

Workshop



Session 1: Trilateral Business Cooperation in Thailand

Collaborations between JBIC and China Governmental Financial Institutions in Third Country Markets

April 2nd, 2019

Japan Bank for International Cooperation

1. JBIC Profile
2. JBIC Financial Instruments
3. Collaborations between JBIC and China Governmental FIs
4. Co-financing projects between JBIC and China Governmental FIs
5. Concept for Collaboration in Third Country
6. Building Infrastructure Projects in Third Countries
7. Joint Workshop among JBIC/CDB/EEC Office

JBIC Profile

◆ Operational Fields :

JBIC's mission is to contribute to the sound development of Japan and the international economy and society by conducting its operations in the following four fields :

- Promoting the overseas development and securement of resources which are important for Japan
- Maintaining and improving the international competitiveness of Japanese industries
- Promoting the overseas business having the purpose of preserving the global environment, such as preventing global warming
- Preventing disruptions to international financial order or taking appropriate measures with respect to damages caused by such disruptions

◆ Business Result

- Commitments for Loans, Equity Participations and Guarantee : 1,193bil JPY (FY2017)
- Outstandings for Loans, Equity Participations and Guarantee : 16,180 bil JPY (March, 2018)

◆ Overseas Network

- | | | |
|-------------|-------------|--------------------|
| ● Beijing | ● New Delhi | ● New York |
| ● Bangkok | ● Moscow | ● Washington, D.C. |
| ● Hanoi | ● London | ● Buenos Aires |
| ● Jakarta | ● Paris | ● Mexico City |
| ● Manila | ● Dubai | ● Rio de Janeiro |
| ● Singapore | | |

JBIC Financial Instruments

Export Loans

Import Loans

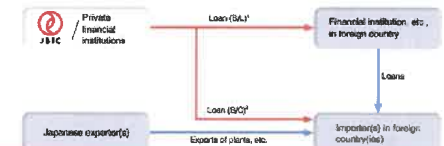
Overseas Investment Loans

Untied Loans

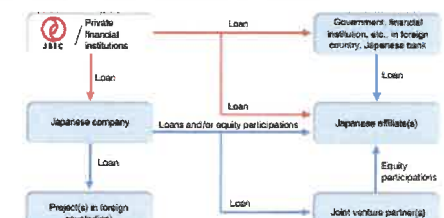
Equity Participations

Guarantees

Export loans are provided to overseas importers and financial institutions to support finance exports of Japanese machinery, equipment and technology.



Overseas investment loans support Japanese foreign direct investments, which can be provided to Japanese companies, overseas Japanese affiliates and foreign governments or financial institutions that have equity participations in or provide loans to such overseas affiliates.



Collaborations between JBIC and China Governmental FIs

MOU between China Development Bank (CDB) and JBIC ~October, 2018~



- To promote cooperation between JBIC and CDB for projects in third country markets which Japanese and Chinese corporations participate or are involved in.
- JBIC and CDB will provide financial support based on the global standard such as openness, transparency, economic validity, debt sustainability and compliance with laws and regulations.

MOU between China EXIM Bank (CEXIM) and JBIC ~June, 2009~



- To provide a cooperation framework that will enable JBIC and CEXIM to provide co-financing to projects undertaken by Japan-China consortia to export to third countries.
- It is expected to help build up strategic cooperation between JBIC and CEXIM

"The Governments of Japan and China shared the common view that the cooperation of Japanese and Chinese companies on projects in third countries will not only expand in both countries economic sectors, but also be beneficial for the third countries involved." (Japan-China Summit Meeting in May 2018)

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Co-financing Projects between JBIC and China Governmental FIs

[Russia Yamal LNG Project]

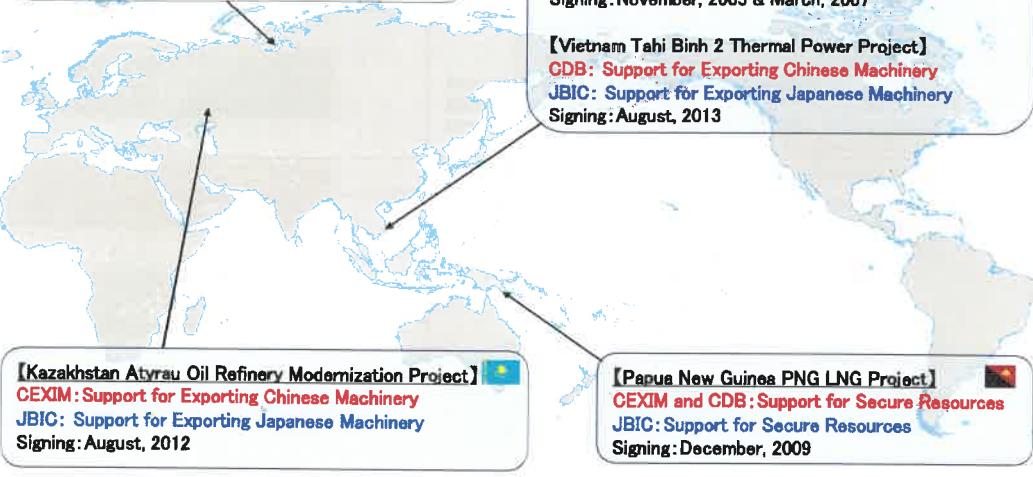
CEXIM and CDB: Support for Secure Resources
JBIC: Support for Exporting Japanese Machinery
Signing: December, 2016

[Vietnam Hai Phong 1, 2 Thermal Power Project]

CEXIM: Support for Exporting Chinese Machinery
JBIC: Support for Exporting Japanese Machinery
Signing: November, 2005 & March, 2007

[Vietnam Tai Binh 2 Thermal Power Project]

CDB: Support for Exporting Chinese Machinery
JBIC: Support for Exporting Japanese Machinery
Signing: August, 2013



[Kazakhstan Atyrau Oil Refinery Modernization Project]

CEXIM: Support for Exporting Chinese Machinery
JBIC: Support for Exporting Japanese Machinery
Signing: August, 2012

[Papua New Guinea PNG LNG Project]

CEXIM and CDB: Support for Secure Resources
JBIC: Support for Secure Resources
Signing: December, 2009

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Concept for Japan-China Collaboration in Third Country



Support by Governmental Financial Institutions → Realization of Co-financing Projects

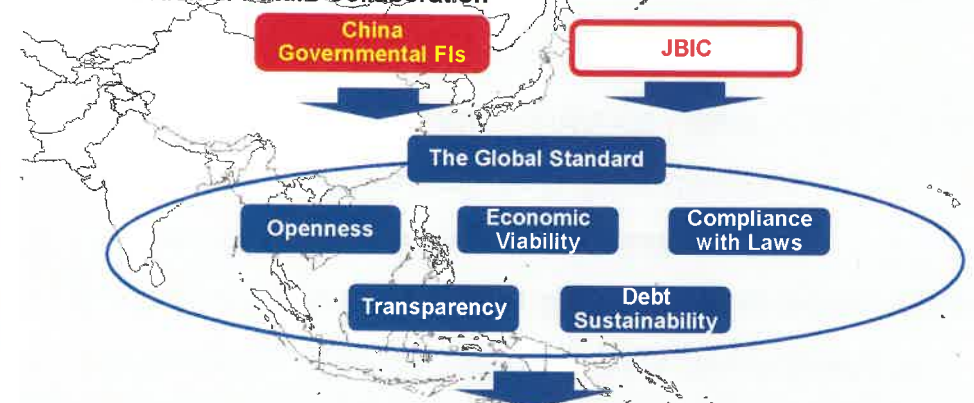


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Building Infrastructure Projects in Third Countries

Direction of Future Collaboration



Responding to huge demand for Infrastructure, especially in Asia

○ Main features of "Bankable Infrastructure Projects"



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Joint Workshop among JBIC/CDB/EEC Office



October 18, 2018 in Bangkok

1st JBIC-CDB Joint Workshop for Bankable Project

- JBIC and CDB jointly hold a workshop with EEC Office
- Identify key issues to consider for a bankable project

December 18, 2018 in Bangkok

2nd JBIC-CDB Joint Workshop for Bankable Project

- Further discussion on key issues
- Jointly propose the solutions to EEC Office based on the mutual understanding between JBIC and CDB regarding the project bankability

We are continuously working on this project and...

Future Collaboration in EEC

With a successful implementation of the specific EEC project, and if Japanese companies and Chinese companies participate, JBIC and CDB will consider further collaboration in EEC region to form "Win-Win-Win" projects for Japan, China and Thailand.



Workshop



Session 2: Cooperation in Promising Sectors

— Introductory Speech —

Promising Areas of Japan-China Business Cooperation in Thailand

-Japan-China Workshop on Business Cooperation in Thailand-

Hiroki Mitsumata, President,
JETRO Bangkok

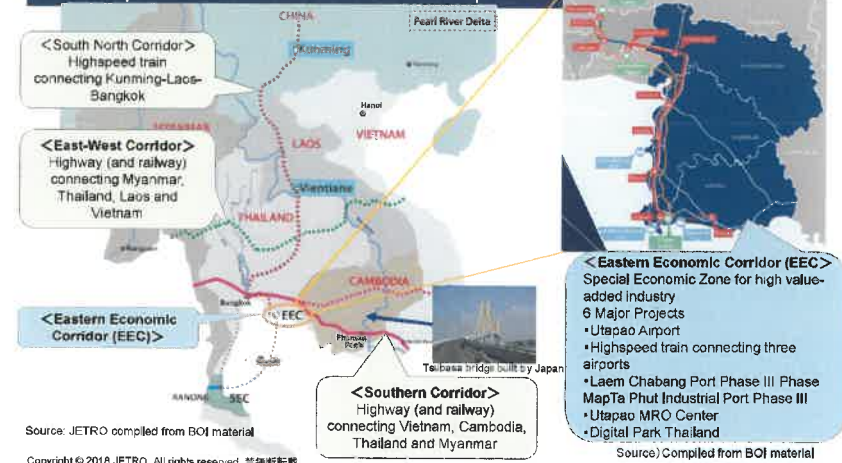
Apr 2019

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JETRO Impact of Economic Corridors Development

➤ Cross border trade and logistic service in Greater Mekong Subregion will be expanded with development of major Economic Corridors. Consequently, EEC boosts the value as a hub.

Three Major Economic Corridors under Development

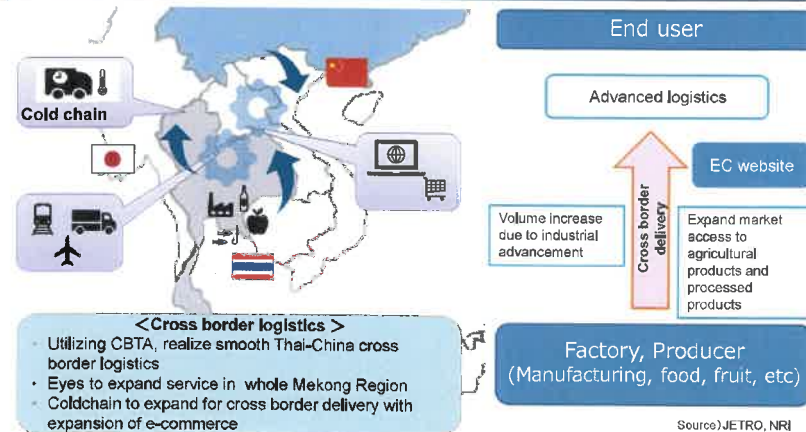


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JETRO Impact of industrial advancement and EC

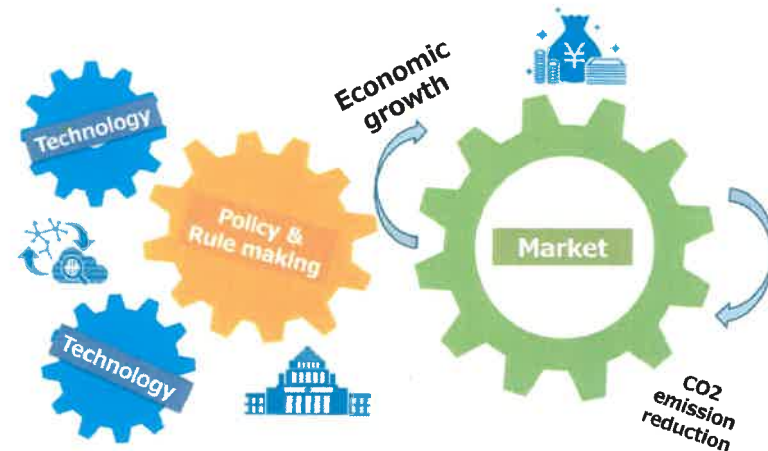
- Further industrial advancement in Thailand will increase volume for B-to-B regional logistics through air, sea, and land for manufacturing goods.
- The spread of e-commerce and CBTA will increase access to neighboring market, boosting cross border logistics and coldchain delivery.

Cooperation between Japan and China in Cross border Logistics



JETRO Combination of technologies and policy drives the market

- Japanese Government has formulated the Strategic Energy Plan in order to promote the adoption of cutting-edge energy technology worldwide
- Japan is taking lead in energy transitions and decarbonization utilizing superior technology owned by Japan



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JETRO Tackling Energy saving and Environment Issues

> Experience in Japan and China cooperation in addressing environment issues may be applied to address the problems Thailand today Thailand such as PM2.5, similar to what experienced in Japan and China

Japan and China have been cooperating in more than 362 projects in energy saving and environment technology to improve pollution and reduce energy consumption in China under the Framework of Japan-China Energy Saving Environment Total Forum since its establishment in 2006 with participation from private and government sector in both sides



<https://www.met.go.jp/press/2018/11/20181126001/20181126001.htm>

Japan and China cooperation in energy saving and environment and technology can be utilized to address various environment issues such as PM2.5 and energy consumption saving in Thailand

Environment and clean energy Issues in Thailand



– Transportation & Logistics –



Japan-China Workshop on Business Cooperation in Thailand Introduction of Japanese Logistics Company in Thailand

2nd April, 2019
Nippon Express (South Asia & Oceania) Pte. Ltd.



The overview of Japanese Logistics Companies in Thailand



Industry	Number of companies	Percentage
Manufacturers	2,346	43.09%
Non-manufacturers	2,890	53.09%
(Transporting, postal service)	(204)	(3.75%)
Other industries	208	3.82%
Total	5,444	100.00%

(JETRO Bangkok Oct 2017)

Year of establishment	Number of bases
60'	1
70'	0
80'	30
90'	61
00'	76
10'	86
Total	254

#Breakdown of 254 bases operated by 131 major Japanese logistics companies in Thailand.

#The total number of employees is 19,000. (Direct employment only)

#The oldest establishment was in the 60'.

In the 80', 90', 2000', and 2010' the number of bases increased to 30, 61, 76, and 86 respectively, and there are 254 bases now.

(Daily CARGO special edition / Overseas bases of logistic companies "2019 version")

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The Prefectures where Japanese logistics companies have bases



Bangkok
Samut Prakan
Chon Buri
Rayong
Chachoengsao
Prachin Buri
Nakton Ratchashima
Ayutaya
Prathom Thani
Nakhon Pathom
Kamphaeng Phet
Chiang Mai
Mukdahan
Songkhla



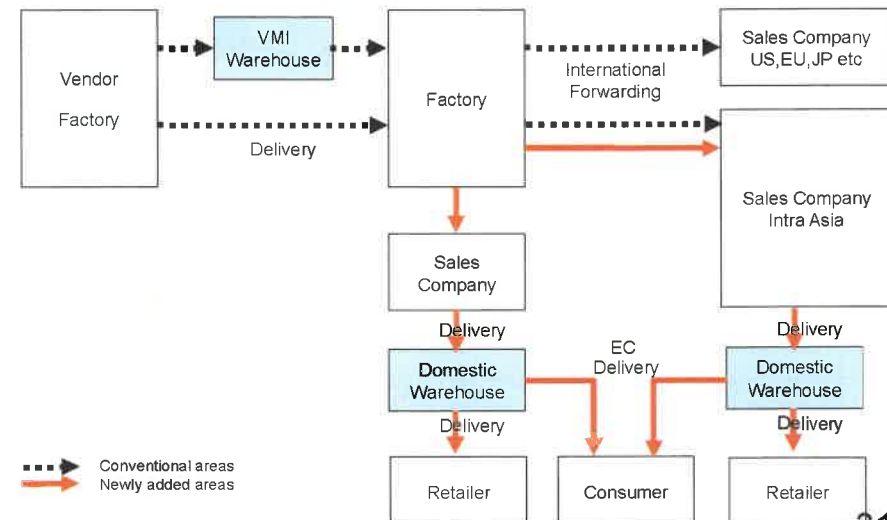
(Daily CARGO special edition / Overseas bases of logistic companies "2019 version")

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New types of logistics to focus on



- New logistics areas that will expand with the increase of New purchaser
- Focus on launching logistics services based on consumer growth, in addition to current logistics demand with manufacturing as a core industry



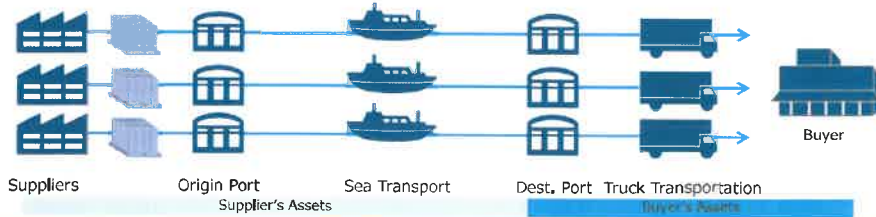
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Buyer's Consolidation

We Find the Way
NIPPON EXPRESS

This type of distribution is to consolidate products produced at factories of several suppliers in the exporting country and transport all of them in the same container by sea from the port of origin to destinations in the name of buyers. By improving the load capacity of container the per unit transportation cost is decreased.

