the data to be collected and its extent within each Scope / Calculating GHG emissions and performing theoretical verification
- ▶ **GX Strategy and Policy Development Service**
Climate change-related information disclosure (TCFD, financial reporting), goal setting, **selection of priority measures**, **evaluation of implementation effectiveness** and **development of roadmap** and action plan (long and short term).
- ▶ **GX Solution Implementation Service**
Introduction of various GX solutions for reduction and offset (renewable energy, certification, credits, EV, energy saving, new energy, CCUS, etc.)
- ▶ **GHG Emissions Management Cloud Service**
GHG emissions management cloud services that include your company and supply chain

Results and Case Studies

The Case of a Food Manufacturing Company

- GHG status quo: Calculated over 2 months
- GX strategy and policy development: Strategy development and priority setting over 3 months
- GX solution implementation: Parallel implementation of multiple measures such as PV, credits, etc.
- GHG emissions management cloud service: implemented over 3 months



Scope 1,2 Reduction Roadmap

	202x~	2030~	2040~	2050
Measure 1	Plan Implementation Operation			
Measure 2		Plan Implementation Operation		
Measure 3			Plan Implementation Operation	

Contact Point

PT. ABeam Consulting Indonesia

Phone: +62-21-526-8660 (available in English & Bahasa Indonesia)

E-mail address: [idabglobalgx_iddl@abeam.com](mailto:globalgx_iddl@abeam.com) (Available in Japanese, English & Bahasa Indonesian)



Decarbonization Solution Advisory Services

Renewable Supply/ EACs/ Calculation on GHG emission etc.

Enel X Advisory Services Japan G.K.

Service outline

- ▶ Supporting procurement of renewable energy ((V)PPA Advisory)
- ▶ Supporting calculation of Scope 1, 2, and 3 based on global standards
- ▶ Supporting roadmap development, including mid/long-term energy strategies
- ▶ Procurement of environmental certificates, etc.

Service Features and Track Records

- ▶ Company belongs to Enel group, an integrated energy company
- ▶ Accompanying and supporting clients to achieve their goals
- ▶ Conducting research on the latest trends in each market



enel X Advisory Services
Global One Stop
Support Services

For Global Companies

EU

APAC

US

- ✓ Providing solutions to reduce GHG emissions based on global standard
- ✓ Tailor-made consulting services are available upon request



Energy
visualization/o
ptimization

Utility Bill
Management

- Visualization on energy consumption
- Calculation on GHG Scope 1,2,3 emission
- Rooms for GHG emission reduction
- Data collection for RE100/CDP¹ report



Energy
visualization/opt
imization

Procurement
Strategy

- Optimization on Energy/Gas procurement
- Measure market risk
- Risk management on energy procurement
- Energy procurement by Reverse Auction



Optimization on
Energy
consumption

Energy
Management

- Real time monitoring on energy consumption
- Algorithm analyse
- Rooms for energy efficiency and energy cost reduction



Renewable Energy

Advisory –
Renewable Supply

- Procurement on EACs
- On-site/Off-site Corporate PPA by renewable energy
- Sustainability strategy

Contact Point

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E-mail: enelxad-jp.enelx@enel.com

English/Japanese

➤ Mr. Hong Sejin

English/Bahasa

➤ Ms. Udyani Putu

Building Trust with Sustainability

Comprehensive Services for Energy Transition and Decarbonization

PwC Indonesia



Product and service outline

ESG Strategy & Sustainable Supply Chain Roadmap

- ❑ ESG strategy & roadmap, Supply chain decarbonisation roadmap, ESG transformation, including people, process and system

Carbon Market Advisory

- ❑ Assistance on carbon project registration for local and international market, carbon credit evaluation, carbon credit project feasibility study, domestic and international carbon trading advisory, legal due diligence against the potential forestry concession area, and relevant accounting and tax advice for carbon trading etc.

Decarbonization Business Development

- ❑ Market analysis, feasibility study, business structuring and strategy development, regulatory advice, cash-flow modeling, and relevant accounting and tax advice on Renewable Energy, Bioenergy, Energy Efficiency, Energy Management, Smart Energy, EV & E-bike, Storage Battery, CCS/CCUS, Direct Air Capture, Hydrogen, Ammonia etc. related business development and implementation.

