添付資料

現地ワークショップ資料

1. 堺市発表資料（英）
2. 日本工営発表資料（英）
3. 遠藤照明ベトナム発表資料（英）
4. カナデビア発表資料（英）
5. 東邦レオ発表資料（英）

現地ワークショップ資料

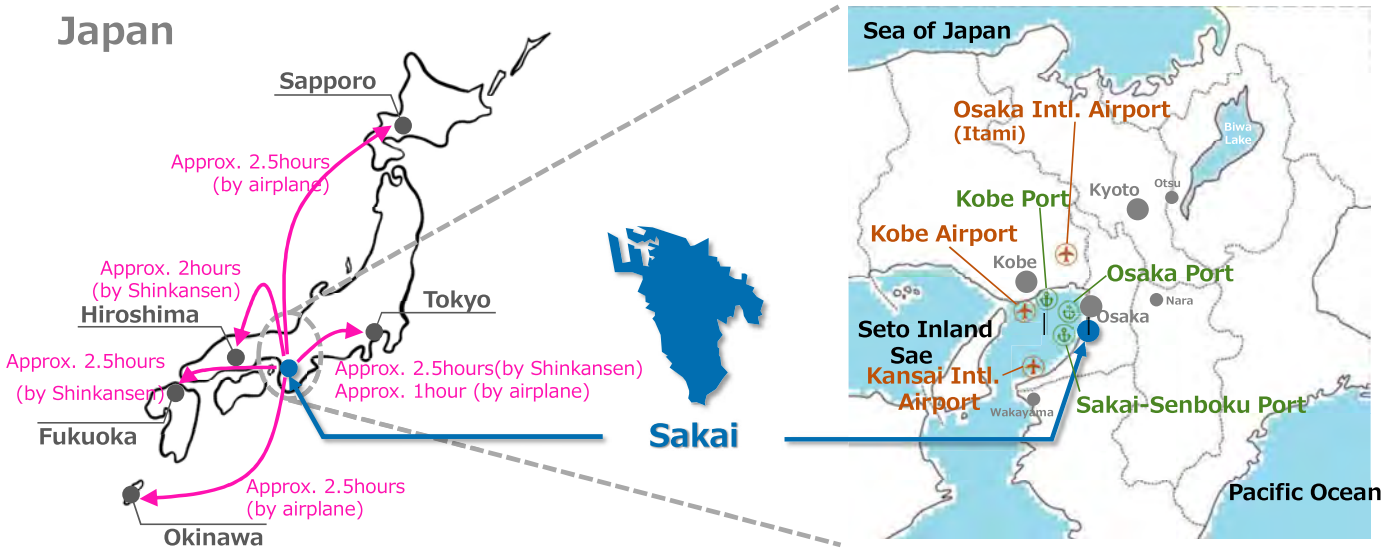
1. 堺市発表資料

1. Introduction of Sakai City

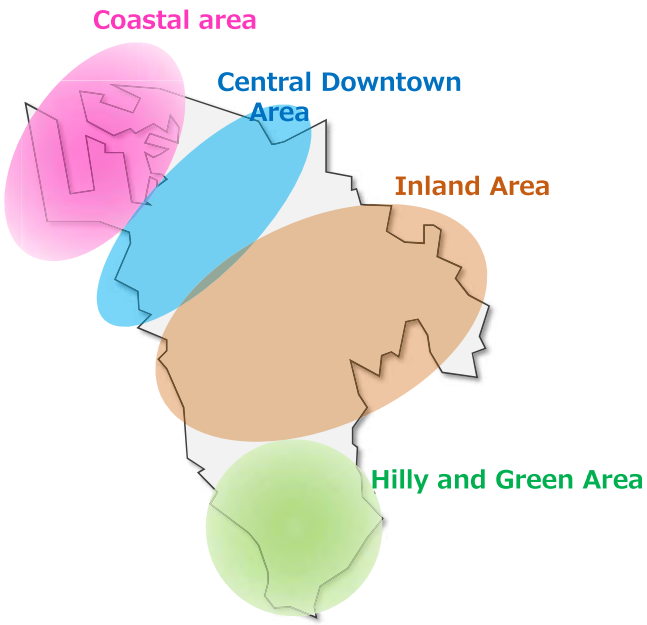
Location

○ Sakai City is the second largest city in Osaka by population and area. It is adjacent to Osaka City and is also close to major cities such as Kyoto and Kobe.

○ With well-developed network of arterial roads and its proximity to international airports and ports, it is easy to reach major cities across Japan including Tokyo, Sapporo and Fukuoka as well as overseas.



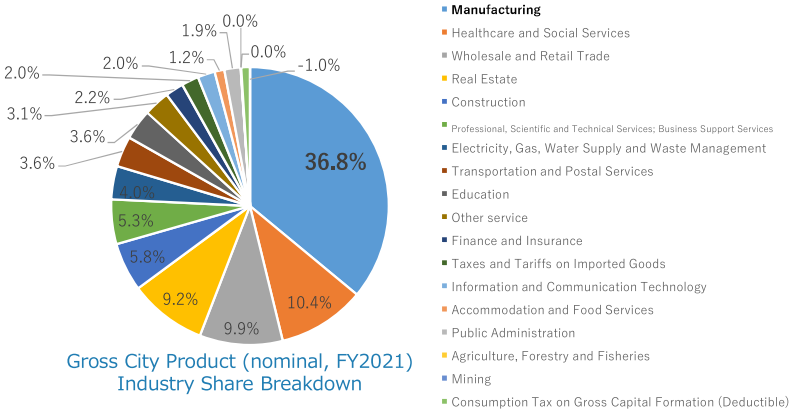
Overview of Society and Economy



■Population： 803,638 (as of October 1, 2025)

■Area：149.83 km^2 (as of March 1, 2025)

■Gross City Product：JPY 3,646.4 billion（nominal, FY2021）
JPY 3,545.9 billion（real, FY2021）



Gross City Product (nominal, FY2021)
Industry Share Breakdown

■Value of Manufactured Goods Shipped：JPY 4,497.7 billion
(as of June 1, 2023)

※Ranked 4th among all municipalities
※The highest among Japan's 20 government-designated major cities per capita manufacturing shipment value

One of Japan's Leading Industrial Cities

○ Sakai City is one of Japan's leading industrial cities and is home to numerous companies with advanced environmental and decarbonization technologies.

○ The Coastal area hosts multiple oil refineries, thermal power plants, gas production plants, and hydrogen production plants, serving as a center for energy production.

Coastal Area in Sakai City

2. Climate Change Mitigation Strategies in Sakai City

Climate Change Plans

○ We have formulated “Sakai City’s Global Warming Action Plan” to comprehensively and systematically implement climate change action.

○ This plan mainly includes the followings:

【FY2030 Goals】

GHG emission reductions within the Sakai City area	:	50% or more compared to FY2013
GHG emission reductions from Sakai City Government operations	:	**50% or more compared to FY2013**
Installed capacity of solar power systems	:	240 MW or more

【Direction of Initiatives toward Achieving Goals】

With climate change mitigation and adaptation positioned as the two wheels of climate action, stakeholders will implement a wide range of initiatives toward decarbonization.

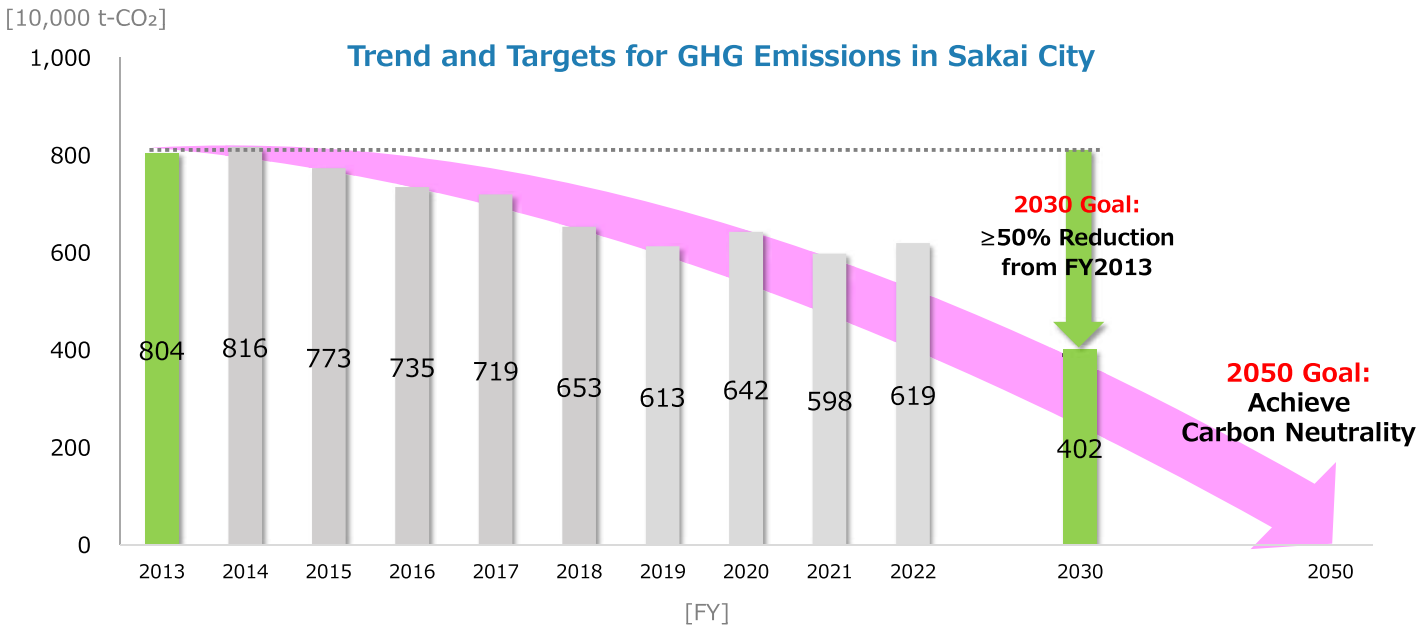
【Mitigation Initiatives for Climate Change】

（1）Reducing GHG emissions from Sakai City Government operations such as :
- ・Promoting comprehensive energy efficiency
- ・Maximizing the introduction of renewable energy
- ・**Sakai Local Energy Production and Consumption Project（Decarbonization Leading Areas）**

（2）Reducing GHG emissions from citizens and businesses such as :
- ・Promoting changes in values and behaviors
- ・**Sakai Local Energy Production and Consumption Project（Decarbonization Leading Areas）**
- ・Promoting decarbonized business management etc.

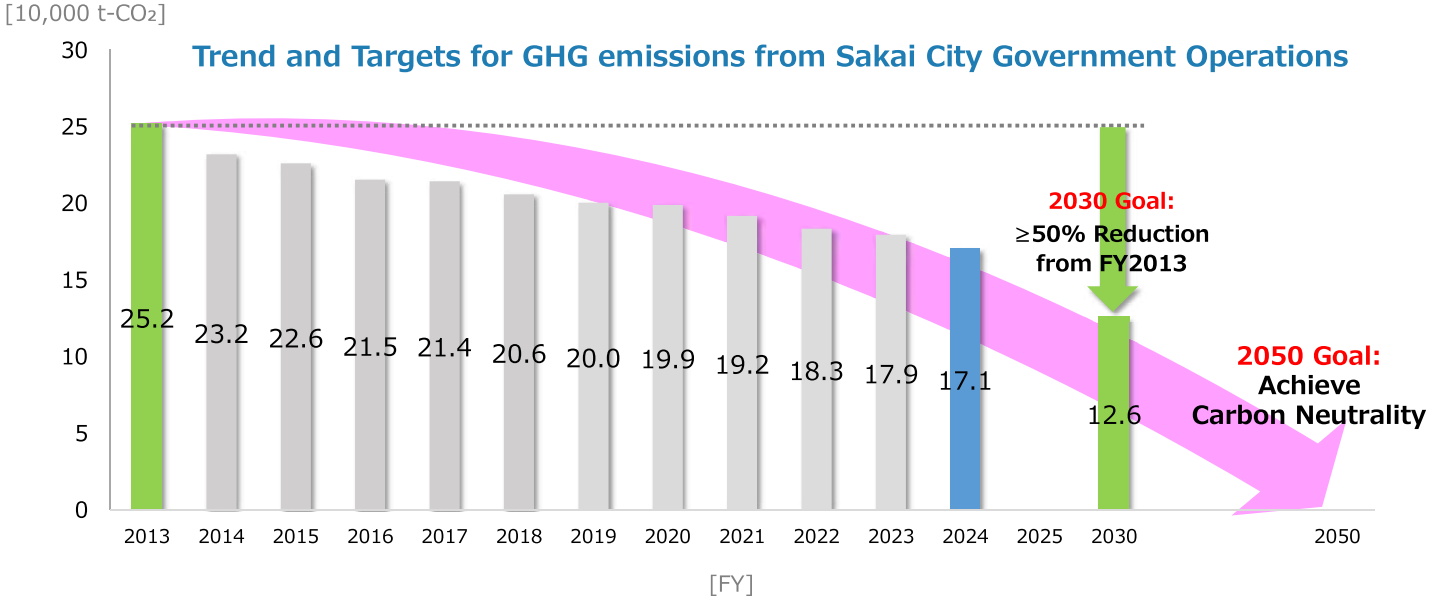
GHG Emission Reductions within the Sakai City Area

○ GHG emission reductions within the Sakai City area are decreasing.



