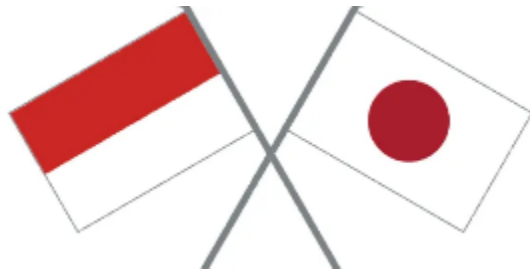


Business Catalog by Japanese Companies for Decarbonization Realization in Indonesia (5th edition)



June 2023

JETRO Jakarta Office

JETRO

Japan External Trade Organization

Introduction

The Indonesian government has an aim to cut greenhouse effect gas by 43.20% with International support and 31.89% without International support until 2030. In addition, in July 2021 there was a presentation of [Indonesia's long-term strategy 2050 toward low carbon and climate resilience] and an announcement of carbon neutral accomplishment target until 2060. Meanwhile there is a possibility of energy demand increase in Indonesia following the economic development hereafter, moreover a high chance of continual dependency level to coal and natural gas as a start of fossil fuel that takes an account for energy support, there is a lot of tasks to achieve carbon neutral.

As the Japanese government is processing support regarding each ASEAN country's decarbonization including Indonesia, an Asia energy transition initiative (AETI) was proposed by the Ministry of economy, trade, and industry in May 2021. Furthermore, to achieve the target of carbon neutral, Indonesian government also makes an initiative such as conducting carbon tax on coal-fired power plants.

As JETRO, processing information sharing related to the Japanese government and Indonesian government's policy for Japanese company investment facilitation in carbon neutral field.

Until now Japanese companies in Indonesia have made an excessive effort toward solar power and so forth renewable energy conduct, carbon dioxide collection, use and storage (CCUS), vehicle electrification et cetera, which is raising the expectation from the Indonesian side to Japanese companies.

This business catalog is an introduction to business which can contribute to emission reduction in industrial activities in Indonesia according to Japanese companies. By using this document, each company's industrial activities can be expected to go toward decarbonization.

June 2023

JETRO Jakarta Office

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1. Renewable energy (Solar, Hydro, Geothermal)

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- **Solar System Installer (EPC)**
(PT. Quint Solar Indonesia)
- **EBLOX / Triple Hybrid Generation System**
(PT. MHI ENGINE SYSTEM INDONESIA)
- **Hydroelectric Plant IPP Project**
(Shinnihon Consultant Co., Ltd/NiX Co., Ltd.)
- **IoT Solution for Reducing Problem at Geothermal Power Plant**
(PT. Toshiba Asia Pacific Indonesia)
- **Products for the Renewable Energy Market (Solar and Geothermal)**
(PT. Furukawa Electric Indonesia)

With zero cost initial investment, green electric power installation is possible

Onsite solar power generation equipment lease

PT. Sojitz Indonesia

Product and Service Outline

- ▶ As the global decarbonization initiative strengthening, it is predicted that more and more companies will have needs for renewable energy installation. Indonesia has a high potential in solar power generation with the rich intensity of solar radiation, and the Government of Indonesia also supports renewable energy installation including solar.
- ▶ Based on the collaboration with a reliable local partner PT Surya Utama Nuansa ("SUN"), Sojitz is proposing the installation of solar PV system in lease form where a customer is not required an initial investment and O&M cost.
- ▶ Through this initiative, customers can achieve reductions of electricity cost and CO2 emission at the same time without bearing the initial cost and maintenance burden after the installation. If you are interested in onsite solar system installation and green electricity use, please reach our contact person as mentioned below.

Actual Result and Example

[Sojitz group renewable energy project]

- Sojitz group has developed and participated in many power plant projects globally in which renewable energy power plant is about 2GW in total.
- As for solar, we have owned and managed 11 power plants in Japan with a total of 284MW, and 4 projects in overseas with a total of 700MW. In addition, we have also owned, managed, and developed 116MW domestic, 872MW overseas wind power plants, and 75MW domestic biomass power plant.

[Onsite solar installation actual result in Indonesia]

***Followings are the track record of our partner, SUN.**

- Global consumer product manufacturer (200kWp)
- Japanese automotive manufacturer (1,900kWp)
- Local group shopping mall (2,000kWp)
- and others. (at the end of 2021, the total installed capacity is more than 50MWp)

Indonesia: Onsite solar



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Solar Power Generation Rental

Alam Energy by Shizen Energy Group



Product and Service Outline

- ▶ Mainly offering solar power generation equipment rental service toward industrial customers such as manufacturing industry and business facilities. Customers don't need to bear by themselves the solar power generation system establishment cost, green electric power can be procured for long term without initial investment. It can be called [third party ownership model], the operation and maintenance management during the contract will be carried out by our company. In addition to the contribution to the decarbonization target, it will also contribute to electric utility expense reduction which is assumed to be rising hereafter.
- ▶ About the plan and construction, our company will assign our onsite contractor quality control, and also we will handle the technology standard completion from the customer's main office, so leave it to our company with no worries. During the term of the contract, proper management operations also will be performed.
- ▶ In addition, a solution comprising 100% renewable energy of used electric power for application of the Joint Crediting Mechanism (JCM) of the Ministry of the Environment (Japan), resilience enhancement through battery storage installation, and renewable energy certificate (I-REC) will be offered comprehensively.

Actual Result and Example

PT ATW Alam Hijau has owned the installation actual result of solar power generation equipment for each place in West Java, East Java, Bali island, and Batam island.

<Construction complete actual result>

1.22 MWp	West Java	Pharmaceutical company factory
0.46 MWp	West Java	Pharmaceutical company factory
1.20 MWp	East Java	Wood processing plant
0.54 MWp	East Java	Wood processing plant
0.47 MWp	Bali Island	Car dealer (several stores)
0.36 MWp	Batam Island	Car dealer (several stores)
0.31 MWp	East Java	Steel pipe factory
0.66 MWp	East Java	Steel pipe factory
0.22 MWp	West Java	Power plant
0.81 MWp	West Java	Pharmaceutical company delivery center

<Installation schedule (July 2022) >

Paper industry maker, daily necessities maker, packaging maker (all in West Java)



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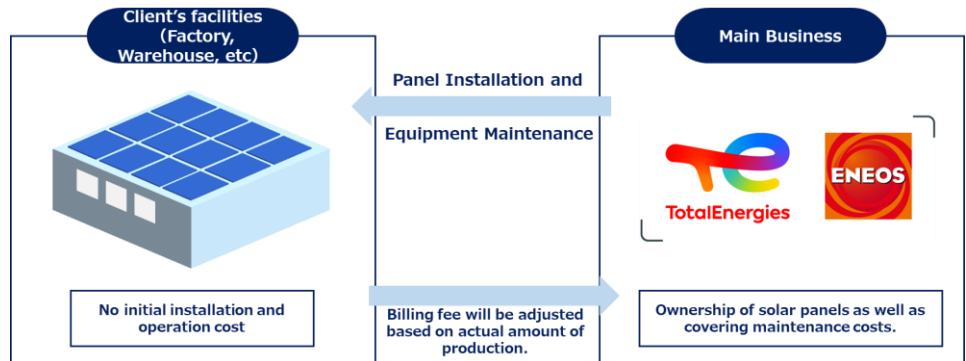
Bahasa : Jessica Rolindrawan: +62 812 85763736 jessica.rolindrawan@alamport.com

B2B Solar Distributed Generation

PT. Nippon Oil Indonesia

Our Product and Service Overview

- ▶ Our company is collaborating with TotalEnergies, a global energy company, and start Independent Rooftop Solar Power Generation business support in Asia (※)
※ Japan, Indonesia, India, Thailand, Vietnam, Philippines, Cambodia, Singapore, Malaysia
- ▶ To realize reduction of customer's electricity costs and supply of low-carbon energy by installing rooftop power generation equipment on the premises and facilities (factories, warehouses) at zero initial cost for corporate customers.
- ▶ Taking advantage of achievements and foundation as experienced energy companies, ENEOS & TotalEnergies support steady supply of Renewable Energy.
- ▶ Similar proposal can be implemented for countries (※) outside Indonesia, where this business is being developed.



Our Portfolio and Clients

- ENEOS Group have developed distributed solar power generation project for gas stations and factories in Japan. In collaboration with TotalEnergies, we are starting to develop projects outside Japan.
 - TotalEnergies own 2GW of power generation capacity in distributed solar power generation business with extensive experiences in Asia.
- <Solar Power Generation Business Support Project in Indonesia>

※ Some example of our partner's, TotalEnergies, clients

- | | |
|----------------------------------|--------------------|
| - Petrochemical Factory | Capacity 1,200 kWp |
| - Food Processing Factory | Capacity 6,800 kWp |
| - Manufacturing and many others. | Capacity 4,800 kWp |



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PT. Nippon Oil Indonesia

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On-site Solar PV Leasing

Installation of Solar PV System on Customer Roofs at Zero Initial Cost

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

Product and Service Outline

- ▶ Xurya provides development, operation and maintenance ("O&M") services for solar installations for industrial and commercial customers in Indonesia. Xurya offers on-site solar power installations in a lease format with no initial investment and no O&M cost burden for customers.
- ▶ In October 2022, Mitsui invested in Xurya (see [Mitsui Topics](#)). Mitsui, as a shareholder of Xurya, will support and promote Xurya's on-site solar power generation business by leveraging its knowledge of distributed solar power business cultivated in countries around the world and through its network in Indonesia and abroad.
- ▶ If you are interested in installation of on-site 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 September 30, 2022, Mitsui is involved in 2.6 GW of renewable energy projects including hydroelectric power generation (Mitsui's net capacity) of which Mitsui owns over 0.7 GW of solar assets.
- Mitsui is involved in distributed solar projects in the U.S. and other countries around the world.

Xurya's track record in On-Site Solar Power

- Established in 2018. Xurya is a leading company and a first mover in Indonesian on-site solar market.
- With a total of over 70 sites for small, medium, and large companies, including textile and food manufacturers, including Japanese companies, and will continue to meet the needs of C&I customers in Indonesia, which is expected to grow in the future.

<Xurya's awarded capacity>

as of the end of Oct 2022, more than 90 MWp

<Project case examples>

Japanese consumer goods manufacturer (6.0 MWp)

Japanese auto parts manufacturer (3.2 MWp)

National ceramics manufacturer (5.6 MWp), etc.