Sustainable Finance

- ❑ Green taxonomy mapping, climate stress testing, climate risk management, sustainable finance framework.

Sustainability Reporting

- ❑ Gap analysis on the current report against international standards/frameworks (including GRI Standards and IFRS S1 and S2), materiality assessment, Sustainability Reporting development assistance, Sustainability Reporting Assurance, climate risk and scenario analysis, GHG accounting and assurance, ESG Rating readiness & improvement and Internal Audit for improving internal process and control in the Sustainability-related areas etc.

Details of Indonesia carbon market advisory

PwC Indonesia offers professional services in a variety of phases for carbon market entry.

① Technical Study

- Measurement of actual emission baseline and results of emission reduction efforts, potential carbon stock and sequestration, carbon offset, and other carbon-related calculations

② Legal Study

- Identification of relevant regulations on Indonesian Carbon Market scheme and assistance on the related legal structure of the carbon project and implementation for local and international businesses to participate in the carbon market

③ Economical Study

- Carbon credit potential analysis which include potential cash inflow from carbon sequestration of carbon projects and carbon accounting services

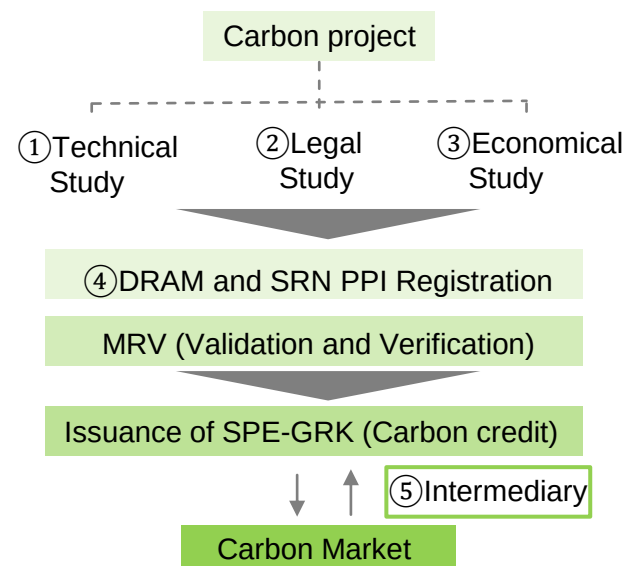
④ DRAM and SRN PPI Registration

- Assistance in preparing DRAM (Design document of climate change mitigation action) and navigating SRN PPI(National registry system for climate change) registration and procedures

⑤ Intermediary Analysis

- Advisory on carbon exchange administrator and intermediary services to participate in the carbon market

Carbon market entry (Voluntary market)



Contact point

PwC Indonesia Japan Business Desk, Advisor (ESG), Kotaro Asai (Japanese and English only)

—Phone number : +62-813-1861-1912

—E-mail address : kotaro.asai@pwc.com



Comprehensive GX Solutions for Our Customers

~End-to-end solutions from CO2 emissions accounting to decarbonization solution~

PT. Kanematsu Trading Indonesia

Product and service outline

- ▶ As the first step in decarbonization activity, we begin with assessing the current situation. Kanematsu provides visualization accounting for Scope 1-3 CO2 emissions in collaboration with our partners.
- ▶ We are jointly proposing and implementing solar power generation equipment rental services with partners to replace electricity derived from coal-fired power plants currently used by customers with renewable energy sources.
- ▶ For needs related to introducing energy-saving facility, we propose utilizing the Joint Crediting Mechanism (JCM). Kanematsu has implemented 9 JCM equipment subsidy projects across the group (Indonesia, Thailand, Vietnam, Philippines, Saudi Arabia), with credits issued for 2 projects. Through this extensive experience, we support clients entire process from applying JCM program to credit issuance.
- ▶ We offer comprehensive decarbonization solutions depends on client needs, including fuel consumption reduction in transportation, introducing power consumption optimization systems for factories, and ensuring stable biomass fuel supply for in-house power generation facility.