GHG Emission Reductions from Sakai City Government Operations

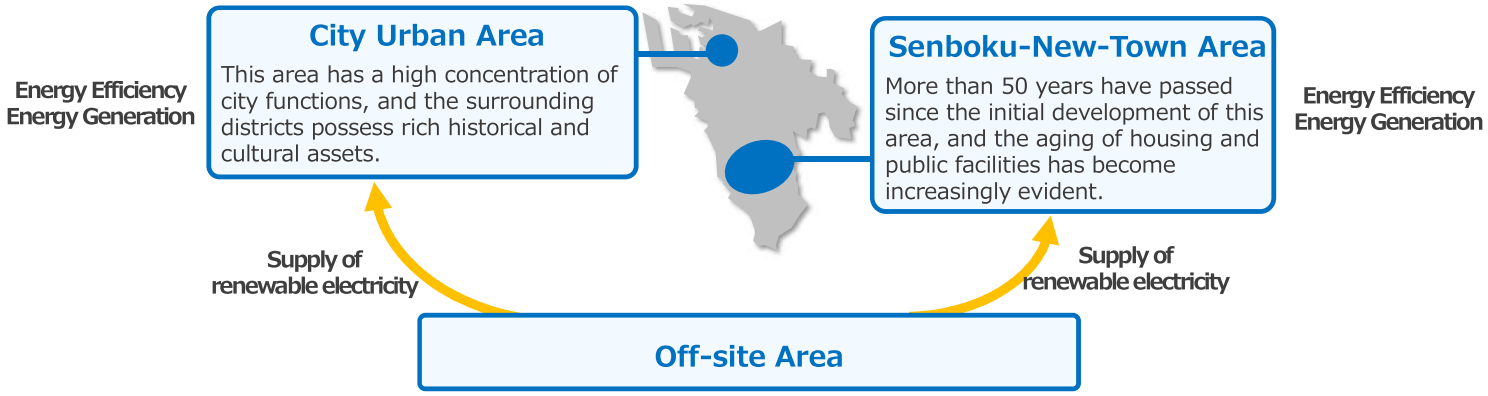
○ GHG emissions from Sakai City Government Operations are decreasing.
Sakai City Government is the 4th largest GHG emitter among entities within Sakai City.



3. Examples of Climate Change Mitigation Initiatives by Sakai City Government

Overview of "Sakai Local Energy Production and Consumption Project"

- ○ We proposed "Sakai Local Energy Production and Consumption Project (the Project)" to the Ministry of the Environment of Japan and were selected as a Leading Decarbonization Area.
- ○ We are promoting energy efficiency and energy generation in public facilities and housing within City Urban Area and Senboku-New-Town. In addition, renewable electricity generated in Off-site Area will be supplied to both City Urban Area and Senboku-New-Town Area.
- ○ The project aims to achieve net-zero CO_2 emissions from electricity consumption in the household and commercial sectors within the target areas by FY2030.



Project Initiatives in City Urban Area

■ Target Facilities（All Public Facilities）

Sakai Traditional Crafts Museum
A facility introduces, exhibits, and sells traditional crafts in Sakai.

Sakai Plaza of Rikyu and Akiko
A cultural tourism facility themed around Sen no Rikyu and Yosano Akiko, who have ties to Sakai.

Fenice Sacay
A hub for the creation, exchange, and promotion of arts and culture

Ichi Elementary School

Tonobaba Junior High School

Yuya Elementary School

Sakai City Hall Main Building Complex

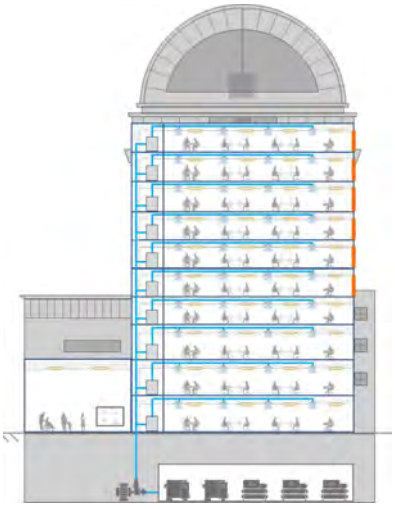
Multi-story Parking Facility for Official Vehicles

Project Initiatives in City Urban Area

■ ZEB Renovation of the Hall Main Building Complex

【Project Overview】
・We aim to obtain ZEB Oriented certification by upgrading aging equipment and introducing advanced energy management systems.
・This project is planned to be implemented through an ESCO project (Guaranteed Savings model).

Building Composition	Main Building	High-Rise Building	Health Center & Parking Facility
Fiscal Year of Completion	FY2003	FY1990	FY2021
Total Floor Area	75,989m²		



【Project Timeline】
FY2024-2027 : FS study, detailed planning, contractor selection, and renovation work
FY2028-2042 : Energy efficiency services

【Main Renovation Details】
・High-efficiency upgrade of air conditioning heat sources
・LED lighting retrofit ・BEMS introduction
・Inverter control for air conditioning units

【Project Outcomes】
Energy reduction rate : 27.8% （21,722 GJ/year reduction）
Estimated reduction in utility expenses : JPY 47,735,511/year

【Key Features】
・The largest total floor area among renovation projects for existing Japanese municipal government buildings.
・Promoting ZEB adoption in private facilities within the city through effective outreach.

Project Initiatives in City Urban Area

■ Introduction of Solar Power in Public Facilities

Fenice Sacay & Sakai Plaza of Rikyu and Akiko : Solar power systems installed through leasing
Multi-story Parking Garage for Official Vehicles : Solar power systems and battery storage installed through lease agreement.

Fenice Sacay

Sakai Plaza of Rikyu and Akiko

Multi-story Parking Facility for Official Vehicles (Solar power systems & battery storage)

■ Introduction of LED Lighting in Public Elementary and Junior High schools

Ichi and Yuya Elementary School and Tonobaba Junior High School : LED lighting upgrades implemented through public works.

Ichi Elementary School

Yayu Elementary School

Tonobaba Junior High School

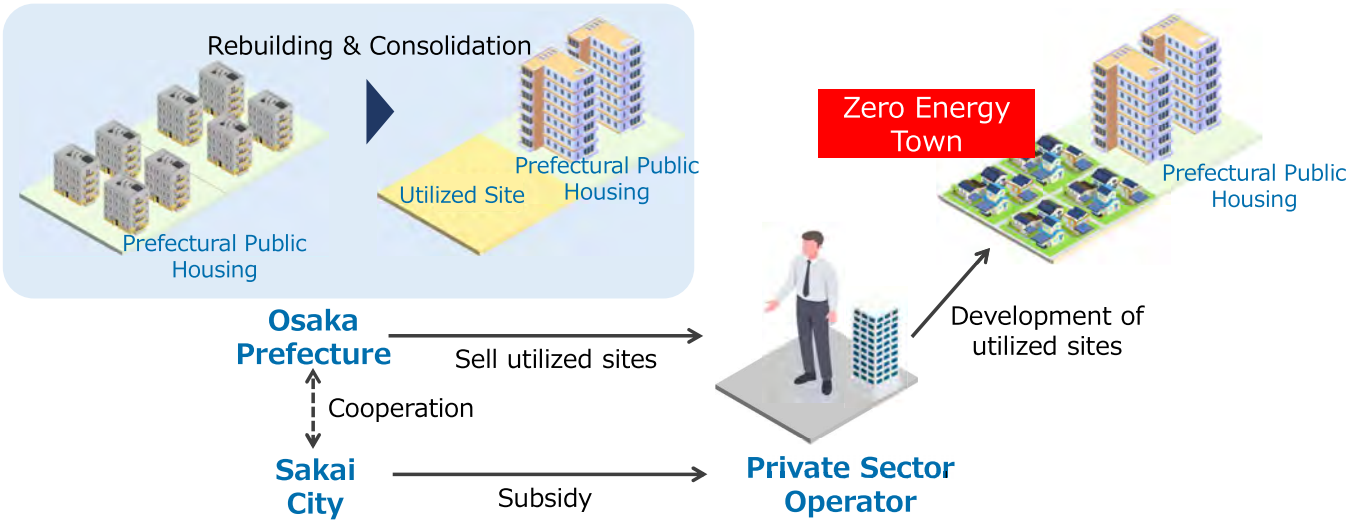
Project Initiatives in Senboku-New-Town Area

■ Target Facilities

Project Initiatives in Senboku-New-Town Area

■ Net-Zero Energy Town Development Project

Create a “Zero Energy Town,” a residential area where total energy consumption is effectively net zero, in newly developed housing areas on utilized sites such as prefectural public housing sites.



Project Initiatives in Senboku-New-Town Area

■ Energy Efficiency in Public Facilities

Currently, 3 municipal facilities (Big Bang, Izumigaoka Civic Center, and the Southern District Development Office) are connected to district heating and cooling systems*.

High-efficiency air-conditioning systems and LED lighting upgrades will be implemented at these three facilities.

*District heating and cooling systems : A system that supplies steam (or hot water) and chilled water from one or several central plants to multiple buildings via pipelines for cooling and heating.

Sakai City Big Bang

: A spaceship-shaped indoor children’s museum and interactive play facility.

Izumigaoka Civic Center

: A community facility with a library, meeting spaces for seniors and people with disabilities, and places for local residents to gather and engage in cultural, educational, and social activities.

Sakai City Southern Regional Development Office

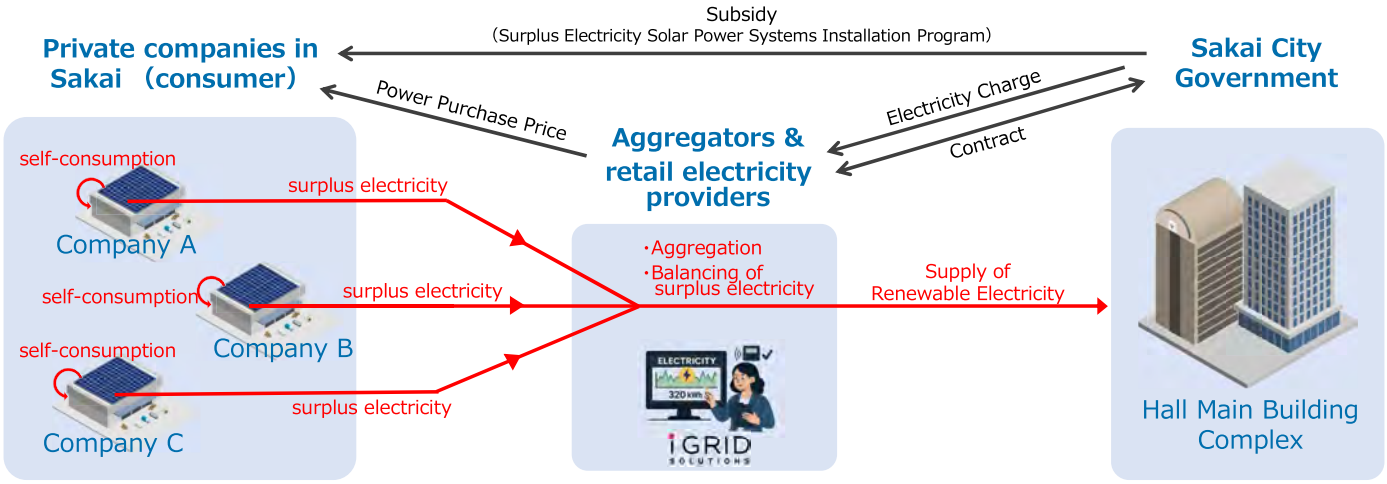
: A local public works branch office responsible for planning, building, maintaining, and repairing roads and related infrastructure in the southern part of Sakai City.

