



エネルギーと環境を考える

**JANUS**

# Introduction of JAPAN NUS International project experience and prospects

To all partner local governments

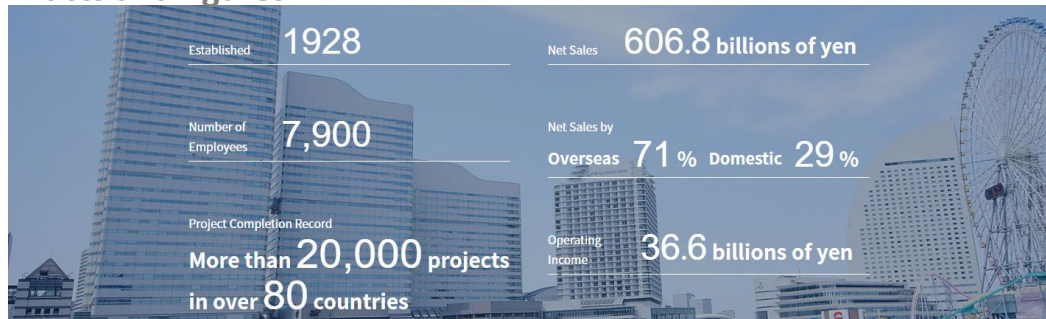
Feb 2024

**日本エヌ・ユー・エス株式会社**



# Company profile - JGC holdings

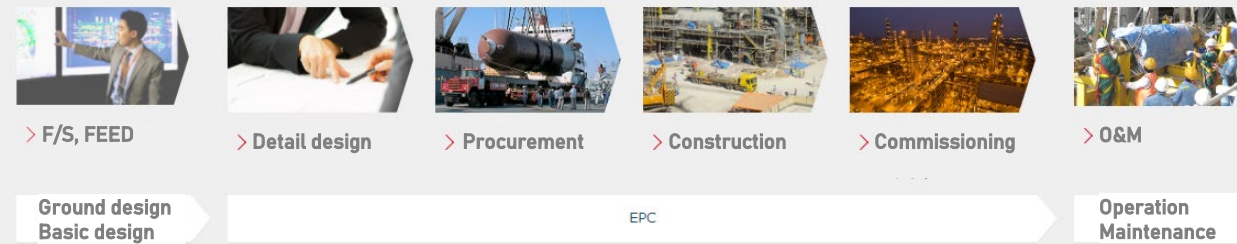
## Facts and figures



## Group structure



## EPC project flow



## Business field

### > Energy transition



LNG  
Offshore  
Renewable energy  
Nuclear energy

CCS  
Hydrogen/Ammonia  
Petro/gas chemical  
CCS

### > Infrastructure



City development  
Airport  
Agriculture

Transportation  
Water treatment  
Smart factory

### > Circular economy and Health care



Waste gasification chemical recycling  
Waste plastic oil chemical recycling  
Polyester chemical recycling  
Sustainable aviation fuel(SAF)

Health care/Life science

### > New business



Licensing business  
Project investment  
Fund business (JGC Mirai fund)  
Platform business



# Company Facts-JANUS

<p>Company Name</p> <p>日本エヌ・ユー・エス株式会社</p> <p><b>Japan NUS Co., Ltd. (JANUS)</b></p>	<p>Head Office</p> <p><b>Tokyo, Japan</b></p>
<p>Capital</p> <p><b>JPY 50 Million</b></p>	<p>Established</p> <p><b>June 3, 1971</b></p>
<p>Shareholders</p> <p><b>JGC HLDGS 88.8%,</b> TEPCO HLDGS 5.5%, KEPCO 2.7%, CHUBU 2.7%</p>	<p>Clients</p> <p><b>Governments, utilities, heavy electric machinery, chemical, and oil companies, etc.</b></p>
<p>Number of Employees</p> <p><b>203 (Mar. 2023)</b></p>	<p>Sales</p> <p><b>JPY 4,637 M (FY 2022)</b></p>

# Our Expertise

We at JANUS strive to contribute to the harmonization of economic development, energy use and environmental protection. Our consulting services will help you expand your business horizons.





# Energy consulting items

## Nuclear Energy: Information Research

We provide a variety of information on **nuclear regulation, safety issues, operating experience, maintenance, and aging management** by timely collaboration with overseas partners in Europe and USA.



### Information Service

Provision of U.S. NPP Licensing Information Services (LIS), European NPP Information Service (NUSEC), U.S. NPP License Renewal Information Service (LR), and so on.