Actual result and example

【Energy Saving Sector】

- Indonesia JCM Project
High efficient Old Corrugated Cartons Process at Paper Factory (Bekasi region)
Annual CO2 reduction: 14,884 tCO2/year
- Factory power consumption optimization system
(Under POC at Kanematsu Group company factory)

【Renewable Energy Sector】

- PT. Kanemory Food Service 637 kWp
- Cimory Group 2,801 kWp

【Transportation Sector (Fuel Consumption Reduction)】

Low-carbonization and logistics efficiency improvement through fuel efficiency enhancement of transport trucks using the Indonesian Safety Recorder (ISR)

【Biomass Sector】

Proven track record of continuous fuel supply and an extensive network serving biomass power plants throughout Japan, providing fuels such as wood pellets and palm kernel shells (PKS).



Paper factory



PT. Kanemory Food Service. 637kw solar PV system

Contact point

PT. Kanematsu Indonesia Trading

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12. Comprehensive Solution to Decarbonization

- **Asset Optimization for NZE**
(PT. Mitsubishi Power Indonesia)
- **JGC's Total Engineering for Renewable Energy**
(JGC Holdings Corporation)
- **Housing and Community Decarbonization**
(PT. Sumitomo Forestry Indonesia)

Asset Optimization for NZE

Asset Evaluation, Technology Introduction with simulation by Energy market Modeling

PT. Mitsubishi Power Indonesia

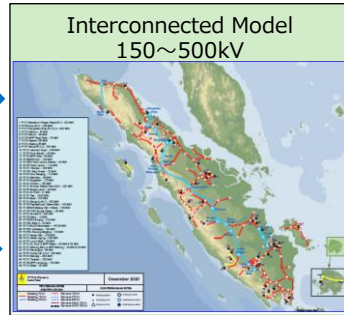
Product and Service Outline

- Countries are required to economically optimize the introduction of renewable energy and the stability of the power system while achieving carbon neutrality targets.
- MHI uses an analytical model of the electricity and energy markets to provide businesses and related organizations with asset evaluation and technology implementation optimization services that address the balance between decarbonization and economic efficiency.
- Based on its broad range of products and technical expertise related to Energy Transition, and the results of analysis conducted in various countries around the world, MHI propose an asset optimization policy for our customers.

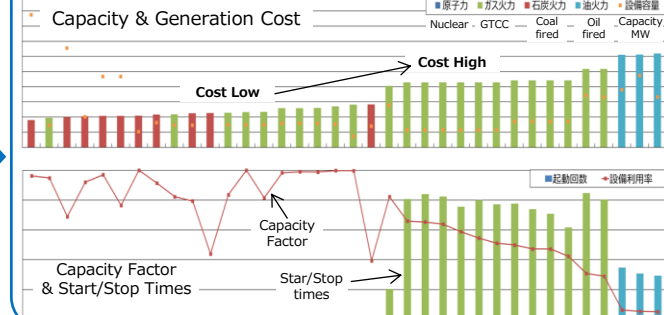
MHI Market Model

Case Assumptions
● Decarbonize Target
● Demand, Fuel Price, VRE Introduction

Asset database
● Transmission Line
● Generation Asset (Location, Spec, Cost))



Operation Pattern Forecast / Upgrade Proposal



Experience and Example

1. Strategy to utilize existing asset

Expect the future utilization of facilities and propose measures to improve profit by modifying it using the best suitable technology for the business environment in future.