Project Initiatives in Off-site Area

■ Sakai City Off-site PPA Project

Private companies in Sakai City install solar power systems at their own facilities using city subsidies and generate electricity.

Sakai City procures surplus electricity from these companies through aggregators that also serve as retail electricity providers.



Project Initiatives in Off-site Area

■ Surplus-Electricity Solar Power Systems Installation Program

【Eligible Equipment】
- ・Newly installed solar power systems at privately owned facilities in Sakai City (excluding residential buildings)
- ・Equipment under a PPA, leased, or owned by the facility

【Subsidy Requirements (Main Conditions)】
- ・Surplus ratio (surplus electricity / total generation electricity) : 20%-70%
- ・Switch currently used electricity to renewable energy by FY2030

【Subsidy Rate and Eligible Expenses】
- ・Subsidy Rate :

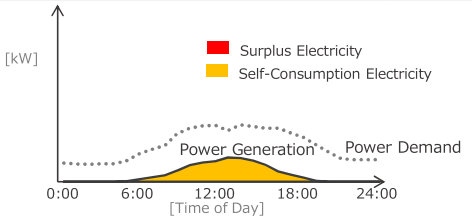
Surplus ratio	Subsidy rate
40%-70%	1/2
30%-40%	1/3
20%-30%	1/4

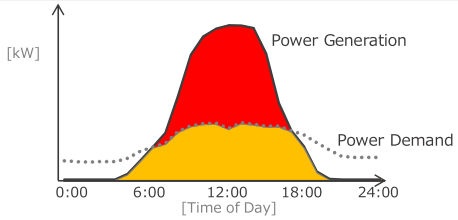
- ・Eligible Expenses : Up to JPY200,000/kW

【Subsidy Approvals (as of the end of October, 2025)】
10 facilities (7 companies)

【Project Outcome】Compared with Fully Self-Consumption Model, Surplus-Electricity Model provides the following benefits:

	Fully Self-Consumption Model	benefits	Surplus Electricity Model (Planned)
Installed Capacity	600 kW	7.5×	4,500 kW
Renewable Energy ratio	2～27 %	Average 3.1×	27～60 %
Surplus ratio	—	Increase	31～61 %





現地ワークショップ資料

2. 日本工営発表資料（英）

Regional Collaboration Project to Promote Carbon Neutrality in Southern Vietnam

Trend of Carbon Credit Market & City-to-City collaboration Project(C3P)

January 30th, 2026

Aki BABA (Ms.)
Project manager
International Environment Dept.
Nippon Koei Co.,Ltd.
https://www.n-koei.co.jp/consulting/english/

Introduction of Nippon Koei in Vietnam

Giới thiệu về Nippon Koei tại Việt Nam

Sustainability & Environment
Urban & Regional Planning

1946
Establishment of Nippon Koei Co., Ltd.

1955
First Project in Vietnam Starting with Da Nhim Hydroelectric Power

1991
Establishment of Nippon Koei Office in Hanoi

2012
Establishment of Nippon Koei Vietnam International Co., Ltd.

2025
Completion of 450+ projects in Vietnam and counting

Transport & Infrastructure
Industrial Parks & Logistics
Engineering & Project Management

Introduction of Decarbonization trend in Vietnam & the City-to-City Collaboration project activities

1) Introduction of world trend in climate change

The Paris Agreement

It is a global treaty adopted in 2015 at the COP21 climate conference in Paris. It aims to combat climate change and limit global warming.
Limit global temperature rise to well below 2°C, and ideally to 1.5°C above pre-industrial levels.
Reduce greenhouse gas(GHG) emissions through national climate action plans of each country.

NDC(Nationally Determined Contributions)

NDCs with own climate goals of each country will be updated every 5 years.
Based on the NDCs, it is planning to provide finance, technology, and capacity-building by international support for implement adaptation and mitigation measures toward low/zero carbon society.

2) Climate target, mitigation plan in Viet Nam

Target sectors of Mitigation in Vietnam

Energy (Emission sources: power sector, Industrial production, construction, Transportation etc.)
Agriculture
Waste
Industrial Processes
Land Use, Land-Use Change and Forestry (LULUCF)

NDC3.0(2025-2030) COMING SOON!

Mitigation Target of NDC(updated 2022) in Vietnam

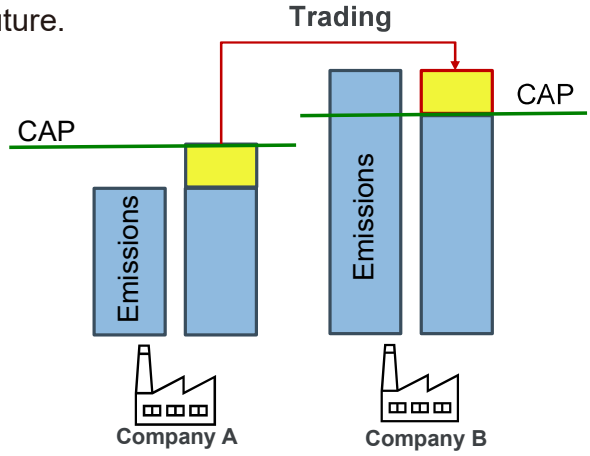
Energy sector	**2030 Target** (Million-ton CO2 equivalent)
Business as Usual (BAU)	678.4 (927.9 for all sectors)
Unconditional (Domestic efforts only)	613.6 (781.6 for all sectors)
Conditional (With international support)	451.4(524 for all sectors)

NDCs official site (UNFCCC)

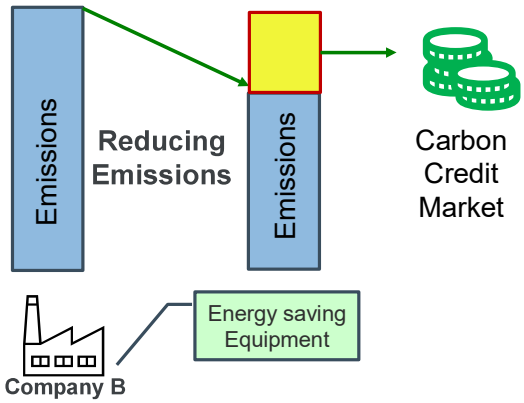
https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs
VIETNAM NDC site : https://unfccc.int/documents/622541

3) Types of Emissions Trading Systems

- "CAP and Trade" is that CO2 emissions are traded between companies that exceed an emissions limit (CAP) and companies that fall below it. "Carbon Credit" are a system that allows organization to sell the CO2 reductions you have achieved through the own measures as credits on the market.
- By introducing these emissions trading, companies can economic and environment benefits in the future.



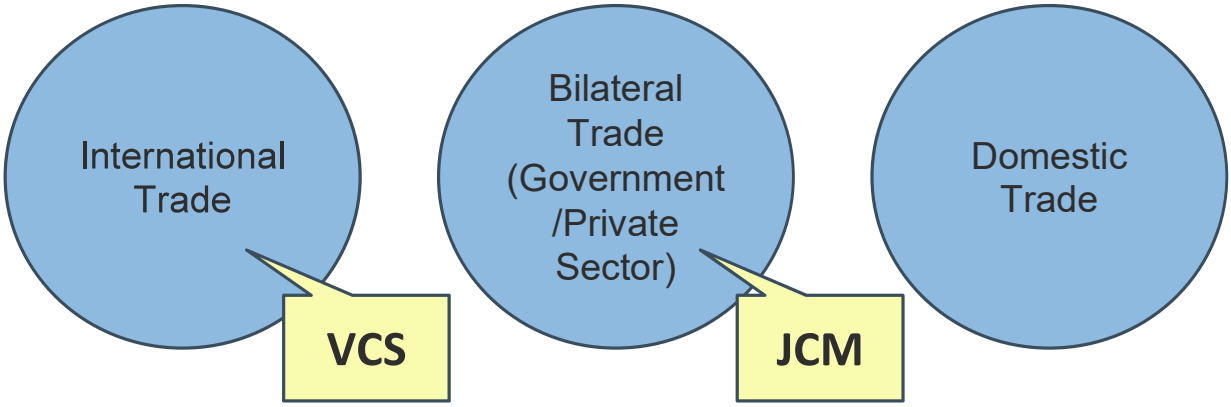
Cap and Trade



Carbon Credit

4) Trend of Carbon Credit Trading in the world

- Carbon credits have become popular since the Kyoto Protocol, and their trading volume has been increasing with the rise of global climate change measures, but it decreased slightly in 2022. Carbon taxes and emissions trading systems (ETS) account for 23% of global GHG emissions, with 475 million tons of credits issued in 2022.



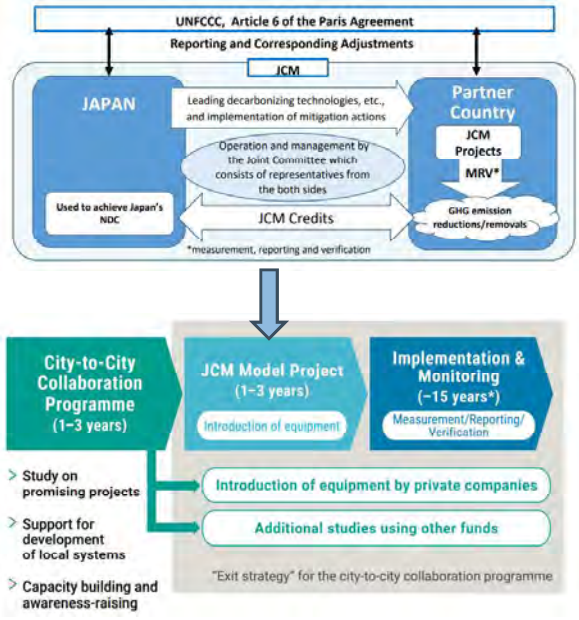
5) JCM&City-to-City Collaboration(C3P)

JCM THE JOINT CREDITING MECHANISM

JCM for GHG emission reductions proceeds with decarbonizing technologies, products, systems, services, and infrastructure as well as implementation of mitigation actions in JCM partner countries. JCM contributes to achieve emission reduction target of both countries.

C3P City-to-City Collaboration Program

The program inspires local actors to implement policies to decarbonize their cities, creating a ripple effect that will drive decarbonization efforts around the world (also known as the decarbonization domino effect)
One of the exit strategies of C3P is JCM model project in right figure.