<Before>



<Buyer's Consolidation>



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Effort to Streamline Transporting

We Find the Way
NIPPON EXPRESS

Carbon dioxide and nitrogen oxide emitted during the business activities of the logistics industry are one of the causes of global warming and air pollution, and thus, it is an important objective for us to operate transporting vehicles efficiently and reduce the amount of emission.

A vehicle operation recorder, known as a digital tachograph device is implemented to the freight vehicle, and obtains the record of abrupt starting and hard braking on top of speed, time, distance, change of engine speed, etc.

Analyze the data, extract problems of driving from each driver, and teach drivers how to make an improvement for each problem.

Since abrupt starting and hard acceleration will increase engine speed, and the amount of fuel consumption will increase, we teach drivers to reduce the amount of fuel consumption, and as a result, the various types of gas emitted can be reduced.



An example of GPS-mounted digital tachograph developed specifically for Thailand (Model: YAZAKI iQsan)

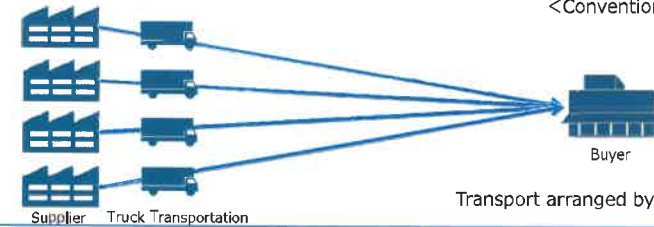
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Cargo Collection Services (Milk-run)

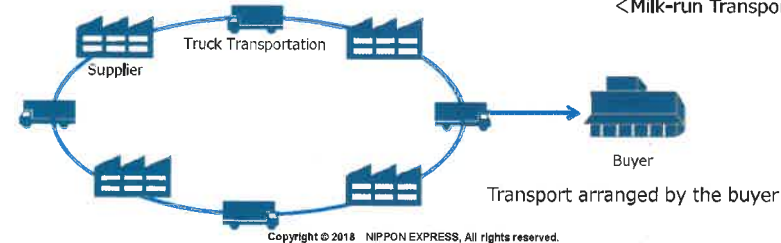
We Find the Way
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This service is a method in which one vehicle makes stops at several suppliers to collect production components. It identifies the individual transport cost included in the price of parts, etc., and facilitates well-planned and efficient procurement logistics through pull-system transport according to a regular transport schedule. The transport method gets its name from the dairy industry, where a milk producer circulates a truck to collect raw milk from the dairy farms.

<Conventional Transport>



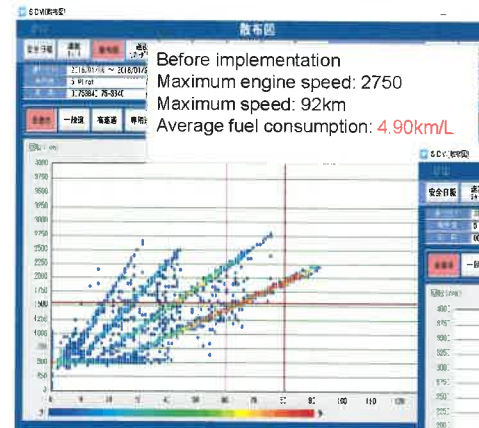
<Milk-run Transport>



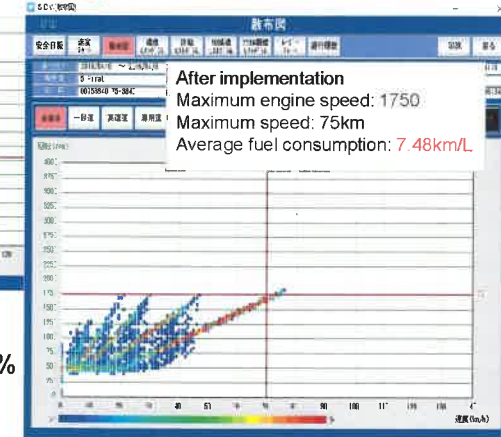
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Effort to streamline transporting

We Find the Way
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Vertical axis: Engine speed
Horizontal axis: Vehicle Speed
Colored area: Fuel consumption
The same distance for both cases



Effect
Emission of gas reduced by 52%
Fuel cost reduced by 52%
Accidents are controlled

(Reference: by Hosoya International Co., Ltd.)

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Currently, the development of Eastern Economic Corridor (EEC) has been collecting most attention in Thailand. It is expected that not only Japanese but also Chinese companies will make significant investments in the development of EEC, and there will be a demand for transporting from and to EEC.

Japanese logistics companies have already prepared business foundations to provide suitable logistics services in the 3 target prefectures in EEC.

To respond to the Chinese customers' demand for logistics services that will arise from Chinese logistics companies, we believe that Japanese logistics companies who have established the network in advance can be utilized to provide high-quality logistics services cooperate with Chinese logistics companies.

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SUNTORY

Our Aspiration from Thailand to China

2nd Apr 2019

Suntory Beverage & Food Asia



Executive Summary

Suntory Beverage & Food Asia has a business unit and manufacturing facility in Thailand and is planning to enter Chinese health food market from Thailand through utilization of e-commerce and another Chinese business unit in Suntory Group

BRANDS SUNTORY

Health Enrichment Company



Our Business in Thailand

We run Two Major Business in Thailand

<p>Beverage</p> <p>2 Factories 860 Employees</p> <p><i>* JV established with PepsiCo in 2018</i></p>	<p>Health Supplement</p> <p>3 Factories 900 Employees</p> <p><i>* started in 1974 * moved from Singapore to Bangkok in 2017</i></p>	<p>Factories: 5 factories/1 laboratory</p> <p>SBFT Laboratory Saraburi factory Pinthong Factory BG Cap Factory Lean Chabang Factory Rayong factory</p>
<p>Sales</p> <p>+20% CAGR</p> <p>2010 2017</p>		<p>Restaurant</p> <p>34 Restaurant FC: Central Group 9 Restaurant FC: S&P Intl.</p>
		<p>Spirits</p>

BRAND'S Suntory – Health Supplement Business

1920
BRAND'S® Essence of Chicken found its way to the Far East, where it quickly became a bestseller.

1970
BRAND'S® Essence of Chicken became a household staple.

1975
1st BRAND'S® Essence of Chicken factory in Nontaburi, Thailand

1982
Launched world's 1st Bottled Bird's Nest drink

1996
Launched BRAND'S® Veta, the first fruit-based essence sold in Thailand

2010
BRAND'S® 175th Anniversary
Opened the world's largest BRAND'S® manufacturing facility at Pinthong Industrial Estate in Thailand.

2017
Established BRAND'S Suntory International as Biz HQ in Thailand

BRANDS SUNTORY
Health Enrichment Company

CSR Activities by BRAND'S in Thailand

BRAND'S Young Blood

- Blood Donation center, Thai Red Cross society
- Since 1997 / 50,000 BEC sampling / year

BRAND'S Summer Camp

- The Biggest free tuition in Thailand since 1990
- Total participants over 1,200,000 students

BRAND'S Brain International Contest

- joint organization: Thailand Crossword Game, A-Math, Kumkorn and Sudoku Association, and Ministry of Education
- since 1987, over 180,000 participants

CSR project related to the royal family

- The Protheses Foundation of H.R.H. The Princess Mother,
- Thai Red Cross Society under the Queen patronage,
- The Princess Mother's Medical Volunteer Foundation,
- The Pediatric Cancer Foundation under the Royal Patronage of Princess Somsavalee,
- The Princess Pa foundation,

— Energy & Environment —

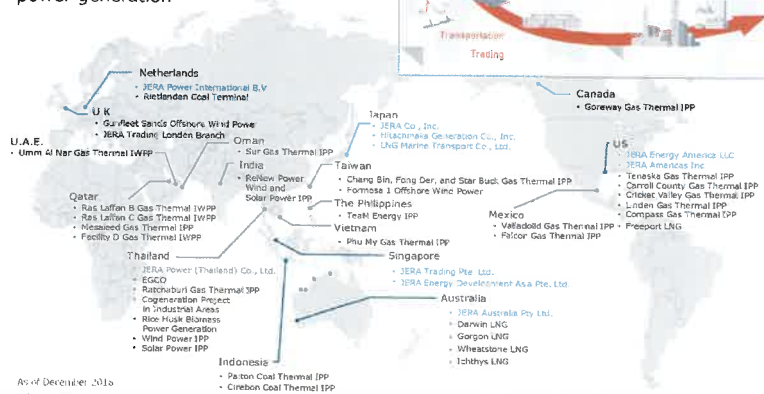
Japan-China Business Cooperation in Thailand

JERA Power (Thailand) Co., Ltd.
April 2019

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JERA'S Overseas Business

"To invest strategically and integrate the value chain from upstream fuel investment and procurement through power generation"



About JERA & JERA-PT

TEPCO	Assets Integration	CEPCO
42,960	Domestic Power Generation (MW) ¹	23,410
190,200	Electricity Sold (GWh) ²	110,200
22,57	LNG Volume (million Tons) ²	12.77

¹ As of January 2019, ² Results for FY2016

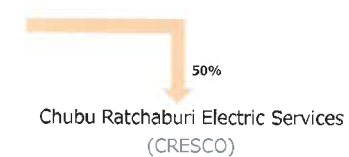
TEPCO
Tokyo Electric Power Company
(TEPCO Fuel & Power)

CHUBU
Electric Power

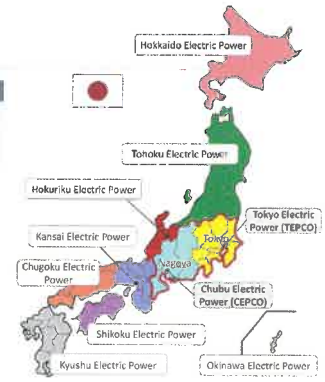


JERA Power Thailand
(JERA-PT)

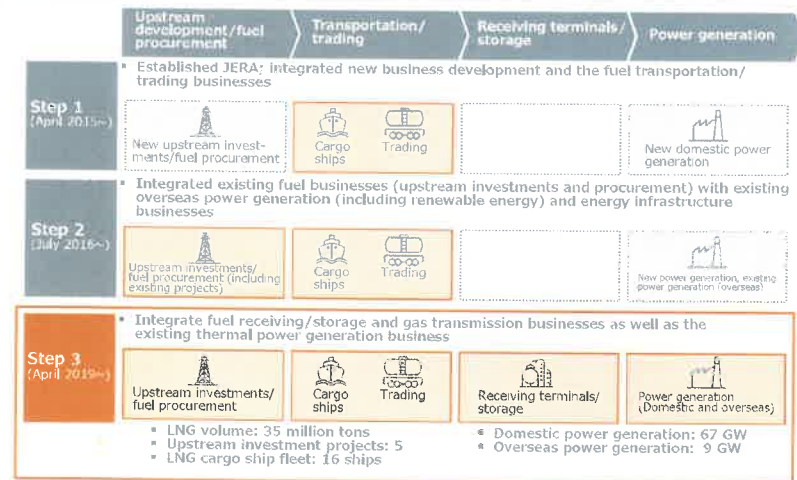
JERA Power Engineering Thailand
(JERA-PET)



Chubu Ratchaburi Electric Services
(CRESCO)



JERA'S Global Energy Business Integration

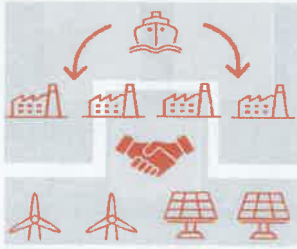


JERA's Mission & Vision

Mission To provide cutting edge solutions to the world's energy issues

Vision 2025 Global Leader in LNG and renewables sparking the transition to a clean energy economy

Through enhancing the LNG value chain and undertaking large-scale renewable development, construct a complementary relationship between LNG-fired power and renewables. Provide stable, economic and clean energy.



- Flexible LNG-fired power supply complementing intermittent renewable energy
- Flexible fuel procurement backed by resource trading
- Balanced development of portfolio of renewable resources promoting diversification from solar PV into offshore wind and others
- Stable renewable power supply with energy storage technologies

JERA

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JERA in Thailand (JERA Power (Thailand), JERA-PT)



Background	<ul style="list-style-type: none"> • Establishment: March 2003 • Former name: Chubu Electric Power (Thailand) Co., Ltd. • Name changing: July 2016 • Current name: JERA Power (Thailand) Co., Ltd. ("JERA-PT")
Main Activities	<ul style="list-style-type: none"> • JERA's power plant assets management/development support • Power plant O&M service • Power plant engineering/ technical consulting service
Location	33/4 The Ninth Towers Grand Rama 9, Tower B 16F, Rama 9 Road, Huai Khwang, Bangkok, THAILAND
Employees	50 (as of April 1st, 2019) (6 Japanese, 29 Thai Engineers, 10 Thai Admin, 5 Drivers)

JERA

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JERA-PT's Function

JERA's Asset Management

- Ratchaburi C/C Plant
- ATBio (Biomass)
- PPTC/SSUT (Co-gen in Industrial Zones)
- Wind & Solar Farms

Asset Development With JERA and JERAEDA (Singapore)

- Conventional Power Plants
- Renewable (Solar, Wind, Battery)
- Gas to Power

Power Plant & Steam Distribution Engineering Services

- Owner's Engineer
- Feasibility Study
- Sales Support

Power Plant O&M Services

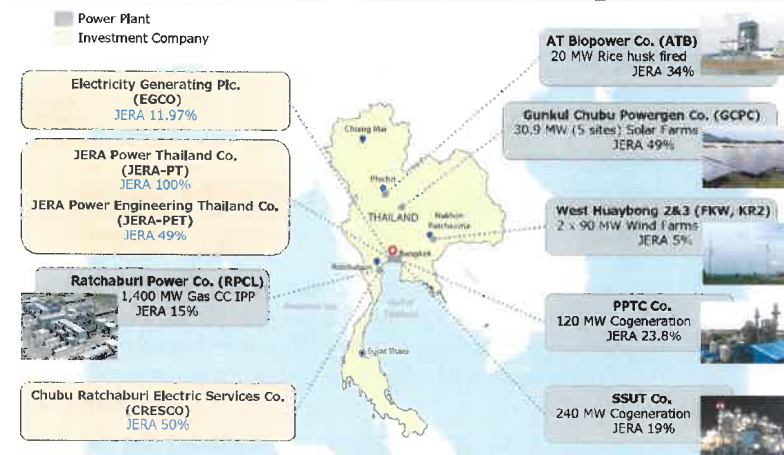
- Ratchaburi C/C Plant (via CRESCO)
- ATBio (Sending SM, OM, MM)

JERA

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JERA Assets in Thailand



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JERA-PT's Services

Engineering (Owner's Engineer)

- Project:** PPTC Gas Cogeneration
Output: 120 MW + Steam 30 t/h
Location: Bangkok COD: 2016
- Project:** SSUT Gas Cogeneration
Output: 240 MW + Steam 60 t/h
Location: Samutprakam COD: 2016
- Project:** KLU Gas Cogeneration
Output: 107 MW + Steam 15 t/h
Location: Pathumthani COD: 2017
- Project:** BPU Gas Cogeneration
Output: 230 MW + Steam 100 t/h
Location: Ratchaburi COD: 2017
- Project:** OSCAR Biomass Power Generation
Output: 2 x 9.9 MW
Location: Nakhon Si Thammarat COD: 2018
- Project:** BSW Biomass Power Generation
Output: 6.0 MW
Location: Surat Thani COD: 2018

O&M

- Project:** RPCL Gas Combined-Cycle
Output: 1,400 MW
Location: Ratchaburi COD: 2008
- Project:** ATB Biomass Power Generation
Output: 20 MW
Location: Phichit COD: 2005

Technical Consultant

- Project:** Feasibility Study for TDEM Solar System Installation
Location: Thailand/ Countries in Asia
- Project:** SPBR Biomass Power Plant Design Improvement
Location: Ang Thong

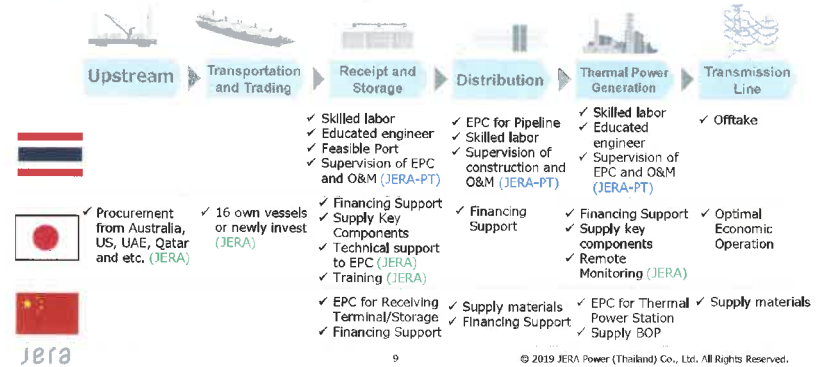
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Japan-China Business Cooperation on Gas to Power in Thailand