### Information Research

Research on aging management, maintenance optimization, operating experience (accidents and incidents), fire protection, and emergency preparedness of NPPs in Europe and USA

### Safety Improvement

Support on safety improvement, application of risk information, meeting new inspection framework and reactor oversight process (ROP), and applying lessons learned to Japanese NPPs

### Overseas Business Support

Support on environmental/safety evaluation, licensing, and due diligence during the planning stage of overseas NPPs

## New Energy/Renewable Energy

To reduce greenhouse gas emissions and stabilize power supplies, **we promote renewable energy by supporting business operators/ investors, biofuel development and development of our own business tools**



### Business Support/Technical Review

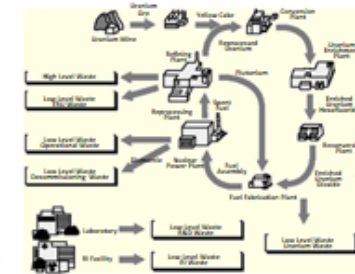
Support planning for operationalizing  
Technical support of facilities/equipment  
Independent technical reviews for financing

### Wind Energy Evaluation

Quantitative assessments of the potential for wind energy potential in complex terrain using ARIA WIND tool

## Nuclear Energy: Back End

To support operation and decommissioning of NPPs and cycle facilities, as well as waste disposal, **we conduct research and analysis on latest domestic/overseas information and perform numerical simulations.**



### Decommissioning

Research and analysis of overseas project experiences, safety regulations, and legal systems

### Fuel Cycle

Research on other countries, numerical simulation for domestic studies, and environmental assessment

### Radioactive Waste Disposal

Follow-up on latest studies in Japan and countries overseas

### Simulation of Underground Migration

Migration of radionuclides from underground repository and impact analysis

## Electricity Market : Information Research/ Business Support

We provide multifaceted consulting services on constantly changing electricity market conditions through our partnerships with domestic and overseas organizations, including **research on worldwide power markets, technology, and regulatory trends.**

Also, we provide support for the **establishment of regional PPS (Power Producer and Supplier)**, facilitating their entry into the electricity markets as part of the liberalization of electricity retail sales.



### Research on worldwide electric utilities

Desk and on-site research on the latest worldwide electric power market trends, technologies, and business strategies

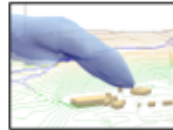
### Business support for regional PPS

Research on electric power demand & electric power supply potential including economic aspects  
Case Studies & business feasibility assessment of regional PPS and study on their expertise

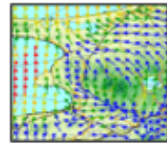
# Environment consulting items-1

## Atmospheric Environment : Numerical Simulation Analyses

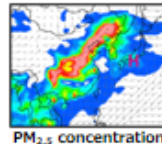
To understand the air quality and efficiency of environmental activities and impact of hazardous materials, we conduct **numerical simulation analysis, and risk evaluation based on our expertise on weather and atmospheric environment** (automated process available).



Plant plume



Wind flow in a complex terrain



PM<sub>2.5</sub> concentration

### Weather simulation

Provisioning of high resolution weather data globally and event analysis based on meteorological information to understand the cause and measures against certain weather events for business optimization.

### Compensation risk assessment

Assessment of maximum damage trend, density and distribution of hazardous chemicals, damage probability distribution, risk of damage for chemical plant accidents.

### Air dispersion and quality simulation

Assessment of environmental impacts of toxic gas from plants, leakage of chemical and radioactive materials, discharge from factories, and vehicular emissions.

Simulations and numerical analysis of environmental policies in Eastern Asian countries (atmospheric-environmental conservation for pollutants including PM<sub>2.5</sub> and ozone).

## Environmental Impact Assessment/ Environmental Conservation

To minimize impacts of resource and infrastructure development on the environment and society, we provide support for **implementation of EIA\***. We also provide that for **environmental modifications such as ocean dumping from the aspects of environmental impact and environmental conservation**.



### EIA in Japan

Support in application procedure, preparation of documents (scoping reports, EIA reports, etc.), monitoring and post survey  
Support for reviewing committees and public consultations

### EIA for Ocean Dumping

Consulting services for international trends and laws related to the ocean dumping based on the London Convention and the domestic laws

### Overseas Feasibility Studies

Studies and procedures related to environmental and social considerations at planning stages of projects funded by private sectors or Official Development Assistance  
Support for EIA by local consultants

## Atmospheric Environment: Air Pollution

To address air quality issues caused by air pollutants such as particulate matter (PM<sub>2.5</sub>) and ozone, we provide support for the application of **air quality modelling and risk assessment techniques**



### Air Emission Inventory

Research on air pollutant/chemical emission inventories based on literature, statistical analysis and questionnaires/interviews

