

# **AZEC Progress Report 2023 in PowerPoint Excerpt from Chapters 3-5**

**December 2023  
Secretariat of AZEC**

### **3. Updated information on AZEC related activities**

Summary of meetings, training programs, frameworks under the AZEC

- 1) Inauguration of “AZEC/GX Promotion Working Team” in Viet Nam
- 2) Inauguration of “AZEC Japan-Indonesia Joint Task Force” in Indonesia
- 3) AZEC International Conference to Promote the JCM and Develop Carbon Markets
- 4) AZEC Energy Transition Workshop 2023
- 5) The 5th CEFIA Government-Private Forum
- 6) Projects in AETI
- 7) Second Japan-Indonesia Public-Private Economic Dialogue (Track 1.5)
- 8) Third Asia CCUS Network Forum
- 9) AZEC Online Seminar

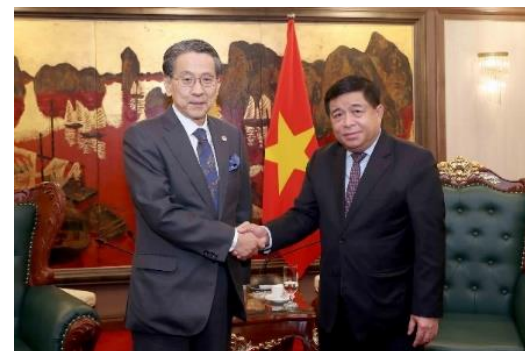
# Updated information on AZEC related activities

## **1) Inauguration of “AZEC/GX Promotion Working Team” in Viet Nam**

On July 26, 2023, Japan and Viet Nam agreed to inaugurate an “AZEC/GX Promotion Working Team” in Hanoi, Viet Nam.

Viet Nam is the first country after the launch of AZEC to inaugurate a framework in which the Japanese public and private sectors and the government of the partner country hold deliberations in the country.

\*Ref: [https://www.meti.go.jp/english/press/2023/0726\\_004.html](https://www.meti.go.jp/english/press/2023/0726_004.html)



*Photo: Japan Bank for International Cooperation*

## **2) Inauguration of “AZEC Japan-Indonesia Joint Task Force” in Indonesia**

On September 21, 2023, Japan and Indonesia agreed to inaugurate AZEC Japan-Indonesia Joint Task Force in Jakarta, Indonesia.

\*Ref: [https://www.meti.go.jp/english/press/2023/0921\\_002.html](https://www.meti.go.jp/english/press/2023/0921_002.html)



*Photo: Japan Bank for International Cooperation*

# Updated information on AZEC related activities

## 3) AZEC International Conference to Promote the JCM and Develop Carbon Markets

- On September 28 and 29, 2023, METI and the Ministry of the Environment (MOE) jointly held the AZEC-JCM International Conference. The conference brought together government officials from energy and environment ministries and agencies in AZEC partner countries.
- At the conference, participants exchanged information and views focusing on five topics: [i] Progress on JCM, [ii] Recent development on carbon markets in partner countries, [iii] Relationship between Energy markets and Carbon markets in partner countries, [iv] Status on Implementing Article 6 of the Paris Agreement, and [v] Possibilities for regional cooperation through collaboration among JCMs and other efforts.
- Participants held proactive discussions on future approaches to promoting the utilization of the Joint Crediting Mechanism (JCM) and developing carbon markets in AZEC partner countries.

\*Ref: [https://www.meti.go.jp/english/press/2023/0929\\_002.html](https://www.meti.go.jp/english/press/2023/0929_002.html)





# Updated information on AZEC related activities

## **4) AZEC Energy Transition Workshop 2023**

The Institute of Energy Economics, Japan (IEEJ) held the AZEC Energy Transition Workshop 2023 from Oct. 13 to 19, 2023. Participants reported and exchanged views on energy transition policies and the challenges faced in their respective countries. Participants also engaged in site visits to witness Japan's cutting-edge technologies and relevant pilot projects. Through this workshop, participants deepened mutual understanding of "one goal, various pathways" to achieve carbon neutrality.

\*Ref: <https://eneken.ieej.or.jp/data/11363.pdf>



## **5) The 5th CEFIA Government-Private Forum**

On August 25, 2023, the 5th CEFIA (Cleaner Energy Future Initiative for ASEAN) Government-Private Forum was held in Bali, Indonesia, jointly with the ASEAN Energy Business Forum (AEBF) 2023. Participants from governments, companies, financial institutions, etc. of Japan and the ASEAN countries held active discussions on cooperation projects between Japan and ASEAN countries toward implementing decarbonizing technologies, cross-cutting efforts for financing, avoided emissions, and foster entrepreneurs, and digital energy management. In addition, a business matching event was held between participating Japanese companies and industrial associations and ASEAN companies.

\*Ref: [https://www.meti.go.jp/english/press/2023/0825\\_005.html](https://www.meti.go.jp/english/press/2023/0825_005.html)



## 6) Projects in AETI

### • Roadmap development

- ✓ The ERIA\*<sup>1</sup> and the IEEJ\*<sup>2</sup> have developed the roadmaps (model analyses) that utilize all energy sources and technologies based on cost minimization models, based on carbon neutrality target years of each ASEAN country.
- ✓ While carefully listening to the requests of ASEAN countries, ERIA accompanies and supports each government in formulating and flexibly optimizing their roadmaps in line with their domestic circumstances and energy policy directions.

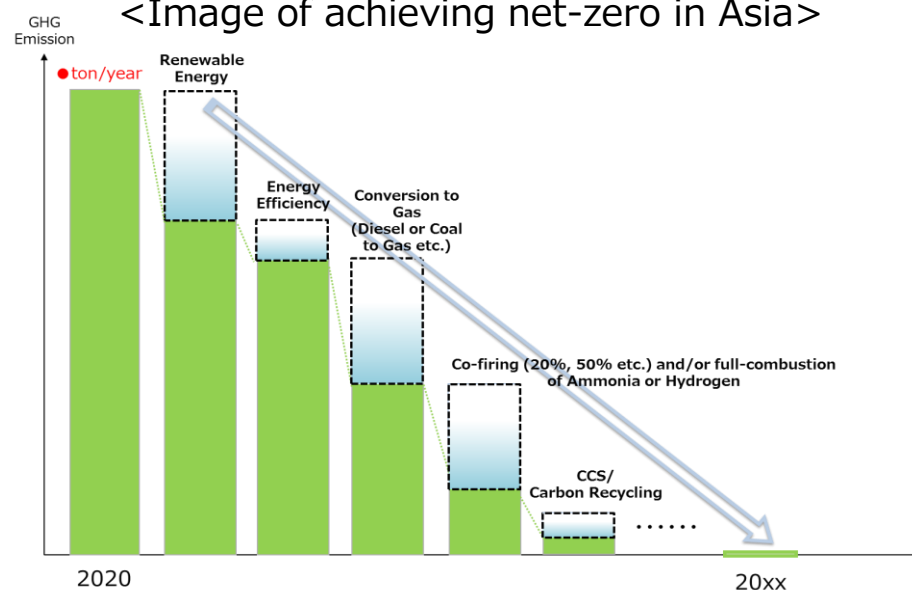
\*1: ERIA = Economic Research Institute for ASEAN and East Asia

\*2: IEEJ = the Institute of Energy Economics, Japan

### • Human resource development

- ✓ Japan has provided HR development training programs for government officials and business professionals in Asian countries, such as Vietnam and Thailand.
- ✓ The program consisted of ①lectures on energy transition and roadmap, ②site visits to key industrial, and ③ business matching session.

<Image of achieving net-zero in Asia>



[Cost minimization model]

- An assumption that **the cheapest energy sources and technologies will be introduced first**, followed by more expensive ones.



# Updated information on AZEC related activities

## 7) Second Japan-Indonesia Public-Private Economic Dialogue (Track 1.5)

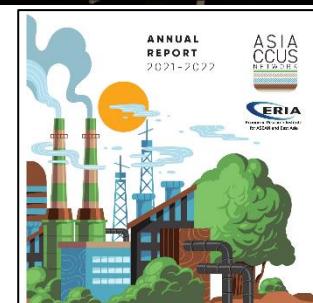
On May 30, 2023, the second meeting of the “Japan-Indonesia Public-Private Economic Dialogue (Track 1.5)” was held in Tokyo to discuss the promotion of efforts by Japanese and Indonesian public and private sectors in such areas as digital technology, green industry and human capital development based on “the ASIA-Japan Investing for the Future Initiative.”

\*Ref: [https://www.meti.go.jp/english/press/2023/0531\\_001.html](https://www.meti.go.jp/english/press/2023/0531_001.html)



## 8) Third Asia CCUS Network Forum

On September 27, 2023, the third Asia CCUS Network Forum was held in a hybrid format at Hilton Hiroshima. The forum provided several activities focusing on the practical aspect of carbon capture, utilization and storage (CCUS): discussion on CCUS importance and global trends, Asia-wide CCUS projects, and a signing ceremony of several memorandums of understanding (MOUs) regarding CCUS, which are developing import/export mechanism of CO2 and knowledge sharing CCS technology. The Asia CCUS Network will continue to support the expansion of CCUS deployment in Asia as a platform.