- **JERA's Strength:**
 - 1) Active in the entire LNG value chain on a global scale
 - 2) High Quality Control, Operation & Maintenance Optimization
- **Chinese Strength: Competitive price of EPC and Materials**
- **Thai Strength: Skilled labor, Highly educated engineer and staff**

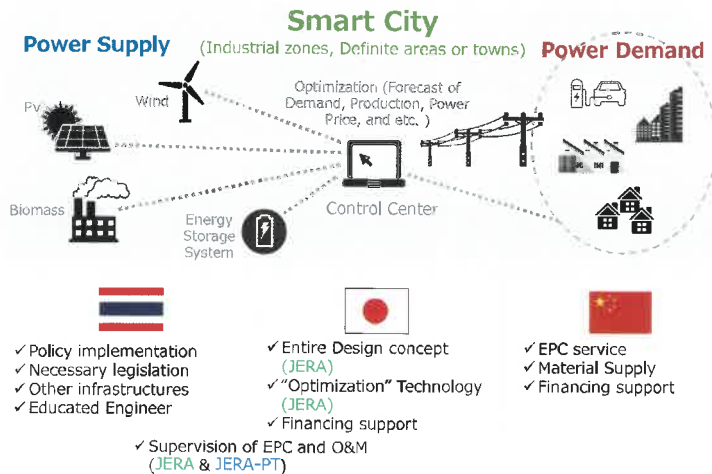


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Japan-China Business Cooperation on Stable Renewable Power Supply with Energy Storage Technologies



JERA

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JERA

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Nerima Waste Incineration Plant (Tokyo)

JFE's Environmental Solution

April 2019

 **JFE Engineering Corporation**

JFE Group Structure

 **NKK** Est. 1912
 **KAWATETSU** Est. 1951


JFE Holdings, Inc.
(est. 2002)

Equity-method affiliate

Japan Marine United



JFE Engineering

Net Sales(million \$)
3,900
Employees
9,300



JFE Steel

Net Sales(million \$)
27,200
Employees
44,400



JFE Shoji Trade

Net Sales(million \$)
19,100
Employees
6,800



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(FY2017) 2

Smart Infrastructure for Global Environment



Waste-to-Energy



Biomass Power Plant

JFE offers the world leading technology



Sewage Treatment



Geothermal Power Plant

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3

Collaboration with Chinese Companies



第一届中日第三方市场合作论坛
第一回日中第三国市场協力フォーラム

2018年10月26日 中国・北京

Photo:JETRO
The 1st Japan-China Forum on Third Country Business Cooperation (26 Oct. 2018, Beijing)

WTE in Singapore



WTE in Myanmar



Hangzhou Boiler Group



Shanghai E&T Environment Engineering

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NOTE: Details will be explained in the presentation.



Thank you

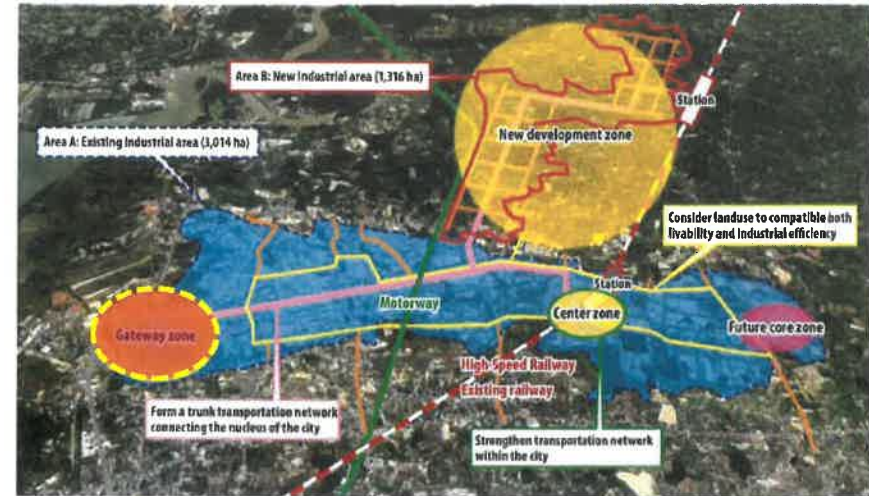
<http://www.jfe-eng.co.jp/en/>

— Smart City —

Japan-China Joint Project and Smart City Project in Thailand and Laos

2019. Apr. 2

INTRODUCTION OF AMATA'S DEVELOPMENT PLAN



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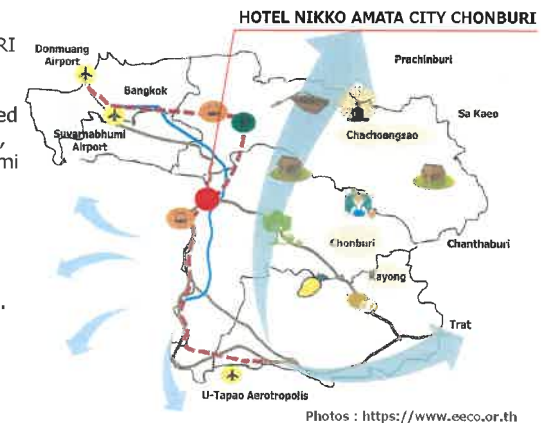
AMATA GATEWAY ZONE—①Hotel Nikko Amata City Chonburi



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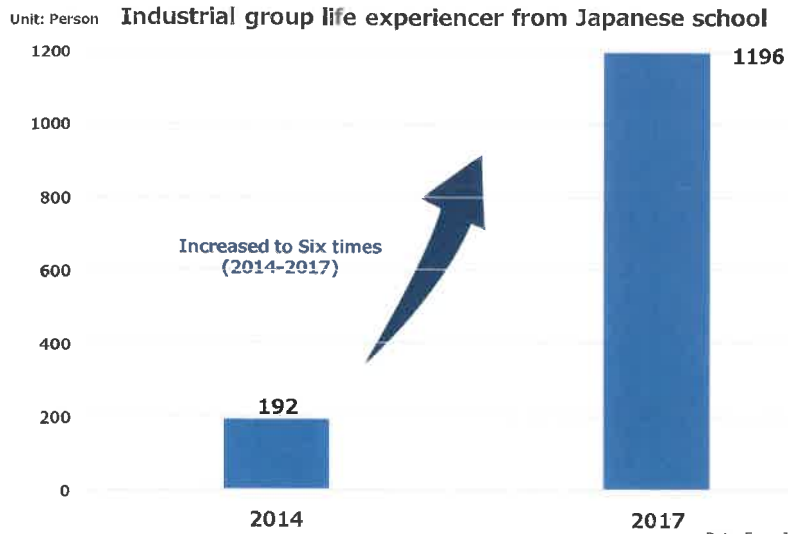
AMATA GATEWAY ZONE—Project Scope

HOTEL NIKKO AMATA CITY CHONBURI is one of projects in EEC area located in Amata Industrial Estate, Chonburi. Because of being **4 stars hotel** located neither far from Bangkok nor Pattaya, and easy to access from Suvarnabhumi Airport, we hope it will contribute to the tourism of Thailand in the future. And as we are a part of EEC, we also focus on investment in **up-lifting innovation and advanced technology** for the future generation. In addition, investment in environmental innovation is the main focus of us too.



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AMATA GATEWAY ZONE--Hotel Potential Customers



Data: From JTB hearing
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4

SOLAR POWER GENERATION SYSTEM



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5

FACE RECOGNITION SYSTEM



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6

AMATA GATEWAY ZONE--②Vocational Training School



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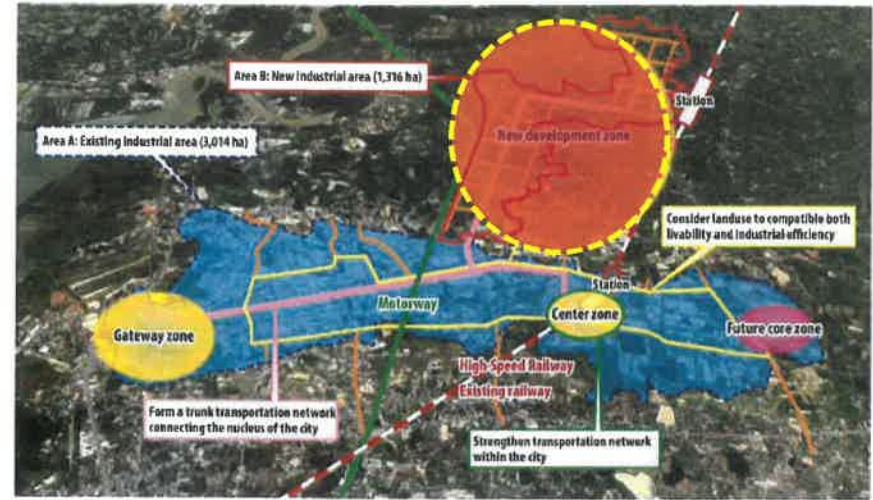
7

AMATA GATEWAY ZONE--③Shopping Mall



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NEW DEVELOPMENT ZONE



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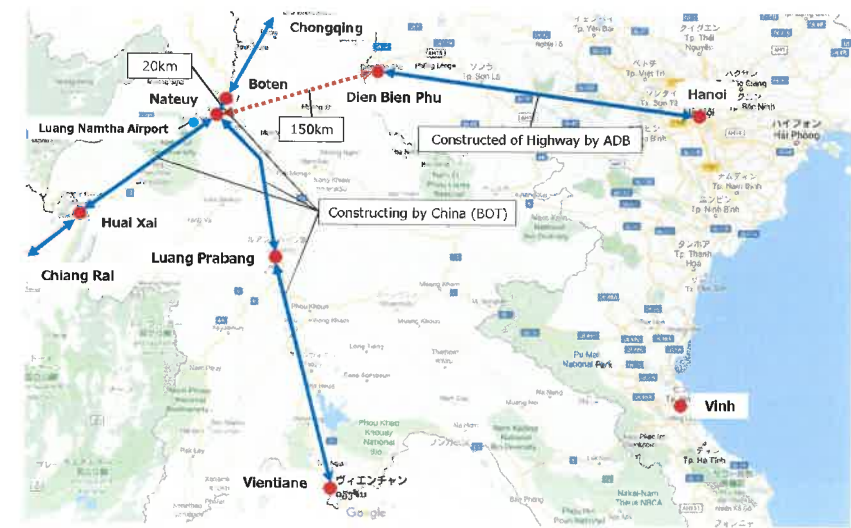
IMPORTANT TRANSPORTATION HUB AREA—Nateuy



Chongqing~Shanghai	2,500km
Chongqing~Laemchabang	2,500km
Nateuy~Lach Huyen	880km
Nateuy~Laem Chabang	1,100km
Nateuy~Dawei	1,200km

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IMPORTANT TRANSPORTATION HUB AREA—Nateuy



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UNDER DEVELOPMENT NATEUY INTRODUCTION

Nateuy



Boten (20km far from Nateuy)



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Thank you

Koji. Komai
Email: koji.komai@fujita.co.jp

www.fujita.co.jp

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Next step Thailand : Smart City

2nd April, 2019
Somsak Garnjanakarn
Hitachi Asia (Thailand) Co., Ltd.



Hitachi is Uniquely Positioned for Digital Transformation that Creates Value

Hitachi
Innovation is in our DNA

OT
109+ YEARS

IT
60+ YEARS

INDUSTRIAL

CITY

BUSINESS

CONSUMER

CLOUD

COMMUNICATIONS

IT

ARTIFICIAL INTELLIGENCE

IT SYSTEMS

BIG DATA ANALYTICS

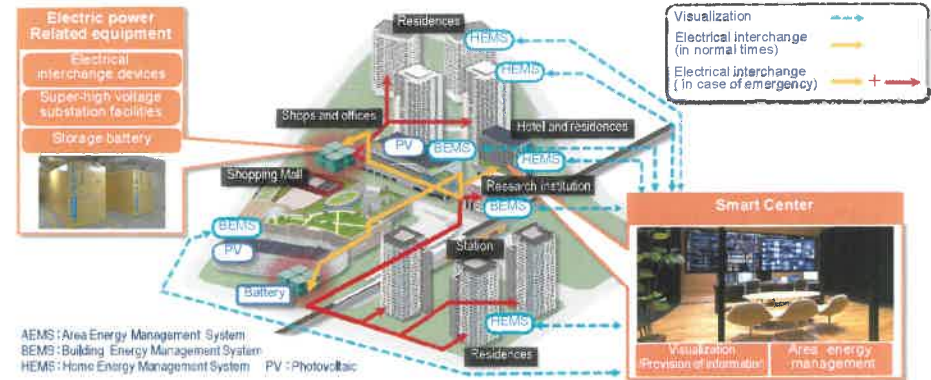
Kashiwa-no-ha Smart City in 2030



Kashiwa-no-ha AEMS:

HITACHI
Inspire the Next

Kashiwa-no-ha Area Energy Management System (AEMS) can efficiently operate, monitor, and control energy across the entire region.



Networking



– Transportation & Logistics –

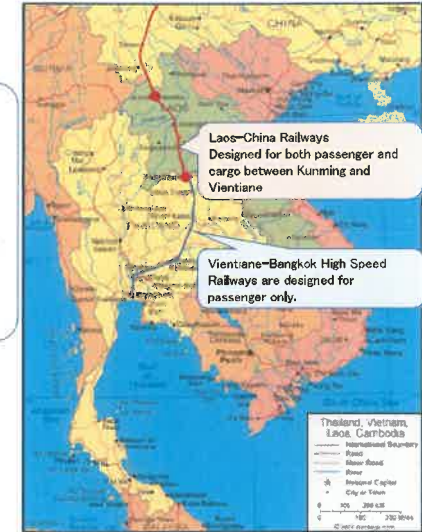
Current Nissin Group's operations in Indochina

- Nissin Group provides several unique services in Indochina.
- On cross-border land transpiration, we provide truck services without transload on the way between Thailand and Vietnam, using our own trucks and 45F containers.
- In Vietnam, we operate daily train services between Hanoi and Ho Chi Minh with using our own car wagon designed for complete automobile units and containers.



Seek for new services using Laos-China Railways with our Chinese partner

- China-Laos Railway is expected to be served in 2022.
- One of the remarkable thing is that this railways, connected to Kunming, China, is designed for both Cargo and Passenger services.
- In the future, China-Laos Railway is planned to link with high speed railway to Bangkok. However, this railway is designed for passenger only.
- Nissin Group would seek new logistics market, such as rail services from Thailand to Europe, with our partnership company in China.



material

3. Shift from "purchase & ownership" to "Rental & Share"

Why "Returnable?" "Out source?" "Rent it?"

- Focus on Packing material with high logistics cost
- From "Disposable" to "Reusable" → Cost reduction
- Rent management is troublesome → Out Source
- Initial cost is big problem → Rental makes it easier to introduce
- Reduce "invisible cost" such as loss and retention risks

nissin provides material returnable service as one stop

- Develop: Join proposal with material vendor
- Rental: Rent packing material quarterly
- Management: Inventory & Balance of packing material
- Cloud System: Equipment, parts, barcode, scanning, transfer, Spot on demand
- Tax Exemption: Serial control on Import & Export
- Logistics service: Production & Reverse Logistics

Nissin Solution

Introduction Issue for Returnable material

- Develop Packing Material
- Initial cost for production
- Management of Packing material
- Running cost for Packing material

Nissin Solution

- Consultation on Packing material
- Rental of Returnable material
- Returnable management + Global Logistics service

Notable Features

- Nissin is consultant of Packing material
- Nissin supplies Rental packing material
- Nissin does ID scan & reverse logistics
- Nissin make packing material visualize by cloud system
- Nissin handles Tax exemption for Packing material
- Nissin offers simple price include management & operation

Benefit on Customer

- Reduce Logistics cost
- Off balance of Packing material
- Material management & traceability
- Focus on Manufacturing & Quality of goods

Operation Flow

Coming Soon

Manufacturer → Packing material → Delivery site

2~4 month cycle

Product Logistics → Reverse Logistics

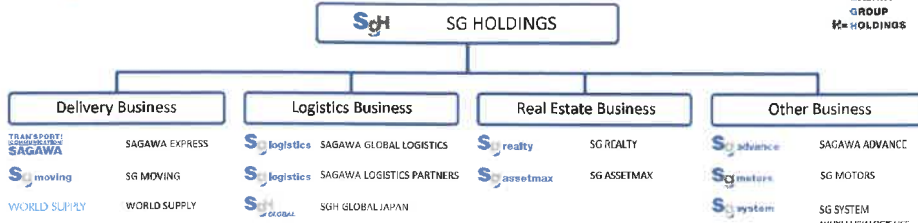
Automatic Documental Inventory Display Traceability Check

(Inventory Information) (Document)

COMPANY PROFILE

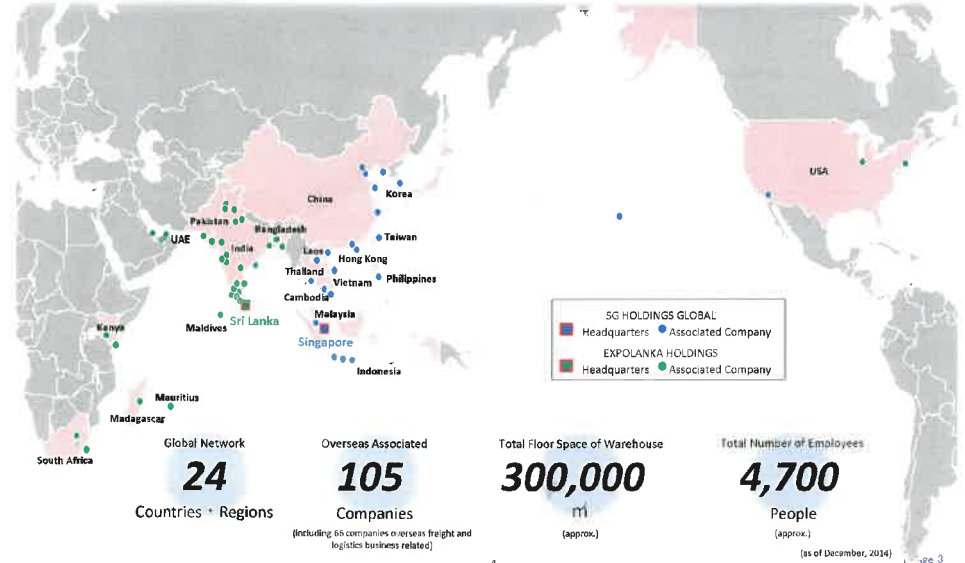
SG SAGAWA (THAILAND) CO., LTD.