### Health Effects

Literature reviews on epidemiology  
Toxicology of health effects  
Support in epidemiologic studies and analysis

### Atmospheric Modelling

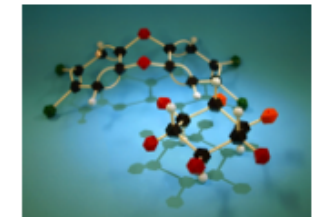
Simulation of air pollution by multi-scale air quality model  
Evaluation of effects of preventative measures

### Data Analysis

Data collection  
Statistical analysis, GIS analysis and risk assessment of air pollutants and health effects

## Chemical substances management

Today, it is internationally required to minimize adverse effects from production and use of chemicals to human and ecosystem health. We provide support in risk management of chemical substances



### Chemical Risk Assessment

Human health and ecological risk assessments of chemicals  
Assistance in policy-making and business practices based on these assessments  
Risk management services

### New and Emerging Issues

Support for taking measures on new, emerging chemical risks, e.g., endocrine disrupting chemicals, PPCPs, nanomaterials and mixture effects of environmental contaminants

### International Chemical Conventions

Consultation for domestic policy-making in accordance with International Conventions  
Organization of international conferences  
Survey on overseas management systems  
Environmental monitoring in line with relevant Convention

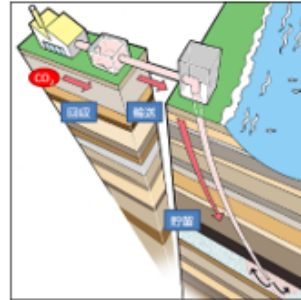


# Environment consulting items-2

## Climate Change

We provide consulting services for **mitigation measures**, i.e., reducing GHG emissions to realize a decarbonized society, and **adaptation measures** to respond systematically to the predictable impacts of climate change.

An Overview of CCS (Source: GCCSI)



### Climate Change

Diverse research on climate change issues  
Support for strategy planning or proposals for CDM/JCM and its credit transaction assistance

### CO<sub>2</sub> capture & storage (CCS)

Research on CCS from multiple perspectives, including: 1) international trends; 2) global and domestic regulatory development; 3) new technologies; 4) economic analysis; 5) environmental impact assessment; and 6) public outreach

## Environmental Education /Leadership Development

With an increasing necessity to communicate about environmental topics among local communities, at schools, and companies, our experts provide support in **scientifically-sound environmental education**.

Workshop on marine debris at school



### Environmental education for companies

Support in leadership development and promotion, and research on environmental activities as CSR

### Events and exhibitions

Attending/organization of exhibitions, environmental conferences

### Environmental education for communities

Production of teaching materials on environmental issues, and organization of community workshops

## Resource circulation/Waste and recycling

To answer the society's needs on waste prevention, waste management and waste disposal, we provide consultation services on **marine litter** and **ocean dumping**.



### Marine Litter

Survey on occurrence and distribution of marine litter, consultation of collection, treatment and waste prevention methods, education programs and public awareness programs etc.



## Fishery Resource Management

Sustainable use of fishery resources such as tuna and bycatch are managed by Regional Fisheries Management Organizations (RFMOs).

We collect fishery information to support appropriate resource management based on **scientific evidence**, ensuring satisfaction of all RFMOs' requirements.



### Resource management

Training of scientific observers  
Planning/implementation of observer programs, including data collection/sampling  
Provision of information on fishery and resource management

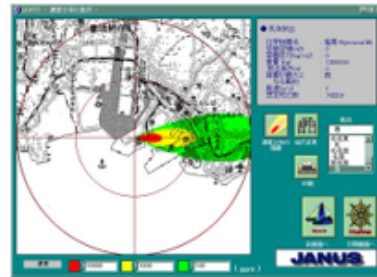
### Bycatch mitigation

Data collection and analysis to support bycatch management  
Development and validation of bycatch mitigation techniques for tuna longline vessels  
Scientific information collection on bycatch species

# Safety & disaster prevention consulting items

## Chemical Plant Safety Impact Assessment

We provide **quantitative evaluations of impacts** of fires, explosions, leaks, and dispersion of chemicals in chemical plants using **impact assessment tools** based on the chemical dispersion simulations. Furthermore, it is possible to **evaluate the degree of damage to local resident** by linking it with population data, **contributing to risk management for government agencies and companies.**



Result example by assessment tool

### Quantitative impact evaluation

Concentration distribution of toxic and flammable gases during chemical leaks, distribution of radiant heat level during fire and distribution of blast pressure during explosion in chemical plants

### Compensation risk assessment for chemical leakage accidents

Impact evaluation on humans of chemical substances based on their diffusion concentration and residence time  
Damage compensation risk assessment based on impact on local residents and population distribution

## Nuclear Disaster Prevention & Exposure Evaluation

We offer analytical services in **atmospheric dispersion modeling and environmental impact assessment** using versatile codes applicable to plume and 3D models.