# Updated information on AZEC related activities

## 9) AZEC Online Seminar (URL: <https://asiazeroemission.com/>)

### Hydrogen By NEDO

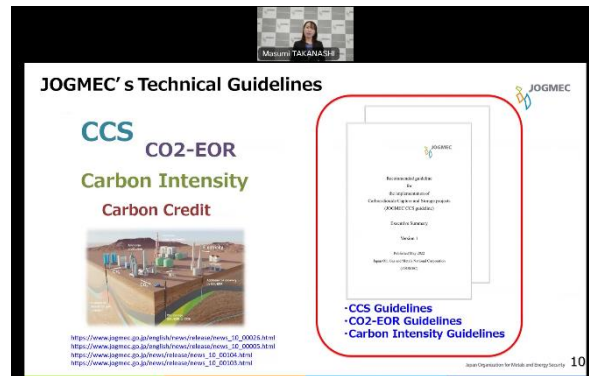
Current Topic: Various Fuel Cell Application development (NEDO)



#### The Contents

- ✓ Japan's policy and related updates including the direction of how to promote hydrogen
- ✓ Introduction and explanation of R&D projects of hydrogen including fuel cell application, hydrogen and gas turbine, MW scale electrolysis

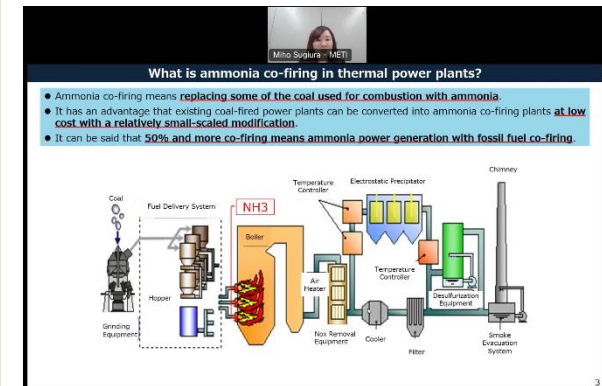
### CCS By JOGMEC



#### The Contents

- ✓ CO2 storage potential in Southeast Asia
- ✓ Introduction of JOGMEC's Workshop and Handbook for CCS Carbon Credit
- ✓ JOGMEC's Technical Guidelines (CCS, CO2-EOR, Carbon Intensity)
- ✓ JOGMEC's projects and cooperation in Asia-Pacific

### Ammonia By METI



#### The Contents

- ✓ Explanation of the effectiveness of ammonia co-firing especially in Asia
- ✓ Introduction of ammonia co-firing into existing coal-fired power plants and ammonia firing into gas-fired power plants
- ✓ Technology development for the utilization of ammonia

## 4. Support Programs and Resources in AZEC

The following are Japanese agencies and organizations engaged in AZEC, with rich experience in financial support and technical cooperation such as capacity building, improving business environments and technology introduction.

- The Association for Overseas Technical Cooperation and Sustainable Partnerships (AOTS)
- The Energy Conservation Center, Japan (ECCJ)
- The Institute of Energy Economics, Japan (IEEJ)
- Japan Bank for International Cooperation (JBIC)
- Japan External Trade Organization (JETRO)
- Japan International Cooperation Agency (JICA)
- Japan Organization for Metals and Energy Security (JOGMEC)
- New Energy and Industrial Technology Development Organization (NEDO)
- Nippon Export and Investment Insurance (NEXI)

# Outline of Supports in AZEC

- Japan provides financial support, technology support and capacity building to AZEC partners pursuing energy transitions tailored to each country's circumstances.



## Supports by Government of Japan

**Financial Support**  
JBIC, NEXI, JICA and JOGMEC etc.

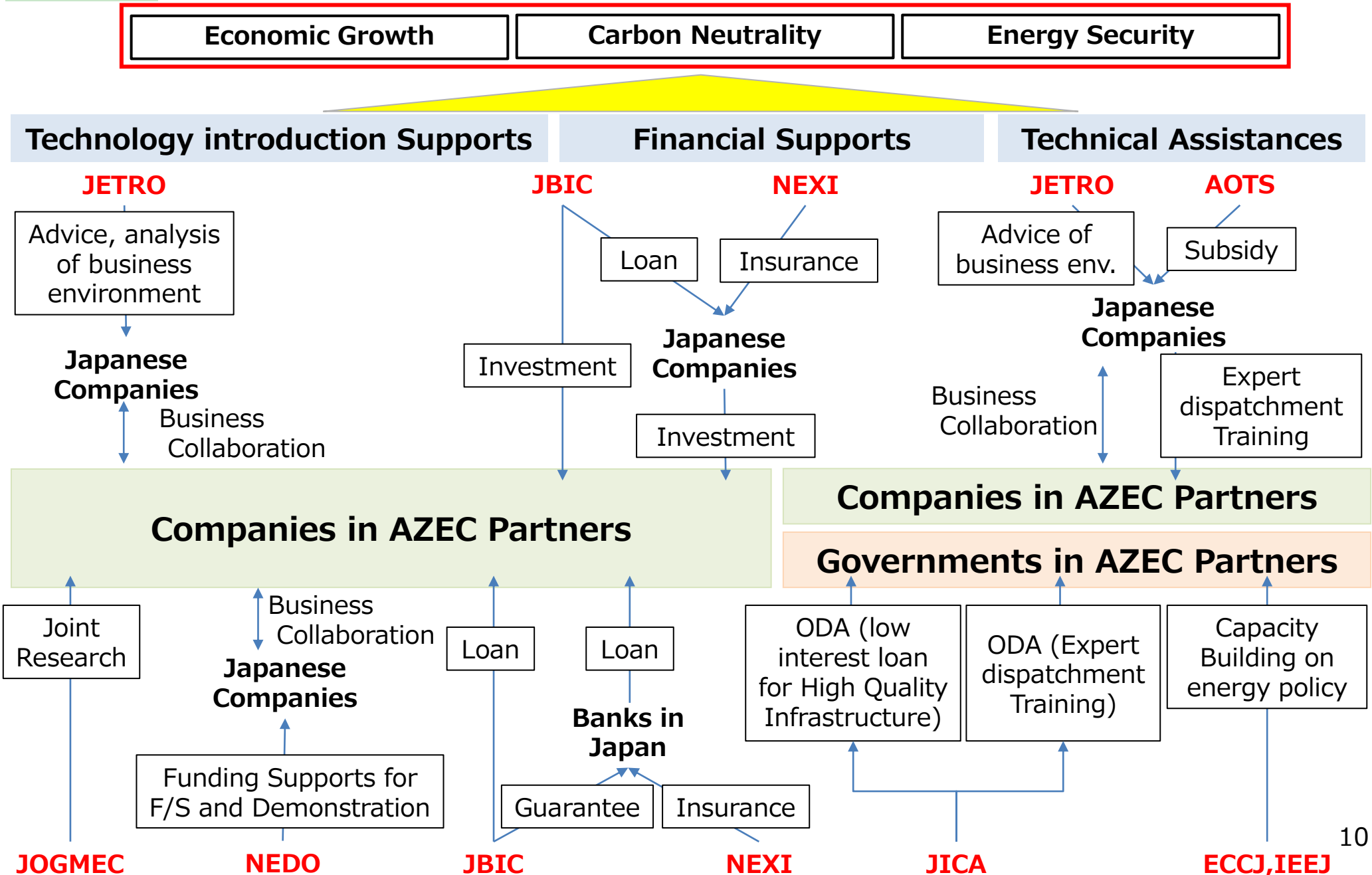
**Technology Support**  
NEDO and JOGMEC etc.

**Capacity Building**  
JICA, IEEJ, ECCJ, AOTS and JETRO etc.



# Outline of Supports in AZEC

\*Including, but not limited to the chart below.



# Supports for AZEC partners by AOTS

AOTS has provided trainings for **3,312 engineers and managers** and has dispatched **182 Japanese experts** to AZEC partner countries through Japanese government subsidized program (Support Program for HRD to Export Carbon Reduction Technology/ HRD Program towards Zero Emission in Asian Countries & Regions)

## Number of Trainees and Experts (FY2014~FY2023\*)

\* The numbers include trainees/ experts of programs completed before end of Oct 2023..

### Overseas Training for Reducing Defects in Automotive Parts Production Process with Electric Furnaces (FY2019)

A Japanese Auto-parts manufacturer sent an engineer to its Thai subsidiary to conduct a 22-day group training on production management using high-efficiency welding furnaces.



#### Achievement

By improving workers' skill and reducing defect rate, the Thai subsidiary has achieved elimination of production and energy losses.

### Thailand

**Technical training in JPN** 941 trainees  
**Management training in JPN** 98 trainees

- FY2017 The Prog. on Monozukuri (Production Management) (THPM)
- FY2019 Prog. on Productivity Improvement (THPI)

**Training in Thailand** 162 trainees

- FY2017 Training for Indoor Wiring Technicians at Overseas Offices - Intermediate
- FY2017 Training for Indoor Wiring Technicians at Overseas Offices - Advanced
- FY2017 On-site Training on Plastic Molding & Mold - Intermediate
- FY2017 On-site Training on Plastic Molding & Mold - Intermediate 1
- FY2017 On-site Training on Plastic Molding & Mold - Intermediate 2
- FY2019 Training for Reducing Defects in Electric Furnace Process
- FY2019 Training for Reduction of Mold Design and Machining Time
- FY2020 Training on Energy Saving at Production Site
- FY2021 Training on Energy Saving at Production Site

**Expert dispatch** 54 experts

### Vietnam

**Technical training in JPN** 327 trainees  
**Management training in JPN** 94 trainees

- FY2017 The Production Management Training Prog. (VNPM)
- FY2017 The Productivity Improvement Training Prog. (VNPI)
- FY2018 The Productivity Improvement Training Prog. (VNPI)
- FY2019 The Program on Productivity Improvement (VNPI)

**Training in Vietnam** 91 trainees

- FY2015 Production Mgt. and Hardened Flesh Remediation
- FY2017 Improvement of Installation and Reduction of CO2 Emission by utilizing VE method etc.
- FY2017 Improvement of Productivity and Energy Efficiency by utilizing IE Methods
- FY2019 Production Management Training for Leaders of Wooden Mold Production Site
- FY2019 QC Mgt. Training for Productivity Improvement

**Expert dispatch** 47 experts

### Laos

**Technical training in JPN** 20 trainees

### Cambodia

**Technical training in JPN** 20 trainees

### Malaysia

**Technical training in JPN** 70 trainees  
**Management training in JPN** 36 trainees

- FY2017 The Prog. on Environmental Management (MYEM)