2 Apr 2019



SG HOLDINGS GLOBAL

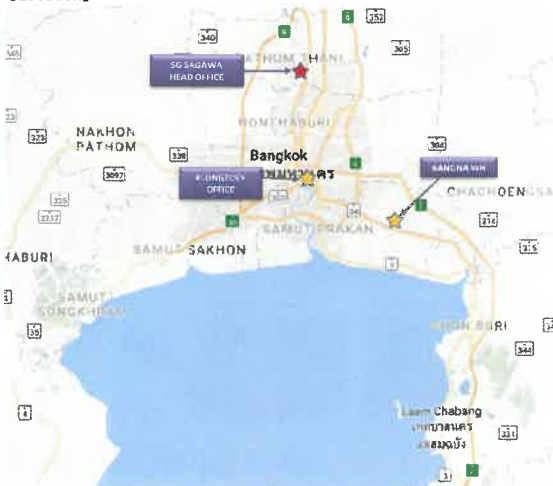
East Asia TIANJIN POLY-SAGAWA INTERNATIONAL TRADING SHANGHAI POLY-SAGAWA LOGISTICS POLY SAGAWA LOGISTICS SHANGHAI DAICHONG SAGAWA LOGISTICS SAGAWA EXPRESS (H.K.) SAGAWA EXPRESS INTERNATIONAL TAIWAN EXPOFREIGHT (HONG KONG) EXPOLANKA FREIGHT (SHANGHAI) EXPO FREIGHT (SHENZHEN) <i>The Others, Total 11 Companies</i>	Southeast Asia SAGAWA EXPRESS PHILIPPINES SAGAWA GLOBAL LOGISTICS (PHILIPPINES) SAGAWA EXPRESS (MALAYSIA) SAGAWA EXPRESS (THAILAND) SAGAWA EXPRESS (VIETNAM) SAGAWA GLOBAL LOGISTICS (MALAYSIA) SAGAWA CUSTOMS BROKERAGE (MALAYSIA) SAGAWA EXPRESS SINGAPORE AMERDIO LOGISTICS (S) AMGAS ASIA PT. SAGAWA INDONESIA EXPOLANKA FREIGHT (VIETNAM) [Indonesia] PT EXPO INPARIA EXPOLANKA FREIGHT (PHILIPPINES) EXPOLANKA FREIGHT (CAMBODIA) <i>The Others, Total 16 Companies</i>	South Asia / West Asia EXPOLANKA HOLDINGS SAGAWA GLOBAL LOGISTICS (PHILIPPINES) [Sri Lanka] EXPOLANKA FREIGHT [India] EXPO FREIGHT EXPOLANKA BANGLADESH EXPOLANKA FREIGHT DUBAI [Pakistan] UNION CARGO CLASSIC TRAVEL <i>The Others, Total 64 Companies</i>	North America SG SAGAWA USA SAGAWA EXPRESS HAWAII EXPOLANKA USA <i>The Others, Total 5 Companies</i>	Africa [South Africa] EXPOLANKA FREIGHT EXPOLANKA FREIGHT (KENYA) EXPOLANKA FREIGHT (MAURITIUS) EXPOLANKA MADAGASCAR <i>The Others, Total 5 Companies</i>
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[Company Information]

Company Name	SG SAGAWA (THAILAND) CO., LTD.
Establish	June, 1989 (SG Group participated since March, 2005)
Capital	2.25 Million Baht
Head office Address	138 Moo 5, Tiwanond RD., Tambol Bangkadi, Amphoe Muang, Pathumthani 12000 (in Bangkadi Industrial Park)
Telephone	02-501-1281-88
Fax Number	02-501-1263
Business Overview	Participation International transportation (air, sea, land) International courier service (Express, Courier) Thailand domestic transport Warehousing and logistics processing

[Location]



[Line Of Business]

Warehouse	Logistic services • 3 rd party logistics • Warehouse and storage
Air & Sea Freight	Freight Forwarding • Air freight • Sea freight
Transportation	Delivery • Domestic transport • Cross border transport • International courier

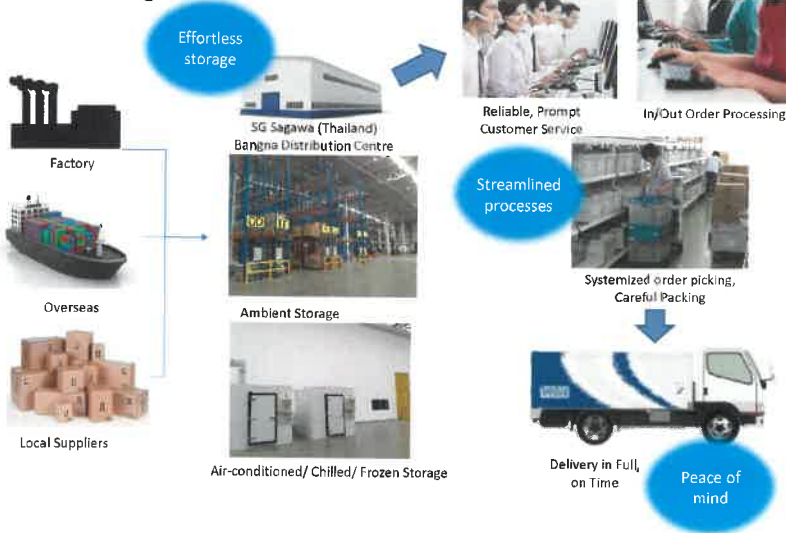


“Trinity Logistics”



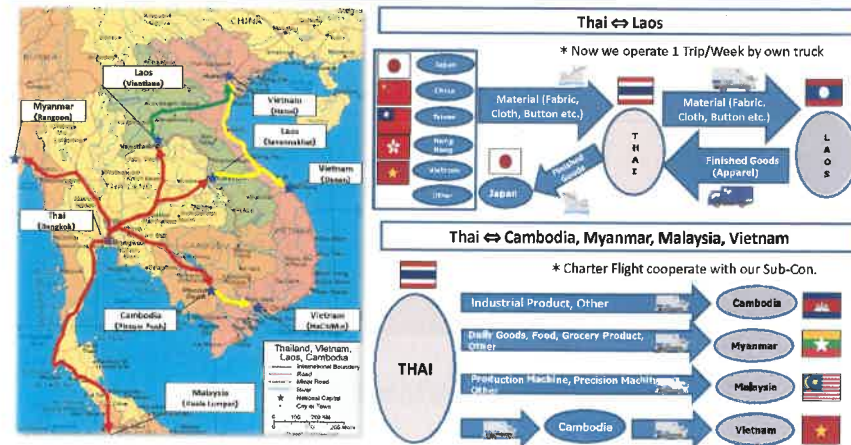
What we can do for you!

After outsourcing...



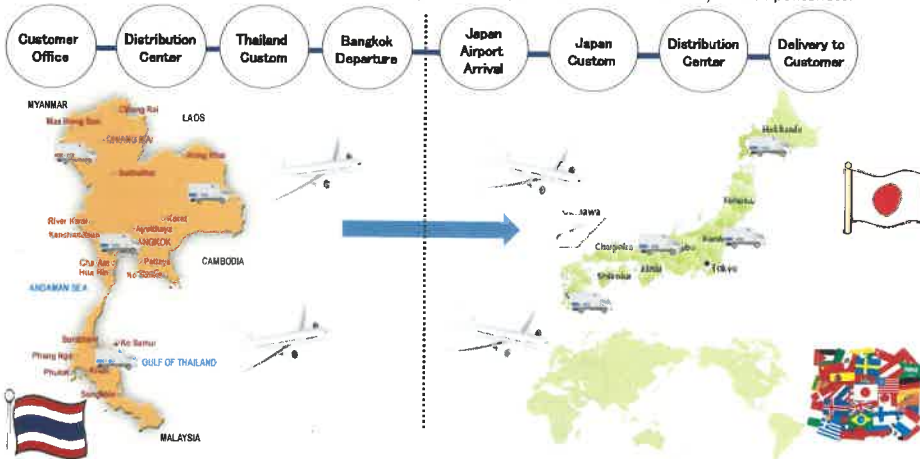
Cross Border Land Transport From Thailand To Nearby Country

We have Cross Border Land Transport Service from Bangkok as Hub to Nearby Country (Laos, Cambodia, Myanmar, Malaysia, Vietnam)



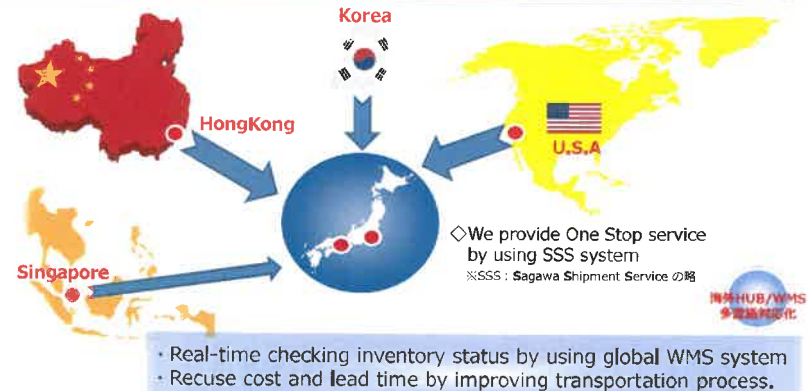
International Courier Service From Thailand To Japan And Worldwide

Our Sale Driver will move around Bangkok and Main Industrial Park by Pickup Truck to collect and deliver Parcel of Customer. Other area will run by our cooperate company. We will deliver Customer's Parcel to destination in Japan and other country worldwide by speedy and certainty. Contact us, our Sale Driver will serve you with politeness.



Cross-border E-commerce

SG Sagawa Group is handling over 8 million shipments/year of E-commerce from overseas to Japan. 1.5millions shipments from Hong Kong. Number of E-commerce shipments is growing rapidly year by year.



- Real-time checking inventory status by using global WMS system
- Recuse cost and lead time by improving transportation process.

【成田LC】

【関空OP】



ラベルスキャン実施画像③ 到着貨物ラベルとの対査
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Structuring global E-Commerce Platform connecting China with Asian countries



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Structuring global E-Commerce Platform connecting China with Asian countries



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SSS system provides one stop solution to Japan

SSS : Sagawa Shipment Service



<Selling point>

If you want to bring your products from overseas to Japan, or promote goods by E-commerce, Sagawa service is the greatest choice for you.

Above service would be also link up with "e-select service" in Japan, we are able to collect payment for you, It's just similar to how you do business in Japan.

Once you provide the delivery information to us, we can support the full set service(From Invoice issue to deliver goods to the consignee's door) for you.

we are able to let you control your stocks which storage at overseas and delivery schedule as well, even if you are located at JPN. Our service is all covering not only from China / Vietnam to Japan but also the other country.

Way bill, Packing List could be also provided by many languages. Of course, our warehouse is available for you, too.



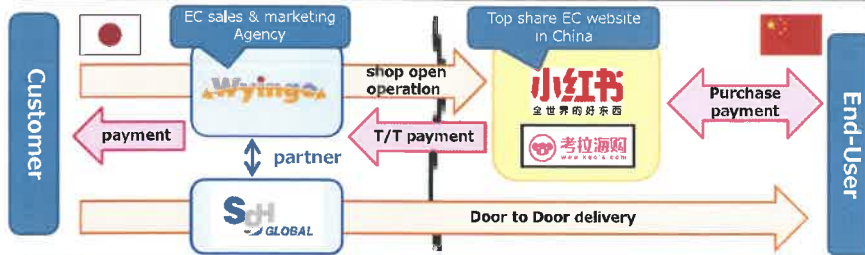
Copyright(C)2014-SAGAWA EXPRESS CO.,LTD. All rights reserved.

Case1 : 小紅書/KAOLA (China)

We help to launch shop and support all operation at Top share EC platform in China.

[What we can do for you ?]

- (1) Support for opening shop and operation outsourcing.
 - ◆ Create a shop in EC platform (shop in shop) and manage operation on behalf of customers.
 - ◆ Selecting goods to sell, translation, Marketing, Customer support, etc.
- (2) Door to Door Delivery
 - ◆ We can deliver from Japan to Chinese individual customers directly.
(One stop service: pick-up/custom clearance/shipping/delivery)



【参考】費用・サービス		
	モールへの保証金	モールごとに設定
(1) 出店・運営代行	初期費用	0円
	月額費用	月間売上上の10%~
	サイト構築	要相談
(2) Door to Door 配送	28円/KG + 15円/0.5KG	
(3) 配達所要日数		●日
(4) 貨物追跡		

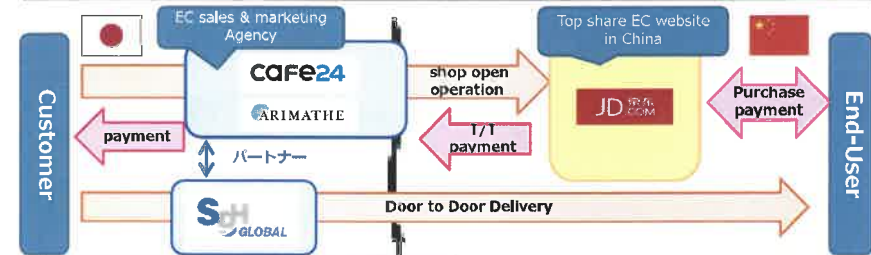
Customer can outsource all the process of E-commerce, so it is easy to start E-commerce business even if they don't have time and knowledge. We promote your goods in China!

Case2 : Tmall/京東 (China)

We help to launch shop and support all operation at Top share EC platform in China.

[What we can do for you ?]

- (1) Support for opening shop and operation outsourcing.
 - ◆ Create a shop in EC platform (shop in shop) and manage operation on behalf of customers.
 - ◆ Selecting goods to sell, translation, Marketing, Customer support, etc.
- (2) Door to Door Delivery
 - ◆ We can deliver from Japan to Chinese individual customers directly.
(One stop service: pick-up/custom clearance/shipping/delivery)



【参考】費用・サービス		
	モールへの保証金	モールごとに設定
(1) 出店・運営代行	初期費用	0円
	月額費用	10万円
	サイト構築	0円
	手数料	8%
(2) Door to Door 配送		
(3) 配達所要日数		●日
(4) 貨物追跡		https://www.sj1-globall.com/index.html

Customer can outsource all the process of E-commerce, so it is easy to start E-commerce business even if they don't have time and knowledge. We promote your goods in China!



SG SAGAWA (THAILAND) CO LTD

Establishment of Cold Chain / Food Factory in Thailand

~ Trend/Difficulty/Our Collaboration with China ~
by

MAYEKAWA (THAILAND) CO., LTD.

Kosuke Yamamoto

(Managing Director)



Company Profile

MAYEKAWA
MYCOM

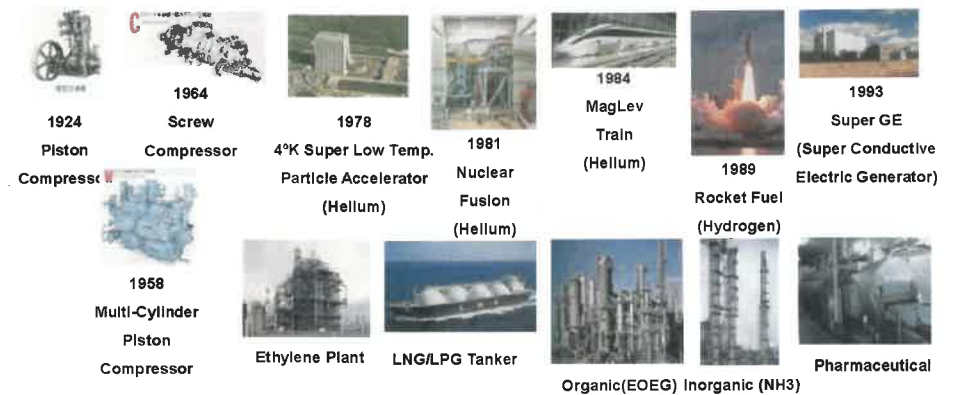


MAYEKAWA MFG. CO., LTD.