Source: https://www.env.go.jp/earth/coop/lowcarbon-asia/english/project/data/jcm_pamphlet_C3P_2024_EN.pdf

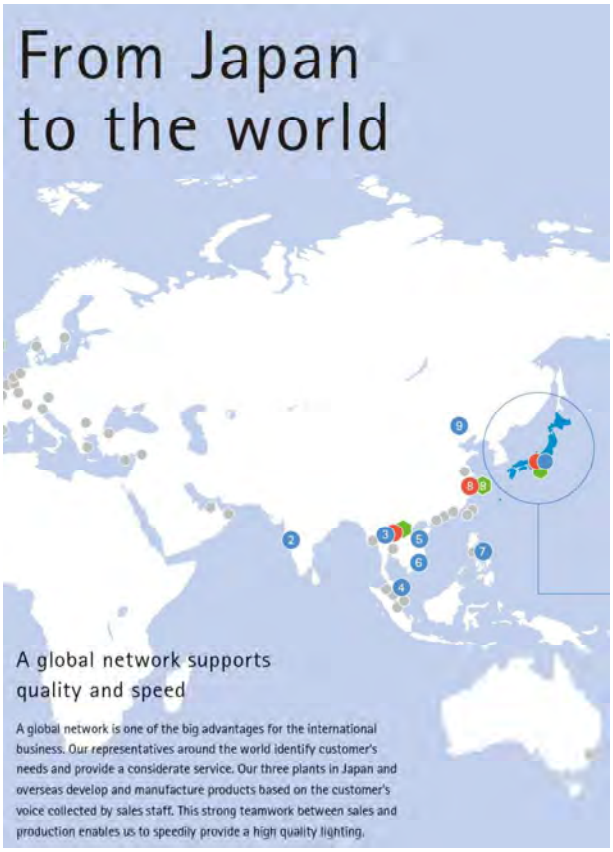
現地ワークショップ資料

3. 遠藤照明ベトナム発表資料（英）

1. Company Overview

Name	ENDO Lighting Corp.
Founded	September, 1967
Established	August, 1972
Capital	¥5,155 million
Businesses	• Planning, design, manufacture, and sale of light fixtures • Sale of interior furnishings and supplies
Fiscal year	March 31
Revenue	\45.7 billion (consolidated basis, fiscal year ended March, 2022)
Employees (consolidated)	1,552 employees (As of March 31, 2022)

1. Company Overview



②Pune / India
ENDO LIGHTING ACCESSORIES (INDIA) PVT.LTD

③Bangkok / Thailand
ENDO LIGHTING (THAILAND) PUBLIC CO.,LTD

④Singapore / Singapore
ENDO LIGHTING SE ASIA PTE.LTD

⑤⑥Ho chi minh City, Hanoi / Vietnam
ENDO LIGHTING VIETNAM CO.,LTD

⑦Manila / Philippines
ENDO LIGHTING (THAILAND)PUBLIC CO.,LTD
Philippine Rep. Office

⑨Beijing / China
ENDO TRADE (BEIJING) CO.,LTD

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2.Daibiru Corner Stone Building

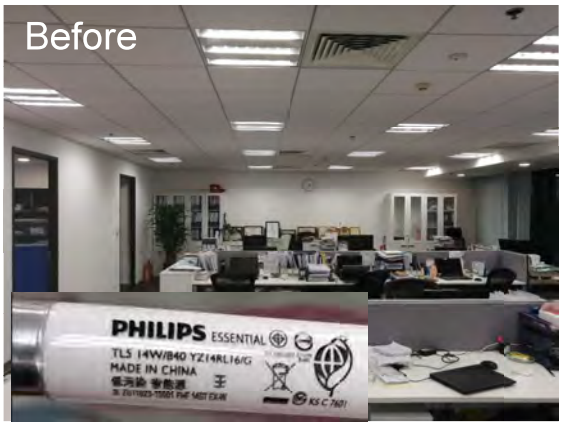
Replaced from High efficiency fluorescent

To High efficiency LED with SmartLEDZ

Without JCM Subsidy Scheme. ALL Lighting 3,000 pcs

■ High efficiency fluorescent

■High efficiency LED with SmartLEDZ



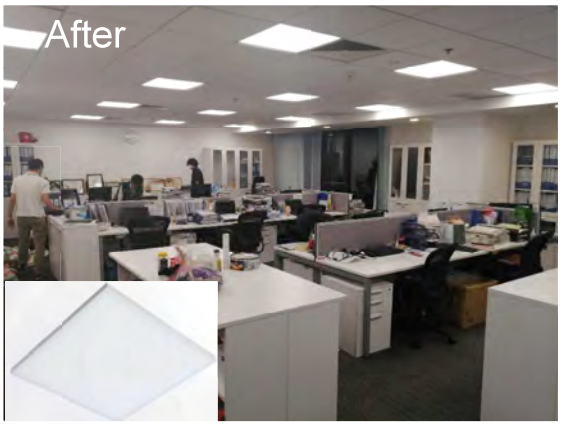
Electricity

50% Down

Total10years

6,300M.VND

Reduce cost



3. Product Features

Tunable 調光調色 LEDZ

Wide lineups and High efficiency

Market standard:110lm/w ENDO:**150-200lm/w**

lm=Amount of light W=Wattage

Daylight to warm color adjustable

Wireless control by smartphone

Easy to use

3. Product Benefits①

Working in an office with constant color lighting can disrupt your body's rhythms and cause sleep disorders.

Increases awakening and focus during the day and relaxation at night.

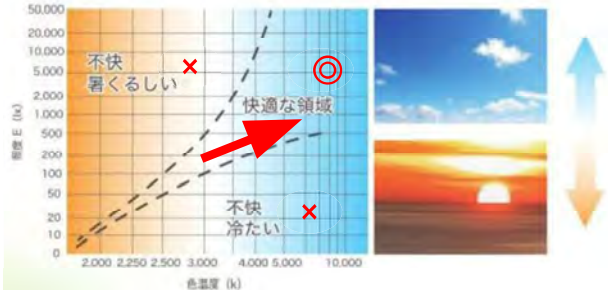
3.Product Benefits②

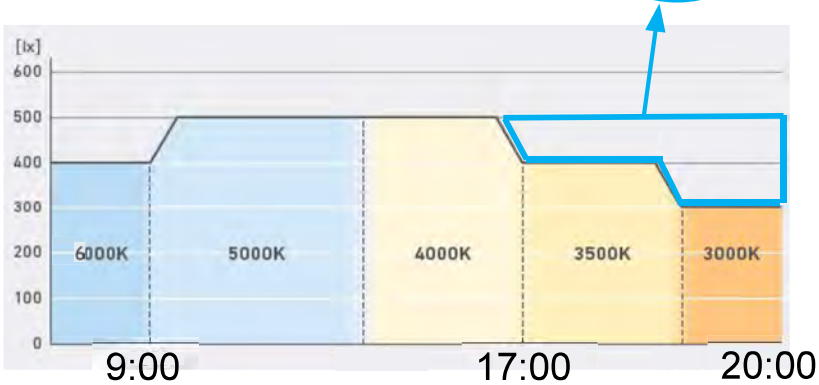
There is a favorable correlation between light color and brightness.

When you use a low color temperature, brightness is low became savi gy.

Energy 12% Saving

クルーゾフ効果 Kluzov effect





3. Product Benefits③

Changing color depending on the purpose of your work can lead to productivity.

High color temperatures improve concentration,

while medium color temperatures increase communication.

Low color temperatures are suitable for creative work.