**Training in Malaysia** 12 trainees

- FY2017 On-site Training for Plastic Molding & Mold Beginners

**Expert dispatch** 7 experts

### Philippines

**Technical training in JPN** 256 trainees  
**Management training in JPN** 46 trainees

- FY2016 The Prog. on Program & Project Management (PHPP)
- FY2017 The Program on Environmental Management (PHEM)
- FY2017 The Corporate Management Program (PHPE)
- FY2018 The Prog. on Program & Project Management (PHPP)

**Training in the Philippines** 215 trainees

- FY2016 Tips for Successful Gemba Kaizen Activities
- FY2017 Gemba Kaizen (SS, Visual Mgt. & Elimination of Muda)
- FY2017 Energy Saving by Improving Machine Efficiency and Quality
- FY2017 Training for Indoor Wiring Technicians at Overseas Offices - Intermediate
- FY2018 Training for Indoor Wiring Technicians at Overseas Offices - Advanced
- FY2018 Basics of Monozukuri and Kaizen
- FY2019 Production Management Training for Leaders of Wooden Mold Production Site
- FY2023 Seminar on Energy Recovery from Waste

**Expert dispatch** 15 experts

### Indonesia

**Technical training in JPN** 533 trainees  
**Management training in JPN** 61 trainees

- FY2017 The Logistics Management Training Program (IDLMP)
- FY2017 The Program on Production Maintenance (IDMP)

**Training in Indonesia** 318 trainees

- FY2017 On-site training for Plastic Molding & Mold Beginners
- FY2018 On-site training on Dies & Molds
- FY2016 Gemba Kaizen (SS, Visual Mgt. & Elimination of Muda) 1
- FY2016 Gemba Kaizen (SS, Visual Mgt. & Elimination of Muda) 2
- FY2017 Basics of Monozukuri 1
- FY2017 Basics of Monozukuri 2
- FY2017 Improvement and Energy Saving of Production Process
- FY2018 Improvement of Production Site utilizing IoT 1
- FY2018 Improvement of Production Site utilizing IoT 2
- FY2020 Training on Productivity Improvement by TPS
- FY2021 Training on Energy Saving Activities at Production Site

**Expert dispatch** 59 experts

### Technical Training in Japan for Construction Engineers of High-Efficiency Thermal Power Plants in which Japanese Companies Involve (FY2017)

13-week JP language training at AOTS training center  
 +  
 8-month onsite training at a power plant in Japan



#### Achievement

The trainees, who have acquired skills in generator installation, long-term maintenance and safety management, are engaged in the construction of high-efficiency thermal and geothermal power plants in Indonesia, contributing to improving power generation efficiency and lowering carbon emissions in Indonesia.

### Singapore

**Technical training in JPN** 11 trainees

### Australia

**Management training in JPN** 1 trainee

### Management Training in Japan The Program on Energy Management in Manufacturing Industry (FY2015, 2016 & 2017)



A 2-week group training at AOTS consisting of lectures, facility visits and group discussion, etc. on

- Energy management at manufacturing industry, and
- Energy saving in each phase of product lifecycle: development, design and manufacturing.

#### Achievement

From AZEC partners, 1 corporate manager from Australia, 8 from Thailand, and 2 from Vietnam participated. They made use of what they learned in Japan to solve the issues and promote energy conservation for the purpose of generating profit at their respective companies.

### Management Training Programs for All Countries & Regions with Participation from AZEC partners

- FY2015 The Production Management Training Program (PMP)
- FY2015 The Prog. on Energy Management in Manufacturing Industry (PEMM)
- FY2015 The Quality Control Training Course (QCTC)
- FY2016 The Corporate Mgt. Prog. on Energy & Resource Saving (CMPE)
- FY2016 The Production Management Training Program (PMP)
- FY2016 The Prog. on Energy Management in Manufacturing Industry (PEMM)
- FY2016 The Quality Control Training Course (QCTC)
- FY2016 The Production Management Training Program 2 (PMP2)
- FY2016 The Program on Development of Smart Community (VNSC)
- FY2016 The Program on Production Management (THPM)
- FY2017 The Corporate Mgt. Prog. on Energy & Resource Saving (CMPE)
- FY2017 The Logistics Management Training Program (LMT)
- FY2017 The Training Program on Program & Project Management (PPTP)
- FY2017 The Training Program on Program & Project Management for Advanced Infrastructure (PPMI)
- FY2017 The Production Management Training Program (PMP)
- FY2017 The Program on Energy Management in Manufacturing Industry (PEMM)
- FY2017 The Quality Control Training Course (QCTC)
- FY2017 The Production Management Training Program 2 (PMP2)
- FY2017 The Quality Control Training Course 2 (QCTC2)
- FY2017 The Executive Program on Production Management 2 (EPPM2)
- FY2017 The Logistics Management Training Program 2 (LMT2)
- FY2018 The Logistics Management Training Program (LMT)
- FY2018 The Program on Innovative Production Management by IT (TIPI)
- FY2018 The Program on Eco Business Innovation (TEBI)
- FY2018 The Production Management Training Program (PMP)
- FY2018 The Quality Control Training Course (QCTC)
- FY2019 The Program on Productivity Improvement (TPPI)

# Supports in AZEC partners by ECCJ

- ECCJ has supported **172 projects** in the field of energy management in AZEC region countries for "legal framework development and human resource development" to enhance energy efficiency and disseminate energy-saving equipment and technologies, in addition to establishing the legal system for the energy conservation act.

## List of METI Energy Conservation Human Resource Development Support Projects (FY 2004 - FY 2023)

As of November 17, 2023

### Lao PDR

- Transfer of Japan's energy conservation legal system and technology
- Establishment of energy conservation legal system
- Narrowing the gap in EE&C policies and legal system in the region
- Sharing CN policies and technologies in industry, buildings, and transportation
- Creation of energy management tools
- Establishment of ASEAN Energy Award
- Advancement of industrial energy management
- OJT for energy-saving diagnosis of factories and buildings
- Creation of energy-saving diagnostic tools
- Energy-saving project formation
- Establishment of energy manager system
- Expansion of quality and quantity of energy managers
- Training and approval of energy manager trainers
- Technical support for SAEMAS construction
- ◆ Establishment of S&L system for air conditioners
- ◆ Regional harmonization of S&L system for air conditioners
- ◆ Introduction of Green Building Code
- ◆ Promotion of ZEB

### Thailand

- Transfer of Japan's energy conservation legal system and technology
- Establishment of energy conservation legal system
- Sharing CN policies and technologies in industry, buildings, and transportation
- Creation of energy management tools
- Establishment of ASEAN Energy Award
- Support for formulation of energy management handbooks
- Establishment of energy manager award system
- Support for formulation of industrial EC guidelines
- Support for introduction of equipment energy management manuals
- Advancement of industrial energy management
- OJT for energy-saving diagnosis of factories and buildings
- Creation of energy-saving diagnostic tools
- Energy-saving project formation
- CN diagnosis/project formation support
- Establishment of energy manager system
- Expansion of quality and quantity of energy managers
- Training and approval of energy manager trainers
- Technical support for SAEMAS construction
- ◆ Establishment of S&L system for air conditioners
- ◆ Improvement of S&L system for air conditioners
- ◆ Introduction of Green Building Code
- ◆ Support for building energy management systems for universities
- ◆ Promotion of ZEB

### Malaysia

- Transfer of Japan's energy conservation legal system and technology
- Creation of energy conservation master plan
- Establishment of energy conservation legal system
- Support for thermal management introduction system
- Sharing CN policies and technologies in industry, buildings, and transportation
- Creation of energy management tools
- Establishment of ASEAN Energy Award
- Advancement of industrial energy management
- OJT for energy-saving diagnosis of factories and buildings
- Creation of energy-saving diagnostic tools
- Energy-saving project formation
- Industrial energy management system model project
- CN diagnosis/project formation support
- Establishment of energy manager system
- Expansion of quality and quantity of energy managers
- Training and approval of energy manager trainers
- Technical support for SAEMAS construction
- ◆ Establishment of S&L system for air conditioners
- ◆ Improvement of S&L system for air conditioners
- ◆ Introduction of Green Building Code
- ◆ Promotion of ZEB

### Indonesia

- Transfer of Japan's energy conservation legal system and technology
- Establishment of energy conservation legal system
- Establishment of energy conservation regulations
- Sharing CN policies and technologies in industry, buildings, and transportation
- Improvement of qualities of energy conservation policy officer
- Creation of energy management tools
- Establishment of ASEAN Energy Award
- Support for building energy management systems for the rubber industry
- Advancement of industrial energy management
- OJT for energy-saving diagnosis of factories and buildings
- Creation of energy-saving diagnostic tools
- Energy-saving project formation
- Industrial energy management system model project
- Introduction of industrial energy saving target setting method
- Establishment of energy manager system
- Expansion of quality and quantity of energy managers
- Training and approval of energy manager trainers
- Technical support for SAEMAS construction
- ◆ Establishment of S&L system for air conditioners
- ◆ Improvement of S&L system for air conditioners
- ◆ Introduction of Green Building Code
- ◆ Promotion of ZEB

### Singapore

- Transfer of Japan's energy conservation legal system and technology
- Establishment of energy conservation legal system
- Sharing CN policies and technologies in industry, buildings, and transportation
- Creation of energy management tools
- Establishment of ASEAN Energy Award
- Advancement of industrial energy management
- OJT for energy-saving diagnosis of factories and buildings
- Creation of energy-saving diagnostic tools
- Energy-saving project formation
- Establishment of energy manager system
- Expansion of quality and quantity of energy managers
- Training and approval of energy manager trainers
- Technical support for SAEMAS construction
- ◆ Establishment of S&L system for air conditioners
- ◆ Introduction of Green Building Code
- ◆ Promotion of ZEB