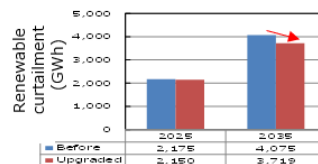
Efficiency of each power plant
(Cost reduction x CO₂ reduction)

Flexibility, Improvement, For, Renovation
Example: gas-fired power generation
● Minimum load (the minimum amount of standby power that must be maintained)
● ramp rate (speed of power up/down)

Driving (Income) Change
Energy market ↑
Regulatory capacity market ↓
Total ↑

Improving operational efficiency across the grid

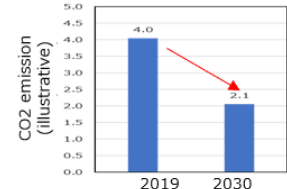
Renewable by renovating generators
Reduce energy control



✓ Minimize reduction of renewable energy generation

renewable energy

Maximum use of CO₂ and emission reduction



✓ Use of renewable energy regardless of grid constraints

2. Future Asset portfolio with decarbonatization

By showing the most economical power supply configuration in the future, we will propose the necessary technology and schedule capital investment, quantify the impact of the business environment, such as change in power demand, and policy options, such as the CO₂ target and use it to assess risks and provide data for policy discussions. MHI has been conducting a joint study with the Bandung Institute of Technology about the decarbonization strategy in Indonesia to propose several suggestions to make it economical and practical.

3. Optimizing facility specification for decarbonatization project

For hydrogen or ammonia project for production or storage, the economy should be estimated based on future generation patterns, equipment specifications, and collection prices. Based on case studies of equipment specifications, MHI propose an optimal equipment configuration based on the fluctuation of prerequisites.

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JGC's Total Engineering for Renewable Energy

(Solar, Geothermal, Hydrogen, Ammonia, Biomass, Wind, etc.)

JGC Holdings Corporation (PT. JGC Indonesia)

Product and service outline

- ▶ As a world-class Engineering contractor, JGC has delivered various plants and facilities globally, supporting client endeavors. Our robust track record spans 20,000+ projects across 80+ countries, earning us recognition for top-tier performance.
- ▶ JGC has long prioritized renewable energy, pioneering solar power in Japan since 2012. With a strong domestic solar power record and projects in Indonesia, Vietnam, Mongolia, and beyond, we're committed to fostering a low-carbon society. This includes expanding into energy transition, carbon management, and sectors like solar, geothermal, biomass, wind, hydrogen, and ammonia.
- ▶ With 1,000+ staff in Indonesia and 2,600+ in Asia, we focus on local projects for competitive pricing, agility, and quality. Our services, from Feasibility Studies to EPC, ensure optimal infrastructure regardless of project size.

Actual result and example

- Geothermal Power Generation (Binary Type) 28MW
- Geothermal Power Generation (Binary Type) 5.6MW
- Solar Power Generation 69MW
- Solar Power Generation 68.8MW
- Solar Power Generation 49MW
- Solar Power Generation 5MW + Battery Storage 3.6MWh
- Roof-Mounted Solar Power Generation Totalling 15MW
- Roof-Mounted Solar Power Generation 2MW
- Roof-Mounted Solar Power Generation 3.35MW
- Roof-Mounted Solar Power Generation 0.2MW
- Roof-Mounted Solar Power Generation 0.2MW
- Roof-Mounted Solar Power Generation 1.1MW
- Biomass Power Generation 75MW
- Biomass Power Generation 75MW
- Others



Geothermal



Geothermal



Solar + BESS



Rooftop Solar



Hydrogen/Ammonia



Biomass Power

Contact point

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Housing and Community Decarbonization

Providing highly efficient, EDGE-certified decarbonized housing

PT. Sumitomo Forestry Indonesia

Business Outline

- ▶ The Indonesian government has announced the goal to achieve Net-Zero Emissions or “carbon neutral” by 2060. In the housing and real estate industry, decarbonization has also become an important topic.
- ▶ By utilizing low-carbon building materials as well as promoting ZEH (Zero Energy Housing) and ZEB (Zero Energy Building), our company is working to reduce CO2 emission during a building’s construction process and when a building is being occupied, and not only in Indonesia but also in other countries around the world. In 2022, we have opened our first LCCM (Live Cycle Carbon Minus) model house in Japan.
**LCCM houses are homes that results in negative CO2 emissions through minimizing CO2 emissions in each stage of the house's life cycle, from construction, occupancy to demolition, as well as creating renewable energy such as solar power generated electricity.*
- ▶ As an effort to make CO2 emissions during construction and occupancy more visible, we are currently in the process of obtaining EDGE certification which is promoted by IFC. Increasing the overall efficiency of a house will also benefit our customers through electricity and water saving. Our future projects in Indonesia will also incorporate environmental certification such as EDGE, and we will lead the decarbonization of housing in Indonesia. Our goal is not only to minimize CO2 emission in residentials, but also the community and society as a whole.