Site at Center of Jakarta City



Site at a Japanese Manufacturing Company



Xurya as 1st top Green & RE startup in G20 Event



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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

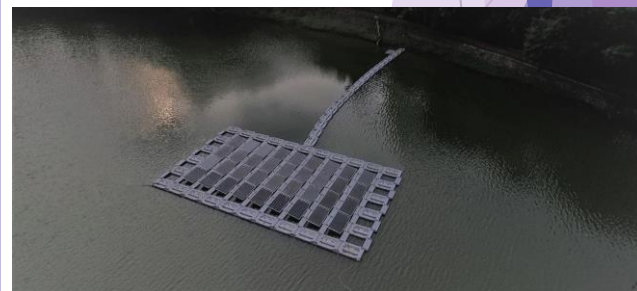
Actual result and example

- 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:

PT. Quint Solar Indonesia (Mrs. Vina: English and Bahasa support)

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EBLOX / Triple Hybrid Generation System

Stable and Maximum Use of Solar

PT. MHI ENGINE SYSTEM INDONESIA

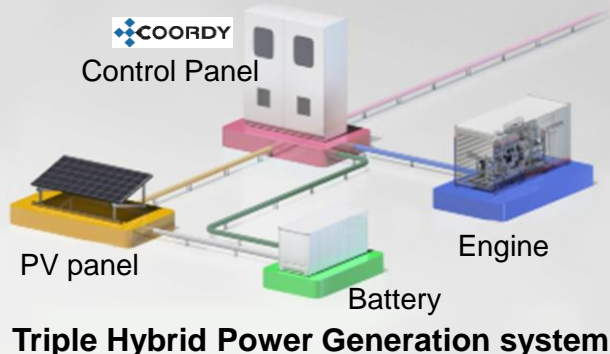
Product and Service Outline

- ▶ 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

PT. MHI Engine System Indonesia (Mr. Joko Nugroho and Mr. M.Muaz Afra Y English and Bahasa support)

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Hydro power plant IPP project

NiX 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 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. At present, under the cooperation of local corporation engineers and Japan head office engineers, we own an integrated engineering service from development to construction management, and there are 2 spots of our company's hydro power plants in Sumatra that are under construction and development.

<Our company power plant actual result>

- | | | |
|---|------|---------------------|
| 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 |

< Our company power plant oversea agenda>

- Under construction: Tongar hydro power plant, output 6.200 kW
(Completion schedule within 2022)
- Under development: Ketaun hydro power plant, output 13.000 kW



Contact Us:

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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

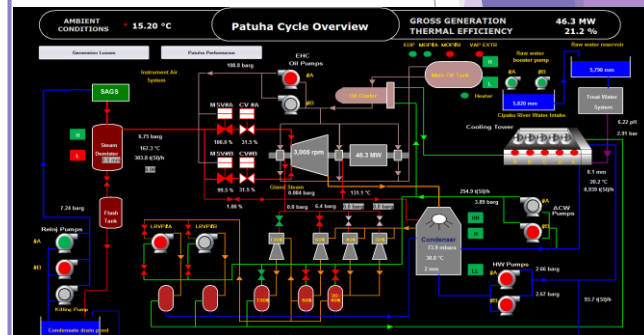
- ▶ We offer IoT service which uses IoT and AI technologies, including predictive failure diagnosis and performance monitoring. This service aims at improving the utilization rate of the power generation facilities at geothermal power plant which is decarbonized power supply.
- ▶ This system is distinguished 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

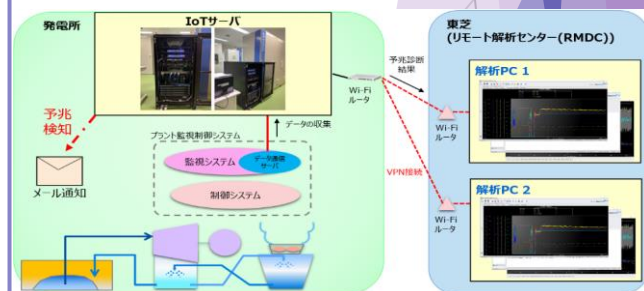
- We have concluded a IoT service contract with Indonesia's PT Geo Dipa Energi (Persero) which includes predictive failure diagnosis and performance monitoring at plant.
- This service represents a commercial version of what has been implemented as a NEDO demonstration project for this power plant in 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



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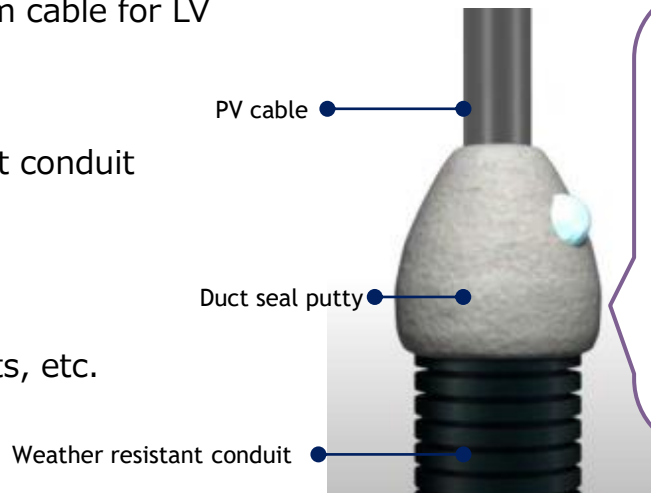
Products for the Renewable Energy Market (Solar and Geothermal)

- 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
 - Green Trough
 - EFLEX
 - Duct seal putty
 - Fire Stop products, etc.



Duct seal putty

No melting in high temperature and high humidity

Easy install,
Light weight, half of other products.

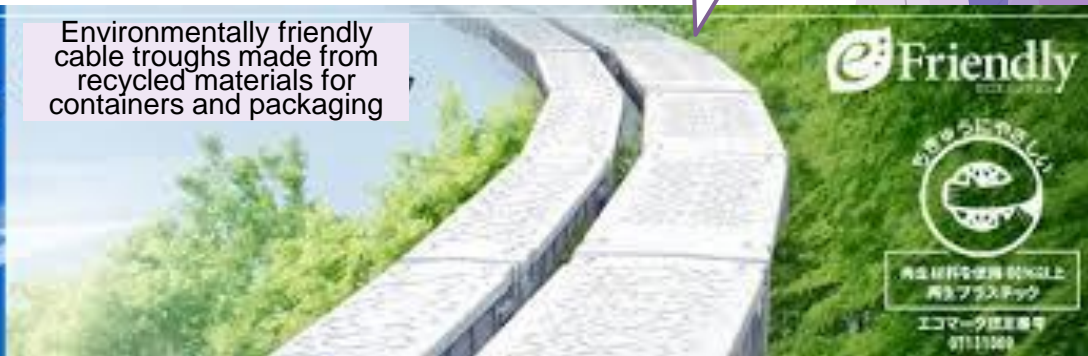
Feature

- PT. Furukawa Electric Indonesia deals with a wide range of cables, piping cable, fire stop products, and power storage systems, etc. for the renewable energy market.
- Products based on the concept of "safe, secure, and comfortable living".
- Ample examples of adoption in ODA projects and private renewable energy facilities.

Maximum 24 kg
Easy to carry and safe
Green trough
from Recycled materials

Recycled Cable Trough

Environmentally friendly cable troughs made from recycled materials for containers and packaging



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2. Biomass/waste power generation

- **Clean Biomethane Fuel Manufacturing Business**

(JGC HOLDINGS CO., LTD.)

- **NF Nanotechnology (NEFS Device)**

(Nanofuel Co., Ltd.)

- **Sustainable Aviation Fuel (SAF) Business**

(JGC HOLDINGS CO., LTD.)

- **Sustainable Aviation Fuel (SAF) Production**

(CHIYODA Corporation)

- **Energy Recovery from Factory Wastewater with Energy-Saving WWT System** **NEW**

(AIKEN KAKOKI K.K.)

- **Effective Utilization of Oil Palm Trunks Project** **NEW**

(Green Earth Institute Co., Ltd.)

Palm oil wastewater (POME) as a raw material Clean Biomethane Fuel Manufacturing Business

JGC HOLDINGS CO., LTD.

Products and Service Outline

- ▶ The palm oil industry contribute to 4.5% of GDP and 3 million jobs in Indonesia and is regarded as a key industry in the country.
- ▶ Since the waste liquid (Palm Oil Mill Effluent : "POME") generated in the oil extraction process of palm oil contains a large amount of organic matter, it is subjected to an anaerobic fermentation treatment in an open lagoon of an open atmosphere prior to discharge into a river and an environment, but in the process, a large amount of methane is generated and released into the atmosphere (methane has a greenhouse effect of 25 times as compared with CO₂)
- ▶ Emissions of GHGs from POME in Indonesia are about 36 million tons per CO₂e per year, and measures against emission methane are an urgent issue.
- ▶ The four companies jointly concluded MOUs at the 2022 AGGPM Forum for the recovery of methane discharged from Indonesian palm oil waste fluids and the production of biomethane fuels.

Actual Results and Examples

- Business: Sales of methane with bio-certification and issuance and sale of carbon credits
- Partner companies: Pertamina Gas Negara, Osaka Gas and INPEX, JGC Holdings
- Biomethane production: 10,000 tons/year*
Planned production increase to 0.1 million tons/year by 2030
- Reduced GHG emissions: 8,000 tons/ year (fuel conversion to biofuels)/150,000 tons/ year (methane recovery)
- Start of operations (forecast): Q1 2025



パームオイル産業
GDP: 4.5%
雇用数: 300万人

項目	数値
パーム油 生産量	4,350万トン/年
POME (生 ガス発生量)	1.37万トン/年 (= 2020 年実績)
POME 由来 GHG 削減 (CO ₂ 換算)	3,600万トン/年



AGGPM 2022
Asia-Pacific Gas Association



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NF Nanotechnology (NEFS Device)

Achieving "Carbon Neutrality" with Non-Liquid Fossil Fuels and New Liquid Biomass Fuels

Nanofuel Co., Ltd.