### Philippines

- Transfer of Japan's energy conservation legal system and technology
- Establishment of energy conservation legal system
- Sharing CN policies and technologies in industry, buildings, and transportation
- Creation of energy management tools
- Establishment of ASEAN Energy Award
- Advancement of industrial energy management
- OJT for energy-saving diagnosis of factories and buildings
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- ◆ Improvement of S&L system for air conditioners
- ◆ Introduction of Green Building Code
- ◆ Promotion of ZEB

### Vietnam

- Transfer of Japan's energy conservation legal system and technology
- Establishment of energy conservation legal system
- Support for formulation of energy conservation laws
- Establishment of infrastructure for enforcement of energy conservation laws
- Sharing CN policies and technologies in industry, buildings, and transportation
- Improvement of qualities of energy conservation policy officer
- Improvement of qualities of local bureau staff
- Creation of energy management tools
- Establishment of ASEAN Energy Award
- Advancement of industrial energy management
- OJT for energy-saving diagnosis of factories and buildings
- Creation of energy-saving diagnostic tools
- Energy-saving project formation
- Establishment of energy manager system
- Expansion of quality and quantity of energy managers
- Training and approval of energy manager trainers
- Technical support for SAEMAS construction
- ◆ Establishment of S&L system for air conditioners
- ◆ Improvement of S&L system for air conditioners
- ◆ Introduction of Green Building Code
- ◆ Promotion of ZEB
- ◆ Building energy saving technology

### Cambodia

- Transfer of Japan's energy conservation legal system and technology
- Establishment of energy conservation legal system
- Narrowing the gap in EE&C policies and legal system in the region
- Sharing CN policies and technologies in industry, buildings, and transportation
- Creation of energy management tools
- Establishment of ASEAN Energy Award
- Advancement of industrial energy management
- OJT for energy-saving diagnosis of factories and buildings
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- ◆ Establishment of S&L system for air conditioners
- ◆ Regional harmonization of S&L system for air conditioners
- ◆ Introduction of Green Building Code
- ◆ Promotion of ZEB

### Brunei Darussalam

- Transfer of Japan's energy conservation legal system and technology
- Establishment of energy conservation legal system
- Sharing CN policies and technology for industry, buildings, and transportation
- Creation of energy management tools
- Establishment of ASEAN Energy Award
- Advancement of industrial energy management
- OJT for energy-saving diagnosis of factories and buildings
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- ◆ Establishment of S&L system for air conditioners
- ◆ Introduction of Green Building Code
- ◆ Promotion of ZEB

# Supports in AZEC partners by IEEJ

- IEEJ has conducted **52 workshops** on new and renewable energy with AZEC partner countries to support human resource and policy development, thus contributing to the introduction of cutting-edge technologies and policy dialogue tailored to the individual circumstances of each country.

## Workshops under METI "New Energy Capacity Building Project" (2013-2023)



### Case 1: Indonesia



Workshop led to provision of grid stabilization service for PV integration in North Sulawesi

### Case 2: Vietnam



Workshop led to HDVC Pre-FS

### Case 3: Vietnam



WS led to increased expectations for policy dialogue on offshore wind policy



# Major Track Record in AZEC partner countries

JBIC has provided financial support for energy transition which contributes to economic growth and addressing climate change.

## **Vietnam**

- Loan for Biomass Fuel Manufacturing and Sales (erex Co., Ltd.)
- Credit Line for Vietcombank to finance renewable energy projects
- Loan for Rooftop Solar Power Generation Project at Thang Long Industrial Park II (Sumitomo Corporation)
- Loan for Manufacturing and Sales of Solar Panel Sheet Glasses (Nippon Sheet Glass Company, Ltd.)

## **Philippines**

- Loan for Share Acquisition of Aboitiz Power Corporation (JERA Co., Inc.)

## **Laos**

- Loan and Project Financing for Nam Ngiep 1 Hydro Power Plant Project

## **Indonesia**

- Loan for renewable energy projects (PT Pertamina (Persero))
- Project Financing for Rantau Dedap Geothermal Power Project
- Project Financing for Muara Laboh Geothermal Power Project
- Project Financing for Rajamandala Hydro Power Plant Project
- Project Financing and Political Risk Guarantee for Sarulla Geothermal Power Project
- Loan for Production and Sale of Recycled Asphalt Mixture (SUGAWARA Industry Co., Ltd.)

## **Thailand**

- Loan for ESCO (Energy Service Company) Business (West Holdings Corporation)

Country	Project Overview	Related Companies	Amount	URL
Indonesia	Loan for Renewable energy projects in Indonesia (implemented by PT Pertamina (Persero)) (December 2022)	Indonesia/PT Pertamina (Persero)	USD30 million	<a href="https://www.jbic.go.jp/en/information/press/press-2022/1215-017136.html">https://www.jbic.go.jp/en/information/press/press-2022/1215-017136.html</a>
Indonesia	Project Financing for Rantau Dedap Geothermal Power Project in Indonesia (implemented by PT Supreme Energy Rantau Dedap (SERD)) (March 2018) *SERD is an Indonesian company invested in by Marubeni Corporation, Tohoku Electric Power Co., Ltd. and other sponsors.	Japan/ Marubeni, Tohoku Electric, Indonesia/PT Supreme Energy Rantau Dedap, etc.	Approx USD188 Million	<a href="https://www.jbic.go.jp/en/information/press/press-2017/0328-010746.html">https://www.jbic.go.jp/en/information/press/press-2017/0328-010746.html</a>
Indonesia	Project Financing for Muara Laboh Geothermal Power Project in Indonesia (implemented by PT. Supreme Energy Muara Laboh (SEML)) (January 2017) *SEML is an Indonesian company invested in by Sumitomo Corporation and other sponsors.	Japan/Sumitomo Corporation, Indonesia/PT. Supreme Energy Muara Laboh, etc.	Approx USD198 million	<a href="https://www.jbic.go.jp/en/information/press/press-2016/0130-52890.html">https://www.jbic.go.jp/en/information/press/press-2016/0130-52890.html</a>



Country	Project Overview	Related Companies	Amount	URL
Indonesia	Project Financing for Rajamandala Hydro Power Plant Project in Indonesia (implemented by PT. Rajamandala Electric Power (REP)) (June 2014) *REP is an Indonesian company invested by The Kansai Electric Power Co., Inc..	Japan/Kansai Electric, Indonesia/PT. Rajamandala Electric Power, etc.	Approx USD66 Million	<a href="https://www.jbic.go.jp/en/information/press/press-2014/0625-22435.html">https://www.jbic.go.jp/en/information/press/press-2014/0625-22435.html</a>
Indonesia	Project Financing and Political Risk Guarantee for Sarulla Geothermal Power Plant Project in Indonesia (implemented by Sarulla Operations LTD (SOL)) (March 2014) *SOL is a Cayman Islands company invested in by Itochu Corporation, Kyushu Electric Power Co., Inc. and other sponsors.	Japan/Itochu Corporation, Kyushu Electric, Indonesia/PT. Sarulla Operations Ltd, etc.	USD492 million	<a href="https://www.jbic.go.jp/en/information/press/press-2013/0331-19526.html">https://www.jbic.go.jp/en/information/press/press-2013/0331-19526.html</a>
Indonesia	Loan for production and sale of recycled asphalt mixture carried out by PT. SUGAWARA KOGYO in Indonesia	Japan/PT. SUGAWARA KOGYO INDONESIA	13 billion Indonesia Rupia	—
Laos	Loan and Project Financing for Hydro Power Plant Project in Lao People's Democratic Republic (Lao PDR) (implemented by Nam Ngiep 1 Power Company Limited (NNP1)) (August 2014, September 2014) * NNP1 is a Laotian company invested in by The Kansai Electric Power Co., Inc., and other sponsors.	Japan/Kansai Electric Power, Laos/MINISTRY OF FINANCE OF LAO P.D.R, Nam Ngiep 1 Power Company Limited, Thailand/EGAT International Company, etc.	USD234.5 million	<a href="https://www.jbic.go.jp/en/information/press/press-2014/0904-28349.html">https://www.jbic.go.jp/en/information/press/press-2014/0904-28349.html</a> <a href="https://www.jbic.go.jp/en/information/press/press-2014/0819-27804.html">https://www.jbic.go.jp/en/information/press/press-2014/0819-27804.html</a>

Country	Project Overview	Related Companies	Amount	URL
Philippines	Loan for Share Acquisition of Philippine Company Aboitiz Power Corporation by JERA Co., Inc. (December 2021)	Japan/JERA Philippines/Aboitiz Power Corporation	USD630 million	<a href="https://www.jbic.go.jp/en/information/press/press-2021/1227-015711.html">https://www.jbic.go.jp/en/information/press/press-2021/1227-015711.html</a>
Thailand	Loan for ESCO (Energy Service Company) Business in Thailand by West Holdings Corporation (March 2020, June 2022)	Japan/West Holdings Thailand/WEST International (Thailand) Co., Ltd.	THB360 million	<a href="https://www.jbic.go.jp/en/information/press/press-2022/0621-016448.html">https://www.jbic.go.jp/en/information/press/press-2022/0621-016448.html</a> <a href="https://www.jbic.go.jp/en/information/press/press-2019/0331-013328.html">https://www.jbic.go.jp/en/information/press/press-2019/0331-013328.html</a>
Vietnam	Loan for Biomass Fuel Manufacturing and Sales Business in Vietnam by erex Co., Ltd. (September 2023, October 2023)	Japan/erex Vietnam/EREX SAKURA BIOMASS TUYEN QUANG CO.,LTD、EREX SAKURA BIOMASS YEN BAI CO.,LTD	USD16.6 million	<a href="https://www.jbic.go.jp/en/information/press/press-2023/press_00119.html">https://www.jbic.go.jp/en/information/press/press-2023/press_00119.html</a> <a href="https://www.jbic.go.jp/en/information/press/press-2023/press_00104.html">https://www.jbic.go.jp/en/information/press/press-2023/press_00104.html</a>