### Exposure Dose Evaluation

Development of an evaluation system and analysis to estimate background dose exposure and gamma-ray exposure in accidents and normal scenarios

### Radionuclide Transport Modeling

Development of modeling systems and analysis of radionuclide behavior among and within specific environmental media in accidents and normal scenarios

### Rapid Environmental Impact Assessment

Real-time evaluation and prediction of background exposure and the development of an environmental impact assessment system that displays the affected areas in the event of an emergency

### Nuclear Power Plant Fire Protection

Research and evaluation of fire protection/PRA and test implementations in conjunction with US research and consulting firms

## Plant Smartification & Digitalization Service "P-SADS"

JGC experts will help you **identify problems in your plant and provide you possible solutions.** We will develop and deploy **tailor-made AI for your plant** to improve the operational efficiency.



### Step1:

Workshops with the clients to discuss problems of the plant

### Step2:

Visualizations of the physical phenomena on the problems, Verifications of the hypothesis on causes of the problems

### Step3:

Data analyses / AI modellings and proposals for solutions including their trials

### Step4:

Promotions of efficiency by systemization / automation of the solutions

## Fire Protection for Nuclear & Other Industries

We support a variety of projects related to **fire protection for nuclear industry** in collaboration with U.S. research institutes and consulting firms they are leading the way in fire protection technology.



Cable tray fire test

### Survey on fire protection

Literature review and site visit survey on fire protection measures and fire PRA implementation status of U.S. nuclear industry

### Fire testing

Conducting fire tests at a U.S. laboratory for the purpose of evaluating fire protection measures and preparing data sets necessary for fire PRA.

### Assessment of fire protection measures

Site visit and evaluation of nuclear power facilities with a U.S. consulting firm

### Fire protection for other industries

Applying our expertise in fire protection for nuclear industry to the advancement of fire protection for other industrial facilities.



# History of international business of JANUS

Keywords: Information research, international environmental conference, environmental impact study

~2011

- International trend survey of nuclear power
- Government treaty response consulting
- Survey related to JGC Group's overseas business
- Environmental and social DD for overseas investment projects



Keywords: Project development

2011~2017

- Business development with JGC Group
- Preparation for renewable energy investment (small hydropower generation)
- Support for renewable energy business formation through CDM, JCM and Japanese fund



Keywords: Multi-stakeholders collaboration

2018~

- Equipment introduction through JICA project
- Investor support using carbon credit scheme(CDM, JCM)
- City-to-city collaboration project for business development
- Business composition consulting for the Ministry of the Environment, ASEAN, ADB, etc.



# Track records of international business of JANUS

JCM study for hydro power  
in Lao PDR

Wind-power EIA in France

Airport EIA in Myanmar  
Rural development study in  
Myanmar by JICA

City-to-City collaboration  
in Maldives

CDM project development(Coal mining) in China

JCM project development  
(Geothermal power x2 )

ADB JCM project expert  
in Palau

City-to-City collaboration  
in Palau

Infrastructure development  
Power Plants, Highway, Wastewater treatment plant, et al  
Environmental impact assessments and/or survey on social  
consideration (about 20 projects)

City-to-City collaboration in Quang Ninh (JNK)

Regulatory survey related to the industrial park (JNK)

Co-Benefit program in Vietnam

Regulatory survey related  
carbon capture and storage in Vietnam

Feasibility study on the cogeneration project  
Biomass fuel, sugar millet bagasse

Low carbon emission model city project in Da Nang (JNK)

City-to-City collaboration in Ben Tre

Ehime Prefecture Economic cooperation and  
development Project

Regulatory survey related to wind power plant (JNK)