Product and Service Outline

-The NEFS system has reduced fuel costs and hazardous substances-

- ▶ Manufacture/sales/maintenance of nano-emulsion fuel equipment
- ▶ Development/manufacturing/sales of new liquid biomass fuel using nanotechnology
- ▶ Diesel power generation business using new liquid biomass fuel
- ▶ Development/manufacturing/sales/maintenance of agitator for various liquid fuel

NF company
NEFS equipment



[300L · 1000L/hr]

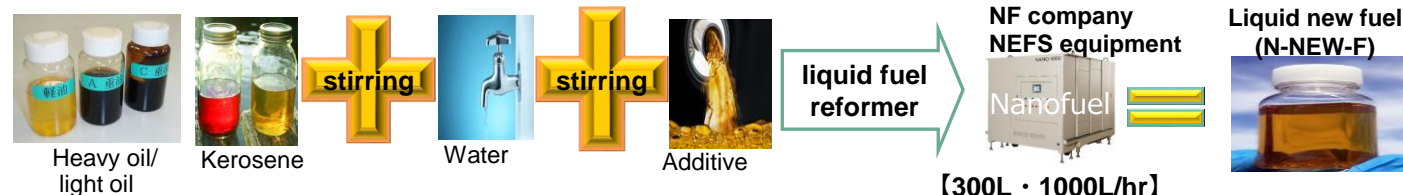
Certified as "Low Carbon Kawasaki Brand" 2021



Actual Result and Example

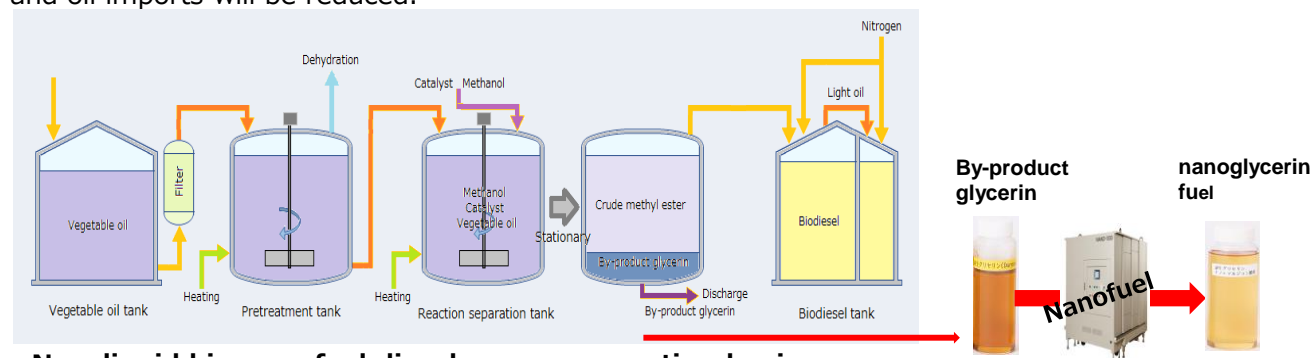
-Nano-emulsion significantly improves combustion efficiency-

1) Nano Fuel Co., Ltd.'s nanotechnology NEFS equipment reduces the consumption of liquid fossil fuels, cuts costs through energy savings, and reduces harmful emissions such as CO₂, NO_x, and PM.



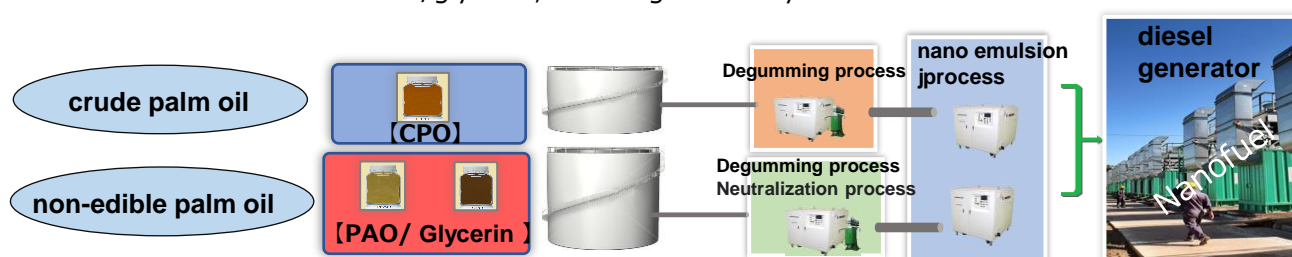
-Production process of BDF and by-product glycerin-

2) We have succeeded in developing a nanoglycerin fuel and manufacturing system that solubilizes by-product glycerin and liquid fossil fuels such as light oil using our unique nanotechnology. Demand for this fuel is expected to be high, as it is significantly cheaper than diesel fuel. In addition, CO₂ can be reduced, and oil imports will be reduced.



- New liquid biomass fuel diesel power generation business -

3) In Indonesia and Malaysia, we will generate diesel power using locally produced palm oil and its oxidized oil as fuel. Our technology reforms the fuel to improve combustion efficiency, and it is possible to use non-edible oils such as PAO/glycerin, reducing electricity costs.



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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)

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Sustainable Aviation Fuel (SAF) Production

Plant Operation Optimization by AI System

CHIYODA Corporation

Product and Service Outline

- ▶ The use of SAF is being promoted as a decarbonization of the aviation industry.
- ▶ Renewable energies are subject to large fluctuation ranges, and their use in plants requires technology to absorb these fluctuations and ensure stable operation.
- ▶ Our AI technology can predict the amount of electricity generated from renewable energy sources and provide dynamic, optimized operating metrics for complex downstream plant operations.

Units

Operation Control

real-time reaction control, visualization of the reaction state, and yield prediction



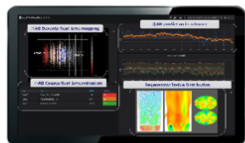
Improvement of Plant Availability

Detecting signs of operation abnormalities and failures reduces unplanned equipment outages, contributing to stable equipment operation and reduction of operating costs.



Trouble prevention

Providing O&M support, trouble prevention by remote monitoring / equipment diagnosis.



Anomaly Prediction AI system

Plant

Productivity improvement

Plant operation optimization, operation automation / autonomy by real-time operation control



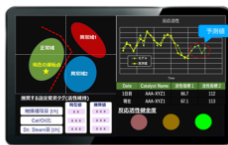
Reduction of environmental load

Improve productivity by optimizing operation and plant efficiency reduce GHG emissions



Advanced maintenance

Quantitatively evaluate the damage accumulated in each device and instrument in real time provides maintenance plan



Plant AI Optimizer

Supply Chain

Data integration platform

Collecting and creating linkage for all design, plant operation, equipment management, inspection data, etc.

Mirai Fusion

Effective use of data and information

- Optimization of supply and demand balance
- Sophistication of operation, security and maintenance
- Production planning, Risk management
- BtB collaboration (tracking by blockchain technology)



Mirai Fusion

Actual Results and Example

- ▶ The effects of modeling reaction and overall optimization have been confirmed in various process plants.
- ▶ Early detection of abnormalities caused by process fluctuations and automatic optimization as a set will reduce operator load, ensure safe plant operation, and optimize the cost balance.

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AIKEN KAKOKI K.K.

Product and Service Outline

► Demand in Palm Oil Industry

The palm oil industry and the dyeing industry, which are Indonesia's major industries, mainly treat their factory wastewater in open treatment ponds. In addition to water pollution, the release of biogas into the atmosphere is an issue.

► Proposed Product and Technology

Targeting the food and chemical industries such as palm oil factories and dyeing factories, the organic wastewater from these factories will be treated with high efficiency. Meanwhile, biogas and biofuel generated from the treatment process are recovered and used to prevent water pollution, reduce GHG emissions and contribute to the return on investment.

► Expected Result

A stable treatment for industrial wastewater and prevention the release of biogas into the atmosphere. The use of recovered energy (biogas and biofuel) as fuel for generators and boilers will promote the decarbonization of factories and create economic benefits.

Achievements

- Approximately 20 years of development and commercialization, and more than 20 units installed.
- Other than palm oil industry, the technology is installed in the general food industry (beverages, agriculture product processing, seafood processing, dairy products, confectionery, seasonings, fermented products, etc.) and general chemical industry (dyed textiles, daily necessities, bioethanol, etc.).

Examples

- Agricultural Product Processing Plant**
Prior to the installation, the operation costs on water treatment were 150 million yen/year. After the installation, it generated profit 35 million yen. There is an economic effect around 200 million yen annually, resulting the investment value recovered within ± 3 years. In addition, more than 2,000 t-CO₂ GHG reduction has been achieved per year.
- Textile Factory**
Prior to the installation, the operation costs were about 100 million yen/year, after the installation, the factory earn additional profit at 10 million yen, and resulting in an economic effect of more than 100 million yen/year.
- Palm Oil Industry**
From April 2023, as a JICA project, we are planning to install the equipment at the state-owned palm oil factory (PTPN5) in Riau.

【Example Cases (Japan)】

Vol. m ³ /d	COD Influent	Electricity Generation kWh/d	Industry
1,000	6,000	5,760	Agriculture Product
1,000	8,000	8,120	Textile
650	4,300	2,817	Food

Granular sludge



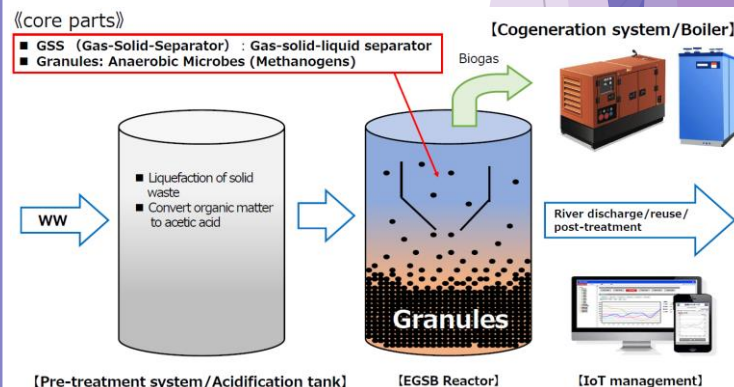
Biofuel



EGSB WWTP (2.6Φx15H)



Energy recovery from WW (Net zero energy type WWTS)



Contact Point

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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.
- ▶ The reduction of CO₂ emissions in the aviation sector is a challenge shared by the world. The main means of achieving this goal is the introduction of SAF (Sustainable Aviation Fuel). We are planning to conduct a feasibility evaluation of a project to produce bioethanol, the raw material for SAF, from OPT obtained in Indonesia.

Activity Status

- Currently executing FS to building up integrated OPT business in Indonesia with a business company.

Bioconversion Technology
by **Green Earth Institute**

Palm Plantation

- Palm biomass supply
- Partnership

supply



Oil Palm trunk

Squeezed process



OPT Pellet



Fermentation

Amino acid
or ChemicalsProcess waste can
be utilized flexiblyBio Gas Power
Generation

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3. Decarbonization of Fossil Fuels, CCUS/Carbon recycling

- **CCS Technologies Supporting the Transition to a Decarbonization**

(JGC HOLDINGS CO., LTD.)