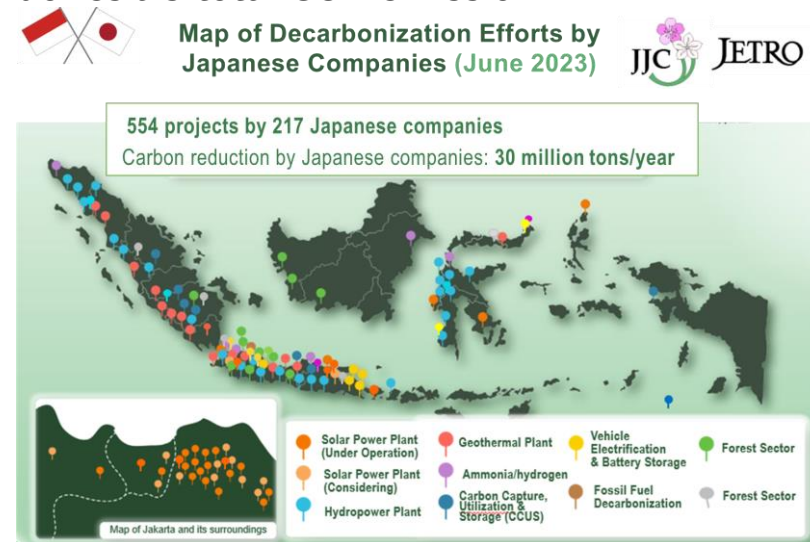
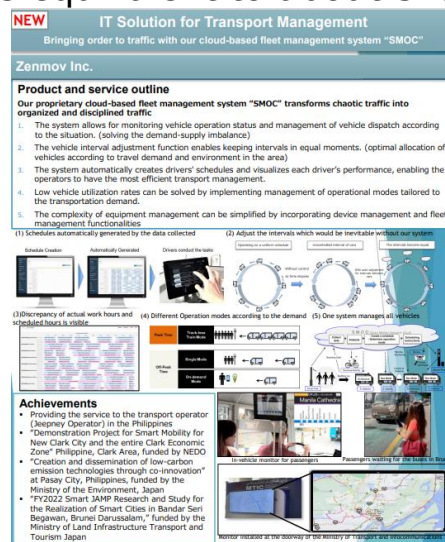
Country	Project Overview	Related Companies	Amount	URL
Vietnam	Credit Line for Vietcombank to finance renewable energy projects in Vietnam (June 2019, March 2023)	Vietnam/Vietcombank	USD265 million	<a href="https://www.jbic.go.jp/en/information/press/press-2022/0329-017547.html">https://www.jbic.go.jp/en/information/press/press-2022/0329-017547.html</a> <a href="https://www.jbic.go.jp/en/information/press/press-2019/0626-012288.html">https://www.jbic.go.jp/en/information/press/press-2019/0626-012288.html</a>
Vietnam	Loan for Rooftop Solar Power Generation Project in Vietnam by Sumitomo Corporation (March 2022)	Japan/Sumitomo Corporation Vietnam/Thang Long Industrial Park II Corporation	Approx. USD8 Million	<a href="https://www.jbic.go.jp/en/information/press/press-2021/0331-016132.html">https://www.jbic.go.jp/en/information/press/press-2021/0331-016132.html</a>
Vietnam	Loan for Manufacturing and Sales of Solar Panel Sheet Glasses in Vietnam by Nippon Sheet Glass Company, Ltd. (August 2019)	Japan/Nippon Sheet Glass Company Vietnam/NSG Vietnam Glass Industries Ltd.	USD54 million	<a href="https://www.jbic.go.jp/en/information/press/press-2019/0829-012484.html">https://www.jbic.go.jp/en/information/press/press-2019/0829-012484.html</a>

## • Business Catalog by Japanese Companies for Decarbonization Realization in Indonesia

JETRO Jakarta Office has published "Business Catalog by Japanese Companies for Decarbonization Realization in Indonesia", introducing products and services developed by Japanese companies operating in Indonesia that can contribute to decarbonization. The catalog introduces products and services in various fields such as the introduction of renewable energy, energy conservation and digital technology.

## • Visualization of Japanese Contribution to decarbonization in Indonesia

JETRO Jakarta Office and Jakarta Japan Club publish a list of decarbonization projects carried out by Japanese companies. It is estimated that Japanese companies' effort reduces 30 million tons carbon dioxide emission, which is equivalent to about 5% of Indonesia's total CO2 emission.



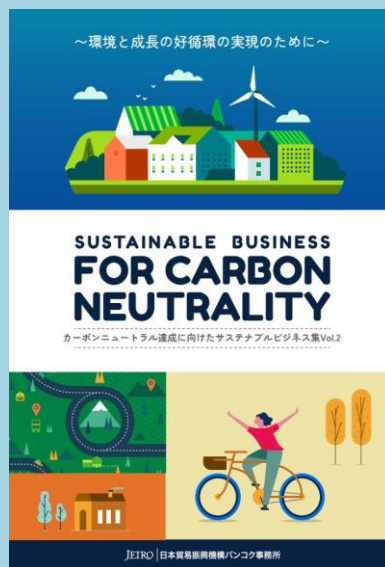
(Indonesian Version)

<https://www.jetro.go.jp/newsletter/jkt/2022/EDISI%20KE%203%20LAPORAN%20DEKARBONISASI.pdf>

JETRO Jakarta Office reported to the Indonesian government (Ministry of Energy and Mineral Resources, Coordinating Ministry for Economic Affairs, Coordination Ministry of Maritime and Investment, and Ministry of Industry). JETRO Jakarta Office has presented these results in around 15 events and seminars by the Indonesian government, industry, and ASEAN related organizations.

- JETRO Bangkok Office is assisting Thai-Japan business collaboration for carbon neutrality with the following programs;
- ① **The JAPAN Pavilion including 9 Japanese companies in “SETA 2022”** which is the Executive Asian Energy Leadership Forum in Sep. 2022.
- ② Organizing the **“Thailand-Japan Sustainable Business Seminar and Business Matching for CN”** and issued **Business Catalog** by JETRO Webpage, co-hosted with EECO and BOI in Feb. and Nov. 2023.
- ③ **“International Energy AZEC workshop”**, organized with Ministry of Energy Thailand in Mar. 2023 to promote Thai- Japan business partnerships.

## “Thailand-Japan Sustainable Business Seminar and Business Matching for Carbon Neutrality” and Business Catalog



Catalog link:

[https://www.jetro.go.jp/ext\\_images/thailand/pdf/JETRO2022CNCatalogueENGFinal.pdf](https://www.jetro.go.jp/ext_images/thailand/pdf/JETRO2022CNCatalogueENGFinal.pdf)

## SETA 2022



Exhibitor Directory :

[https://www.jetro.go.jp/ext\\_images/thailand/pdf/seta2022exhibitordirectoryeng.pdf](https://www.jetro.go.jp/ext_images/thailand/pdf/seta2022exhibitordirectoryeng.pdf)

## International Energy AZEC Workshop



Flyer :

[https://www.jetro.go.jp/ext\\_images/thailand/pdf/230308AZECFlyerENFinal.pdf](https://www.jetro.go.jp/ext_images/thailand/pdf/230308AZECFlyerENFinal.pdf)



As a climate change countermeasure, JICA is promoting the implementation of the Paris Agreement and co-benefits type climate change countermeasures. Over the past 50 years, the cumulative total of ODA loans to Southeast Asian countries in the AZEC region is **976 billion yen** (loan amount) for **119 projects** (number of L/A).

## THAILAND

THE BAN CHAO NEN HYDROELECTRIC PROJECT  
UPPER QUAEYAI HYDRO POWER PROJECT (ES)  
NONG PLA LAI PROJECT  
BHUMBOL HYDRO POWER PLANT REHABILITATION PROJECT  
THE SIRIKIT HYDROELECTRIC PROJECT UNIT 4  
LAM TA KHONG PUMPED STORAGE PROJECT  
**INNOVATION ON PRODUCTION AND AUTOMOTIVE UTILIZATION OF BIOFUELS FROM NON-FOOD BIOMASS (SATREPS)**

## MALAYSIA

THE TEMENGOR HYDRO-ELECTRIC PROJECT  
TRENGGANU HYDRO-ELECTRIC PROJECT  
TENOM PANGI HYDRO-ELECTRIC PROJECT  
BERSIA HYDRO-ELECTRIC PROJECT  
KENERING HYDRO-ELECTRIC PROJECT  
BATANG AI HYDROELECTRIC PROJECT  
REHABILITATION OF THE TENOM PANGI HYDROPOWER PROJECT  
KENYIR HYDROELECTRIC POWER PLANT PROJECT II  
**DEVELOPMENT OF ADVANCED HYBRID OCEAN THERMAL ENERGY CONVERSION (OTEC) TECHNOLOGY FOR LOW CARBON SOCIETY AND SUSTAINABLE ENERGY SYSTEM (SATREPS)**

## INDONESIA

THE KARANGKATES SECOND STAGE DEVELOPMENT PROJECT  
WLINGI MULTIPURPOSE PROJECT (DAM AND POWER STATION)  
WONOGIRI MULTIPURPOSE DAM PROJECT  
THE ASAHAN HYDROELECTRIC AND ALUMINUM PROJECT  
WONDGIRI HYDRO POWER PLANT PROJECT  
SAGULING HYDRO-ELECTRIC POWER PLANT PROJECT  
BAKARU HYDROELECTRIC POWER PLANT PROJECT  
RIAM KIWA HYDROELECTRIC POWER PLANT PROJECT (ES)  
KOTAPANJANG HYDROELECTRIC POWER & ASSOCIATED TRANS.LINE PRO  
BILI-BILI MULTI-PURPOSE DAM PROJECT  
RENUN H.E.P. & ASSOCIATED TRANSMISSION LINE PROJECT  
WONOREJO MULTIPURPOSE DAM CONSTRUCTION PROJECT  
PEUSANGAN 1 & 2 HYDROELECTRIC POWER PLANT PROJECT  
SIPANSIHAPORAS H.P.P. PROJECT  
MULTIPURPOSE DAM H.P.P. PROJECT  
UPPER CISOKAN PUMPED STORAGE HEPP (ES)