Founded: Since 1924 (in Tokyo, Japan.)
Corporate offices : 3-14-15 Botan, Koto-ku, Tokyo 135-8482, Japan
Established in 1924
Capital : 1 billion yen
Employees: 4562 (31/12/2016 , including group companies.)
President : Shin Maekawa

MAYEKAWA
MYCOM

Our History and application of compressors



1924 1960 1970 1980 1990 2000 2010 2019

95th YEARS / GROUP

31th YEARS / Thailand

MAYEKAWA
MYCOM

Business Field

Section1 - Snow melting system for winter road Heat pump system

Section2 - Transport System
Cooling system for Liner Motor Train, Super conductivity System

Section3 - Auto-mobile company
Environment testing system

Section4 - Space & Sea
Hydrogen fuel used for SPACE SHUTTLE LNG tanker

TRANSPORT & SCIENCE

Section2 - Air Conditioning System
TOYAKO Summit in Japan. Building air conditioning

Section1 Cold Distribution Center
Cold Store, Cold Distribution center

Section3 - Super Cold Storage (-60°C)
Facial Air with Air Cycle

Section4 - Chilled water
Adsorption chiller with solar panel

Cold Store Building A/C

MAYEKAWA
MYCOM

Business Field

Section1 - Gas Compressors, Gas recovery for Petro Chemical Industry, Chemical Engineering

Section2 - Nuclear Nuclear fusion facility

Section3 - Grand Cooler for Air Plane, Air Conditioning system for HZA satellite rocket

Section4 - Superconductivity CERN LHC, the world largest circle particle

CHEMICAL & SCIENCE

Section1 - Beverage and brewery Soft Drink, Brew house, Coffee and other Beverage Ice Cream, Pudding

Section2 - Food Processing Automated food delivery system

Section3 - Chilled & Frozen Ready Meal Hamburger Patty Freezing Various Cooking & Freezing System

Section4 - Meat Processing Automated setup robots

Food & Drink

MAYEKAWA
MYCOM

Global Network



Asia Pacific Region



Company Profile in Thailand

MAYEKAWA (THAILAND) CO., LTD.

Founded : 1988 (2531) ~

- Sales : USD 50,000,000 approx.
- No. of employees : 160
- 10 Japanese (as of March 2019)
- Branch office : Trang, Rayong

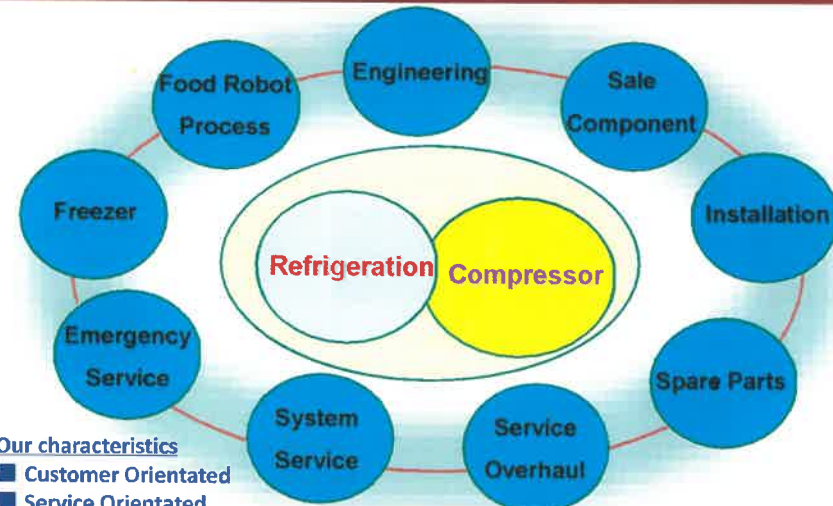
Business Activities

- Sales of **MYCOM Compressors** and other refrigeration component
- Sales of Food Robots (Deboning machine)
- After-Sales Service (Component)
- **After-Sales Service (Refrigeration System)**
- **Design/installation** of refrigeration plant
- Food Process Engineering (Automation)
- **Consultation Service**
- Design & Manufacture industrial freezers (IQF tunnel / Spiral / Flow / Batch / Blast)
- Support business activities in the region



MAYEKAWA MYCOM

Our Characteristics



Our characteristics

- Customer Orientated
- Service Orientated
- Advanced technology from all over the world
- Strong solid based and history in the region
- Integration of Sales, Engineering, Manufacturing, Project and Service function

MAYEKAWA MYCOM 56

1. Development of society and Cold Chain

1. TREND

- 1) Establishment of cold chain is required when the economy reaches certain levels.
- 2) In ASEAN region, we see a greater demand for cold chain in the past decades. The demand is still increasing every year.
- 3) Thailand is and will be the center of the cold chain in the region. However, there are many difficulties that need to be overcome.

2. DIFFICULTY AND CHALLENGES for COLD WAREHOUSE OWNERS

- 1) Energy sources is limited and energy consumption is increasing
- 2) Lack of skilled engineers to operate the industrial refrigeration system
- 3) Maintain safety and harmless environment
- 4) High investment cost



2. Our collaboration with Chinese companies

1. ESTABLISHMENT OF COLDWAREHOUSE & FOOD FACTORY

- 1) Provide technical information and concerns, share business information, including business matching, introducing people, etc., in Thailand and surrounding countries.
- 2) Design and provide industrial refrigeration system with energy concerned.
- 3) Provide a reliable system and service to operate the system, reducing the burden to keep many skilled engineers inside factory and cold warehouse.
- 4) Provide a system safe to the society, appropriate design of the system for export, and friendly to the environment.



2. Our collaboration with Chinese companies

2. PROCUREMENT from suppliers

- 1) There are many overseas suppliers making refrigeration components in China. When we design the refrigeration system, we do often use their products.
- 2) There are many Chinese suppliers who are looking for opportunity to expand their business in Thailand, selling their refrigeration equipment. They usually face difficulty because of their brand name and quality. We, Mayekawa is one of the few industrial refrigeration engineering companies in Thailand who have experience judging the quality of components and provide opportunity to support their business activities.
- 3) Provide service support for these suppliers



THANK YOU



— Energy & Environment —



Energy Solution Provider with century of history



Key Facts

Overview of Osaka Gas

- Started business operation in 1905
- Serving over 5.9 million units for gas supply
- Imports about 9.5 MTPA of LNG (in 2017)
- Headquarters in Osaka, Japan
Affiliates : Perth, New York, Houston, London, Singapore, Bangkok, Indonesia
- Developing gas business in 4 countries (Japan, Singapore, Thailand and Italy)
- Developing about 4 GW of power business in 5 countries
- Investing in upstream & mid- and down-stream assets in 11 countries



Financial/Operational Highlights

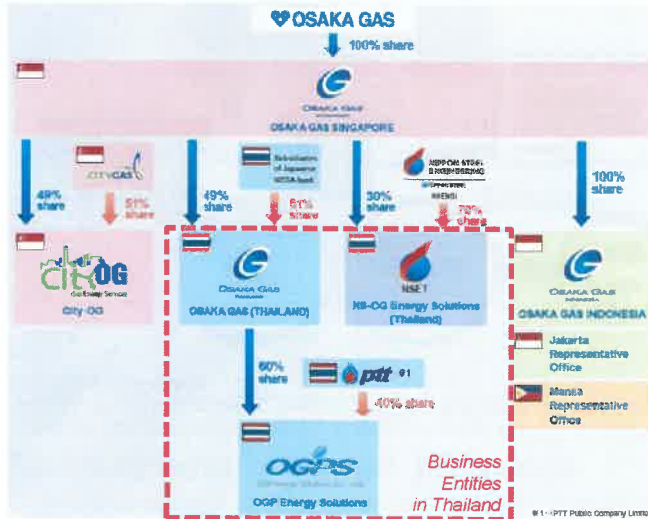
(Consolidated, March 2018)

- Net Sales: US\$ 12.2 billion* (¥1,296 billion)
- Operating Income: US\$ 735 million* (¥78 billion)
- Credit Ratings: S&P: AA- / Moody's: Aa3

*US\$1=¥106.2

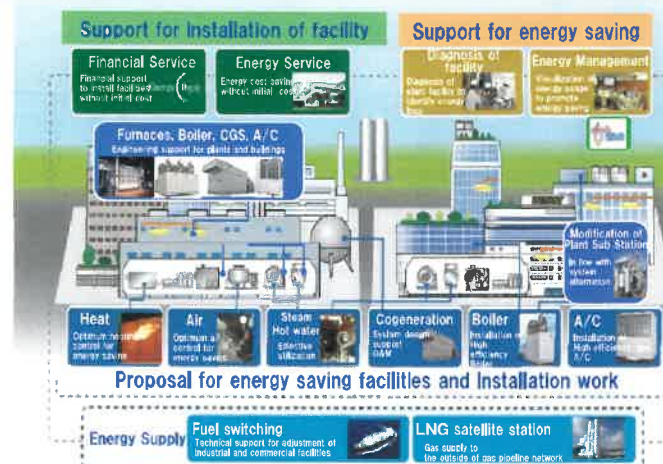


Structure of Osaka Gas Group in Southeast Asia



Total Energy Solutions

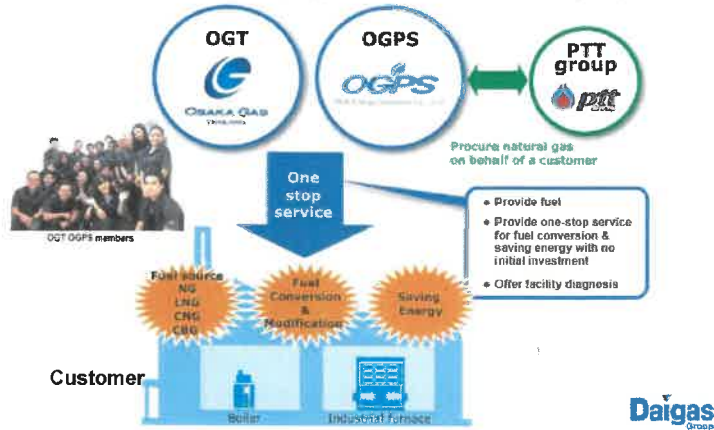
Wide range of energy services to optimize customers' energy usage.



Osaka Gas THAILAND (OGT) & OGP Energy Solutions (OGPS):

Comprehensive utility business

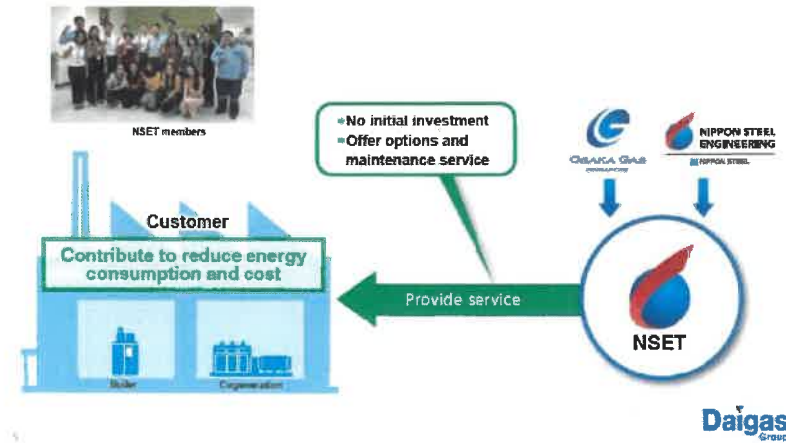
Sales of gas products including Boilers, Furnaces, CNG, Compressed Biogas, Biogas Upgrading System, Water Process and utility business for industrial users



NS-OG Energy Solutions (NSET)

Cogeneration energy service business

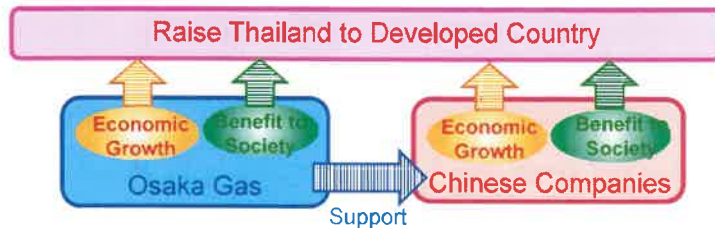
Offer energy efficiency enhancement and energy cost reduction services by installing cogeneration system at customers' site.



Collaboration with Chinese companies Contribution to Thailand!

"The completion of ready-to-implement regional development models helps to drive economic development and Thai society in accordance with the Thailand 4.0 policy and will result in Thailand quickly rising to the level of a developed country."

Vision and Mission of EEC ~<https://www.eeco.or.th>



-We are ready to contribute to development of Thailand directly as well as indirectly through collaboration with Chinese Companies in EEC, utilizing our Gas related and Environmental Friendly technology.

Daigas Group

Contact Us

OSAKA GAS (THAILAND) Co., Ltd.

Phone +66-2-255-7550 Fax +66-2-255-7553

55 Wave Place Building 10F, Unit 10.04, Wireless Road, Lumpini, Pathumwan, Bangkok 10330 Thailand

OGP Energy Solutions Co., Ltd.

Phone +66-2-255-7550 Fax +66-2-255-7553

55 Wave Place Building 10F, Unit 10.04, Wireless Road, Lumpini, Pathumwan, Bangkok 10330 Thailand

NS-OG Energy Solutions (Thailand) Ltd.

Phone +66-2-744-1880 Fax +66-2-744-1330

909 Ample Tower 20F, Debaratna Road, North Bangna, Bangna, Bangkok, 10260 Thailand

Osaka Gas Co., Ltd. Head Office

3-5-11, Doshomachi, Chuo-ku, Osaka, 541-0045, Japan

Phone +81-6-6205-3546 Fax +81-6-6202-2218

OSAKA GAS SINGAPORE Pte. Ltd.

182 Cecil Street #31-02 Frasers Tower, Singapore 069547

Phone +65-6221-2456 Fax +65-6221-2478

Daigas Group

SEMINAR "SMART BOILER, SMART SAVING ENERGY"



MIURA Industries (Thailand) CO.,LTD.

Company Profile



Name
MIURA Co., Ltd.

Location
7 Horie, Matsuyama, Ehime
799-2696, Japan

Founded
December 1, 1927

Established
May 1, 1959

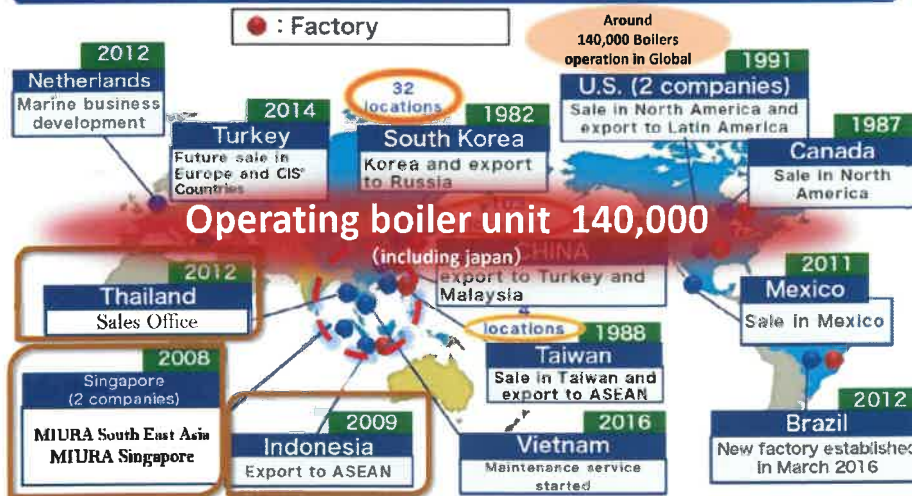
Capital
95,440 million yen (900 million dollars)

Issued stock
125.29 million
The first sections of the Tokyo Stock Exchange
and Osaka Securities Exchange

Employees
5,013
Miura group total
(Overseas 1,393)

Miura Worldwide Expansion

14 companies, 7 factories, Sales and Maintenance in 19 countries



MIURA INDUSTRIES (THAILAND) CO.,LTD. Company Profile



- ◆ **President & CEO**
MURAKAMI Masahiko (Mr.)
- ◆ **Location**
84/2 Moo9, Bangwua, Bangpakong,
Chachoengsao 24130 Thailand
- ◆ **Founded**
August 6, 2014
- ◆ **Capital**
12,000,000 THB (363,637 dollar)
- ◆ **Employees**
45 people (Japanese 5 people)
- ◆ **Business Outline**
Once-through Boiler,
Water Treatment, Exhaust gas Boiler
Food Equipment, Medical Equipment
Chemical, Maintenance

Bangkok Sales office and Rayong Maintenance Service office



Maintenance office

Branch	Rayong Maintenance Service Office
Address	9/19, Room no.A6, 3rd Floor, Moo 4 Mabyangporn, Pluakdaeng, Rayong 21140
TEL	038-650-911 (Rayong branch)
FAX	038-650-912 (Rayong branch)
Open	1 October, 2018