- **Carbon Recycling Technology**

(CHIYODA Corporation)

- **CT-CO2AR™ CO₂ Reforming Catalyst**

(CHIYODA Corporation)

- **CO₂ Reduction with Gas Co-Generation**

(PT. MHI ENGINE SYSTEM INDONESIA)

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

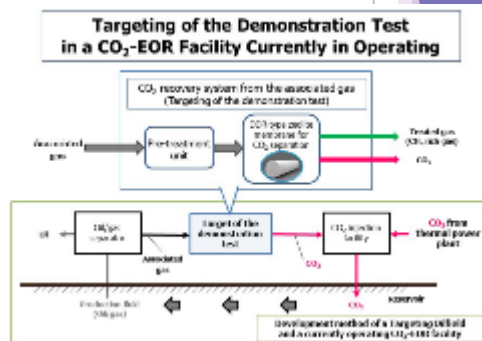
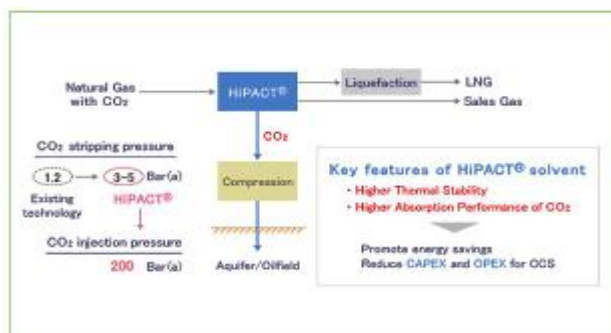
High-Pressure Recycled CO₂ Collection Process "HiPACT®"

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

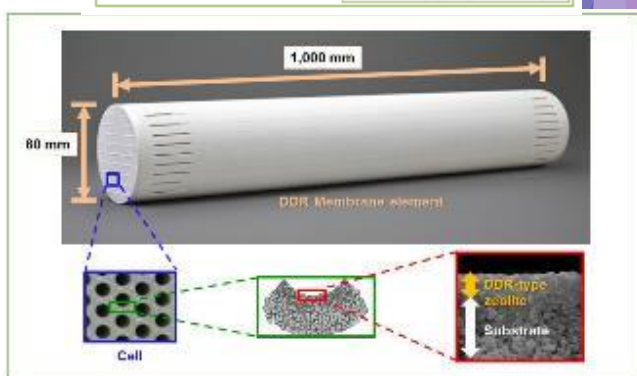
CO₂ Separation Techniques Using DDR Zeolite Membranes

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
[ナフタナ・インダストリアル・サービシエ (株) 社・セルビア国]

HiPACT® plant
MS a.d. Novi Sad (Serbia)



DDR 膜ゼライト製

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Carbon Recycling Technology

Solutions to Achieve Carbon Neutrality

Chiyoda Corporation (PT. Chiyoda International Indonesia)

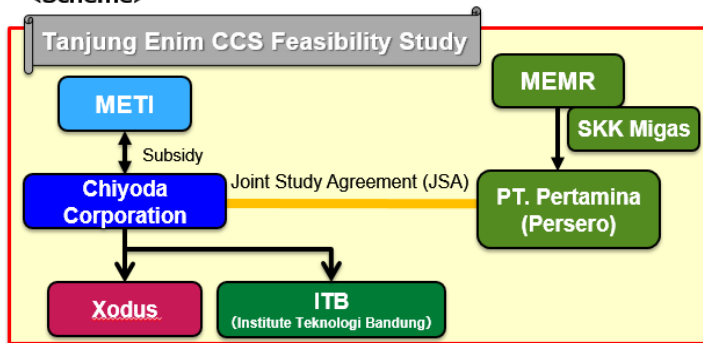
- ▶ Chiyoda Corporation has a wealth of experience and technology in the fields of design, procurement and construction of petroleum, natural gas and chemical plants. As a comprehensive engineering company, Chiyoda provides a variety of solutions for the realization of a decarbonized society.
- ▶ In Indonesia, we are currently conducting a feasibility study for a CCS project together with Pertamina. We are also actively working on the development of CCUS (CO₂ Capture, Utilization and Storage: carbon dioxide separation, recovery, utilization and storage) technologies, and are proceeding with demonstration and commercialization of those in Japan and overseas.

Use cases

CCS Feasibility Study

- Conduct a Feasibility Study on the large-scale CO₂ capture, transportation, and storage in South Sumatra together with Pertamina and ITB.

<Scheme>



Para-xylene (Polyester clothes/Plastic bottles)

- Para-xylene production from CO₂ and H₂
- Para-xylene is essential to manufacture polyester clothes and pet bottles
- R&D stage in NEDO Project (July 2020 – March 2024)
- Partnership with the University of Toyama, Nippon Steel Engineering Co.,Ltd., Nippon Steel Corporation, HighChem Company Ltd., and Mitsubishi Corporation

https://www.chiyodacorp.com/media/200714_e.pdf

Carbonate (Concrete)



Waste concrete



Capture/Fix
CO₂ with
Calcium



Recycled aggregate



Aggregate

- ◆ Technology by "Blue Planet" (start-up company in US).
- ◆ Chiyoda has entered into MOU with Blue Planet and Mitsubishi Corporation.
- ◆ Chiyoda participates in project demonstration in US by providing technical support and accelerating commercialization.

https://www.chiyodacorp.com/media/210205_e.pdf

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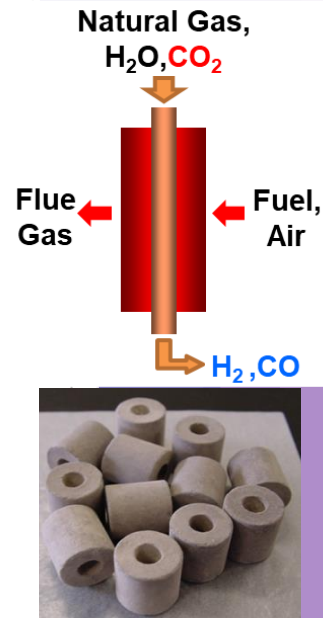
E-mail address: ueda.ayaka@chiyodacorp.com

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.

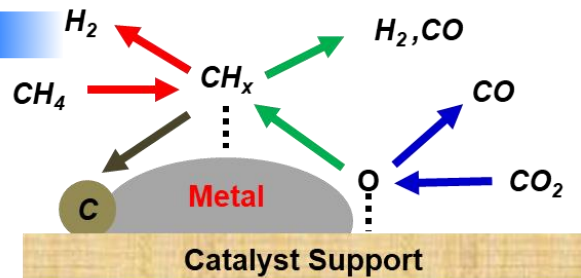
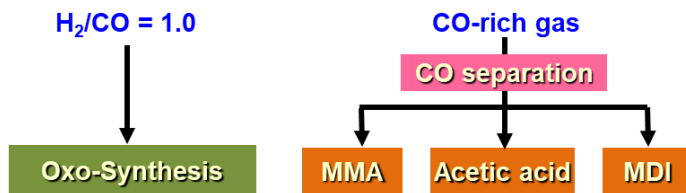
See more on youtube: https://www.youtube.com/watch?v=f6TtfF_vm-E



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.

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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

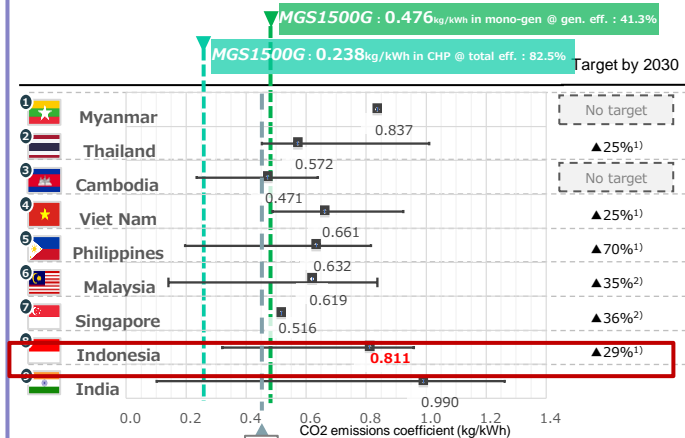
- Under the circumstances where decarbonization efforts are required worldwide, all companies were being required not only setting their target, but also establishing a practical plan and its verification. Other than short term solution such as Renewable Energy Certificates (REC), we propose Gas Co-generation 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 CO ₂ 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



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4. Electrification of Vehicles, Battery

- **BaaS**

(PT. Santomo Resources Indonesia)

- **DENDO DRIVE HOUSE**

(PT. Mitsubishi Motors Krama Yudha Sales Indonesia)

BaaS

-Battery as a Service-

PT. Santomo Resources Indonesia

Product and Service Outline

- ▶ While working on electric motorbike batteries using BaaS (Battery as a Service) business, we are also contributing to the realization of Indonesia's decarbonization and ecosystem construction. At the present time we are conducting electrical motorbike sale and battery replacement station service for the motorbike, and also offering services related to all of these.
- ▶ Electric motorbike being sold at present has 60 km maximum travel distance with 1.500 W power. Roughly it has the same running performance as an 80cc engine displacement gasoline motorbike. The most special feature is the battery can be switched, so it doesn't necessary to charge it at home or charge it at the charging station. The battery usually needs a charging time of around 4 to 6 hours, but this service offers a battery switch within seconds, which is realizing waiting time solution for the user's charging challenges. Users will use an exclusive application, so they can see the motorbike's condition and the nearest battery switch station.
- ▶ At the present, electric power for the battery switch station has been supplied by PLN, but by using a renewable energy source's supply which has been considered to have more contribution to carbon neutral. And for now, the battery is only used for electric motorbikes, but function expansion to use it for other household appliances has been considered and hereafter there is a plan to carry out a verification experiment.

Actual Result and Example

- On February 17th, 2022 there was an MOU signing with PT Swap Energi Indonesia. As the same company's partner which has managed a monopoly on BaaS business in the eastern Indonesia area. At the present it is running 7 battery switch stations in Makassar city, Sulawesi island. Based on the cooperation with PLN, 6 stations were established in the PLN offices within Makassar city.
- On March 18th of the same year there was an MOU signing with PT Goto Gojek Tokopedia, which then setting for a goal to make all two-wheeled vehicles owned by Gojek drivers within the same mentioned area to be electrical in 2030. At the present, there are 20 units of electric motorbikes being used by Gojek driver.
- Travel distance, unprepared charging infrastructure, and unit price problems can be seen as the obstacles to the electric motorbike popularization, but in this project, the aforementioned problem had been settled and ready for the challenge to improve the user-friendliness. The travel distance and charging infrastructure problem had been settled by using the battery switch type electric motorbike and the battery switch station's establishment and expansion, and the unit price problem had been settled by selling the electric motorbike at the same price as low engine displacement model's gasoline motorbike. According to some drivers' opinions, they believe that it is lower compared to gasoline motorbike fuel price and maintenance cost.
- At the present, we are analyzing the running performance and battery switch data, carrying out a user interview, and improving service and battery switch station's places.



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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.

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5. Energy Conservation

- **Low Carbon Solution for Industry**
(PT. Mitsubishi Heavy Industries Indonesia)
- **Continewm**
(Continewm Co., Ltd)
- **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)
- **Galilei Airtech System** **NEW**
(FUKUSHIMA GALILEI CO. LTD.)