## LAOS

NAM NGUM HYDROPOWER PROJECT  
NAM LEUK HYDROPOWER PROJECT  
NAM NGUM 1 HYDROPOWERSTATION EXPANSION PROJECT  
**MONSOON WIND POWER PROJECT**  
**PROJECT FOR INTEGRATED ENERGY MASTER PLAN TOWARDS SUSTAINABLE CARBON NEUTRAL SOCIETY**  
**PROJECT ON POWER SYSTEM MASTER PLAN**  
**THE STUDY ON POWER NETWORKS SYSTEM PLAN**

## CAMBODIA

PHNOM PENH TRANSMISSION AND DISTRIBUTION EXPANSION PROJECT  
**KAMPONG CHHNANG PROVINCE SOLAR POWER PROJECT**  
**PROJECT FOR DEVELOPMENT OF CLEAN ENERGY TRANSITION ROADMAP TOWARDS CARBON NEUTRAL SOCIETY**  
**PROJECT FOR IMPROVEMENT OF TRANSMISSION SYSTEM OPERATION AND MAINTENANCE**

## PHILIPPINES

THE ABULUG RIVER HYDROELECTRIC PROJECT (ES)  
TONGONAN GEOTHERMAL POWER PLANT CONSTRUCTION PROJECT  
SOUTHERN NEGROS GEOTHERMAL DEVELOPMENT PROJECT  
PALINPINON II GEOTHERMAL PROJECT  
TIWI GEOTHERMAL POWER PLANT COMPLEX REHABILITATION PROJECT  
MAK-BAN GEOTHERMAL POWER PLANT COMPLEX REHABILITATION PROJECT  
MT. LABO GEOTHERMAL PROJECT  
NORTHERN NEGROS GEOTHERMAL PROJECT  
**CAPACITY DEVELOPMENT ON ENERGY POLICY AND PLANNING FOR A MORE EFFECTIVE AND COMPREHENSIVE PHILIPPINE ENERGY PLAN (PEP) FORMULATION**  
**SUSTAINABLE IMPROVEMENT OF RENEWABLE ENERGY DEVELOPMENT IN VILLAGE ELECTRIFICATION**

## VIET NAM

HAM TUAN - DA MI HYDROPOWER PROJECT  
DA NHIM POWER SYSTEM REHABILITATION PROJECT  
DAI NINH HYDROPOWER PROJECT  
THAC MO HYDROPOWER STATION EXTENSION PROJECT  
SUPPORT PROGRAM TO RESPOND TO CLIMATE CHANGE(I)~(VII)  
**QUANG TRI PROVINCE ONSHORE WIND POWER PROJECT**  
**NINH THUAN PROVINCE ONSHORE WIND POWER PROJECT**  
**WASTE TO ENERGY AND WASTE TREATMENT PROJECT IN BINH DUONG PROVINCE**  
**SUSTAINABLE DEVELOPMENT OF RURAL AREA BY EFFECTIVE UTILIZATION OF BIO-WASTES WITH HIGHLY EFFICIENT FUEL CELL TECHNOLOGY(SATREPS)**  
**ESTABLISH OF ENERGY MANAGEMENT TRAINING CENTER**  
**MASTER PLAN FOR ENERGY CONSERVATION IN THE POWER SECTOR**  
**THE STUDY ON NATIONAL ENERGY MASTER PLAN**

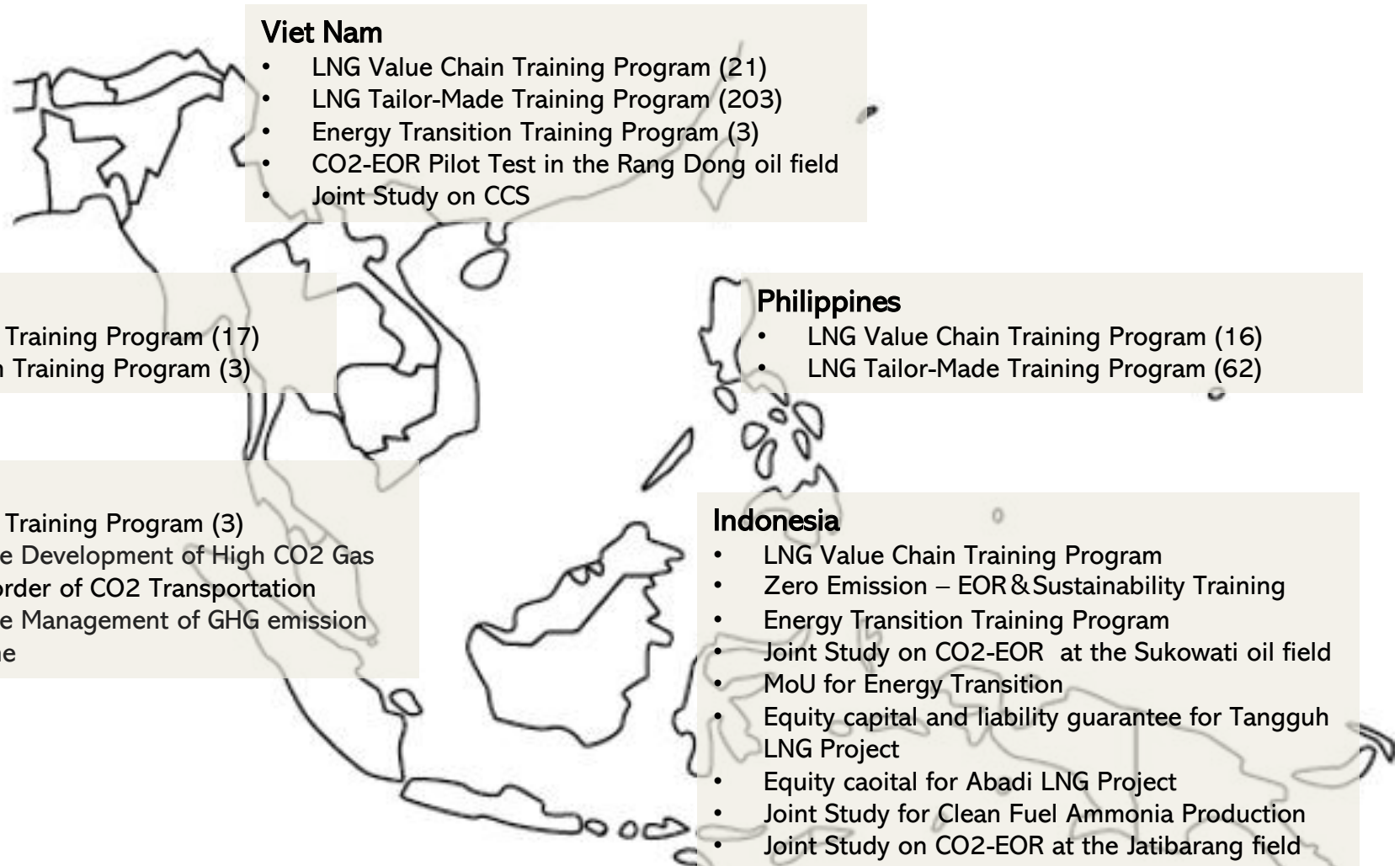
LAHENDONG GEOTHERMAL POWER PLANT PROJECT  
ULUBELU GEOTHERMAL POWER PLANT PROJECT  
ASAHAN NO.3 HYDROELECTRIC POWER PLANT CONSTRUCTION PROJECT  
CLIMATE CHANGE PROGRAM LOAN (I~III)  
LUMUT BALAI GEOTHERMAL POWER PLANT PROJECT  
HULULAI GEOTHERMAL POWER PLANT PROJECT  
**MASTER PLAN FOR ENERGY TRANSITION MANAGEMENT PROJECT**  
**TECHNOLOGY DEVELOPMENT OF STEAM-SPOT DETECTION AND SUSTAINABLE RESOURCE USE FOR LARGE ENHANCEMENT OF GEOTHERMAL POWER GENERATION (SATREPS)**  
**CAPACITY DEVELOPMENT FOR ENHANCEMENT OF THE GEOTHERMAL DEVELOPMENT**  
**THE PROJECT FOR INTEGRATED SUSTAINABLE ENERGY AND FOOD PRODUCTION FROM MICROALGAE-BASED CARBON CAPTURE UTILIZATION (SATREPS)**