Branch	Bangkok Sales Office
Address	216/52 13th Floor, L.P.N. Tower, Nanglinchee Road, Chongnonsee, Yannawa, Bangkok
TEL	02-285-3423
FAX	02-285-3424
Open	1 October, 2018

Product line-up

Once-Through Boiler

- Steam boiler
- Hot water boiler
- Electric boiler
- Thermal Oil Heater



Specialty Boiler and Marine

- Heat recovery boiler
- Marine boiler



Water Treatment Equipment

- Water softener
- Colormetry
- Chemical and Feeder



Food and Medical Equipment

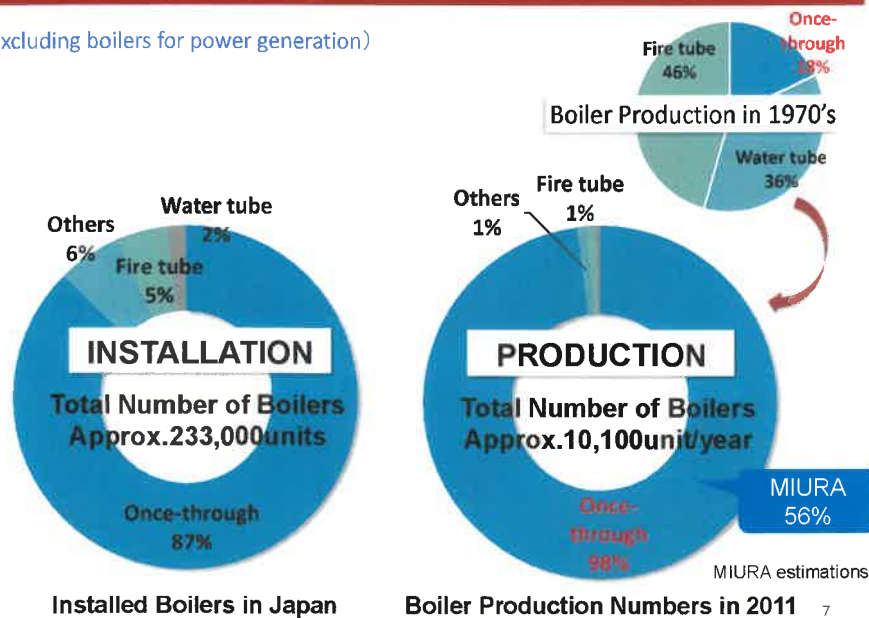
- Vacuum Coolers and Defrosters
- Steam Sterilizers



6

Boiler Market in Japan

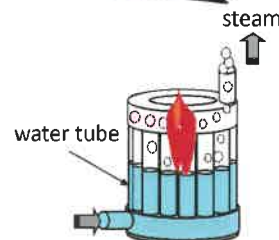
(excluding boilers for power generation)



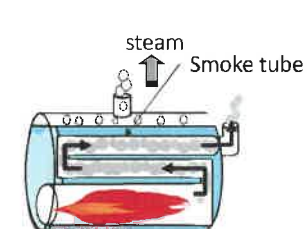
Type of Boilers

Steam Boiler

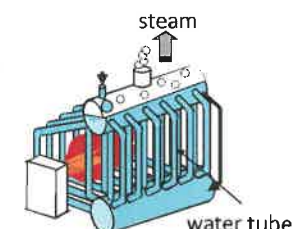
Once-Through Boiler



Fire Tube Boiler



Water Tube Boiler



62^s

Comparison of Once-through Boiler & Fire tube Boiler

	2 ton/h : 2 ton/h	
	Once-through boiler	Fire tube boiler
Water holding capacity (liter)	Low	High
Time required to generate steam (min)	Short	Long
Radiation loss	Low	High
Energy saving / Design efficiency	High	Low

Note: Ratio with the same quantity of evaporation.
All values are actual measurement values based on Miura data.

5

There is almost no accidents of Once-through Boiler

- Every year in Thailand there are the boiler explosion accidents. Enormous damage occurred.

Amount of accident and casualty year 2013~2015

	Fire tube boiler		Once-through boiler	
	Accident	Casualty	Accident	Casualty
Thailand	6	56 (6)	0	0
Japan	2	1 (0)	0	0



Amount of casualty within ()

Boiler explosion accident site occurred in year 2014

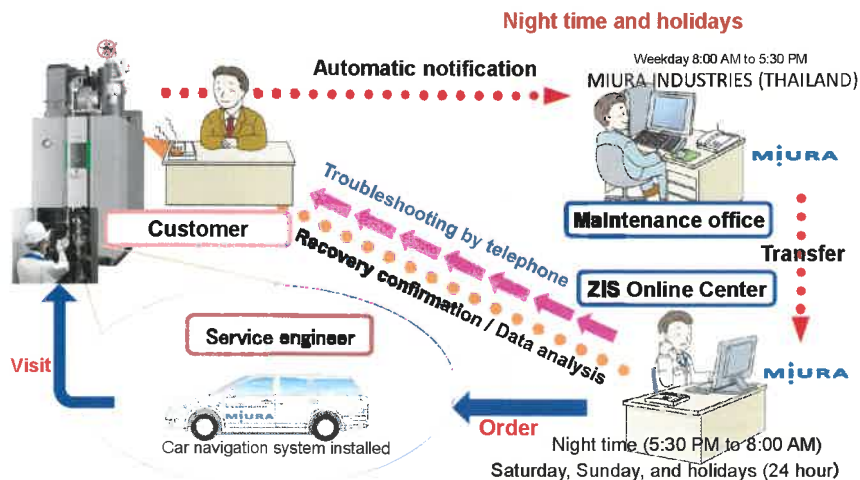
- Fire tube boiler has large contents of pressurized water

	Fire tube boiler	Once-through boiler
Structure		
Water content	Much	Little

20 : 1

Fire tube Boiler explosion power is 20 times bigger!

MIURA Online Maintenance Overview



Energy Saving Analysis service

First step for saving energy is controlling present situation

Earth have big problem 「Global Warming」

Which big cause is CO₂ (Carbon Gas) and greenhouse effect gas.

Due to energy using, although thinking of a view point of energy efficiency using which has emission a huge of CO₂ (Carbon Gas), must try to reduce emission also.



Saving Energy Check Up Menu

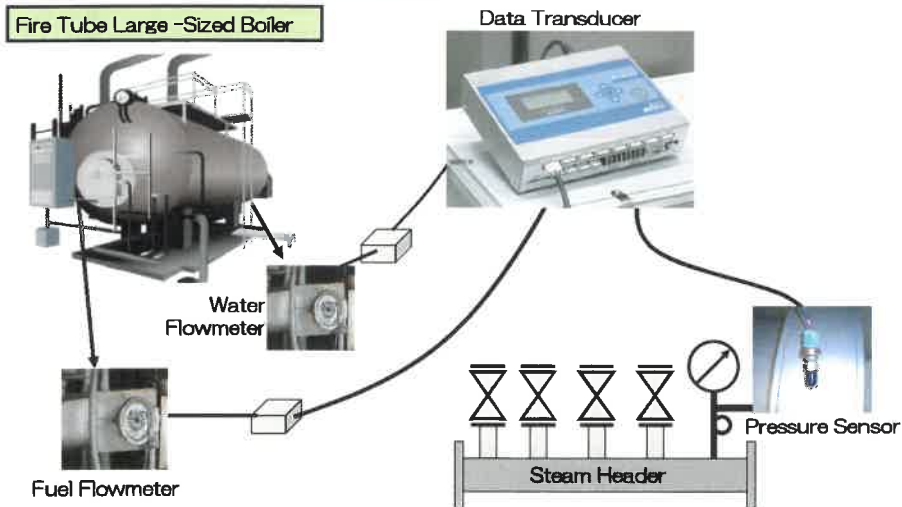
- Operating boiler present situation Daily Analysis
- Measure used steam amount in short time. Load Analysis
- Based on change used steam amount in short time. Simulation
- Go to customer's factory directly, examine saving Energy In factory Factory Check Up

Visible of Energy Checking "DATA LOGGER"

Can measure changing load within 5-30 seconds

Visible energy changing powerful tool

By using MIURA's measurement tool for 30 years.
The result of analysis **more than 50,000 units!**
MIURA technical service **contribute customer's energy saving.**

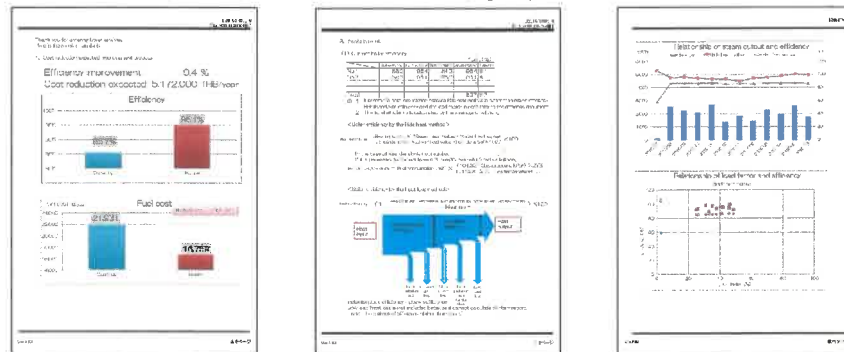


What is Daily Analysis

◆ Daily Analysis is "macro [visible change]"

Use electronic sensor to analyze boiler's daily data such as feed water, fuel consumption, flow rate etc.

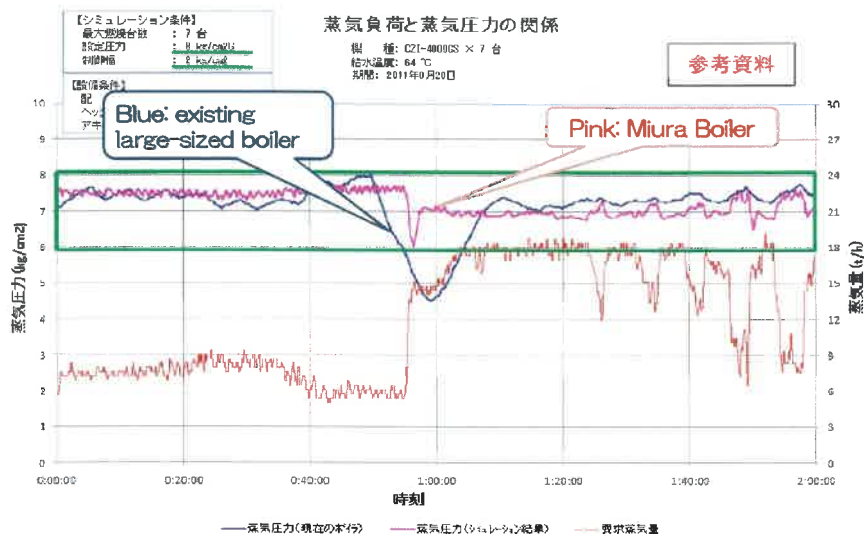
This data is analyzed by Miura technical team, using original [daily analysis software] and analyze.



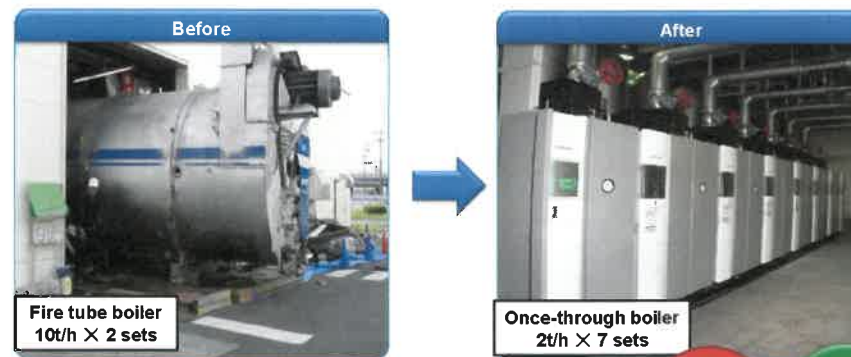
Daily Analysis of MIURA "This is amazing!"

- unidentified point of daily management is thoroughgoing survey, solution.
 - Miura measure at site for calculating necessary exhaust gas temperature, air comparison.
 - Efficiency is in-output heat, heat emission calculation.
- Data is valid and verifiable.
- Reducing cost is not only fuel cost but also human resource expense. Approach for many expense.

Boiler load simulation



Example of MI System 1 (Case in Thailand)



	Large boiler	Once-through	Advantage
Efficiency (%)	76.0	95.6	19.6 % Up
Fuel consumption (1,000THB/year)	72,044	57,274	14,770,000THB Reduce cost*
CO ₂ volume (ton-CO ₂ /year)	15,993	12,714	3,279 ton Reduce volume

Low NOx
25ppm
(Convert O₂=0%)
Natural Gas Fuel

Install space
45%
Less space

★customer's boiler conditions

- Operation time: 24h/day, 300day/year
- Average using steam volume 10.2t/h
- Fuel Natural Gas (10THB/Nm³)

Reference material
Summary of analysis for five companies (MIURA Investigation)

	Company A	Company B	Company C	Company D	Company E	
Industry	Food	Textile	Machinery	Food	Hospital	
Status of existing boilers						
Overview	Boiler type	Firetube	Firetube	Firetube	Firetube	Firetube
	Steam output (kg/h)	#1 4700 #2 5600	#1 5,600 #2 5,800	#1 10,600 #2 3,400	#1 7800 #2 6200	4700
	Unit	One each	One each	One each	One each	One
Fuel	Fuel type	Heavy Oil	Natural Gas	LPG	Natural Gas	DIESEL
	Fuel consumption (year)	3,336,059 L	1,638,197 m3N	1,270,133 kg	3,842,525 m3N	683,637 L
Efficiency	Operation efficiency	85.0	85.8	85.1	89.9	87.6
Status of after boiler replacement						
Overview	Boiler type	One through	One through	One through	One through	One through
	Steam output (kg/h)	1800	2000	2000	2000	2000
	Unit	9	4	6	6	2
Fuel	Fuel type	Heavy Oil	NG	LPG	LNG	LPG
	Fuel consumption (year)	3,082,228 L	1,459,987m3N	1,134,785 kg	3,734,519Nm3	549,193 kg
Efficiency	Operation efficiency	92.0	95.9	95.3	95.0	95.9
CO2 Reduction amount(tCO2)		781	549	421	263	489
Payback period(years)※		4.8	5.0	7.4	6.7	1.09

* These figures are calculated by the reference price.



**The Best Partner of
 Energy, Water and Environment**

MIURA

<http://www.miuraz.co.jp/en/>

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**Activity of IHI Group
 in Thailand & China**



2 APR 2019

**IHI ASIA PACIFIC (Thailand)
 Sales & Marketing Dept.**

ITEM

- 1. About IHI Group**
- 2. Activity in Thailand**
- 3. Activity in China**
- 4. Business View with Chinese Partner**

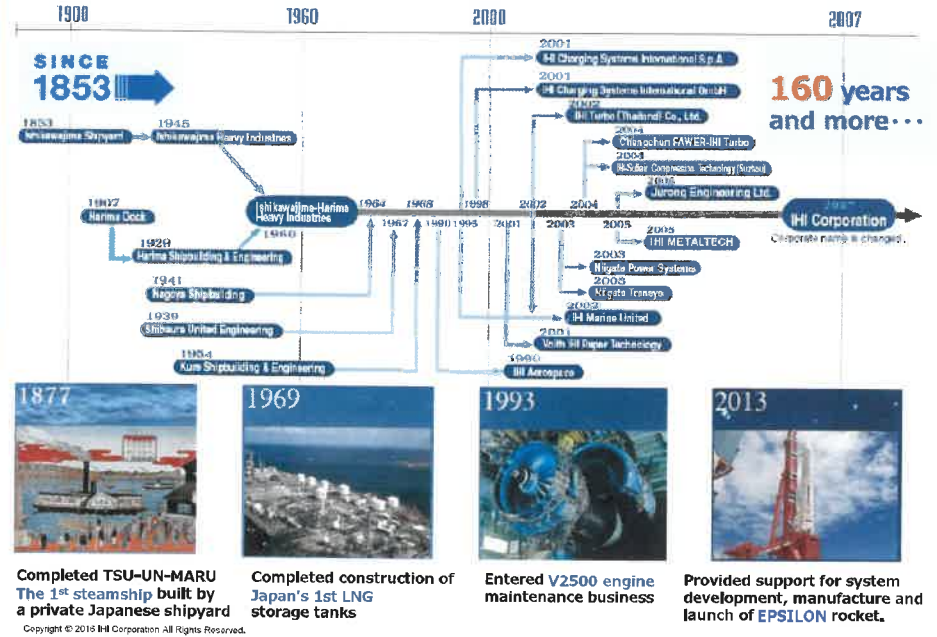


1. About IHI Group



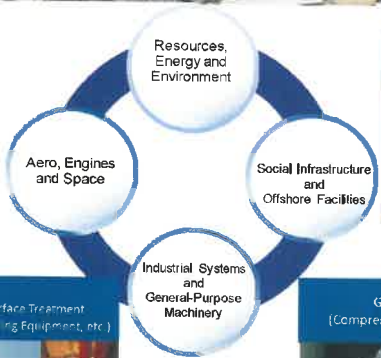
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About IHI - IHI Group History -



Completed TSU-UN-MARU The 1st steamship built by a private Japanese shipyard
 Completed construction of Japan's 1st LNG storage tanks
 Entered V2500 engine maintenance business
 Provided support for system development, manufacture and launch of EPSILON rocket.