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)



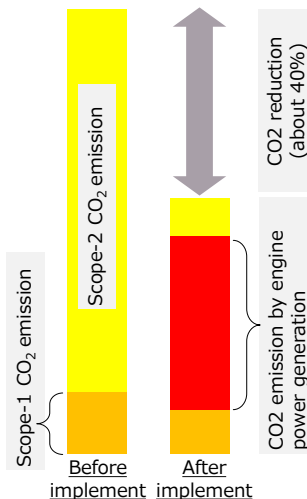
Waste Heat Power Generation



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

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Continewm Co., Ltd

Product and Service Outline

- ▶ With plus static electricity charge in air conditioner, [heat exchange efficiency] will be lowering because the air flowing won't become an airflow following the turbulence design, so it will spend some amount of electric power (electric power loss about 20%). By installing [continewm] to the existing air conditioning equipment (AC or chiller), the static electricity charge will be decreasing and then the heat efficiency will improve, it can preserve the temperature faster and longer on the set temperature, and finally, the compressor burden is lowering and that is the idea.
- ▶ During installation there is no need to reconstruct the existing equipment, only cleaning will be carried out and the installation or removal is easy. Moreover, after installation, there will be only periodic cleaning without running cost. The product durability will be years and for indoor use, it can be around 10 years (but it is no longer applied if there is a heat or pressure burden and used while bending).

Actual Result and Example

- Our company business is to help [raising the value by ESG measure] toward the realization of a sustainable society. In short E's point of view in E (Environment), S (Social), and G (Governance), contributes to the strategy making for the climate change risk and handling.

<Actual result conducted within Japan>

*some selection

Manufacturing industry :

- Denso Co., Ltd
- Totsuka denshi Co., Ltd
- Komatsu Co., Ltd
- Nippon mektron Co., Ltd
- Coca cola bottlers Japan Co., Ltd

The others :

- Toyota museum
- NTT east Japan Co., Ltd

<Actual result conducted overseas>

*some selection

The others :

- Embassy of Canada (Thailand)
- Embassy of France (Thailand)
- Seto denshi Vietnam Co., Ltd (Vietnam)
- Jia tsun Industrial Co., Ltd (Taiwan)

Contact Us:

Company name :

PT. Toyota Tsusho Mechanical & Engineering Service Indonesia (TTME)

Location : MM2100 industrial park

Website : <https://www.ttme.co.id/>

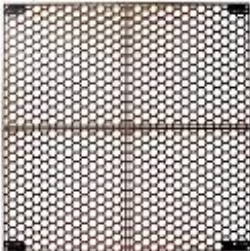
—Contact person

(Japanese, Indonesian, English support) —

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E-Mail : kimura@ttme.co.id

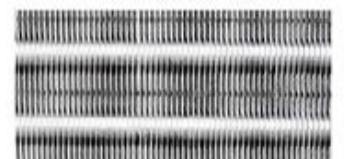
Phone number : +62-811-117-0657

CONTINEWM® Specification		MADE IN JAPAN
	Size	1940x1040x2 (mm)
	Weight	300g
	Color	Dark Brown
	Shape	Rectangular (Max. width 1040mm, Min. width 1040mm)
	Material	Specific Clay Mineral, Low density polyethylene
	Manufactured	Japan (Manufactured at a factory in Japan of a company based on the first section of the Tokyo Trade Exchange)
	Manufacturer & Distributor	CONTINEWM CO., LTD.
	Patent Number	Pat. No. 5545-15 (Academic guidance & Joint research) Tokyo Institute of Technology, Kanagawa Institute of Technology
	International patent application	PCT / JP2018 / 542347
	Registration of designs	No.1507440



Without CONTINEWM

With CONTINEWM



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%

Business information service

Company name : PT Toyota Tsusho

Mechanical

& Engineering

Service Indonesia

(TTME)

Location : MM2100 industrial park

Website : <https://www.ttme.co.id/>

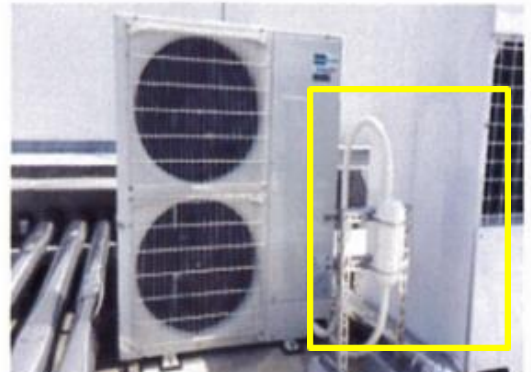
— Contact person

(Japanese, Indonesian, English support) —

Name : Jun Kimura (Ms)

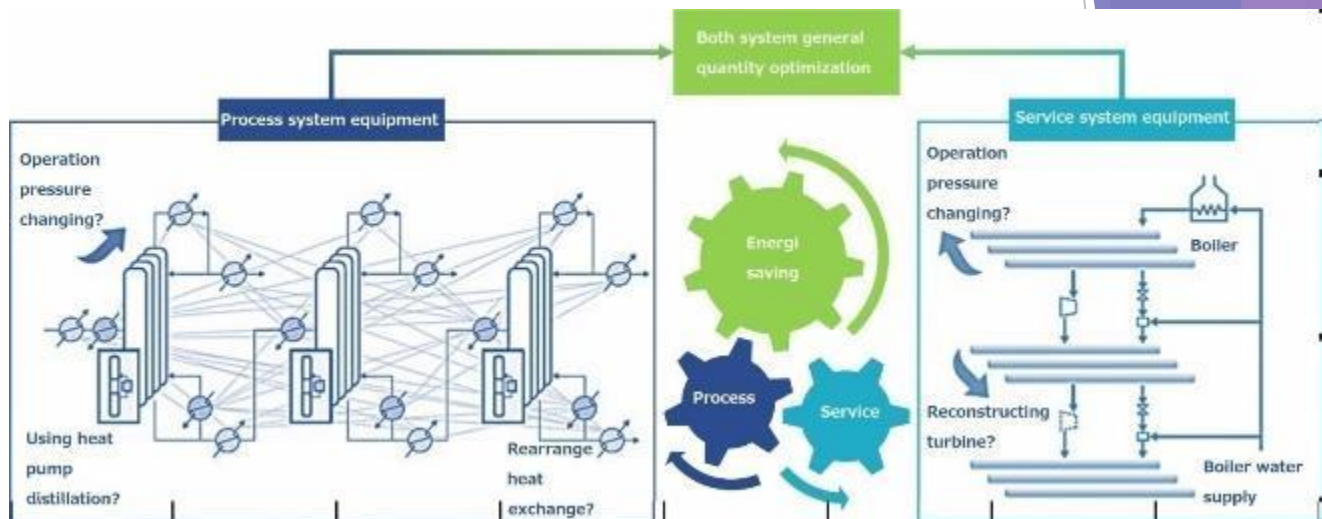
E-Mail : kimura@ttme.co.id

Phone number : +62-811-117-0657



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

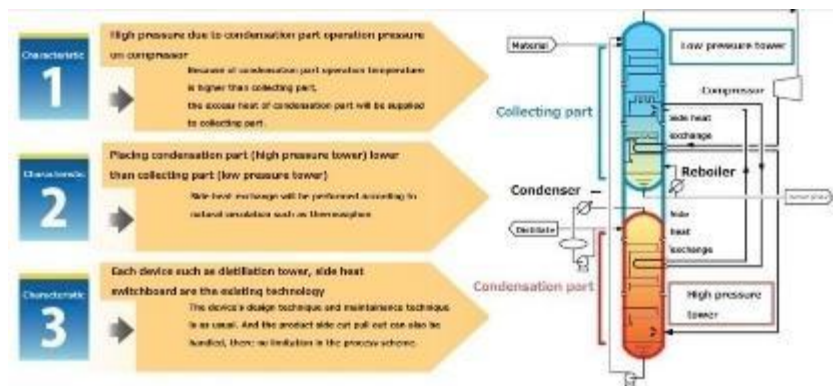
- Steam consumption reduction: >25 ton/year (>20 %/year reduction)
- Fuel gas reduction: equivalent to 1.5 MW
- Increase in power generation consumption amount : slight increase (additional pump part)

Contact Us:

TOYO Engineering Corporation
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 E-mail: toshihiro.wakabayashi@toyo-eng.com
 Web site: <https://www.toyo-eng.com/jp/>

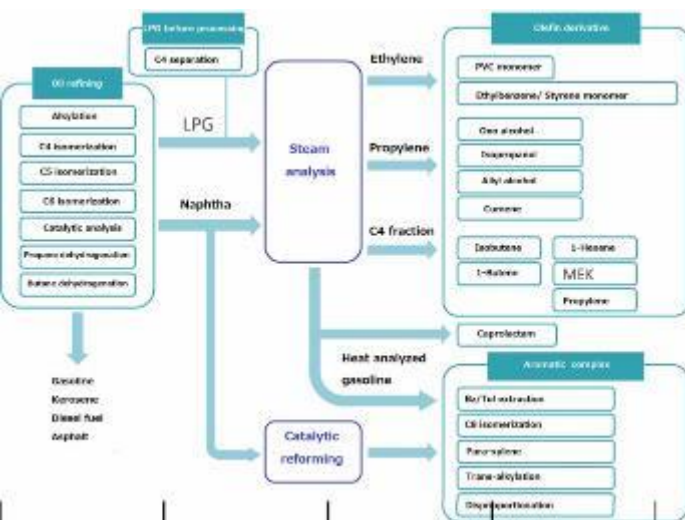
TOYO Engineering Co., Ltd**Product and Service Outline**

- ▶ Through many services of petrochemistry and oil refinery, more than 50% energy saving performance can be secured. Without using any special equipment, by applying to the existing distillation technology, the GHGs reduction effect can be offered due to energy shift from heat to electricity and the high economic saving, while preserving the existing maintainability.

**Applied subject**

Whether the existing improvement or new establishment can be expected to have a superior economic effect, by the following distillation tower.

- 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**

SUPERHIDIC® which can realize ultimate energy saving form in distillation operation is used by Maruzen Petrochemical Co., Ltd alcohol ketone device in 2014, as a contribution target in energy saving advancement and greenhouse effect gas emission amount reduction, then starting the business operation in 2016 and has been running well.