International
Finance Corporation
WORLD BANK GROUP
Creating Markets, Creating Opportunities

EDGE is a building environmental assessment system. EDGE certification is awarded to buildings that are able to save 20% or more on energy usage, water usage and embodied energy, compared to a typical building. Meanwhile, EDGE Advanced certification is awarded to buildings that are able to save 40% or more energy.

Portfolio and Future Projects

Project	1	2	3	4
Location	Bekasi	Makassar	Depok	Bogor
Progress	Handed over	Launch on Jun 2024	Launch on Nov 2023	Launch on Nov 2024
Area	5 ha	14 ha	6 ha	3 ha
Units	157	508	350	150
EDGE Level	N/A	EDGE Certified	EDGE Advanced	EDGE Advanced
Decarbonization Features	Energy-saving design, LED, water-saving	Energy-saving design, LED, water-saving	Energy-saving design, LED, water-saving, smart home, solar panel, AAC	Energy-saving design, LED lights, water-saving, smart home, solar panel, AAC

The Morizen Cluster in Makassar, South Sulawesi

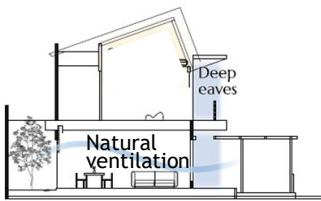


Sustainable Design
(Natural Ventilation, Shading)

LED Lighting & Solar Panel

Water-saving Feature

Environmentally Friendly Material



Contact point

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13. Climate Change Adaptation Technologies

- **Disaster Risk Assessment Services**

(Nippon Koei Co., Ltd.)

- **Pump Technology for Flood Control**

(EBARA Vietnam Pump Company Limited)

Disaster Risk Assessment Services

Protecting facilities and land from more frequent and more severe disasters due to climate change

Nippon Koei Co., Ltd.

Overview of Products and Services

- ▶ In Indonesia, river flooding and landslides are becoming more frequent due to the strong impact of global warming, and earthquakes, tsunamis, and volcanic eruptions are occurring.
- ▶ **As construction consultants, we properly assess disaster risks and propose countermeasures.** We help companies protect their facilities and land from various disasters.
- ▶ **Examples of our services.**

Facility Safety Improvement (Safety Assurance)

- Assess the disaster risk of existing facilities and propose necessary countermeasures.
- When building a new facility, we will propose a safe facility structure that addresses disaster risk.

Investment planning that avoids disaster risk

- When selecting investment locations for new projects, we identify properties with low disaster risk.



Photo: Damage from the July 2017 Northern Kyushu Torrential Rain Disaster
Example of multiple events (flooding, mudslides) occurring simultaneously

Simulation of Landslide Disaster

Achievements and Example

【Achievements】

- As the top construction consultants in Japan, we have been engaged in numerous disaster response and disaster prevention projects.
- East Japan Earthquake, Kumamoto Earthquake, Noto Peninsula Earthquake, and West Japan Torrential Rain Disaster.

【Example: Multi-hazard analysis using 3D City Model】

- We simulated the extent and scale of damage caused by heavy rain.
- Based on the results, it is possible to select safe locations for business investment and consider disaster countermeasures for existing facilities in dangerous locations.



Green: River flooding area
Teal: Landslide areas

3D disaster risk assessment map (simulation)

Contact and Information Inquiry

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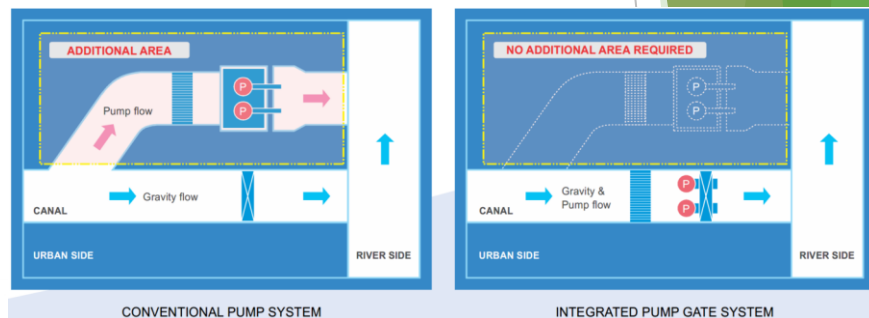
Pump Technology for Flood Control