Support for JCM project application  
Biomass power plant in Hau Giang Province

Gas-fired power plant  
in Central Jawa

City-to-City collaboration  
in Banda Aceh

Hydropower development  
in West Sumatra

Geothermal power in  
South Sumatra

LNG receiving terminal  
in Banten

Energy saving project for  
Industrial park in Jakarta

City-to-City collaboration in  
Gorontalo

Hydropower development  
in Tanatraja

Oil and Gas development  
in Sulawesi

City-to-City  
collaboration in Bali

JICA project in  
Denpasar

City-to-City collaboration in  
Semarang

Volcanic disaster  
prevention policy  
survey in West Jawa

Carbon Capture  
and Storage in  
Central Jawa

# Our achievement –CDM project development

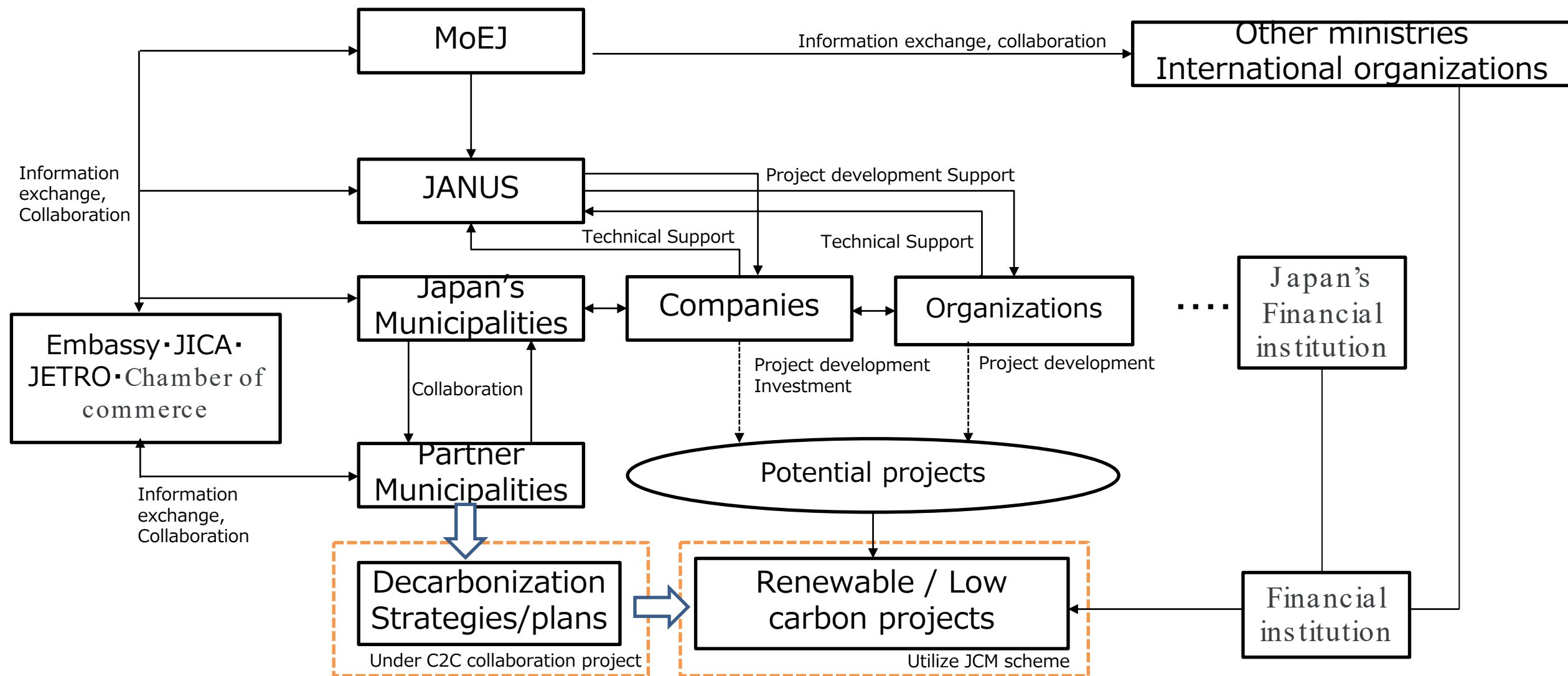
Subject	Target Countries	Type of project	Client	implementation fiscal year (usu. April 1 to March 31)
Creation of CDM project evaluation indicators	-	indexing	private-sector business	2004
CDM feasibility study on cogeneration system using coal mine methane in Shanxi, China (CDM registered: Ref. 3190)	China	F/S	Global Environment Center Foundation	2006
Malan Coal Mine Methane Utilisation Project (Validation)	China	CDM Audit Support	private-sector business	2008
Survey on CDM project using waste-to-energy system in Anhui Province, China	China	F/S	Global Environment Center Foundation	2008
Development support services for CDM project at Shaguang Coal Mine in Shanxi Province, China	China	F/S	private-sector business	2008
Survey on CDM project using waste-to-energy system in Anhui Province, China	China	F/S	Global Environment Center Foundation	2008
Feasibility Study on CNG Utilization and its CDM Conversion in Changji City, Shanxi Province, China	China	F/S	private-sector business	2008
CDM Feasibility Assessment of Associated Gas Recovery and Utilization Project in Oil Field	Kazakhstan	F/S	private-sector business	2008
Duerping Coal Mine Methane Utilization Project (Verification)	China	CDM Audit Support	private-sector business	2009
Survey on Cogeneration CDM Project Using Pellets of Agricultural and Forestry Residues in Jiangsu Province, China	China	F/S	Global Environment Center Foundation	2009
Cikaso Hydroelectric Power Project in Indonesia (CDM)	Indonesia	CDM Development Support	private-sector business	2010
Support for MRV methodology development for the project "Project Identification Study on Greenhouse Gas Emission Reduction through the Introduction of Geothermal Power Generation Facilities (Flash and Binary Systems) in the Republic of Indonesia" (Second Call for Proposals)	Indonesia	MRV Methodology Development	NEDO (Recommissioning)	2011
Biomass Power CDM Feasibility Study with Standardized Baseline Development for Off-Grid Electricity in Cambodia	Cambodia	F/S	Global Environment Center Foundation	2011
Bilateral Offset Credit Scheme MRV Model Demonstration Study "Methane Recovery and Utilization by Livestock Manure Treatment Using a Bio-Digester"	Cambodia	F/S	Global Environment Center Foundation	2012
MRV methodology development support for the project "Project Identification Study for the Modernization and Upgrading of Coal-Fired Power Plants in the Republic of Kazakhstan," a part of the Global Warming Mitigation Technology Dissemination and Promotion Project	Kazakhstan	MRV Methodology Creation Support	NEDO (Recommissioning)	2012