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%+

Moreover, a high rating has been obtained from the industry-academic government, as shown in the following

- 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

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Advanced Technology Business Department
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Web site: <https://www.toyo-eng.com/jp/>

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

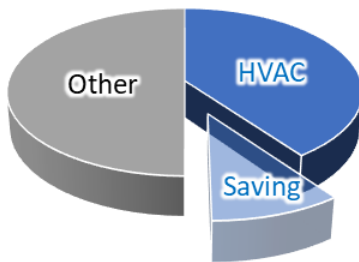
Contract

Installation

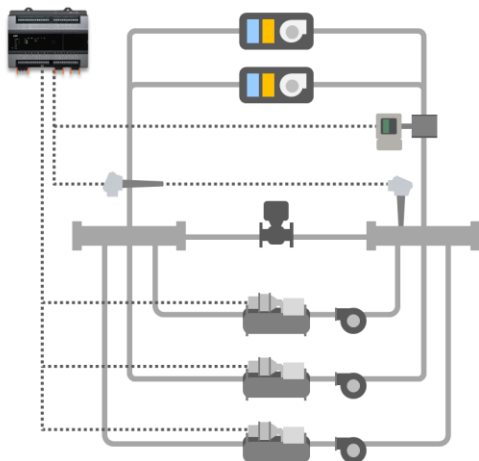
Guarantee



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

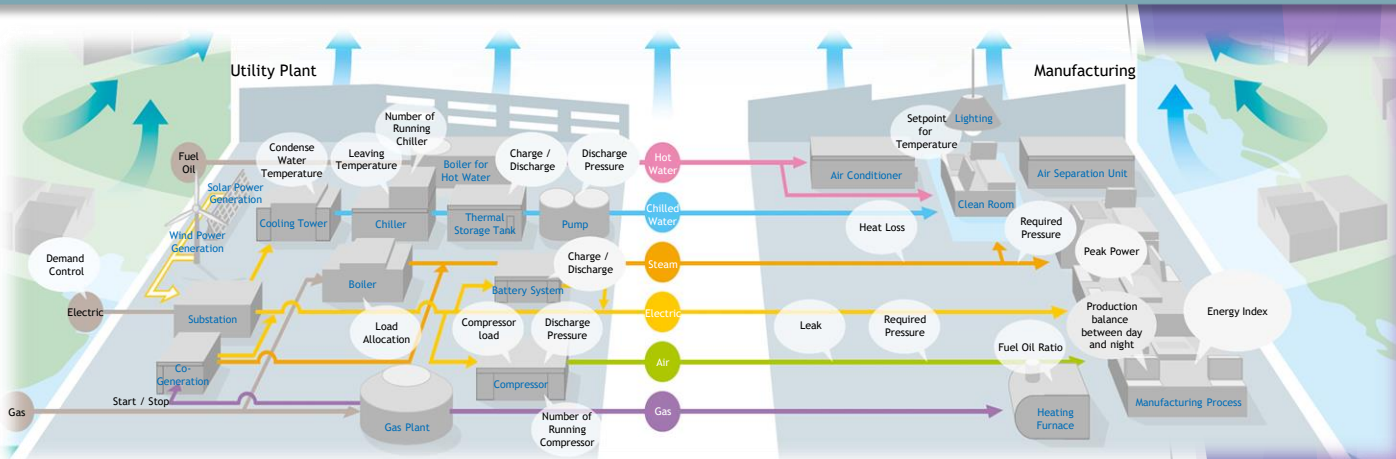
Contact point

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- (Bahasa • English) Tommy Yang y.tommy.zv@id.azbil.com
- (Japanese • English) Mori Takemasa t.mori.6j@id.azbil.com

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

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SATO HOLDINGS CORPORATION

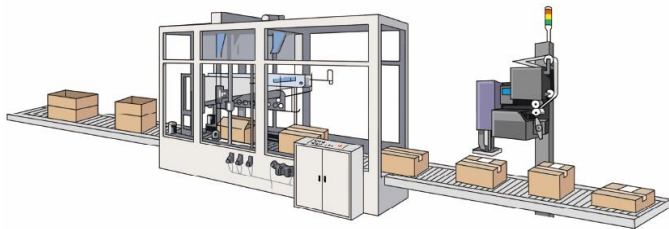
Product and Service Outline

- ▶ 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



FUKUSHIMA GALILEI CO. LTD.

Product and Service Outline

- ▶ Reducing energy costs, improving in-store environments, and increasing productivity by improving air-conditioning ventilation methods in supermarkets and other stores.
- ▶ Utilizing the air conditioning system with separation process of latent heat and sensible heat, a desiccant air conditioner is introduced for latent heat treatment, and a high sensible heat air conditioner is introduced for sensible heat treatment.
- ▶ Comfortable and energy-saving store environment will be achieved by controlling the positive pressure inside the store and supplying dehumidified air from the bottom of the showcase.
- ▶ The air-conditioning load due to ventilation in summer can be reduced by 70%, and the load on refrigeration equipment can be reduced by 20%.
- ▶ Automatic optimization maintains a comfortable store environment and contributes to labor saving. This system is a system suitable for the "with-corona" era, contributing to energy saving with proper ventilation.

Actual Result and Example

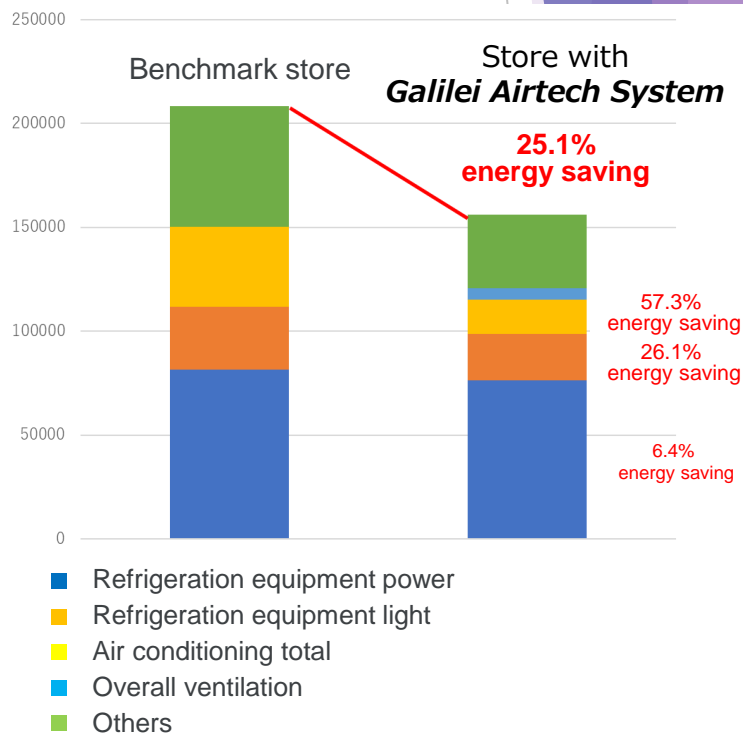
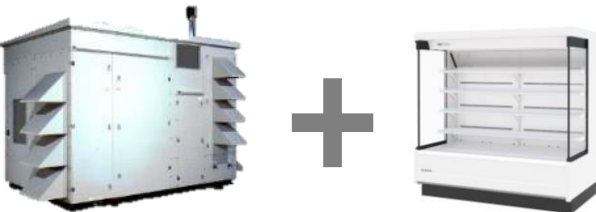
At a supermarket (3,800m²)

[Energy saving effect]

- More than **20% reduction in power consumption** in summer from conventional system (See figure on the right).
 - Annual energy saving effect : around 370 juta IDR
 - Additional Equipment cost : around 1 milyar IDR
 - Payback period : around 2.9 years
- [In-store environment] in front of showcase
- Benchmark store: temperature (21°C) and humidity(93%)



- Store with **Galilei Airtech System**
- Temperature (24°C) and humidity (47%) (comfortable)



Comfort + **Labor saving**
 + **Energy saving** + **confidence**

※The figures based on the data from examples in Japan.

Contact point :

PT. FUKUSHIMA GALILEI INDONESIA

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(E-mail) : oosugi.kaz@galilei.co.jp (Mr. OOSUGI : English and Bahasa)

6. Utilization of digital technology

- **MaaS ~ Mobility as a Service ~** **UPDATED**
(PT. Nagase Impor-Ekspor Indonesia)
- **Plant Operations Digital Transformation Solution EFEXIS®**
(CHIYODA Corporation)
- **Operation Optimization Navigator LNG Plant AI Optimizer™**
(CHIYODA Corporation)
- **Climate Cloud Platform for Measuring CO2 Emissions**
(Asuzero Singapore Pte. Ltd.)
- **GHG Emission Calculation Cloud Service** **NEW**
(Zeroboard Inc.)

PT. Nagase Impor-Ekspor Indonesia

Product and service outline

- ▶ Making full use of advanced algorithm which use AI/Cloud that has been proven in European, American, and ASEAN countries, we provide a Telematics service for business and corporation that can contribute on cost improvement, distribution efficiency, fuel consumption improvement, labor cost reduction, improvement of driving propensity, accident reduction, insurance premium reduction, and CO₂ emission amount reduction, et cetera.
- ▶ The service is easy to be implemented and can be operated only by installing our company application on the driver's smartphone. *As for the special data service, the device needs to be installed in the car.
- ▶ The UI/UX supports 4 languages (Japanese, English, Thai, and Indonesian) , therefore operations from both the management and staff can use this service smoothly.
- ▶ The CO₂ emission is calculated on the application based on the vehicle model, year, driving propensity, cruising distance, and fuel consumption, and the results are provided in real time.
- ▶ Various analyzed data, reports, and feedback for improvement can be provided in a real time manner based on our 3 main service which are Fleet Management System, Drive Insight and Drive Safe.
- ▶ With software that supports expandability, this allow our system to be combined and integrated with the customer's existing system.



Contact point

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Actual result and example

- Our company has experience with multiple companies in the US, Australia, and ASEAN region, especially for Automotive OEM, Insurance industry, logistics industry, and public transportation. In Indonesia, we are conducting PoC with several companies and full deployment of our service will start in October 2022.

Target industry

- Logistics industry, insurance industry, lease and rental industry, car maker, automobile dealer, et cetera.

CHIYODA Corporation

Product and Service Outline

- ▶ EFEXIS[®], the brand name of Chiyoda's innovative digital solution, improves the productivity and stability of industrial facilities.
- ▶ We provide solutions in the form of optimization, stabilization, safety, remote control, labor saving, and visualization for the operation, maintenance, and security of your plant.
- ▶ By using the EFEXIS[®] solution, you can improve productivity by optimizing plant operation, reduce costs for operation, maintenance, and safety, and reduce environmental impact without major equipment modifications.