High Color Temperature	Middle Color Temperature	Low Color Temperature
		

4.Case Study

If **50pcs** are replaced

from fluorescent

Cost simulation

■Conditions

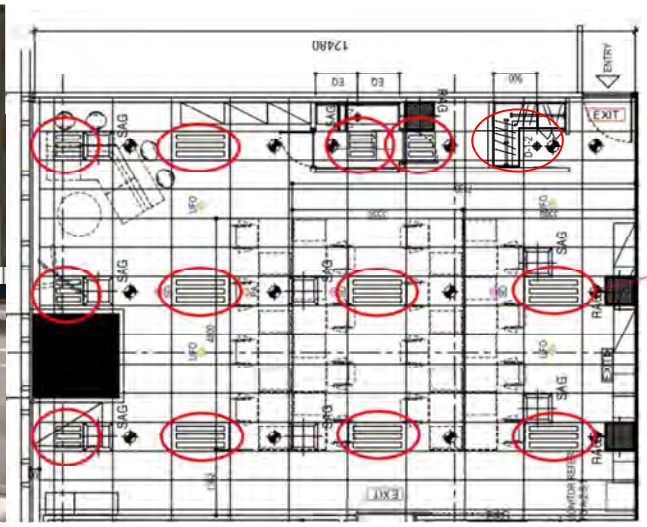
Total initial cost 88M.VND

Before:54W×50pcs＝**2.7kW**

After:36W×45%Dim×50pcs＝**0.8W**

Energy **70%** Saving

Before



After

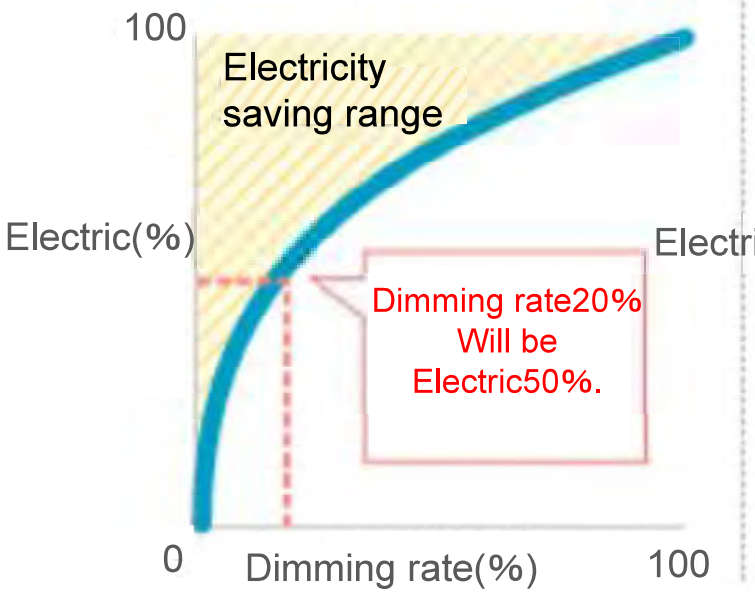
Tunable

調光調色

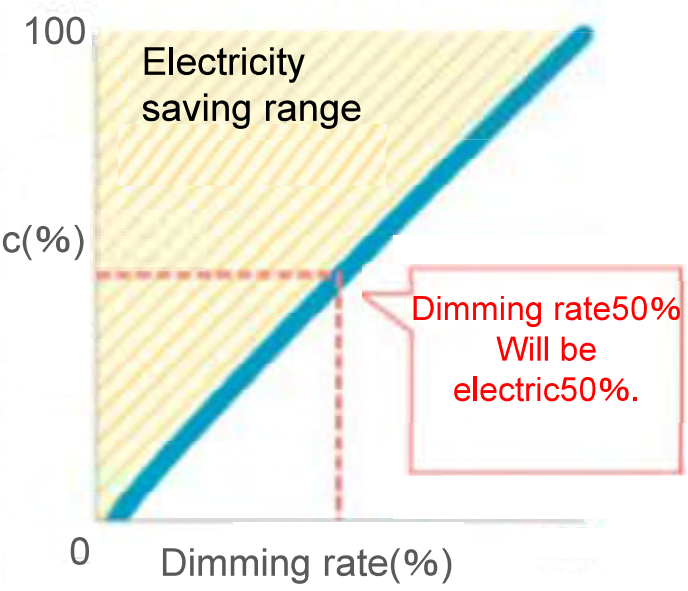
LEDZ

Reduce electricity consumption by dimming

In case of fluorescent



In case of LED



If 50pcs are replaced

from fluorescent

Cost simulation

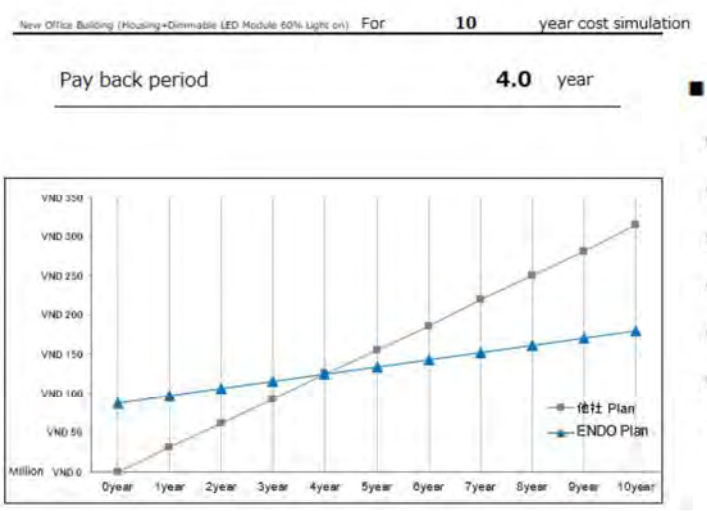
■In case of using 10years

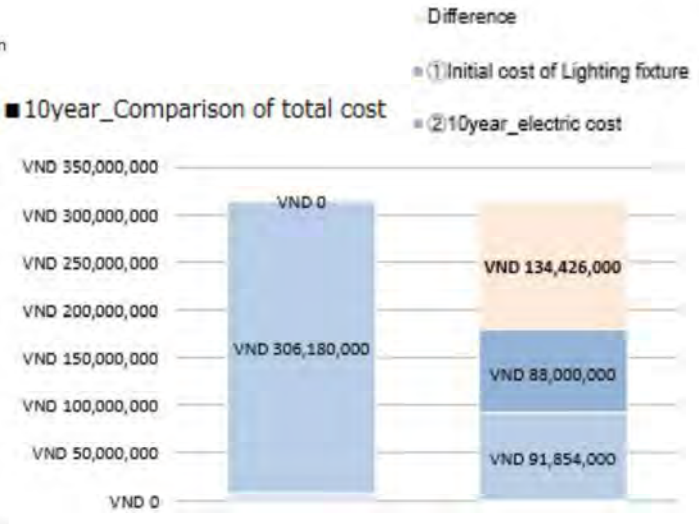
250day×12hour×10year×

3,300VND×1.9W＝**100M.VND**

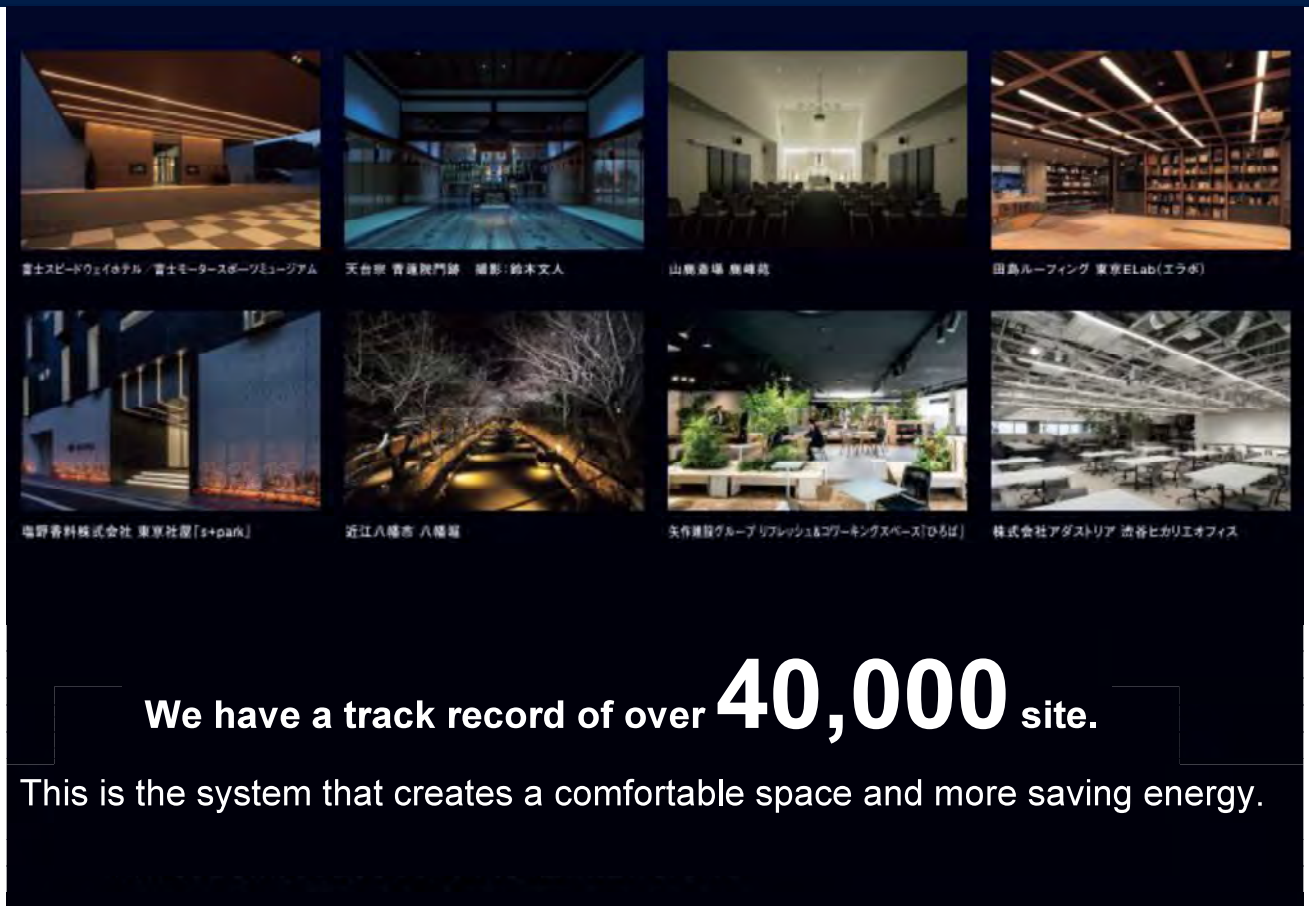
Lamp maintenance cost **34M.VND**

Total 10years
134M.
VND reduce





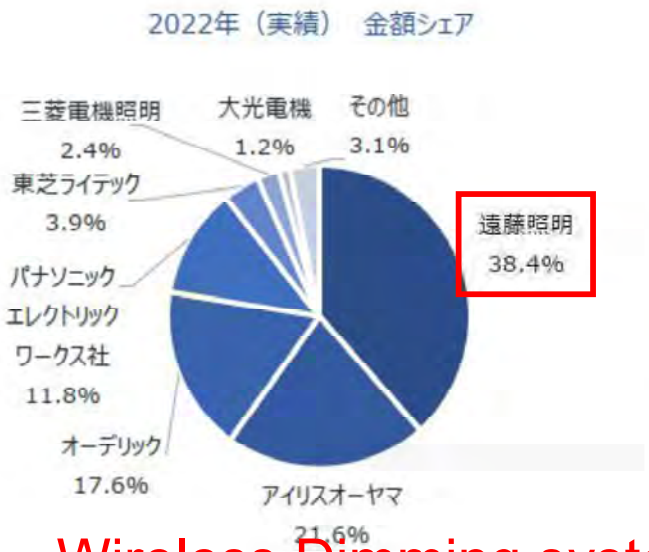
Smart LEDZ SYSTEM

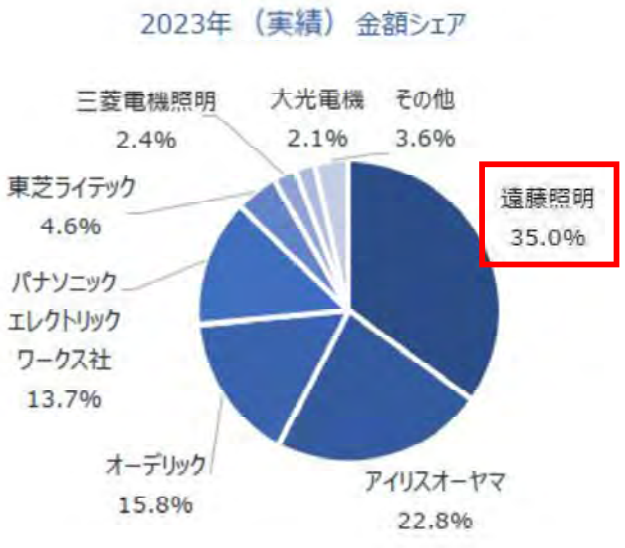


We have a track record of over 40,000 site.

This is the system that creates a comfortable space and more saving energy.

Smart LEDZ SYSTEM





Wireless Dimming system share No.1 in Japan.

Fuji Keizai
Marketing Research & Consulting Group

Value Up

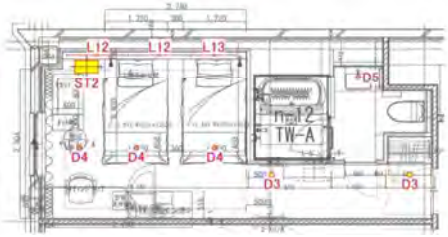
EDGE

5. What ENDO VN can provide

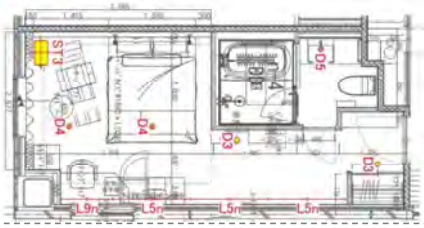
■Lighting Plan

(Public area of hotel)

(Guest room A)



(Guest room B)



■3D Rendering Image

(Simulation when proposing)

(Actual photo at site)

■Luminaire List

現地ワークショップ資料

4. カナデビア発表資料（英）

Introduction of Corporate

Kanadevia
Technology for people and planet

Company's Name	KANADEVIA CORPORATION (1/10/2024) HITACHI ZOSEN CORPORATION
Founded	1881 by Edward Hazlett Hurter (from UK)
Incorporated	1934
Headquarters	Osaka and Tokyo
Stock market	Listed on Tokyo Stock Exchange
Offices	193 (158 consolidated subsidiaries and 35 affiliates).
Employees	12,964 (consolidated)
Paid-in Capital	45.44 billion yen (≒ US$ 318 million)
Net Sales	610.5 billion yen (≒ US$ 4.273 billion)
Net Income	22.1 billion yen (≒ US$ 154.7 million)

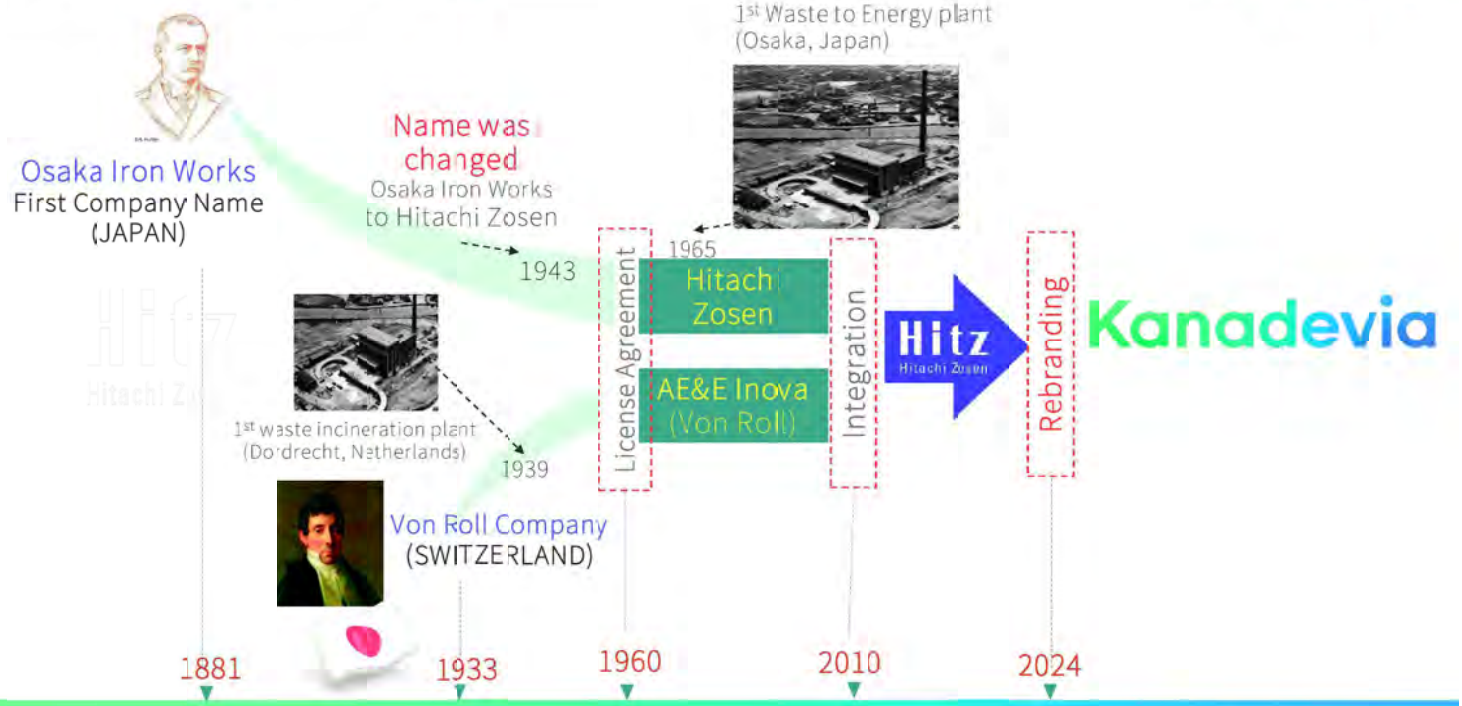
(As of 01/04/2025) 1 JPY = US$ 0.007

Sales Structure by Business Segment

* From April 2025, it is reorganized as Machinery Business HQ and Infrastructure Business HQ to enhance engagement toward each product