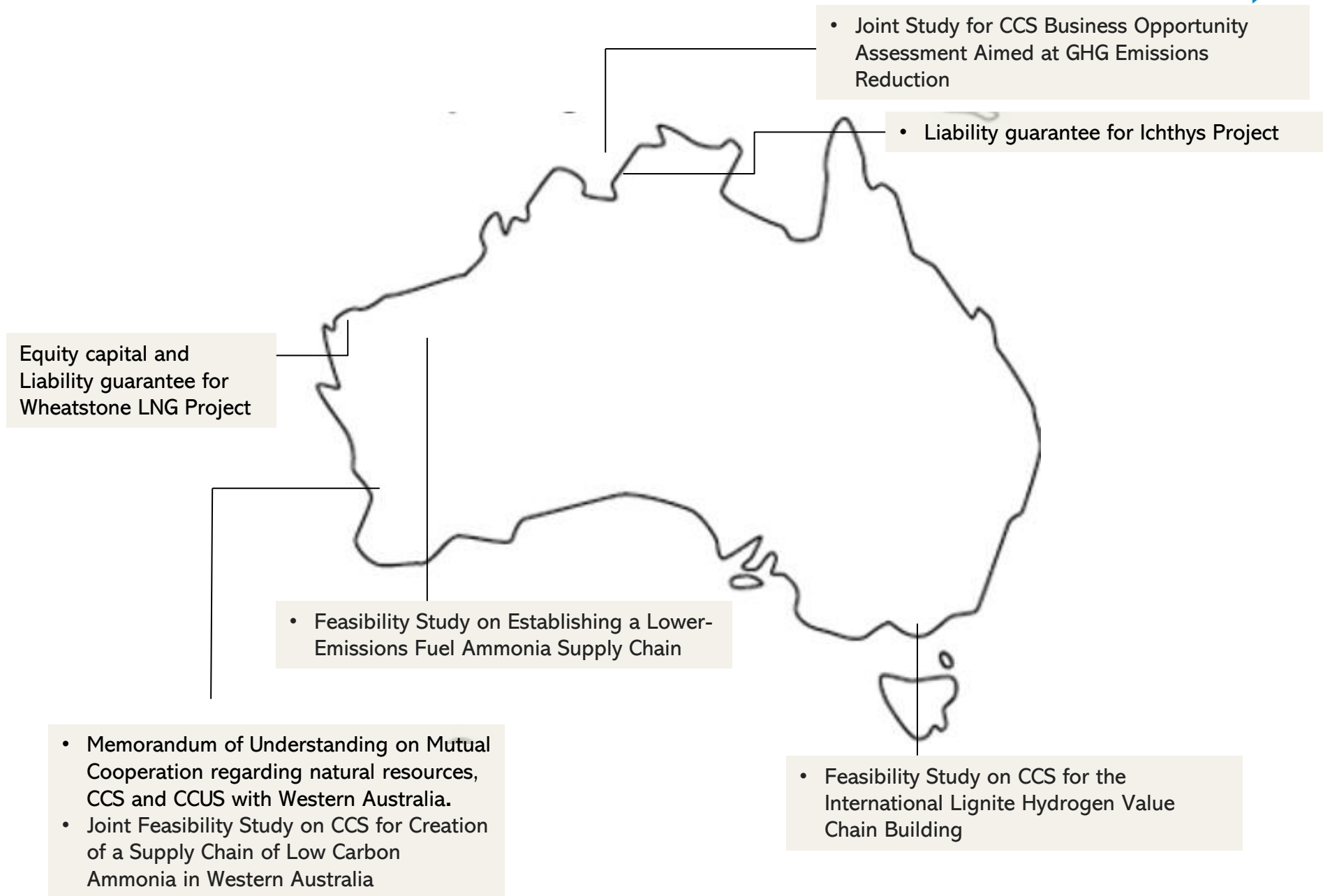


Project	Support	Companies	Amount
Supporting a long-term energy transition roadmap and master plan to achieve a national carbon neutral society in Cambodia	Technical Cooperation	Ministry of Mines and Energy (MME), Cambodia Kyoto University, Nippon Koei, Chugoku Electric Power Co.	250 million yen
Supporting a long-term energy transition roadmap and master plan to achieve a national carbon neutral society in Indonesia	Technical Cooperation	PLN, Ministry of Energy and Mineral Resources (MEMR), Indonesia Japanese Partners (Procurement Stage)	250 million yen
The Project for Integrated sustainable energy and food production from microalgae-based carbon capture and utilization in Indonesia	Technical Cooperation	Padjadjaran University / Bandung Institute of Technology / Indonesia University of Education / Gadjah Mada University / National Research and Innovation Agency / Jawa Power / Awina Sinergi International	300 million yen
Indonesia: Peusangan Hydroelectric Power Plant Construction Project (Phase II)	ODA Loan	PT PLN	Commitment: 13.6 billion yen
Indonesia: Additional Loan for Asahan No.3 Hydroelectric Power Plant Construction Project	ODA Loan	PT PLN	Commitment: 13.4 billion yen Pledged, LA not yet
Supporting a long-term energy transition roadmap and master plan to achieve a national carbon neutral society in Laos	Technical Cooperation	Ministry of Energy and Mines (MEM), Laos Tokyo Electric Power Company (TEPCO), TEPCO, Mitsubishi Research Institute, Pacific Consultants, etc.	280 million yen
Waste to Energy and Waste Treatment Project in Binh Duong Province	Private Sector Investment Finance	Vietnam BIWASE	
Supporting construction and operation of an 88MW onshore wind farm in Ninh Thuan Province, South Vietnam	Private Sector Investment Finance	BIM Energy Holding, (Vietnam), ACEN(Philippines), Sumitomo Mitsui Banking Corporation, etc.	
Supporting construction and operation of a 600MW onshore wind farm in Sekong/Attapeu Province, Laos (cross-border electricity sales to Vietnam)	Private Sector Investment Finance	Monsoon Wind Power Company, Mitsubishi Corporation, Sumitomo Mitsui Banking Corporation, etc.	

# Supports in AZEC partners by JOGMEC

- JOGMEC has supported cooperation and human resource development training programs for decarbonization and energy transition in Thailand, Indonesia, Vietnam, Malaysia, the Philippines, and Australia.





## Energy Transition Training Program for countries in South-East Asia

- **Project outline (Purpose, Strengthen point, Schedule)** : JOGMEC provides “Energy Transition Training Program” for participants from South-East Asia from February 27th 2023 to March 10<sup>th</sup> 2023.
- **Organization name, Partner organization name** : Relevant Ministries, Agencies and NOC in each country
- **Country or Regions** : 12 participants from Indonesia, Malaysia, Thailand and Vietnam
- **Funding organization, Contents, Terms** : Courses focusing on utilization of LNG, the need of energy transition are provided.



Lecture Scene



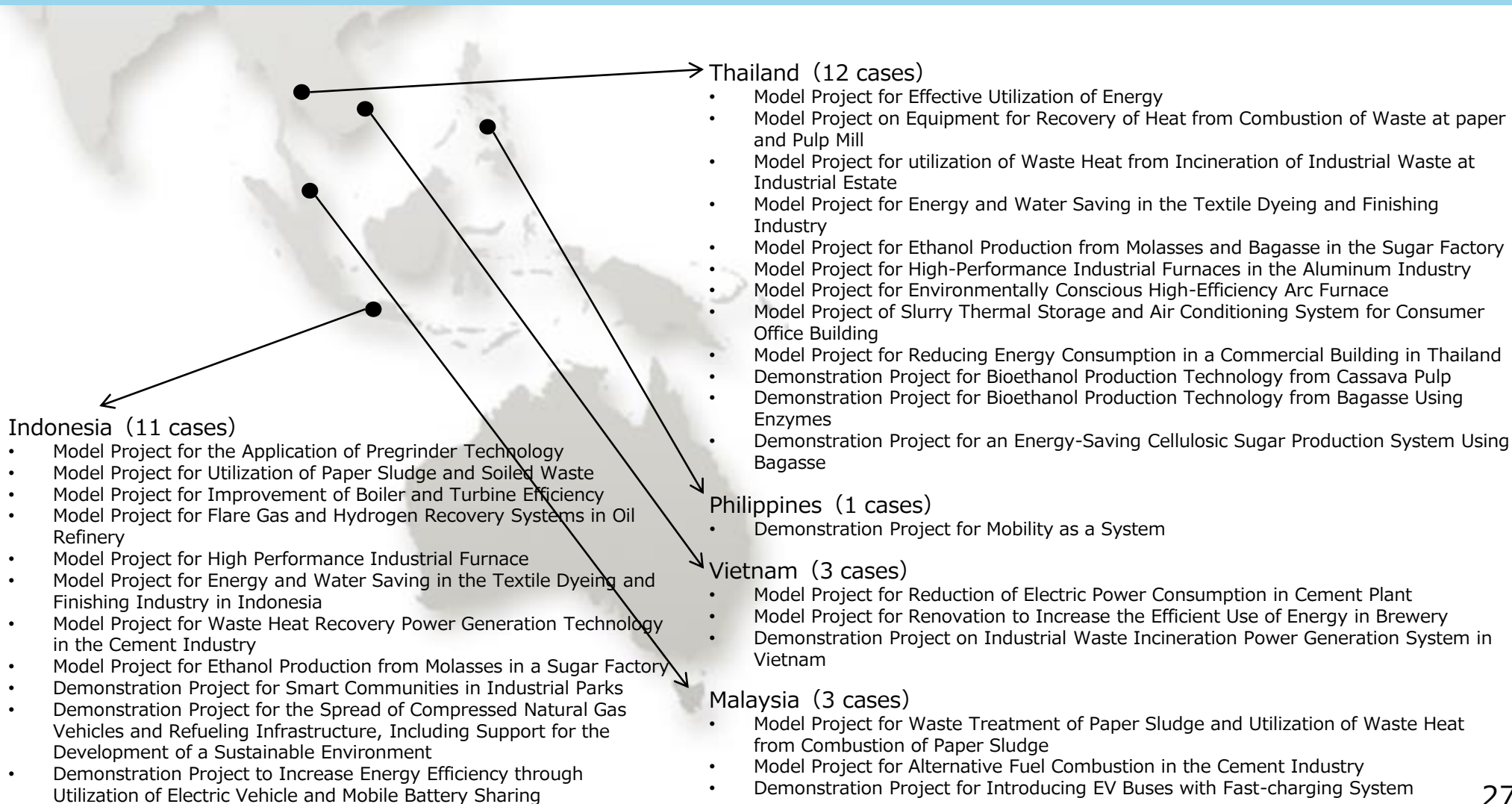
Group photo at the closing ceremony

## LNG Value Chain Training Program for Asian countries

- **Project outline (Purpose, Strengthen point, Schedule)** : JOGMEC provides “LNG Value Chain Training Program” for senior officials from Asian countries in October 2023. The program covers various aspects of LNG business, from LNG value chain business, technical aspects to site visits to LNG receiving terminals in Japan.
- **Organization name, Partner organization name:** Relevant Ministries, Agencies and NOC in each country
- **Country or Regions** : Indonesia, Philippine, Thailand, Vietnam and countries in South Asia
- **Funding organization, Contents, Terms** : The program is expected to play a key role in promoting and deepening strong relationships better Japan and Asian countries and facilitate the further usage of LNG.



- NEDO has supported the introduction of Japan's technology for decarbonization and energy transition in Thailand, Indonesia, Vietnam, Malaysia, and the Philippines. The following **30 projects** have been implemented in the past.