Actual Results and Use Cases

PLANT AI Optimizer

- Installed in LNG facilities and Oil Refineries

Abnormal detection AI

- Installed in LNG facilities

Remote monitoring and diagnose system

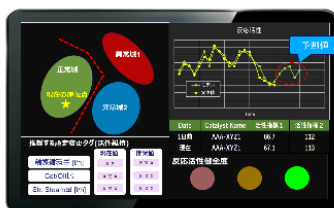
- Installed in Oil Refineries

Automation & autonomy operation system

- Proven in Oil Refineries

Boost Performance Reduction of OPEX, De-carbonization

EFEXIS[™] PLANT AI OPTIMIZER
Increase productivity
Reduce environmental impacts

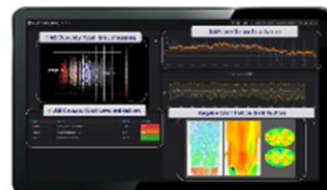
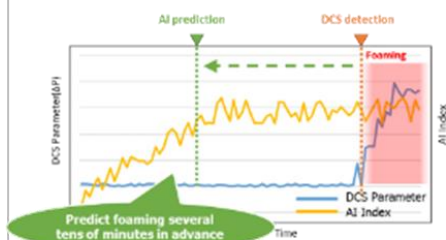


EFEXIS[™] CDU Optima
Automation & Autonomy Operation



Improvement of Utilization

EFEXIS[®] Anomaly Prediction AI system
Early detection of abnormal operation and failure of equipment



Contact point

CHIYODA Corporation
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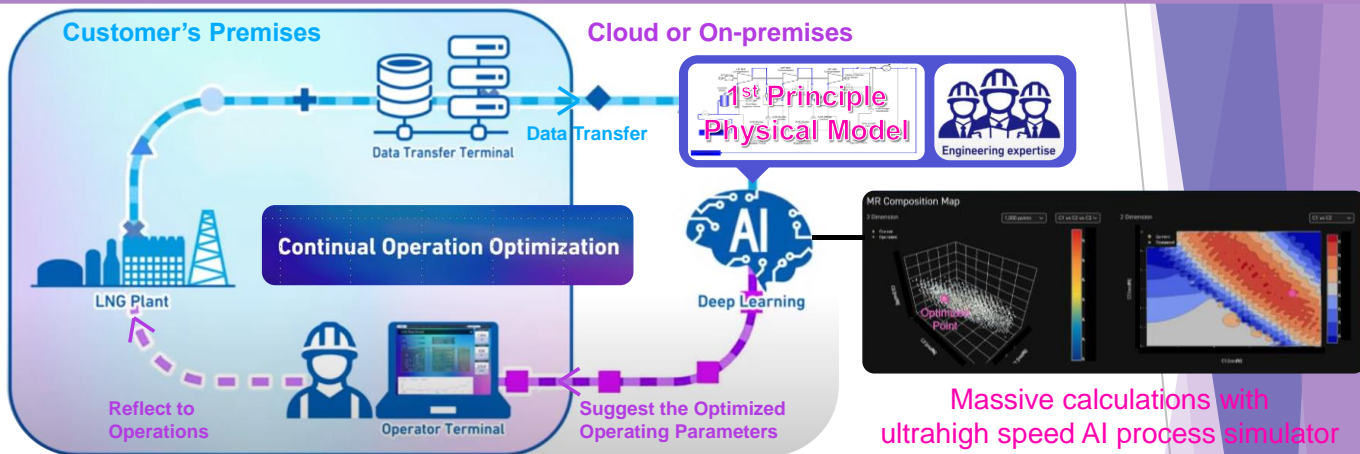
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Operation optimization navigator LNG Plant AI Optimizer™

CHIYODA Corporation

Product and Service Outline

- ▶ The demand for liquefied natural gas is expected to increase significantly in the future due to the increase in global energy demand and in response to environmental issues. In addition, reduction of LNG production cost is strongly required.
- ▶ It is possible to safely increase LNG production and improve economic efficiency without physical modifying plant facilities based on our experience in LNG plant engineering, procurement, and construction, combined with innovative AI technology.



Actual Results and Use Cases

For the PT Donggi-Senoro LNG plant in Indonesia, we confirmed increased LNG production through improved efficiency by using the "LNG Plant AI Optimizer™".

- ▶ Increased earnings through up to 5% increase in annual LNG production.
- ▶ Contribution to Fuel Gas Saving (Energy Saving) and up to 5% reduction of CO2 emissions.
- ▶ No modification of plant facilities or installation of additional equipment is required. The system can be installed and operational in a very short period of time. The system can be introduced without changing the current plant operation methods and operators.
- ▶ The system has a learning function that continuously improves the efficiency of plant operation.

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Product Movie

Climate Cloud Platform for Measuring CO₂ Emissions

Asuzero Singapore Pte. Ltd.

Product and Service Outline

- To take actions on climate change and sustainability, as the first step, measuring GHG emissions to understand the current situation is required.
- Asuzero, a climate cloud platform for enterprises to measure GHG emissions, can reduce man-hours for calculation by up to 70% and provides a one-stop solution including lectures of calculation methods, goal settings and also consultation for reducing CO₂ emissions.



FEATURE 01 AI-OCR & High Accuracy

- AI-OCR scan and visualize: Automatic calculation and intuitive user-friendly experience
- Highly accurate and reliable: Certified according to ISMS and ISO14064-3*1

FEATURE 02 CDP Accredited Consultation

- Not only cloud platform, but also offering comprehensive sustainability consultation to reduce CO₂ emissions and report according to global initiatives, such as TCFD and CDP

FEATURE 03 One-stop solutions for decarbonization

- Support for energy efficiency, energy creation and carbon offset with our partners

Track Record

- 3,000+ customers
- Working across various industries such as manufacturing, construction, real estate, logistics, transportation and finance

Customers

- Obayashi Corporation (the major construction company headquartered in Japan)
 - Succeeded to visualize GHG emissions of each construction site
- ST Engineering (the technology and engineering company headquartered in Singapore)
 - Succeeded to unify the method of calculating GHG emissions of each entity throughout the global supply chain



Contact Point

PT. Asuzero Singapore Pte. Ltd.

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GHG Emission Calculation Cloud Service

Transforming Climate Change into Social Possibilities
~ Working diligently to solve the shared challenge of climate change ~

Zeroboard Inc.

Product and service outline

The calculation and visualization of greenhouse gas (GHG) emissions not only improves corporate value but also contributes to cost reductions. Zeroboard is a cloud service that calculates GHG emissions according to international rules and manages efforts to reduce GHG emissions.

▶ Reliable

Verified to follow ISO14064-3 calculation standards
Zeroboard is ISMS (ISO27001) certified

▶ Track Record and Usability

With over 2,400 companies already using our product, zeroboard has a solid reputation for ease of use based on customer feedback.

▶ Network Effect

Ability to acquire and link primary data from suppliers, harnessing the network-effect to create a rapidly growing ecosystem.



Actual result and example

Zeroboard is used by a wide range of companies ranging from large cap to SMEs who are required to disclose their Scope 1-3 GHG emissions.

Companies committed to decarbonizing their operations with zeroboard

Used by
Over 2,300
companies



Contact point

Zeroboard (Thailand) Co., Ltd. (Mr. Suzuki: English support)

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7. Effective use 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.)

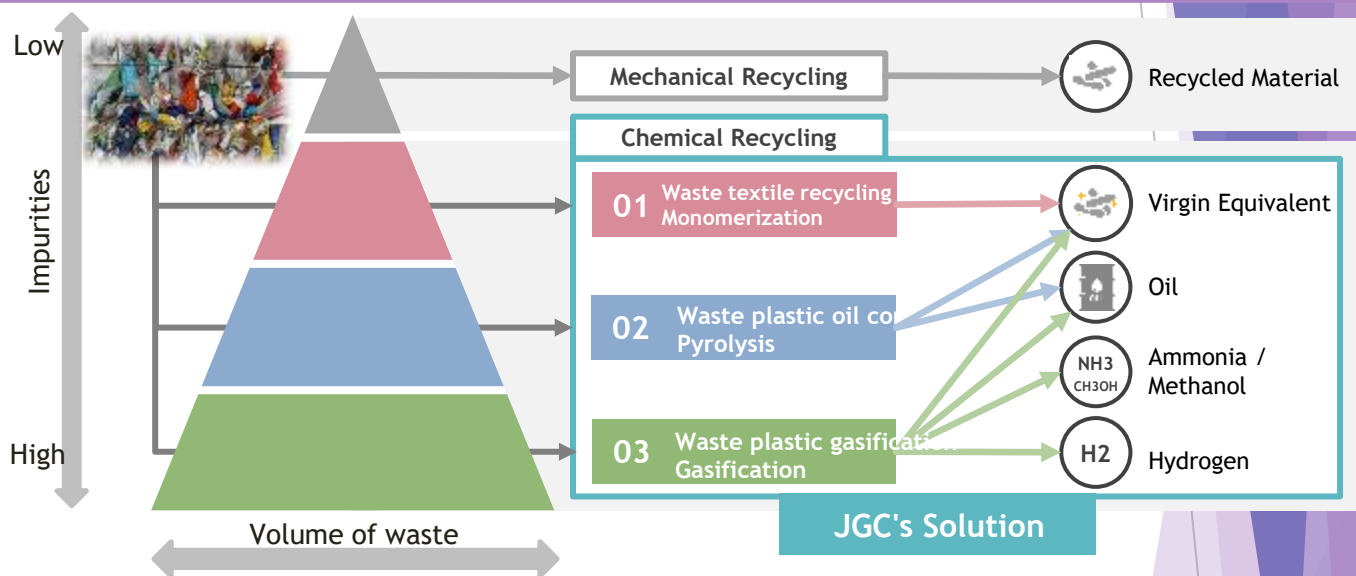
Waste Plastics and Waste Textile Recycling Technology

- 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	<ul style="list-style-type: none"> ✓ Textile-to-Textile Recycling ✓ Excellent in eliminating dyestuffs and impurities compared to material recycling 	<ul style="list-style-type: none"> ✓ Process of obtaining heat decomposition oil derived from waste plastics ✓ Waste plastics containing PVC and PET can be processed without separating them. 	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ Only technology with a proven track record of decolorization, impurities removal, and commercial operations 	<ul style="list-style-type: none"> ✓ 10-year commercial operation record 	<ul style="list-style-type: none"> ✓ Long-term commercial track record (only in gasification)

Contact Points

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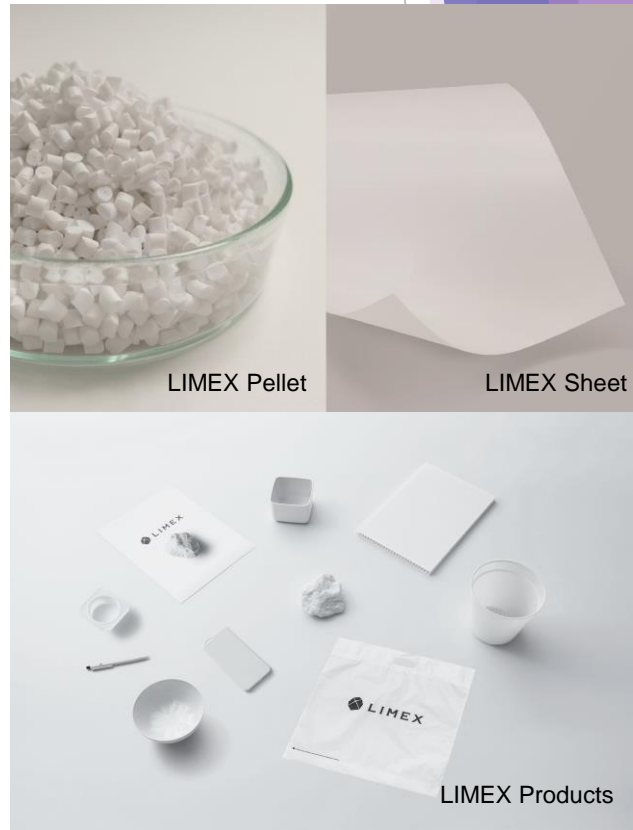
Product and Service Outline

- ▶ 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.