EBARA Vietnam Pump Company Limited

Overview of Products and Services

- ▶ **EBARA Vietnam**, we provide pumps and engineering solutions to help protect lives from disasters such as floods caused by climate change. Among our offerings, we would like to introduce one of the pump facilities achieving the target with high-liability and minimum resource utilization.
- ▶ **Gate Pump** is a compact flood control system combining drainage pump and flood gate functions, which offering pace-saving and cost-effective solution.

<Comparison with conventional pump station >



<Characteristic>

- **Small - space**
- **Easy - maintenance**
- **High - reliability**

<Basic Specification>

Pump Size	350~1500 mm
Capacity	10~300 m ³ / min.
Total Head	2~7 m

Achievements and Example

This Gate Pump installed in an International airport in Vietnam. Installation work completed in a significantly shorter time than conventional pump station.

EBARA Group offers flood control solutions customized to various needs in regions –not limited to gate pumps. For inquiries, please contact our contact in Indonesia office.



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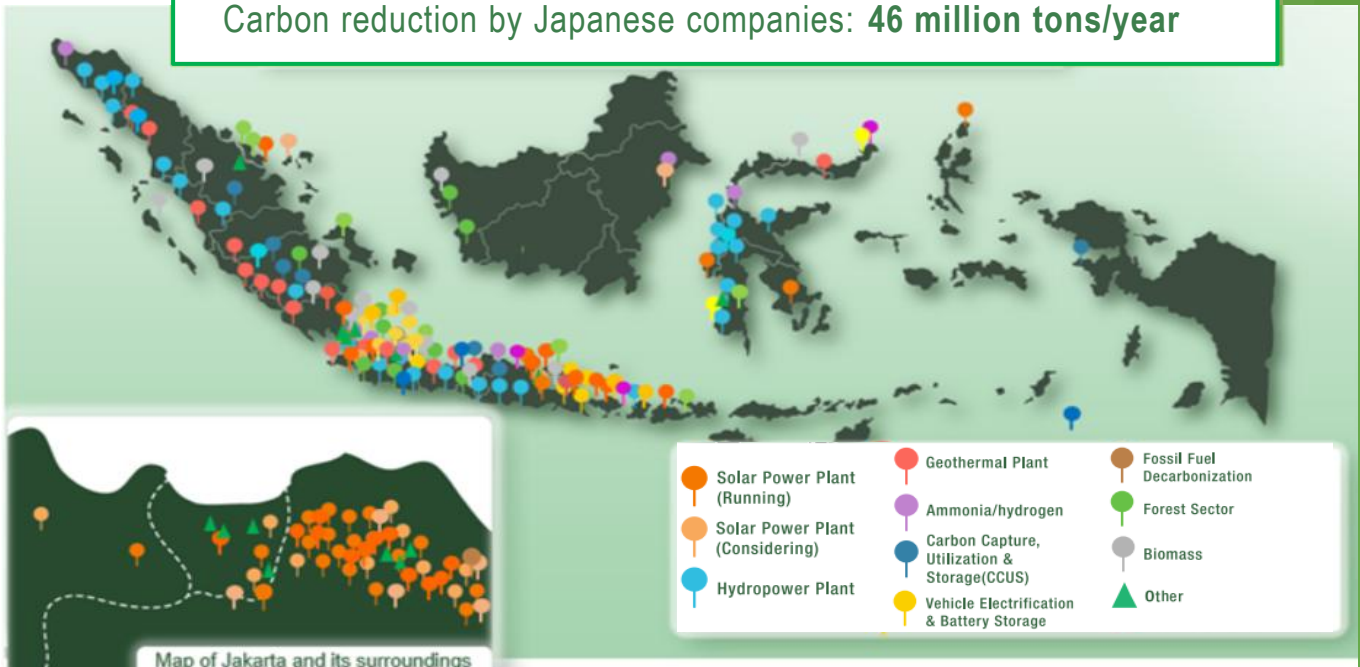
Homepage : www.ebaraindonesia.com