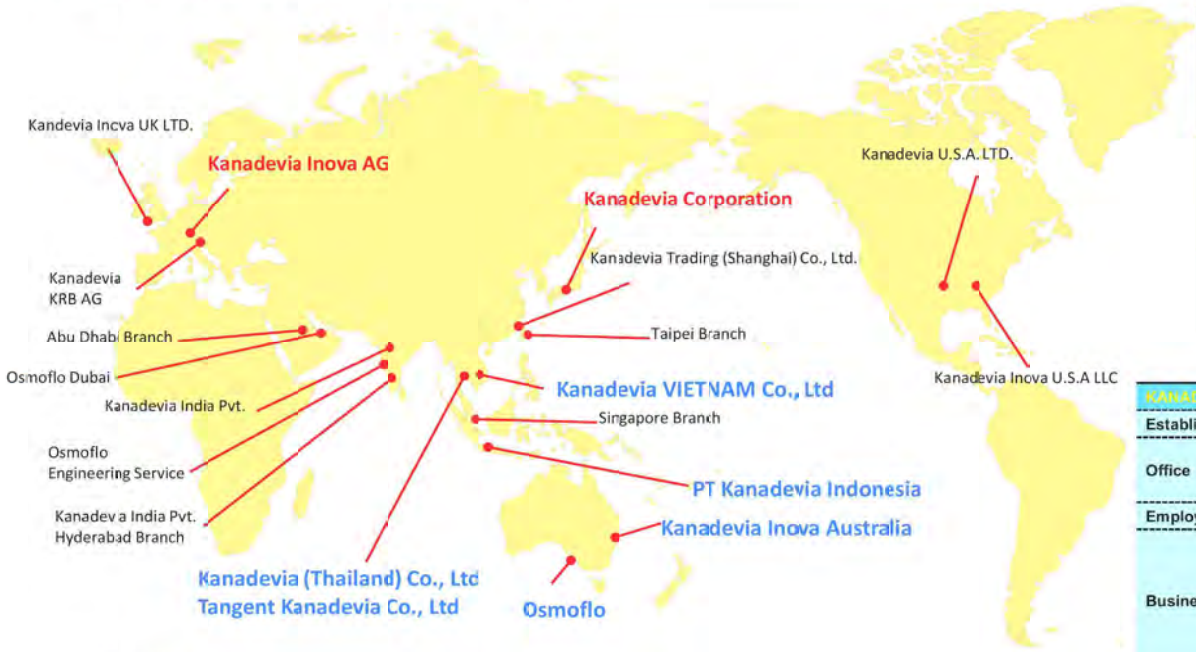
Our Waste Management - History

Kanadevia
Technology for people and planet



Major Overseas Offices & Subsidiaries

Kanadevia
Technology for people and planet



as of March, 2025

Japan
2 Head Offices
8 Domestic Offices
7 Works Locations

Overseas Subsidiaries & Affiliates
42 Overseas Subsidiaries & Affiliates

Overseas office
Total 15 Overseas Offices

KANADEVIA VIETNAM	
Establishment	2004
Office	• Ho Chi Minh city (Headquarter) • Hanoi (Branch)
Employees	Approx. 100
Business field	• Detailed engineering for Plant (CAD 2D drawing & 3D model) • Procurement • O&M business • Business supports

Major Business

Kanadevia
Technology for people and planet

	Business fields	Detail
	Environmental system	▪ Waste to Energy Plants ▪ Methane Fermentation Systems ▪ Desalination Plants ■ Eco-agriculture Systems / Waste to Biochar Plants (EFCaR) ■ Material Recycling Systems ■ Water, Sewage and Industrial Wastewater Treatment Systems ▪ Energy and Resource from Organic Waste, and Leachate Treatment System
	Carbon Neutral Solution	▪ Hydrogen Generation Systems (HydroSpring) ▪ Electro-chlorination Systems ▪ SCR NOx Removal System ▪ Nuclear Fuel Cycling-Related Equipment • Methanation Equipment (HiMethz) • Zeolite Membrane Separation System (HDS) • Pressure Vessels • Wind Power Generation
	Machinery & Infrastructure	**Machinery Business** - Electronic Control Equipment - GPS Remote Monitoring Systems - Food and Pharmaceutical Equipment (Sorting machine) / Sterilization systems / Filter Presses - Factory Automation / Film Manufacturing Equipment / Precision Casting Products **Infrastructure Business** - Hydraulic gates - Shield tunneling machine - Marine Civil Engineering - Flap-Gate Type Seawall against flood disaster - Steel structure - Bridges - Steel chimneys - Offshore Floating Structure
	Others	- All-solid-state Lithium-ion Batteries

Remark: Red color text: technologies introduced into the Vietnamese market

2. Our Circular Economy models for Sustainable waste management

Sustainable Waste Management Model

Kanadevia
Technology for people and planet

(1) Waste –to– Energy (WTE)

(2) Methane Fermentation

(3) Carbonization (Waste to Biochar, WtB)

CO_2 emission reduction

Recovered Energies

Recycling materials

Solid waste

Sludge

Recovered Materials from dry Recyclables in Material Recycling Facility

Recycle

Material Recycling: Glass, Paper, Metals, Recyclable Plastic

Energy & Compost from bio-waste with anaerobic digestion

Fermentation / Anaerobic digestion

Energy Recovery: Biomethane
Material Recycling: Compost & Fertilizer

Energy & Material from non recyclable waste with thermal treatment

WTE

Energy Recovery: Power & Heat
Material Recycling: Metals & Minerals

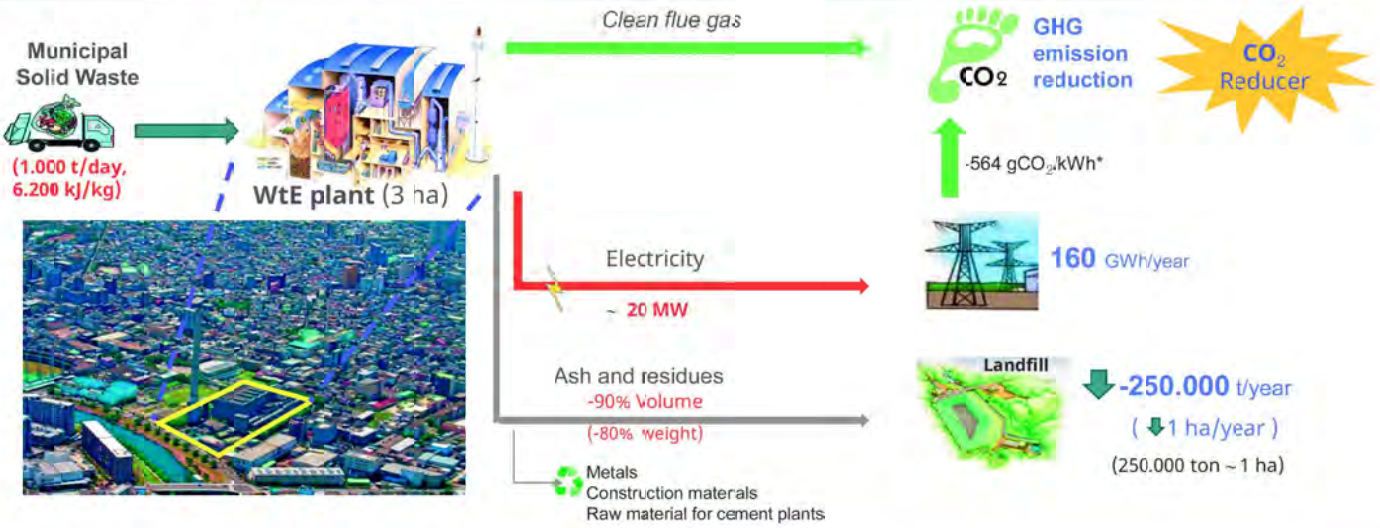
Bio-char & fertilizer from Sludge & Livestock waste

Carbonization

Energy Recovery: Bio-char
Material Recycling: Fertilizer

1. Waste to Energy plant (1)

Kanadevia
Technology for people and planet



Proven technology (Engineering):
- Good adaptability of various wastes (pre-treatment is not required)
- Reliable operation (less trouble), Long lifespan (8000 hrs/yr x 20-25 yrs)
- High volume reduction of waste

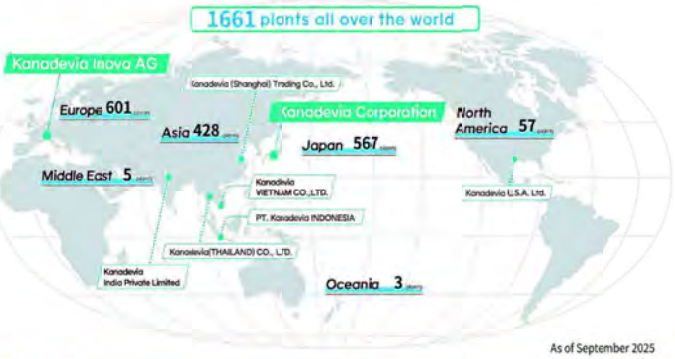
Environmental impact:
- Meeting strict gas emission standards
- Low greenhouse emission (CO_2 reducer)
- Generating stable clean energy
- Recycling by-products
- Completely hygienic management

Economic aspects:
Profitable business:
- Selling electricity, Recycling material
- Carbon credits (JCM)
- Economic development

* https://www.jica.go.jp/activities/issues/climate/ku57pq00001o5yry-att/separate_table.pdf

1. Waste to Energy plant (3)

Kanadevia
Technology for people and planet



2. Methane Fermentation (1)

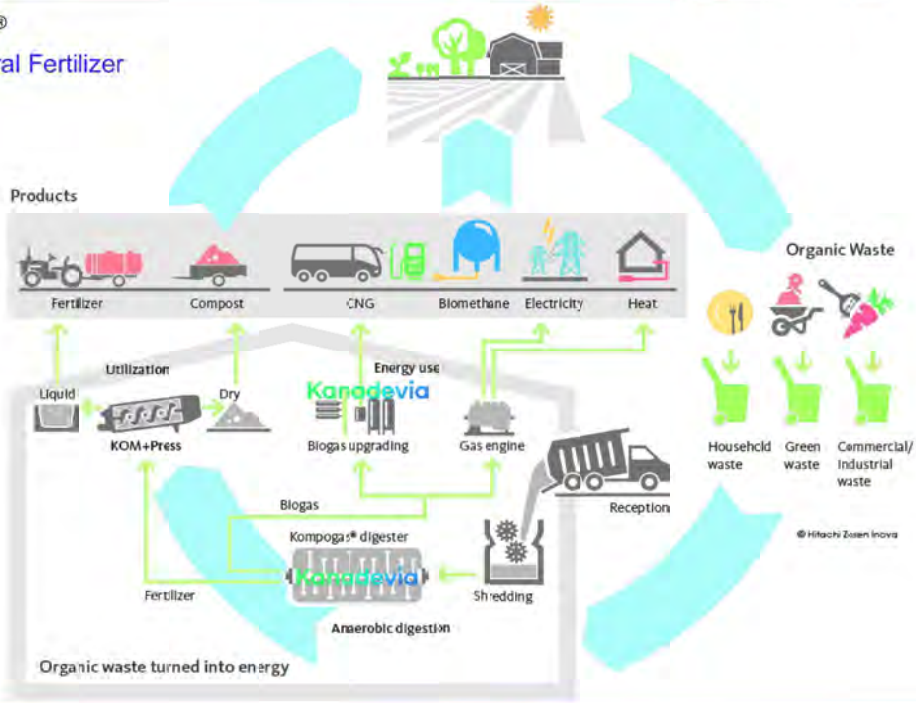
Kanadevia
Technology for people and planet

(1) Methane Fermentation with Kompogas®

Biogenic wastes → Raw biogas and natural Fertilizer

Kompogas® Anaerobic Digestion

- This technology uses continuous anaerobic digestion to recycle biogenic waste, producing natural fertiliser and renewable energy in the form of green power and heat or biogas as the basis for alternative fuels
- This has become one of the global market leaders, with almost 100 reference plants worldwide.
- Mature technology, flexible component arrangements and largely automated processes guarantee long plant lifetimes, high efficiency and low maintenance costs.
- By recycling organic waste into materials and energy, the process closes the environmental cycle cost-efficiently.