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8. Finance/Insurance etc.

- **Insurance Product Development et cetera**

(PT. Marsh Indonesia)

- **Leasing for Installing the Carbon Free Equipment**

(PT. Mitsubishi HC Capital and Finance Indonesia (MHCI))

- **Environmental Investment in Indonesia using JCM
(Joint Crediting Mechanism)**

(Tokyo Century Corporation)

PT. Marsh Indonesia

Product and Service Outline

(Insurance broker business and insurance adviser business in renewable energy issues)

- ▶ As an insurance broker and adviser company, we are carrying out a lot of insurance broker business and insurance adviser business on the renewable energy issues (solar, wind power, hydropower, biomass, geothermal energy) in Indonesia.
- ▶ On the project financing issues, we are having an actual result as being a business owner's adviser and lender's adviser, carrying out insurance arrangement and insurance program with insurable and bankable condition.

(Industrialization support on the insurance side for hydrogen, ammonia multi-fuel combustion, CCS project)

- ▶ In this field, besides the case's composition, the insurance market dialogue is an important thing. Our company is grasping insurance market new trends and initiative plans through habitual communication with the insurance market, and all this information will be needed for industrialization. In addition to the insurance market undertaking condition, carrying out a case composition will be supporting the insurance and risk management point of view in the project.
- ▶ We are working on insurance product development toward an electric car and carbon neutral related product popularization and selling promotion.

(Creating ESG risk rating)

- ▶ Recently, insurance companies take charge of natural disaster risk are getting more interest in ESG, and customer company ESG initiatives are starting to bring an effect in insurance terms. Besides making dialogue with the insurance company, our company also performs a [visualization] of customers company ESG initiative, collecting the dialogue materials with the insurance market, and carrying out the insurance undertaking support.

Actual Result and Example

- Insurance broker, insurance adviser's actual result (business owner's insurance adviser, lender's adviser) on the hydroelectric power generation, wind power generation, solar power generation, biomass power generation, geothermal electric power generation's case
- Carrying out a roadshow and explanation meeting to the insurance market about customers company's hydrogen, ammonia multi-fuel combustion, and CCS initiative
- Insurance product development and composition related to electric car
- Insurance product development and consideration of the product related to carbon neutral

Contact Point

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Shinnosuke.Izumi@marsh.com (Izumi)
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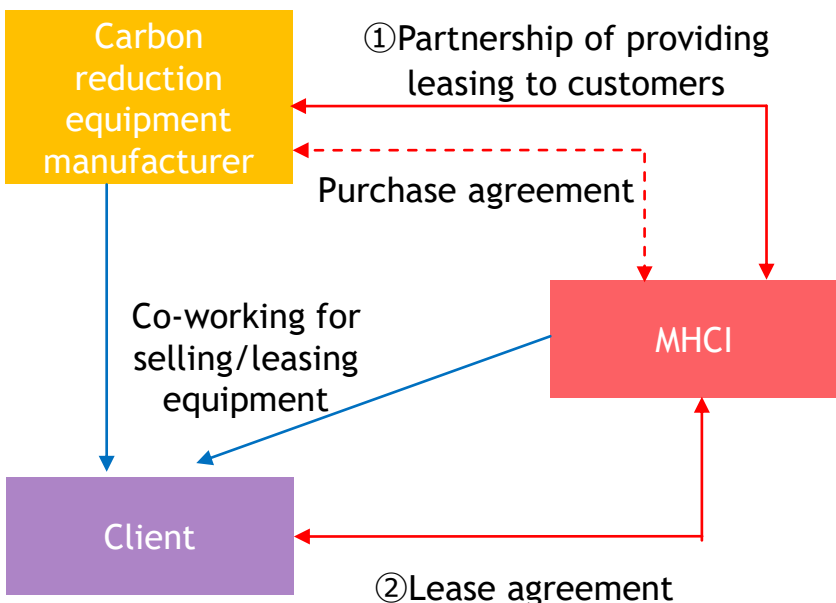
Leasing for installing the Carbon Free Equipment

～Leveling investment cost, Electricity cost reduction, Tax Benefit～

PT. Mitsubishi HC Capital and Finance Indonesia (MHCI)

One of our Service Outline

- We established a new division, “Sustainability and Business Development Division” and leasing for solar panel, boiler, gas turbine, air conditioner and so on which can contribute to carbon reduction.



【①Partnership Agreement】

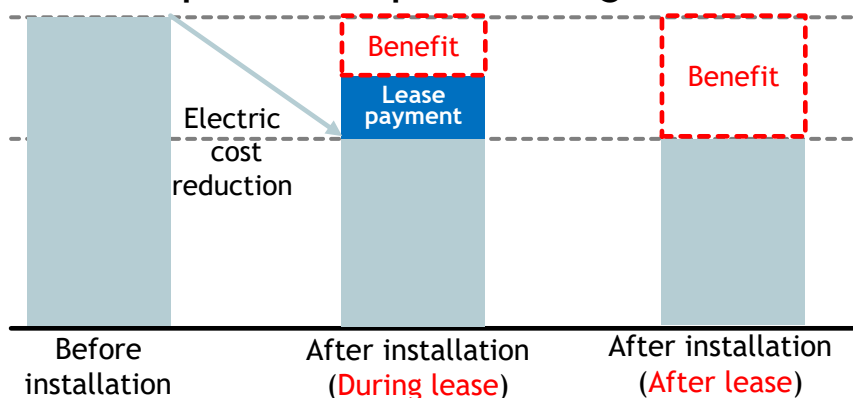
- Partnership agr. between manufacturer and MHCI. Co-work to offer the installation of equipment.

【②Lease Agreement】

- MHCI provides lease to customer

※MHCI also provides manufacturing equipment leasing, car leasing etc.

【Case example of Solar panel leasing】



<Benefit of leasing>

- ✓ Leveling investment cost
- ✓ Reduction of Electricity cost
- ✓ Tax benefit (Leasing payment is counted as COST for tax purposes)

(※) Above chart is just an image. Cost reduction may change depends on the condition and electricity cost fluctuation. MHCI does not guarantee the cost reduction.

Contact point

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- Tantonio Sujono (Indonesia/English)

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Environmental Investment in Indonesia using JCM (Joint Crediting Mechanism)

Tokyo Century Corporation

Overview of Product/Service

- Japan implements JCM (Joint Crediting Mechanism) in order to contribute to the reduction and absorption of global GHG emissions, and to build a mechanism for technology transfer and countermeasures that can respond flexibly and promptly to the situation in developing countries.
- Among the JCM financial support programs, JCM Model Project will provide subsidy up to 50% of CAPEX, reducing investment cost.
- Tokyo Century is the first Japanese financial service company to Represent JCM, in developing businesses using decarbonization technologies in SEA countries.

Project Example

- JCM Model Project (FY2017)
Absorption Chiller installed at a Chemical Factory in Karawang West Jawa
- JCM Model Project (FY2018)
High Efficiency Injection Molding Machine installed at Plastic Factory in Bekasi West Jawa
- JCM Model Project (FY2022)
2.1MW Solar Power Plant installed at Aluminum Factory in Bogor West Jawa



(High Efficiency Injection Molding Machine)

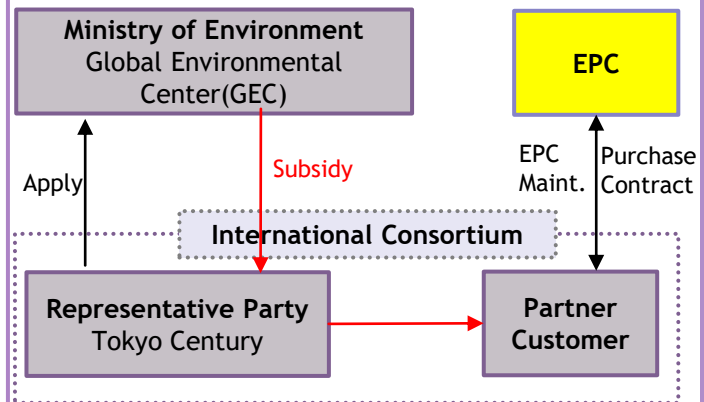


(Absorption Chiller)



(Solar Power Plant)

Scheme



Contact:

Tokyo Century Subsidiary in Indonesia

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9. Strategy formulation and consulting for decarbonization

- **Strategic Consulting for Decarbonization**

(Qunie Corporation)

- **CMP WAY** **NEW**

(CM PLUS GROUP CORPORATION)

Strategic Consulting for Decarbonization

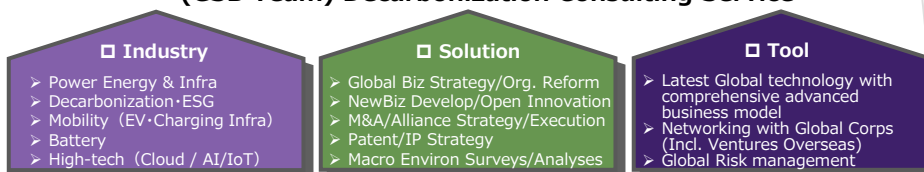
From Strategy Formulation to Implementation in High-tech, Electricity and energy, and Mobility

Qunie Corporation

Product and Service Outline

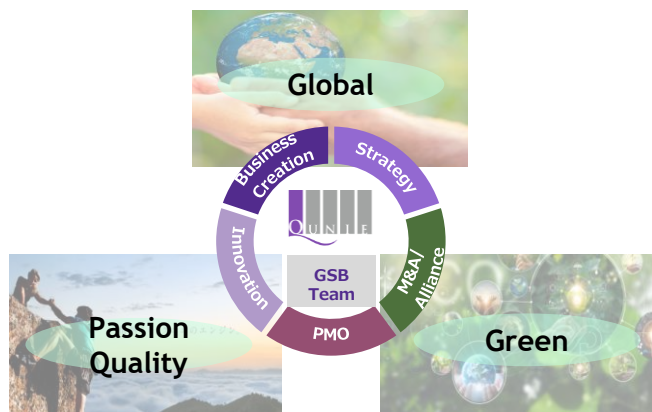
- ▶ Qunie Corp. is a consulting company in the NTT DATA Group, providing consulting services in Japan and globally, from management strategy formulation to implementation to achieve corp. innovation.
- ▶ In the decarbonization area, our GSB team offers consulting to assist Japanese corps in establishing 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

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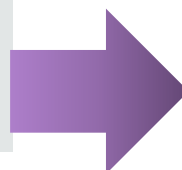
CM PLUS GROUP CORPORATION

Product and service outline

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

Energy
Solution


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

Comprehensive
Energy Solution

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'.

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.

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(Inquiries regarding this document)

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