Map of Decarbonization Efforts by Japanese Companies

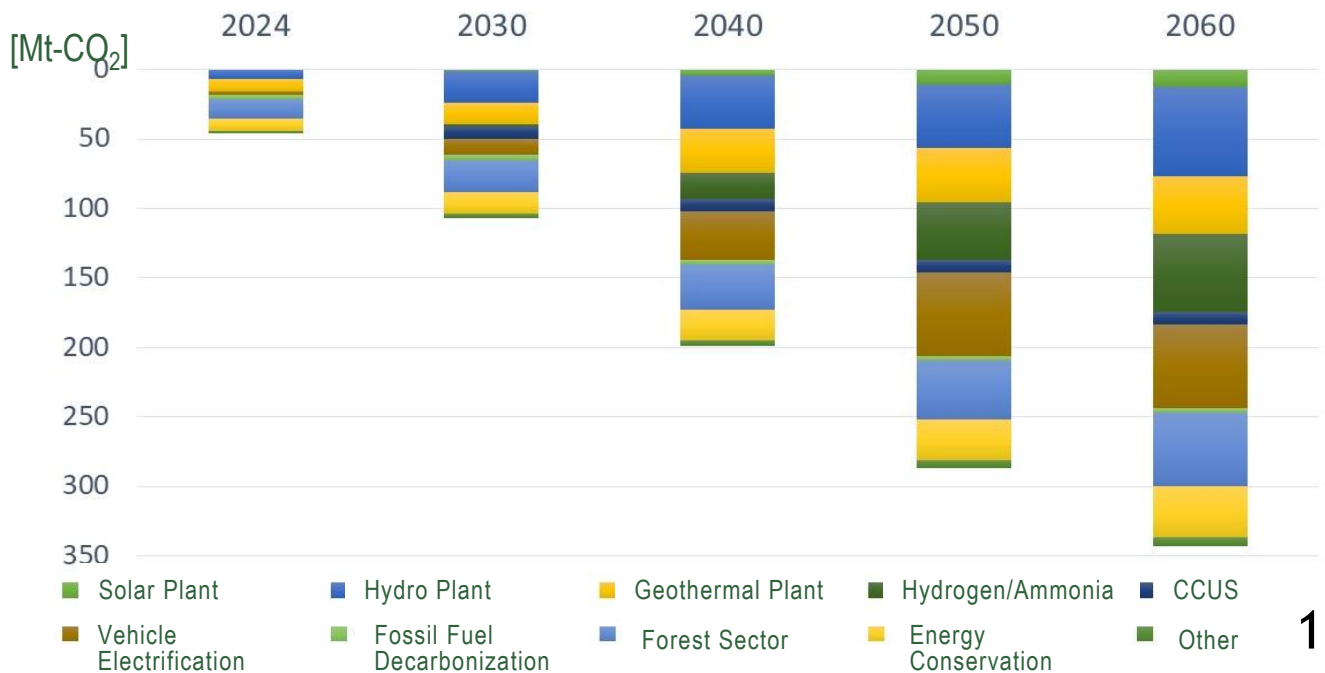
Jakarta Japan Club (JJC) and JETRO Jakarta publish decarbonization projects carried out by Japanese companies. It is estimated that Japanese effort reduces 46 million tons carbon dioxide in Indonesia in 2024.

698 projects by 311 Japanese companies

Carbon reduction by Japanese companies: **46 million tons/year**



Emission Reduction



This business catalog is published on the website of the Japan External Trade Organization (JETRO) Jakarta Office.



日本語



English



Bahasa Indonesia

Contacting the listed companies for purposes other than those stated in the catalog is strictly prohibited.

Talk to JETRO First! **JETRO Jakarta Office**

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