# Our achievement –JCM project development

Subject	Target Countries	Type of project	Client	implementation fiscal year (usu. April 1 to March 31)
JCM feasibility study "3.7MW flow-in small hydropower".	Indonesia	JCM F/S	Global Environment Center Foundation	2014
JCM Feasibility Study "Introduction of Bagasse Utilization Cogeneration in Sugar Mills".	Vietnam	JCM F/S	Global Environment Center Foundation	2014
Support for MRV Methodology Preparation by Photovoltaic Power Generation Project in Palau	Palau	JCM F/S	Global Environment Centre Foundation (Recommissioning)	2014
JCM scheme support (Japanese company promotion business)	Japan	JCM promotion	MOEJ	2015
JF-JCM scheme development support	Japan	JCM promotion	Ministry of the Environment	2016
JF-JCM scheme development support and project ITD review	Japan	JCM promotion	Ministry of the Environment	2017
JCM facility subsidy project by CNG co-firing for public transportation in Semarang, Indonesia	Indonesia	JCM Equipment Assistance Support	private-sector business	2018
Infrastructure Development Study Project for Bilateral Credit Acquisition, etc. in FY2049 (Banda Aceh and Tubinggi, Indonesia)	Indonesia	JCM F/S	Ministry of Economy, Trade and Industry (Recommissioning)	2019
<b>FY 2019-21 City-to-city collaboration Project (Indonesia, Semarang city/Bali-Toyama city)</b>	<b>Indonesia</b>	<b>F/S</b>	<b>Ministry of the Environment</b>	<b>2020-22</b>
<b>FY 2020-22 City-to-city collaboration Project for Realization of Decarbonized Society (Malaysia, Iskandar and Kota Kinabalu-Toyama city)</b>	<b>Malaysia</b>	<b>F/S</b>	<b>Ministry of the Environment</b>	<b>2020-22</b>
<b>FY 2020-22 City-to-city collaboration Project (Maldives, Male-Toyama city)</b>	<b>Maldives</b>	<b>F/S</b>	<b>Ministry of the Environment</b>	<b>2020-22</b>
FY 2020 Bilateral Credit Facility Subsidy Project Mega Solar Project in Mandalay Region	Myanmar	JCM Equipment Assistance Support	private-sector business	2020-22
<b>FY 2021-23 City-to-city collaboration Project (Indonesia, Gorontalo – Ehime prefecture)</b>	<b>Indonesia</b>	<b>F/S</b>	<b>Ministry of the Environment</b>	<b>2021-23</b>
<b>FY 2021-23 City-to-city collaboration Project (Indonesia, Bali – Toyama city)</b>	<b>Indonesia</b>	<b>F/S</b>	<b>Ministry of the Environment</b>	<b>2022-24</b>
<b>FY 2022-24 City-to-city collaboration Project (Palau, Airai - Urasoe city)</b>	<b>Palau</b>	<b>F/S</b>	<b>Ministry of the Environment</b>	<b>2022-24</b>
<b>FY 2023-25 City-to-city collaboration Cooperation (Malaysia, Iskandar - Toyama city)</b>	<b>Malaysia</b>	<b>F/S</b>	<b>Ministry of the Environment</b>	<b>2023-25</b>
<b>FY 2023-25 City-to-city collaboration Project (Viet nam, Ben tre – Ehime prefecture)</b>	<b>Vietnam</b>	<b>F/S</b>	<b>Ministry of the Environment</b>	<b>2023-25</b>
JCM Application support for Biomass	Vietnam	JCM Equipment Assistance Support	private-sector business	2022
JCM Application support for Geothermal	Philippines	JCM Equipment Assistance Support	private-sector business	2022