2. Methane Fermentation (2)

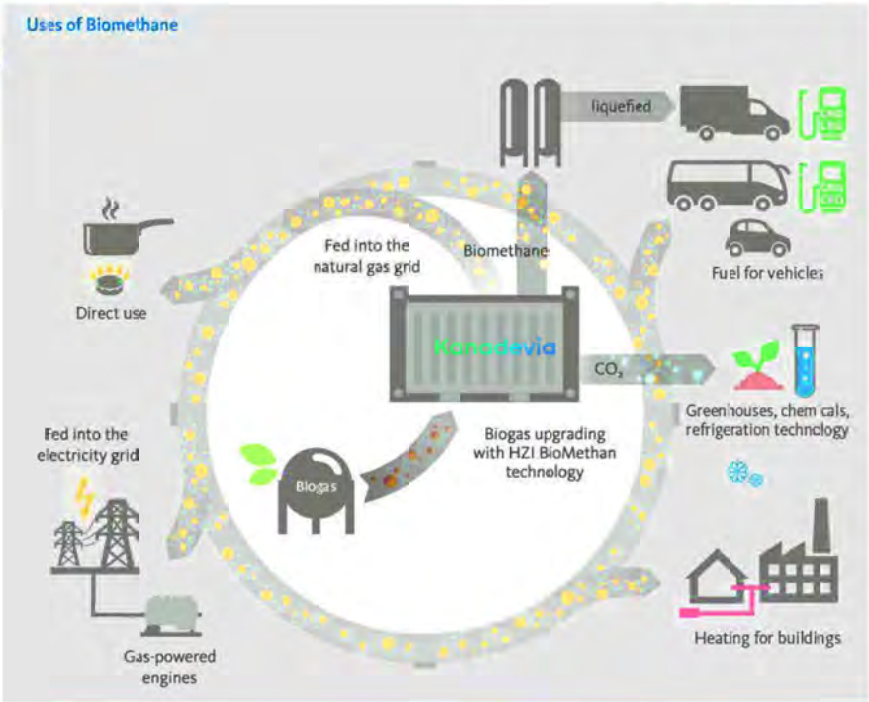
Kanadevia
Technology for people and planet

(2) Gas upgrading:

Raw biogas → high-purity biomethane (LNG, CNG)

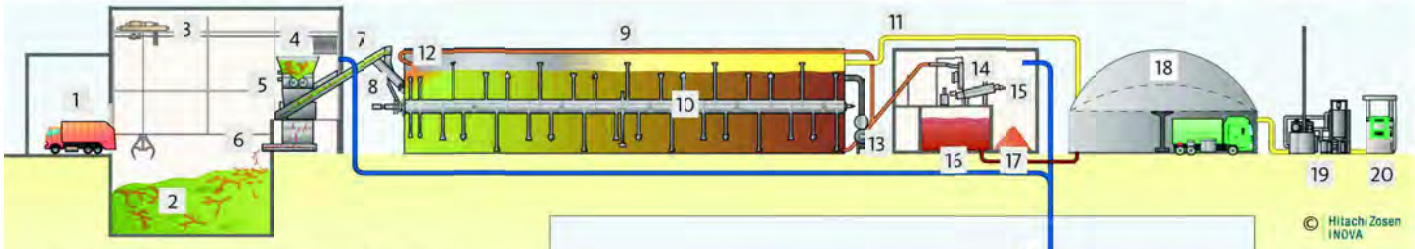
BioMethan Gas Upgrading

- This technology convert raw biogases into high-purity biomethane that can be used as a versatile energy source.
- The high-purity biomethane can be used for several purposes: (i) LNG, CNG for vehicles, (ii) daily direct use, (iii) generation of electricity, (iv) heating for building.
- A by-product of the process is carbon dioxide, which can be used to generate additional revenues in the form of gaseous, liquefied or solid carbon dioxide deployed as an industrial product gas



2. Methane Fermentation (3)

Kanadevia
Technology for people and planet

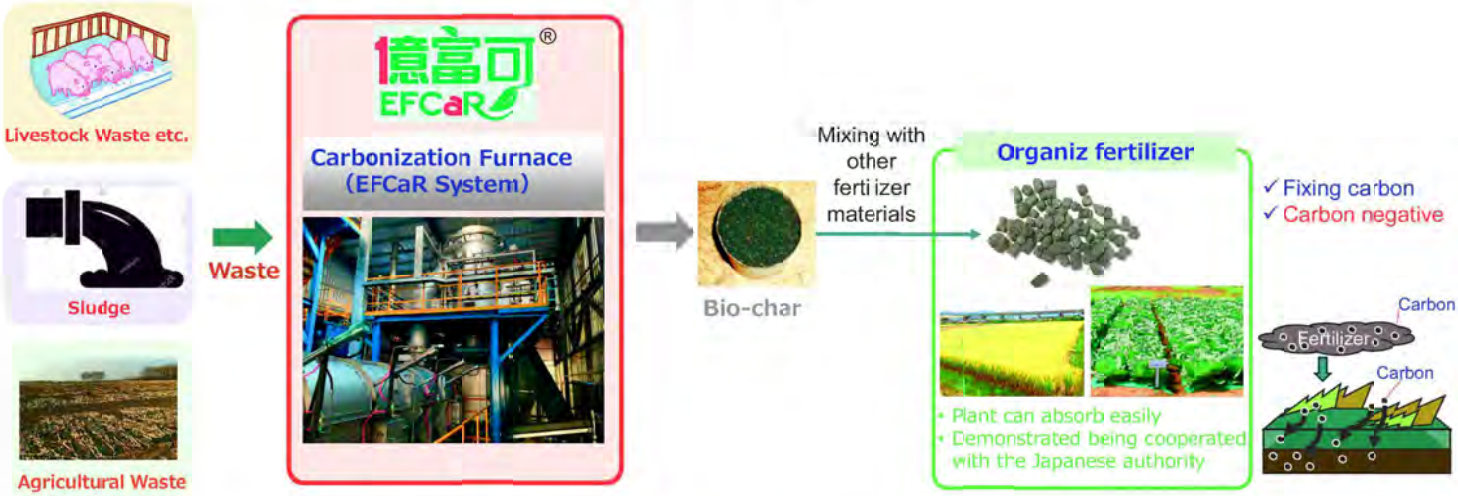


1. Waste receiving lobby
2. Waste bunker
3. Waste crane
4. Shredder
5. Sieve
6. Sieved rejects
7. Conveying system
8. Feeding system
9. Digester
10. Agitator
11. Biogas pipe
12. Inoculation pipe
13. Discharge system
14. Kom+Press (Dehydration system)
15. Speed screen
16. Liquid fertilizer
17. Compost
18. Biogas tank
19. Biogas upgrading equipment
20. Biogas refuelling station
21. Aerated composting tunnels
22. Compost screening equipment
23. Air ventilation system
24. Acidic exhaust air scrubber
25. Biofilter

3. Carbonization (Waste to Biochar, WtB)

Kanadevia
Technology for people and planet

Energy Free Carbonizing for Resource recovery (EFCaR®)



- Continuous carbonization with uniform temperature without heat source
- Produced carbide which has high calories since making it with low temperature is applicable for mixed ingredients for fertilizer directly.

現地ワークショップ資料

5. 東邦レオ発表資料（英）

Executive Summary

This document introduces Toho Leo□sustainable infrastructure solutions, focused on measurable ROI, cost reduction, and risk mitigation, in line with the sustainability direction.

Our integrated approach□covering stormwater management, water reuse, circular economy, urban greenery, and smart monitoring□ prioritizes financial performance and asset protection, with examples such as J-MIX stormwater retention (□11% ROI) and Zero-Water Building solutions (10-year ROI >100%).

TOHO LEO SOLUTION

TOHO LÉO

SOLUTIONS

J-MIX Financial Comparison & ROI

ROI :11%
Payback » 9 years

J-MIX cost: PHP 7,400 / m^2
Retention / recharge: 41%
Flood frequency: 1 event / year
Typical repair loss: PHP 2,000 / m^2 / event

Item	Concrete Tank	Retention Pond	Drainage Expansion	J-MIX
Primary function	Store water	Open water storage	Discharge water	Retain + infiltrate
CAPEX / unit	PHP 12k-25k / m^3	PHP 8k-15k / m^3	Increasing	~PHP 18k / m^3 (equiv.)
Mechanical parts	Pumps	Minimal	Pumps	None
Maintenance	High	Medium	High	Minimal
Space usage	Basement	Dedicated land	Underground	**Under pavements**
Failure risk	High	Medium	Medium	Low
System behavior	Centralized	Centralized	Centralized	**Distributed**

Regulation-driven value: J-MIX offsets mandatory storage requirements in combination with ponds or tanks, allowing downsizing of reservoir ponds and mechanical systems.

Case of Housing Complex in Japan

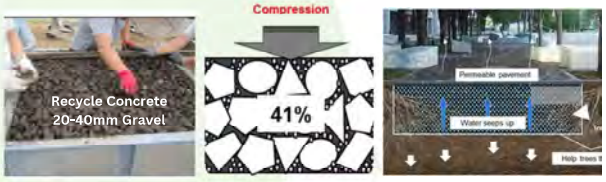
OUTCOME

The required stormwater storage volume was reduced from 4,312 m^3 to 107 m^3 through retention and infiltration measures.
Although the infrastructure cost remained at approximately USD 0.8 million, converting the detention pond area into residential land generated **USD 1.5 million in land value savings.**
The project also delivered environmental benefits, including groundwater recharge and enhanced greening.

Stormwater infiltration and flooding management

J-mix (retention base)

Product derived from recycled concrete, crushed to a uniform size, used beneath permeable concrete surfaces to create subsurface space for stormwater retention and planting pits

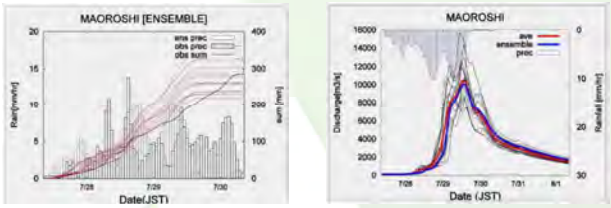


In Japan, installing this product beneath streets and parking lots allows us to retain surface runoff on-site, instead of directing it to drainage systems that ultimately discharge to the sea.This approach reduces flood risk and long-term drainage infrastructure cost.

Benefits

- Flood mitigation
- Recharge local groundwater, supporting long-term water availability for wells and reducing surface discharge
- Less development impact (impervious surface)

Monitoring



The monitoring graphs on the right show infiltration performance validated through field measurements.

ECO SOIL ☒ROI SUMMARY

ROI = 10%+
Estimated total value including branding & valuation = 35☒50%

All property value and branding effects are indicative estimates,
dependent on market conditions and project execution quality

PROJECT SETTINGS
- Area: 20 ha = 200,000 m² - Soil improvement depth: 500 mm
- Eco Soil ratio: 30% - Cost: $50 / m²
- Total investment: 200,000 m² × $50 = $10,000,000

DIRECT COST RETURN

Category	ROI / m²	Evidence
Tree saving	$0.80	Replacement cost = $200 / tree Saving = 800 × $200 = $160,000
Maintenance	$2.50	Baseline $2.5 / m² / year Reduction = 10% 10 years $2.50 / m²
Drainage	$0.50	Drainage CAPEX = $25 / m² Reduction = 2%
Soil avoidance	$1.00	Allowance = $0.10 / m² / year 10 years = $1.00 / m²
Environmental value	$0.50	Conservative environmental value allowance = $0.50 / m² ($CO_2$ storage, biodiversity reporting, internal ESG value)
TOTAL (Cost-based)	$5.30 / m²	

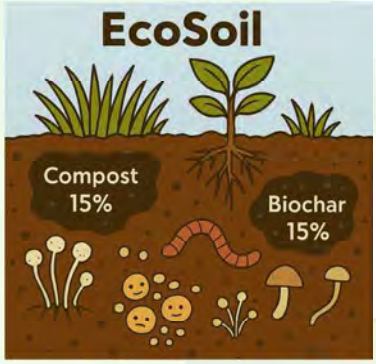
ADDITIONAL VALUE CREATION (NOT COST-BASED)

Category	ROI / m²	Evidence
Sustainable Branding	$5.00	Assumed brand & market advantage contribution
Property Value Uplift	$7.5–15	Assumed asset value = $1,500 / m² Uplift rate = 0.5–1.0%
TOTAL VALUE	$17.8–25.3	

Regenerable eco soil

ECO SOIL

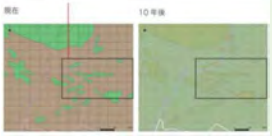
Biochar creates habitats for microbes and improves permeability, while compost supplies nutrients and microbial food. Activated microbes build soil aggregates, supporting healthy plant growth with fewer pesticides. This enhances biodiversity, increases CO_2 sequestration



Biochar

Compost

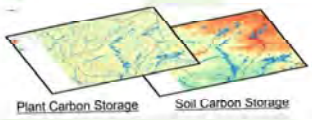
Monitoring

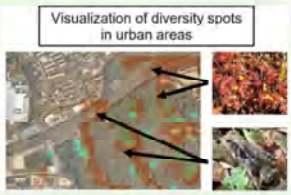


Visualize the progress toward the ☒deal scenario☒by calculating the current levels of biodiversity enhancement and CO_2 reduction achieved at the development site at the time of measurement

Biodiversity Baseline & Performance Monitoring

Visualizing a complex ecosystem with a **"DNA metabarcoding"** and **"network of relationships"**.