About IHI - Business Areas and Products -



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5

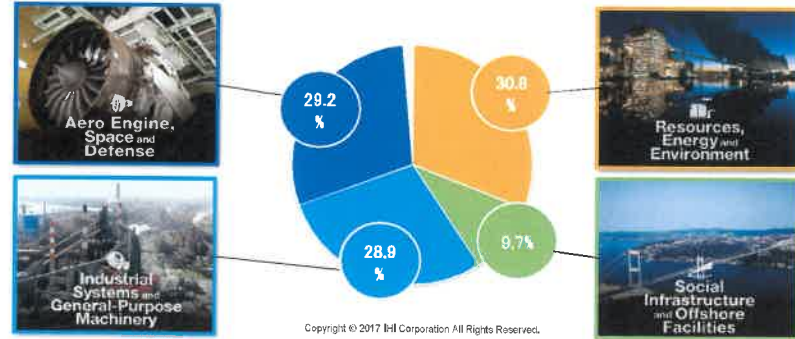
About IHI - Segment and Group Sales -



Net Sales (million yen)



Net Sales Ratio (FY 2017 consolidated)

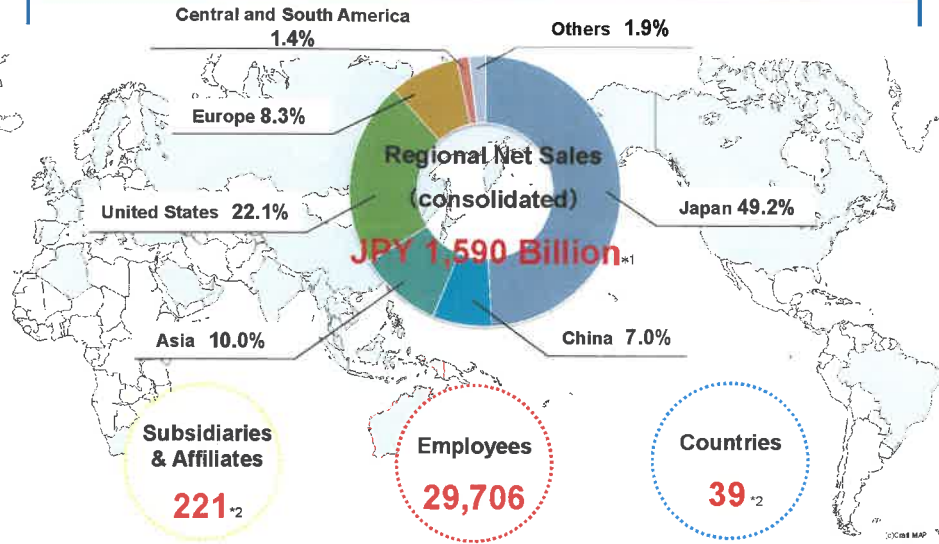


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About IHI - Regional Sales -

IHI



*1: FY 2017

*2: ■ Headquarters, Branches, Overseas Offices, Subsidiaries & Affiliates

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Reference Number: IXC 7

2. Activity in Thailand

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About IHI - IHI Group Network in Thailand -

IHI

IHI Bangkok Rep. Office / IHI Asia Pacific (Thailand) Co., Ltd

Establish: 1971 / 2014

Employee: 59

Business:

- Area Management, Area Liaison of THAILAND
- Sales Activity of all IHI group Products
- Purchasing activity on behalf of IHI group



IHI Power System (Thailand) Co., Ltd.

Establish: 2012

Employee: 20

Business:

- Sales & Maintenance of Gas Turbine Power Plant



TJEL THAI JURONG ENGINEERING LIMITED

Establish: 1988

Employee: 324

Business:

- EPC services in Power Generation Sector
- Erections for Industrial Plant, Infrastructure



IHI TURBO (THAILAND) CO., LTD.

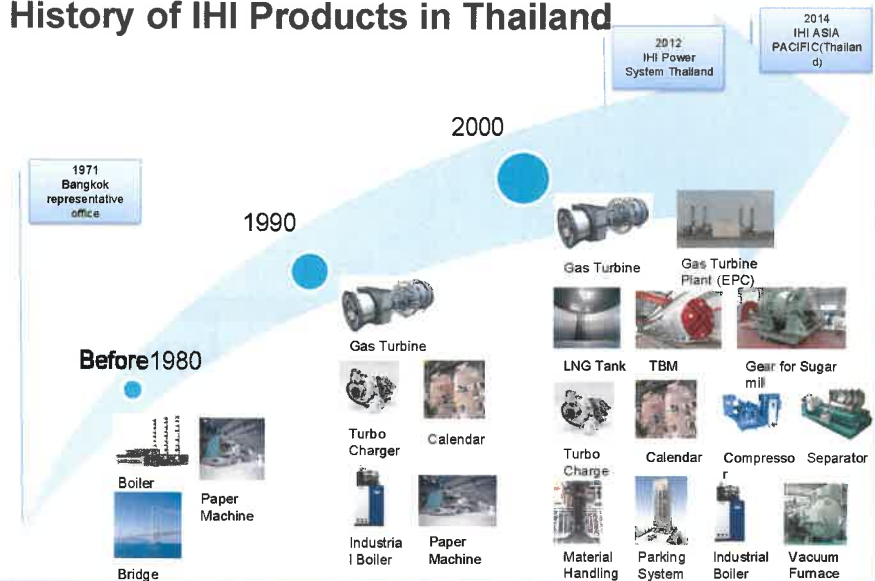
Establish: 2002 Employee: 699

Business:

- Manufacturing and Sales of Turbochargers



History of IHI Products in Thailand



IHI

Reference Number: 67

Delivery Record

-Gas Turbine·LNG Tank-

Rojana Power

Product : LM6000PC x 5 / LM6000PD x 3
Output : 286MW / 180MW



Ratchaburi World Cogen

Product : LM6000PD x 4 units
Component : Combined Cycle Co-Generation
Output : 210MW



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B. Grimm BIP Power Ltd /Bangkadi Clean Energy
Product : LM6000PD x 4

Suvarnabhumi Airport (DCAP)

Product : LM6000PD x 2
Component : Combined Cycle Co-Generation
Output : 80MW

Sahacogen

Product : LM6000PC x 3 units
Component : Combined Cycle Co-Generation
Output : 168MW



LNG Tank

Product : LNG Tank
160,000m³ x 2 units

● Completed Project ● Ongoing Project

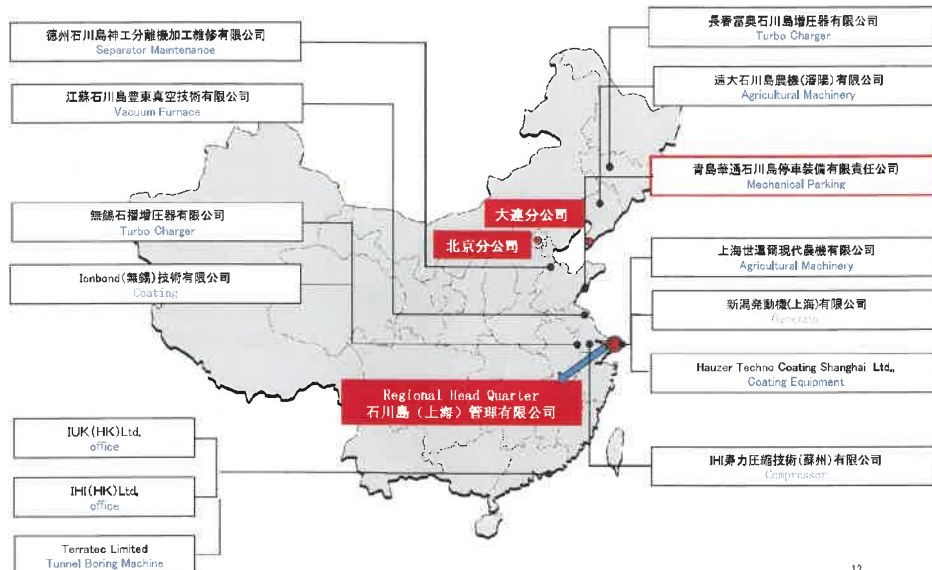
Reference Number: X001

3. Activity in China

IHI

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IHI Group Network (China)



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Flagship product in China

-Turbo Charger and Compressor-



-Agricultural Machinery-



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Flagship product in China

-Industrial Machinery-



Automated Warehouse



Feeder for press machine



Stepping cylinder



Vacuum furnace

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Flagship product in China

-Energy and resources-



LNG Terminal in Shanghai



LNG Terminal in Hainandao

-Social Infrastructure-



Tunnel Boring Machine



Mechanical Parking

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4. Business View with Chinese partner

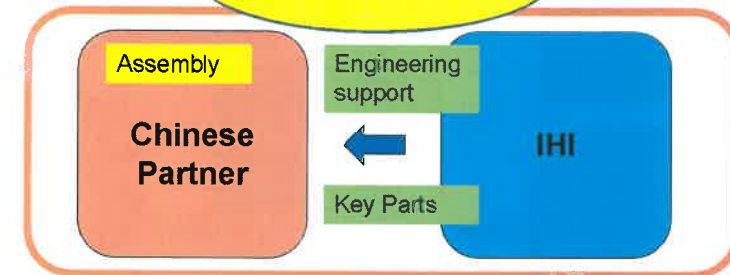
IHI

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Case1: Machinery

Equipment Sales

JV or Partnership



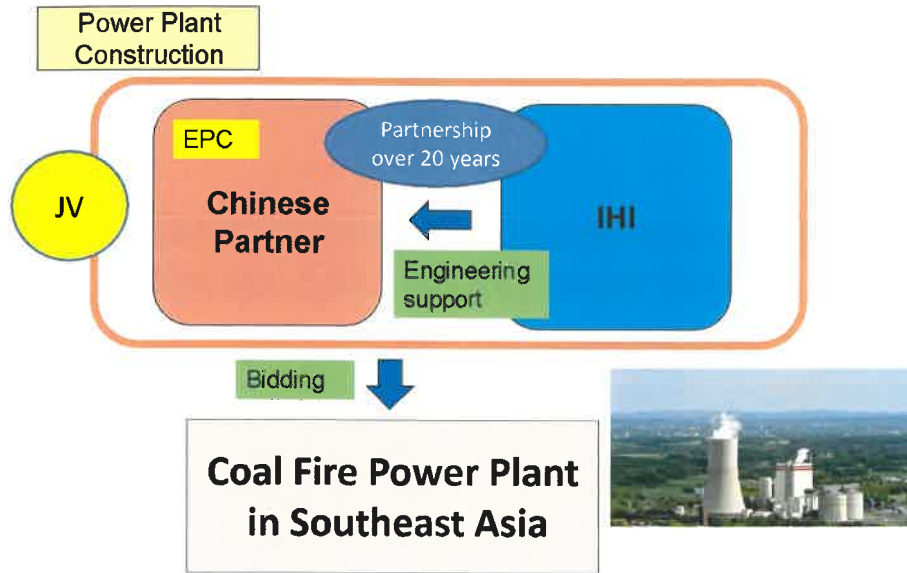
Export



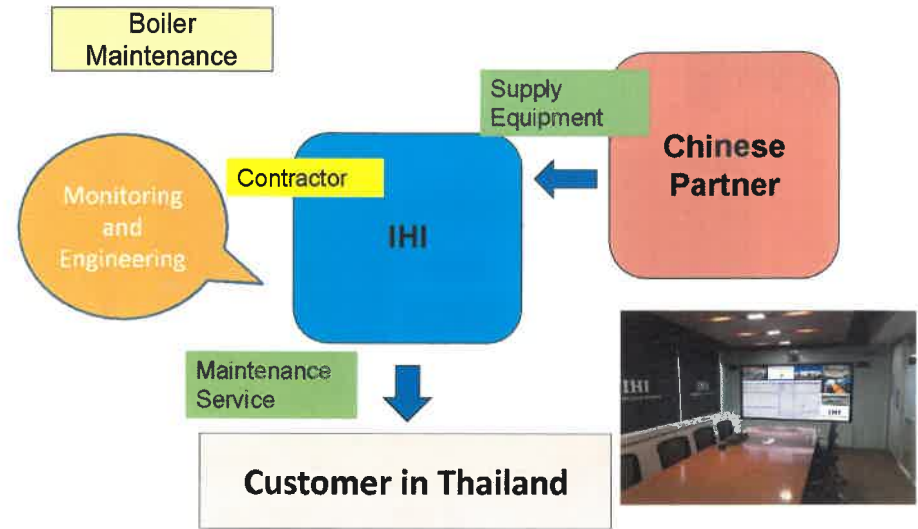
Overseas Market



Case2: Power Plant Project



Case3: Boiler Maintenance



IHI
Realize your dreams

IHI

— Smart City —

Study on New Energy Management Services for Industrial Park

April 2019

TEPCO Energy Partner, Inc.

I Introduction of TEPCO and our Energy-Saving Solutions

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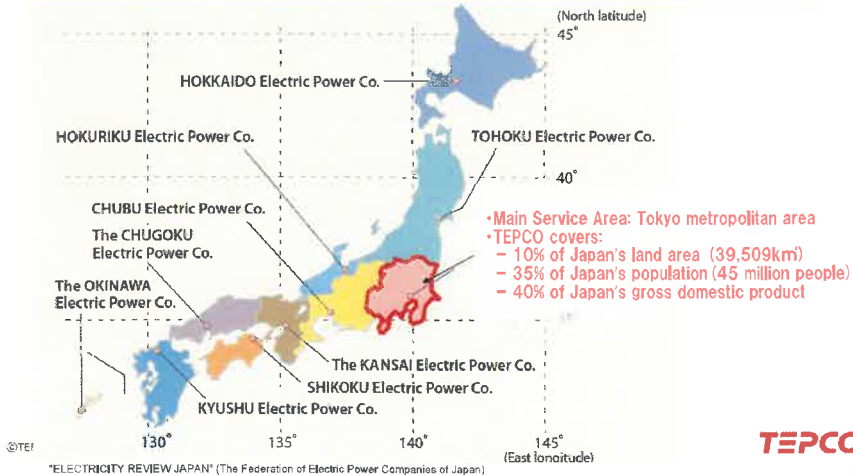


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1 . Electric Power System in Japan and TEPCO

In Japan, 10 regional privately owned and managed General Electricity Utilities have the responsibility of supplying electricity to each region.



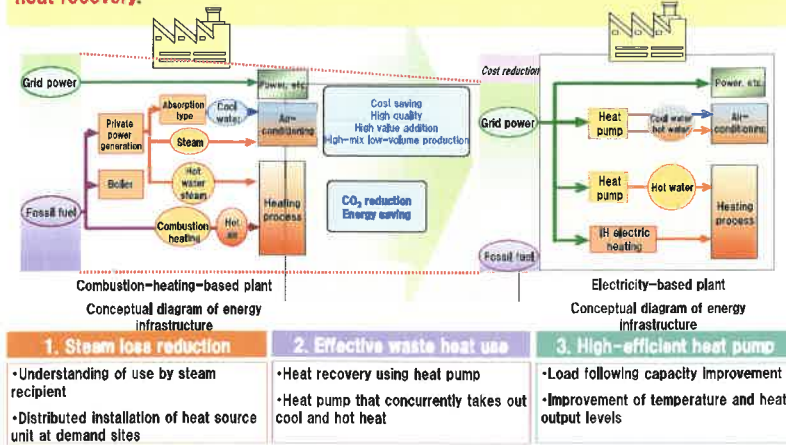
2 . Retailer under TEPCO Holdings



3. Features of TEPCO's Energy-Saving Solutions Plant that Uses Waste Heat

5/12

Key phrases of energy saving and CO₂ saving are **steam reduction, heat pump and heat recovery.**



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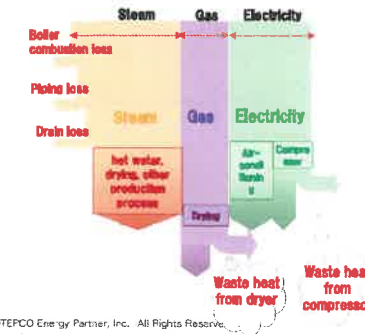
TEPCO

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4. Effective Use of Waste Heat: Effective Use of Heat Pump System

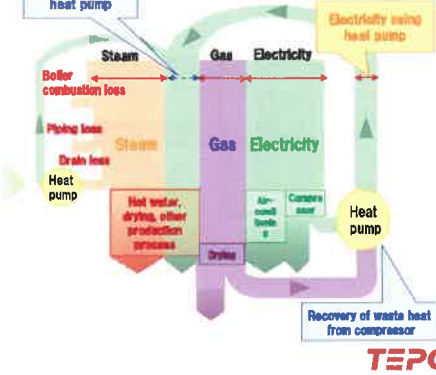
6/12

Steam-based system plant
Infrastructure of conventional (steam-based) plant
[Steam-concentrated heat source]



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Plant that uses waste heat with heat pump system
New plant infrastructure
[Distributed installation of high-efficiency units]



TEPCO

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5. TEPCO EP's Strategies

7/12



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TEPCO

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II Study

on New Energy Management Services for Industrial Parks

8/12

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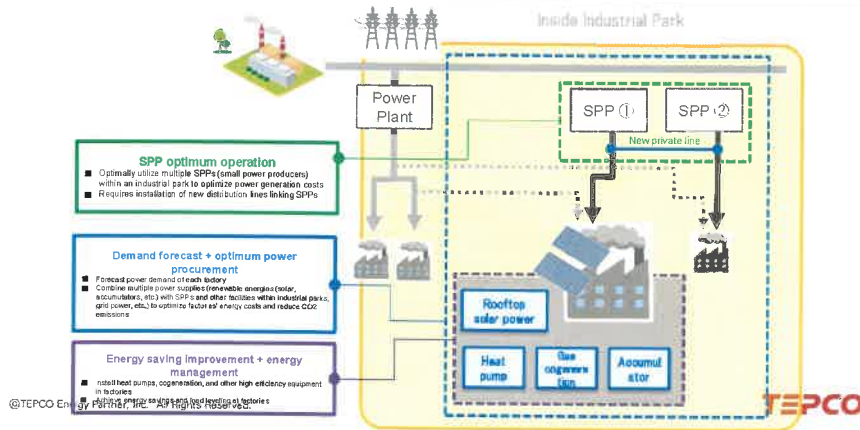
TEPCO

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6. From energy savings measured in factory units to "area" units 9/12 Establishing new energy management services for industrial parks

The aim is to move away from the conventional provision of energy services measured in factory units and to establish an energy management business model in "area" units, comprising multiple factories.