# Multi-stakeholders collaboration by C2C project

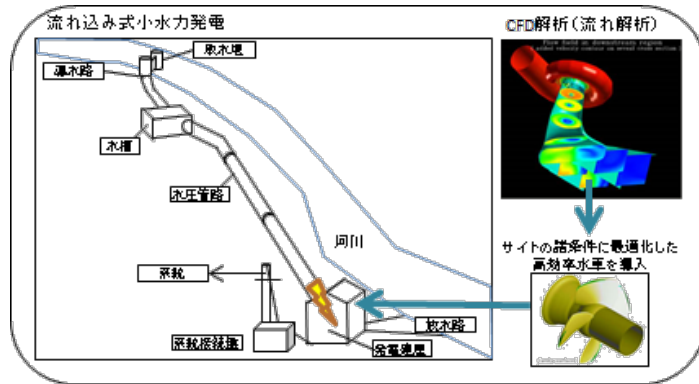


# Achievements relating facilities introduction

## JANUS

### Small hydro power generation

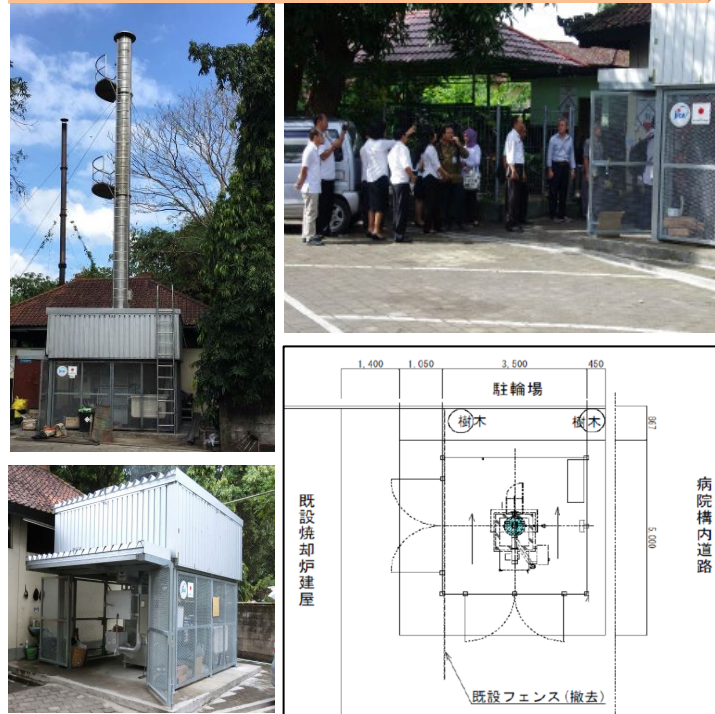
Formed a business with the aim of in-house investment. The project was suspension because conditions did not match with the local counterpart.



## JANUS × Technology holder

### Medical waste management

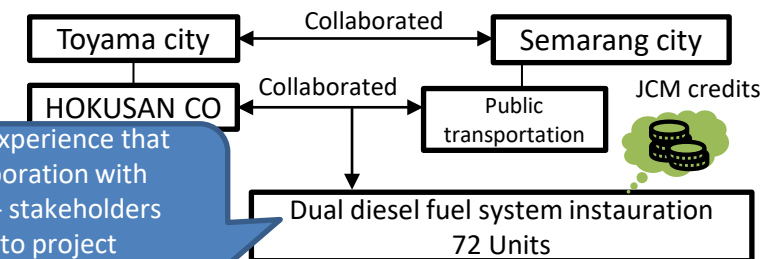
A small incinerator was introduced to process medical waste from hospitals through a JICA project.