Benefits

- Increased and forecasted improvement in biodiversity.Our biodiversity indicator is based on soil microbial richness (DNA metabarcoding), vegetation diversity, and canopy cover☒measurable indicators acceptable under International Finance Corporation Performance Standard 6.
- CO_2 reduction
- Healthier and more resilient plant and tree growth

ZERO-WATER BUILDING ☒ROI SUMMARY

10-year ROI ☒ 133%
Payback period ☒ 7☒8 year
Investment = $7.5 / m²
Return (10 years) = $10 / m²

- Water volumes are calculated in cubic meters (m^3).
- ROI is normalized to USD per square meter (USD / m^2) for development comparability.
- Property value uplift and branding premiums are intentionally excluded.
- All values are conservative estimates.

DIRECT ROI SUMMARY

Category	ROI / m² (10 yrs)	Evidence
Water purchase saving	$3.50	Allowance = $0.35 / m² / year - 10-year value = $3.50 / m²
Sewer fee reduction	$1.50	Allowance = $0.15 / m² / year - 10-year value = $1.50 / m²
Flood / retention value	$3.00	Allowance = $0.30 / m² / year - 10-year value = $3.00 / m²
Water security	$1.00	Allowance = $0.10 / m² / year - 10-year value = $1.00 / m²
Monitoring & compliance	$1.00	Allowance = $0.10 / m² / year - 10-year value = $1.00 / m²
TOTAL (Cost-based)	$10.00 / m²	

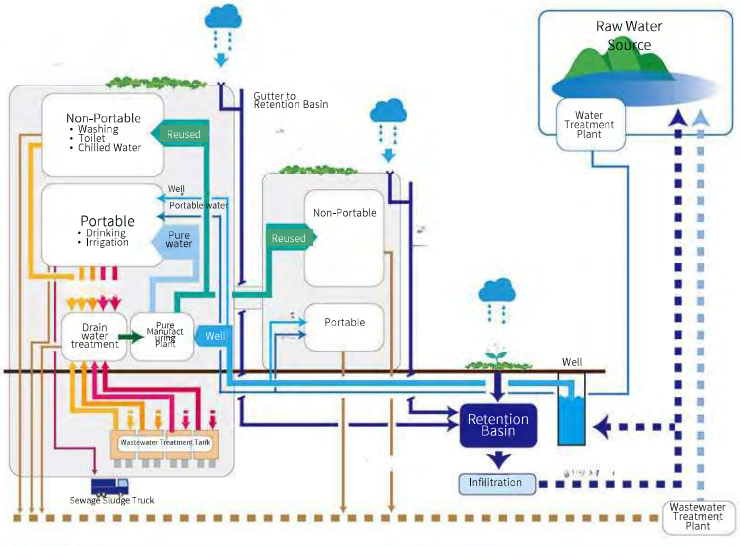
ENVIRONMENTAL & SUSTAINABILITY ECONOMIC VALUE

Category	ROI / m²	Evidence
Watershed & flood protection	$1.50	Allowance = $0.15 / m² / year - 10-year value = $1.50 / m²
Water quality & ecosystem	$1.00	Reduced pollution & restoration risk - 10-year value = $1.00 / m²
CO_2 & energy reduction	$0.30	Avoided emissions 1 kg CO_2 / m² / year - 10-year value $0.30 / m²
Sustainable finance	$0.25	Conservative finance benefit - 10-year value = $0.25 / m²
TOTAL VALUE	$13.05 / m²	

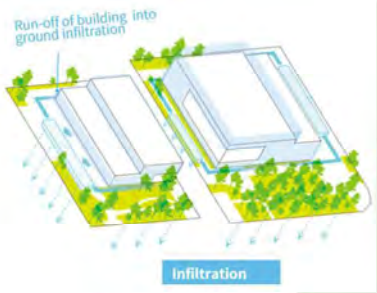
Water management

Near Zero-water system

Using a proven water-recycling technology with a strong track record in Japan, we provide a Zero-Water Building solution that maximizes the reuse of water collected from surface runoff in parking areas and streets.
We also offer a monitoring system that visualizes the building☒water impact on its surrounding watershed.



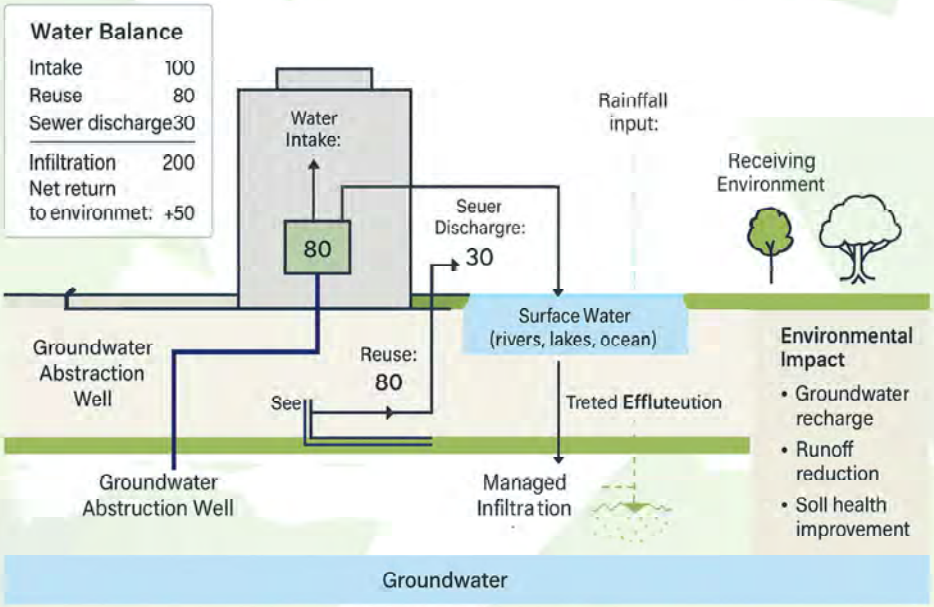
Zero-Water Building: Reuse + Infiltration > Potable + Well Water Use



Benefit

- Maximized infiltration leads to (1) smaller of central treatment system, (2) mitigation flood, (3) Increase the volume of water available for reuse
- This system improves the development☒overall watershed balance by reducing discharge load and increasing beneficial reuse.

Visualizing Water Recycling and Its Environmental Impact



Urban Green ROI SUMMARY

ROI: 10% / year
Payback: 10⊠12 years

Urban greenery reduces cooling demand, drainage load, and maintenance cost while increasing ESG value and certification readiness (LEED, IFC PS6)

PROJECT SETTINGS
Rooftop green cost: USD 200 / m^2
Wall green cost: USD 400 / m^2
Development scale: 20 ha (200,000 m^2)
Green coverage: 30,000 m^2 (20,000 m^2 rooftop + 10,000 m^2 wall)

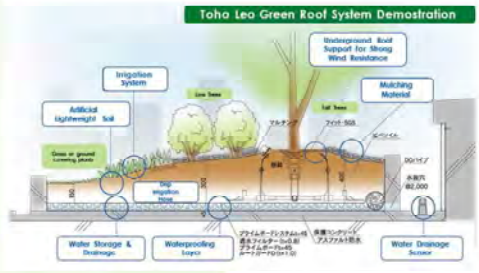
DIRECT COST RETURN

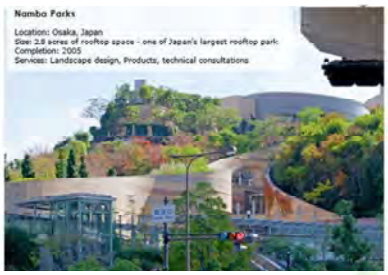
Category	ROI / m^2	Evidence
Energy saving	$10.00	Reduced cooling load 5–10%
Waterproofing life extension	$7.50	Lower temperature fluctuation extends membrane life
Stormwater reduction	$5.00	Reduced runoff lowers drainage infrastructure burden
Environmental value	$6.50	CO_2 reduction, biodiversity uplift, ESG contribution
TOTAL (Cost-based)	$29	

Urban Greenery

Rooftop / wall green

Toho Leo has more than 40 years of experience in urban greening. We provide technologies and products that enable greenery in challenging environments, such as rooftops and walls where planting conditions are difficult.





Waste Management ROI SUMMARY

ROI: 20%
Payback: 4[illegible]5 years

The waste management system converts construction and organic waste into reusable resources, reducing landfill dependency. It delivers a short payback period while strengthening ESG and circular economy performance for large-scale developments

PROJECT SETTINGS
Initial CAPEX: USD 300,000
Annual OPEX: USD 10,000

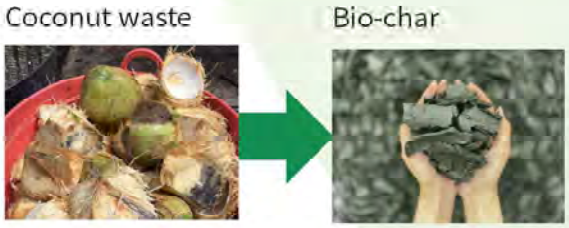
DIRECT COST RETURN

Category	ROI	Evidence
Avoided disposal cost	$60,000.00	On-site waste reuse reduces landfill disposal volume by 20–30%, lowering hauling and tipping costs.
Material recovery	$25,000.00	Recycled concrete and organic waste replace 20–40% of virgin landscaping and soil materials.
Logistics efficiency	$10,000.00	Reduced off-site hauling cuts waste-related truck trips by 25–40%
ESG & branding value	$10,000.00	Circular waste reuse reduces waste-related CO_2 emissions by approximately 15–30%
TOTAL	$105,000	

Waste Management

Circular Economy

We will reuse organic waste and concrete from nearby facilities or the Ayala Group, and support high-quality product development using Japan□proven greening technologies.
The diagram below illustrates how two primary waste streams (concrete and organic waste) are converted into high-value resources.



Benefit

- Contribution to ESG / Certification Credits
- Presence of a Circular Economy
- Reducing Waste in the Development
- CO_2 Reduction

Smart Monitoring ROI SUMMARY

ROI: 15%
Payback: 6 years

The smart monitoring system visualizes flooding, infiltration, water reuse, biodiversity, and CO_2 reduction. It supports compliance with JCM, IFC PS6, and LEED, improving governance and reducing operational risk.

PROJECT SETTINGS
IMonitoring CAPEX: USD 300,000
Annual OPEX: USD 10,000
Coverage: Entire 20 ha development

DIRECT COST RETURN

Category	ROI	Evidence
Avoided regulatory and compliance penalties	$35,000.00	Continuous monitoring reduces flood-related and regulatory risk by approximately 20–40%.
ESG financing and credit advantage	$30,000.00	Verified ESG monitoring can reduce financing costs by 0.2–0.5% through green or sustainability-linked loans.
Operational efficiency and early issue detection	$15,000.00	Predictive monitoring reduces unplanned maintenance costs by 15–25%.
Branding and stakeholder transparency value	$10,000.00	ESG dashboards increase investor and stakeholder confidence by approximately 10–20%
TOTAL	$90,000	

Smart Monitoring

Integrated Dashboard

Develop an integrated monitoring system for environmental improvements—covering infiltration volume, reused water, groundwater levels, biodiversity, and CO_2 reduction—and link it to SMAI's ESG dashboard that makes compliance with JCM, IFC PS6, LEED, and climate finance more transparent.

The integrated dashboard consolidates site-level environmental data and presents real-time ESG metrics for SMAI and financial institutions.

Benefit

- Transparency for ESG & Compliance
- Evidence-Based Decision Making
- Transparency for Stakeholders