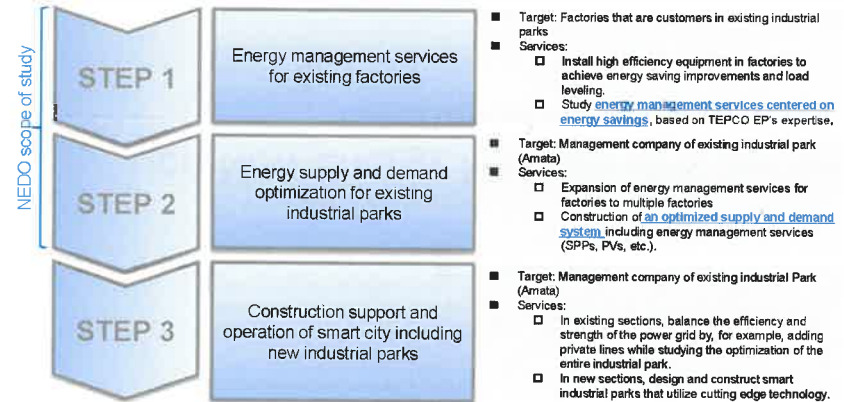
In cooperation with AMATA group, we are studying energy optimization in terms of both supply and demand, viewing AMATA's industrial parks as mini grids through the utilization of IoT and other leading technologies.



7. Study steps 10/12

In establishing a new energy management service model, the steps below will be followed and the scope gradually expanded.

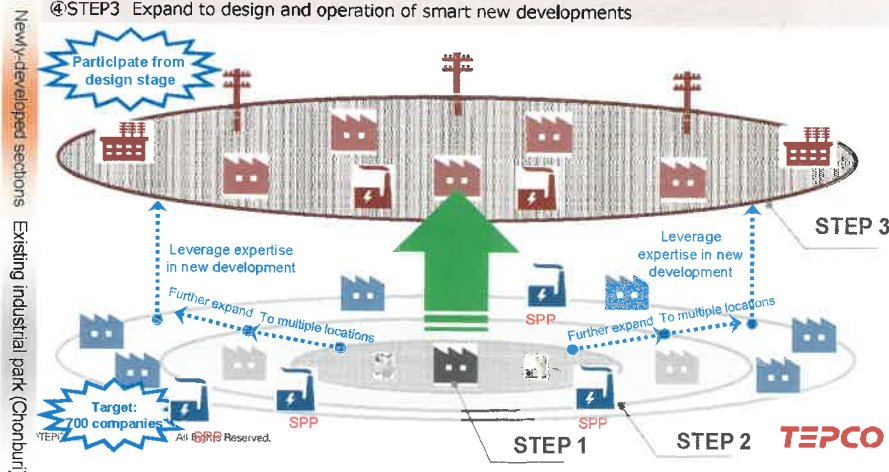
Ultimately, the aim is for a collaborative smart city project with Amata.



Mobilize TEPCO's expertise in achieving micro grids for industrial parks, for both supply and demand TEPCO

8. Study steps - visual 11/12

- STEP1 Start with energy saving improvements and load leveling in individual factories
- STEP2 Validate optimization impact by linking demand side and supply side, including group control of multiple factories, SPPs, PVs
- STEP3 Expand optimization scope to entire existing industrial park
- STEP3 Expand to design and operation of smart new developments



9. Correlation of benefits to stakeholders from introducing new energy management services for industrial parks 12/12

	STEP 1 Energy Management Services	STEP 2 Energy Supply and Demand Optimization Services	STEP 3 Smart City Construction Support and Operation
Industrial park operator (Amata)	<ul style="list-style-type: none"> Improve evaluation of industrial park 	<ul style="list-style-type: none"> Improve environmental evaluation by energy cost reduction and CO2 reduction across entire industrial park Further improve evaluation of industrial park 	<ul style="list-style-type: none"> Improve efficiency and strength of power system of entire industrial park A good example of a smart-converted micro grid in an industrial park is when the evaluation of the industrial park improves, and the evaluation of the operator also improves
Supply side (SPP)		<ul style="list-style-type: none"> Reduce fuel cost for optimal operation of SPPs 	<ul style="list-style-type: none"> SPP optimal facility formation Reduce fuel costs for optimal operation of SPPs
Service provider (TEPCO Energy Partner, Inc.)	<ul style="list-style-type: none"> Develop effective proposals that grasp any latent needs for equipment replacement by utilizing customer facility operation condition and specification data Monitor to enable ongoing relationship maintenance and energy saving proposals 	<ul style="list-style-type: none"> Optimize the resources of the demand side (factory) and the supply side (e.g. SPP) enabling the creation of new value such as energy cost reduction and low CO2, etc. Strengthen relationships between operator and factories through the value gained 	<ul style="list-style-type: none"> Provide new energy management services in "area" units by expanding the scope to the entire industrial park
Demand side (factory)	<ul style="list-style-type: none"> Reduce energy costs by improving energy saving Monitor to enjoy the benefits of continuous operation monitoring and energy saving proposals 	<ul style="list-style-type: none"> Enjoy the benefits of energy cost reductions and CO2 emissions cuts in factory units by reaping the benefits of supply and demand optimization throughout the entire industrial park 	<ul style="list-style-type: none"> Enjoy the benefits of further energy cost reductions and power quality improvement by improving the efficiency and strength of the power system

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Introduction of MinebeaMitsumi Smart City Solutions

2019-4-2
MinebeaMitsumi Inc

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- Introduction of Smart City Solutions
- Expandability for Future
- Business Model

MinebeaMitsumi Confidential

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MinebeaMitsumi Inc.

Corporate name	MinebeaMitsumi Inc.
Established	July 16, 1951
Capital	68,258 million yen (As of March 31, 2018)
Representative	Yoshihisa Kainuma, Representative Director, CEO & COO
Outline of Business	Machinery components business, Electronic devices and components business
Consolidated Net sales	879,139 million yen Sales Estimation 940,000 million yen (April 1, 2017–March 31, 2018) (April 1, 2018–March 31, 2019)
Consolidated Number of Employees	89,135 (As of August 31, 2018)
Number of consolidated subsidiaries and affiliates	95 (As of August 31, 2018)

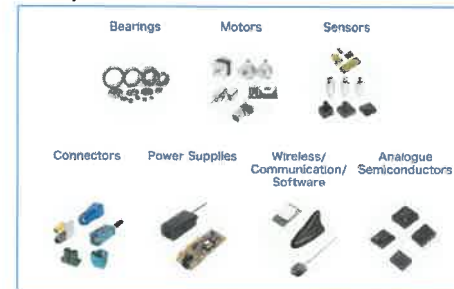
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3

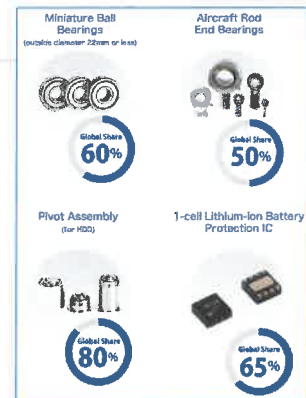
Products

Core business of MinebeaMitsumi

Our products



Global share No.1



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4

Solutions for new market

Smart City Solution is IoT* Technology for Infrastructure

*IoT: Internet of Things



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5

21st Century Products "Product 21"

Smart City solutions integrate various new products



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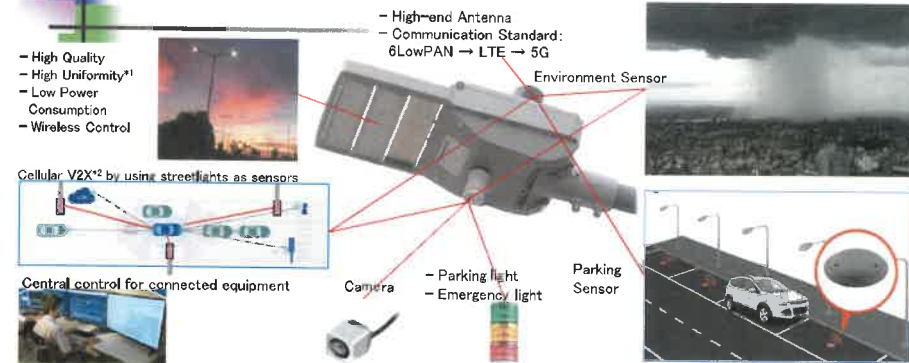
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Wireless LED Streetlights

play a significant role in smart city!



*1 Uniformity: Ratio of bright evenness. The closer the ratio to 1, the more even the brightness.
*2 Cellular V2X: Communication technology which uses mobile communication network(LTE, 5G, etc.) to make Vehicles communicate with pedestrians, infrastructure, etc..

8

Start from Wireless LED Streetlight

- Our wireless LED streetlights enables the reduction of energy cost.
- Expandability by deploying network platform to control various sensors and devices connected by wireless communication.
- Our business model makes it possible without extra budget.



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9

Proving Test and Practical Operation

<Hamamatsu Factory>

- **Narrow Band** (Radio Frequency)
 - Wireless LED Streetlight (with environment sensor)
 - Parking Sensor
 - Smart Meter
- **Broad Band** (Radio Frequency)
 - Optical Fiber + Wi-Fi
 - Security Camera
- **Control Center**

<Cambodia>

- **Practical operation about 5,000 wireless streetlights**
 - Phnom Penh
 - Siem Reap
- **Proving test of same environment with Hamamatsu factory.**
 - Inside Diamond Island in Phnom Penh city

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Example of installation in Cambodia

We had started supplying services for around 5,000 streetlights installed.

Streetlights in residential area



Streetlights and camera in parking lot with parking sensors



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11

High quality wireless LED streetlight

design lifetime: 10 years

- Less LED discoloration
- Strong lens of polycarbonate

- Passed 500h salt spray test
- Special paint application for anti-electric corrosion



Passed vibration test which is recommended by MLIT*1

*1: Ministry of Land, Infrastructure, Transport and Tourism

IP66 for each module and case

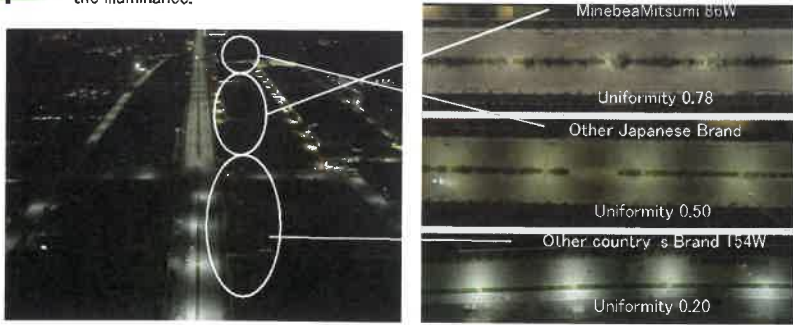
- Protect from 94% of induced lightning by the countermeasure against 15kV lightning-induced surge.
- Power supply survives 360V for 1 hour.

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12

High Uniformity* (On-site comparison) bright and safe with low electricity power

*Uniformity: Ratio of light evenness. The closer the ratio to 1, the more even the illuminance.



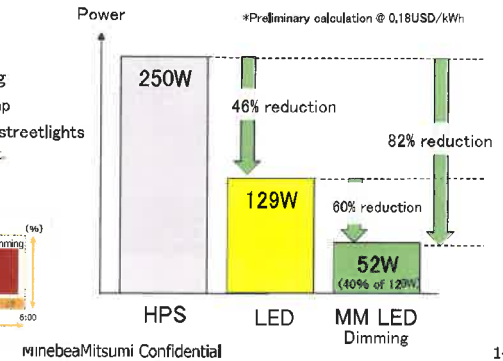
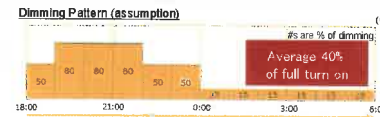
*Total uniformity is calculated by ourselves with measured values of illuminance on road surface.

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13

High efficiency & wireless dimming for energy saving 82% reduction from the HPS light

- High efficiency (140lm/W @ 5,000k)
- Wide range of dimming (15-100%)
- Energy saving with appropriate dimming about 82% reduction from HPS(Natrium) lamp replace of HPS lamps to our wireless LED streetlights would lead to the reduction of electric cost.



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MinebeaMitsumi Smart City Platform

We use both broad band communication and narrow band communication in our solutions.

6 LowPAN mesh networking method is used as narrow band communication for devices and nodes.



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Central control of devices (lowers management cost)

Dashboard

- Device and network conditions can be monitored in real time
- Each icon shows the devices
- Red ones need attention by the operators



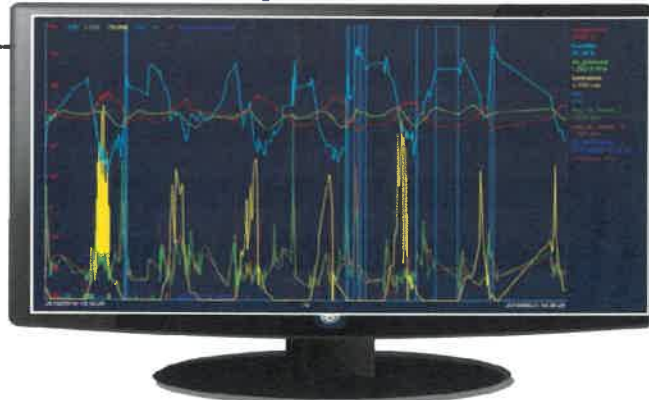
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Sensor data real time monitoring of various data

Environmental sensor on streetlights

- Temperature (red)
- Humidity (aqua)
- Pressure (green)
- Wind (dark green)
- Illuminance (yellow)
- Rain (blue)



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Parking management Parking sensor + camera

- Parking sensor detects where cars are parked
- We can check usage status after clicking the parking icon.
- Camera shows the visual status
- Can be used for the marketing



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Traffic management Integration of map and video

- Clicking the icon on the map turns of the video
 - jam
 - accident
 - Wrong-way driving
- Video recognition option will help to detect such events



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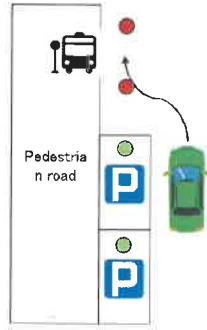
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- Business Model

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Collaboration of parking sensor and disaster/crime-preventing signal
Find parking space and illegal parking

- Parking sensor has 2 roles to make sure that
 - whether car is in a parking lot.
 - whether car is in no-parking zone.
- We can notify the parking status of the illegal parking through connecting our parking sensors by disaster-preventing signals from our streetlight.



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Application during peacetime
Find parking space on the road at a glance

- It's very hard to find the parking space in the crowded area near shops and restaurants.
- Drivers can find the parking space soon by the green light which receives the signal from the parking sensor.



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In case of emergency

Adding the function of disaster-preventing/crime-preventing signal to the light

Avoid fleeing to the dead end

Show the direction to the broader road



参照: Google Map

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- Expandability for Future
- Business Model

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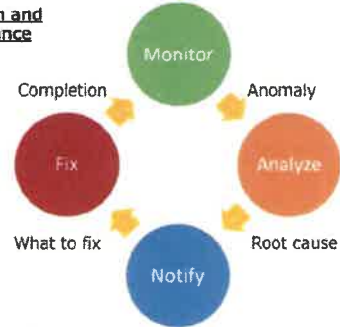
O&M Service by network

- MinebeaMitsumi offers the paid-service of operation and maintenance for all streetlights
 - Center control for monitoring process by MinebeaMitsumi cloud platform
 - Analysis of the network and hardware failure
 - Remote software update
 - Etc.
- Early anomaly detection and fix with less number of human resource

Network / device management consoles



Operation and maintenance service



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Smart Street Light in Thailand 2019.

- MinebeaMitsumi Inc will start to provide Smart Street Light Sample from Apr/2019 with wireless network.
- Cambodia and Japan have been started already for our Smart street light with wireless system, So we will provide step by step for each country with energy saving . It will be very soon in China too.

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Thank you

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