## JANUS × Local government × Technology holder

### Fuel conversion to public bus

A project aimed at reducing carbon emissions by switching from diesel fuel to gas. System installed on 72 public buses



Our experience that collaboration with multi- stakeholders leads to project success

**Our experience : Collaboration with multi- stakeholders leads to project success**



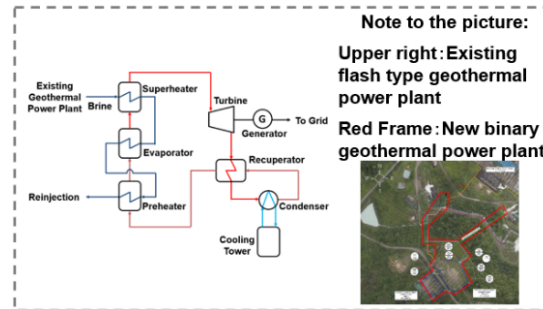
# Collaboration with project investors

JANUS × JGC × Business owner × Technology holder

## Outline of GHG Mitigation Activity

Installing Not registered

The project involves the introduction of a new 28 MW binary geothermal power plant to the existing 120 MW flash geothermal power plant owned and operated by the partner participant in the Mahanagdong district of Leyte Island. As a superior decarbonization technology, Organic Rankine Cycle technology is adopted to enable geothermal power generation at relatively low temperatures, resulting in clean and stable power generation. This project contributes to the achievement of Philippines' policy for a renewable energy ratio target of 35% in 2030.



Site of JCM Project

## Expected GHG Emission Reductions

76,220 tCO<sub>2</sub>-eq./year

= (Reference CO<sub>2</sub> emissions)  
- (Project CO<sub>2</sub> emissions)

• Reference CO<sub>2</sub> emissions  
= (Quantity of the electricity generated by the project) [MWh/year]  
× Emission factor [tCO<sub>2</sub>/MWh]  
• Project CO<sub>2</sub> emissions  
= 0 [tCO<sub>2</sub>/year]



## Outline of GHG Mitigation Activity

Installing Not registered

In Hau Giang Province, a 20 MW biomass power plant project is to generate power by burning rice husks produced in the adjacencies. The electricity is sold to the Vietnam Electricity to replace the grid power and to reduce greenhouse gas (GHG) emissions.

This is the first biomass power plant for commercial use in Vietnam and contributes to the country to achieve its Paris Agreement goal to "reduce greenhouse gas emissions by 9% in 2030 compared to cases where no counter measures are taken."



Site of JCM Project

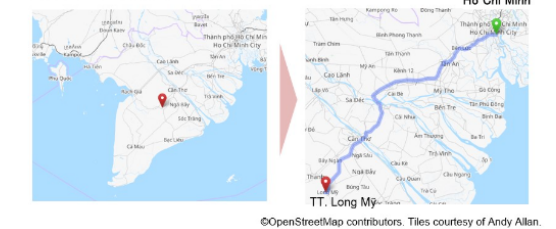
## Expected GHG Emission Reductions

36,814 tCO<sub>2</sub>-eq./year

= (Reference CO<sub>2</sub> emissions)  
- (Project CO<sub>2</sub> emissions)

• Reference CO<sub>2</sub> emissions  
= (Quantity of the electricity generated by the project) [MWh/year]  
× Emission factor [tCO<sub>2</sub>/MWh]  
• Project CO<sub>2</sub> emissions  
= (Heat Quantity needed for project's fuel transportation) [GJ/year]  
× Emission factor [tCO<sub>2</sub>/GJ]

210km southwest of Ho Chi Minh.

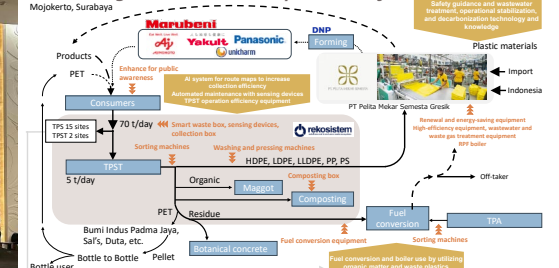


JANUS × ASEAN state countries × Japanese company association × Local government × Local companies

Through the Japan-ASEAN Integration Fund, we will conduct business matching in collaboration with groups of Japanese companies (CLOMA) that are willing to invest in recycling and waste management businesses to address waste treatment issues in ASEAN.



## Grand Design : Circular Economy Model Project





# Our vision

Japan NUS Co., Ltd. utilizes its advanced consulting capability developed in the fields of energy, environment, and social science to contribute to the creation of a sustainable society and a prosperous, secure future society.

1. A close partner to our clients at all times  
We support our clients to find solutions to their challenges and problems. All our executives and consultants tackle issues together with our clients with a desire to make improvements.
2. Information service from a global perspective  
We effectively utilize our global and valuable technical information, knowledge, and wisdom to contribute to creating 'new wisdom' and 'the future' for our clients.
3. Business beyond the limits of consulting  
We utilize our know-how, experience, and networks acquired in consulting to take on a range of businesses in Japan and overseas that help to create a sustainable society.
4. Fair and equitable business activities  
We always conduct compliance-aware business activities and sustain a high level of social credibility.