## List of projects supported by NEXI in AZEC partner countries(FY2001~2023)

### Vietnam

- ❑ Loan Insurance for Phu My 3 project(2003)
- ❑ Loan Insurance for Nhon Trach II (2010)
- ❑ Loan Insurance for Song Bac Hydropower Project(2011)
- ❑ Loan Insurance for Dakdrinh Hydropower Project(2011)
- ❑ Loan Insurance for Dong Nai 5 Hydropower Project(2011)
- ❑ Loan Insurance for NamNa 3 Hydropower Project(2012)
- ❑ Loan Insurance for Srepok 4A Hydropower Project(2012)
- ❑ Loan Insurance for Chi Khe Hydropower Project(2012)
- ❑ Loan Insurance for Vinacomin Bauxite Mining and Alumina Refinery Project(2012)
- ❑ Loan Insurance for Bac Me Hydropower plant construction Project(2014)
- ❑ Loan Insurance for Transmission and substation construction Project (2014)
- ❑ Loan Insurance for Vinh Tan-Song May-Tan Uyen 500kV line project(2015)

### Laos

- ❑ Overseas Investment Insurance for Lao Silicon Co., Ltd(metal silicon manufacturer) (2012)

### Thailand

- ❑ Overseas Investment Insurance for Investment in Independent Power Producer (2019)

### Malaysia

- ❑ Loan Insurance for Malaysia International Shipping Corporation Berhad (LNG tanker)(2003)

### Singapore

- ❑ Loan Insurance for Revolving Credit Facility to JERA Trading International Pte. Ltd. (2023)

### Philippines

- ❑ Overseas Investment Insurance for Coral Bay Nickel project (2008)
- ❑ Loan Insurance for Taganito Nickel Project(2011)

### Indonesia

- ❑ Export Credit Insurance for Cilegon Power project(2004)
- ❑ Overseas Investment Insurance for Tangguh LNG Project(2007)
- ❑ Loan Insurance for Tangguh LNG Project(2007)
- ❑ Loan Insurance related to PT. Budi Acid Jaya's Project for Reducing Greenhouse Gas Emission (2008)
- ❑ Loan Insurance for Karebbe Hydropower Project by PT INCO (2009)
- ❑ Loan Insurance for Java-Bali Submarine Cables Project (2011)
- ❑ Export Credit Insurance for Donggi-Senoro LNG Project(2011)
- ❑ Overseas Investment Insurance for Donggi-Senoro LNG Project(2011)
- ❑ Loan Insurance for Transmission and substation construction Project (2012)
- ❑ Loan Insurance for Donggi-Senoro LNG Project (2014)
- ❑ Loan Insurance for Jawa2 Combined Cycle Power Plant (2016)
- ❑ Loan Insurance for Muara Laboh Geothermal IPP Project (2017)
- ❑ Loan Insurance for Muara Karang Combined Cycle Power Plant (2017)
- ❑ Loan Insurance for Jawa 1 LNG to Power Project (2018)
- ❑ Loan Insurance for Rantau Dedap Geothermal IPP Project(2018)
- ❑ Insurance for Tangguh LNG Expansion Project(2016)

### Australia

- ❑ Loan Insurance for Ichthys LNG Project(2012)

Project outline	Organizations	Amount	URL
Australia / Loan Insurance for Icthy's LNG Project	INPEX, France / Total Energies SE, The Bank of Tokyo-Mitsubishi UFJ, Ltd., Sumitomo Mitsui Banking Corporation, Japan Bank for International Cooperation, and Export-Import Bank of Korea ("KEXIM")	Insurable Amount: USD2750 million	<a href="https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/004619.html">https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/004619.html</a>
NEXI signs MOU with Ministry of Mines and Energy (MME) of Cambodia	Ministry of Mines, Energy (MME) of Cambodia, NEXI	—	<a href="https://www.nexi.go.jp/en/topics/newsrelease/2023030201.html">https://www.nexi.go.jp/en/topics/newsrelease/2023030201.html</a>
Indonesia / Overseas Investment Insurance & Loan Insurance for Tangguh LNG Project	LNG Japan Corporation	Overseas Investment Insurance/Insured Amount: JPY16.5 billion Loan Insurance/Insured Amount: USD71.4 million (max)	<a href="https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/en/topics/newsrelease/002306.html">https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/en/topics/newsrelease/002306.html</a> <a href="https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/en/topics/newsrelease/002157.html">https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/en/topics/newsrelease/002157.html</a>
Indonesia / Overseas Investment Insurance & Loan Insurance for Donggi-Senoro LNG Project	Mitsubishi Corporation, PT. PERTAMINA, PT. Medco, Sumitomo Mitsui Banking Corporation, The Bank of Tokyo Mitsubishi UFJ, Ltd. and Mizuho Bank, Ltd., Japan Bank for International Cooperation ("JBIC") and Export-Import Bank of Korea ("KEXIM")	Overseas Investment Insurance/Insured Amount: USD1250 million Loan Insurance/Insured Amount: USD382 million	<a href="https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/003815.html">https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/003815.html</a> <a href="https://www.nexi.go.jp/en/topics/newsrelease/005530.html">https://www.nexi.go.jp/en/topics/newsrelease/005530.html</a>

Project outline	Organizations	Amount	URL
Indonesia / Loan Insurance for Jawa2 Combined Cycle Power Plant	Indonesia / PT PLN(Persero), Japan Bank for International Cooperation (JBIC), Bank of Tokyo-Mitsubishi UFJ (BTMU) as Agent, Mizuho Bank (Mizuho), Australia and New Zealand Banking Group (ANZ)	Insured Amount: JPY 12.7 billion + USD 18 million	<a href="https://www.nexi.go.jp/en/topics/newsrelease/2023071101.html">https://www.nexi.go.jp/en/topics/newsrelease/2023071101.html</a>
Indonesia / Loan Insurance for Muara Laboh Geothermal IPP Project	Sumitomo Corporation, Belgium / Electrabel S.A., Indonesia / PT. Supreme Energy, Japan Bank for International Cooperation (JBIC), the Asian Development Bank (ADB), Mizuho Bank, Ltd., the Bank of Tokyo-Mitsubishi UFJ, Ltd. and Sumitomo Mitsui Banking Corporation	Insurable Value: Equivalent to USD 132 million	<a href="https://www.nexi.go.jp/en/topics/newsrelease/2017012402.html">https://www.nexi.go.jp/en/topics/newsrelease/2017012402.html</a>
Indonesia / Loan Insurance for Muara Karang Combined Cycle Power Plant	Indonesia / PT PLN (Persero), Mitsubishi Corporation, Indonesia / Wijaya Karya, Mitsubishi Hitachi Power Systems, Mitsubishi Electric, Japan Bank for International Cooperation (JBIC), The Bank of Tokyo-Mitsubishi UFJ (BTMU) as Agent, Mizuho Bank (Mizuho), Australia and New Zealand Banking Group (ANZ)	Insured Amount: Equivalent to JPY6.2Billion+USD14.9 million	<a href="https://www.nexi.go.jp/en/topics/newsrelease/2017030704.html">https://www.nexi.go.jp/en/topics/newsrelease/2017030704.html</a>
Indonesia / Loan Insurance for Rantau Dedap Geothermal IPP Project	Marubeni Corporation, Tohoku Electric Power Co., Inc. France / ENGIE S.A., Indonesia / PT. Supreme Energy, International Cooperation (JBIC), the Asian Development Bank (ADB), Mizuho Bank, Ltd. (lead arranger), Sumitomo Mitsui Banking Corporation, and the Bank of Tokyo-Mitsubishi UFJ, Ltd.	Insurable Value: USD 126 million	<a href="https://www.nexi.go.jp/en/topics/newsrelease/2018032601.html">https://www.nexi.go.jp/en/topics/newsrelease/2018032601.html</a>

Project outline	Organizations	Amount	URL
Indonesia / Loan Insurance for Jawa 1 LNG to Power Project	Marubeni Corporation, Sojitz Corporation, Indonesia / PT Pertamina (Persero), Mitsui O.S.K. Lines, Ltd., Japan Bank for International Cooperation (JBIC); Mizuho Bank, Ltd.; MUFG Bank, Ltd.; Oversea-Chinese Banking Corporation Ltd.; Crédit Agricole Corporate and Investment Bank, Tokyo Branch; and Société Générale Tokyo Branch	Insurance Value: USD 403 million in total	<a href="https://www.nexi.go.jp/en/topics/newsrelease/2018101501.html">https://www.nexi.go.jp/en/topics/newsrelease/2018101501.html</a>
Indonesia / Loan Insurance for Tangguh LNG Expansion Project	LNG Japan Corporation	—	<a href="https://www.nexi.go.jp/en/topics/newsrelease/2016111401.html">https://www.nexi.go.jp/en/topics/newsrelease/2016111401.html</a>
NEXI signs Amendment of the MOU with PT PLN (Persero)	Indonesia / PT PLN(Persero), NEXI	—	<a href="https://www.nexi.go.jp/en/topics/newsrelease/2023030101.html">https://www.nexi.go.jp/en/topics/newsrelease/2023030101.html</a>
Singapore / Loan Insurance for Revolving Credit Facility to JERA Trading International Pte. Ltd.	JERA, JERA Trading International Pte. Ltd. (JERATI) and Sumitomo Mitsui Banking Corporation	-	<a href="https://www.nexi.go.jp/en/topics/newsrelease/2023071101.html">https://www.nexi.go.jp/en/topics/newsrelease/2023071101.html</a>



Project outline	Organizations	Amount	URL
Vietnam / Loan Insurance for Phu My3 BOT Power Project	Kyusyu Electric power Company, Sojitz Corporation, England / BP Holdings N.V., and Singapore / Sembcorp Utilities Ltd.	Insured Value : Principal 95 million + premium	<a href="https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/001324.html">https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/001324.html</a>
Vietnam / Loan Insurance for Song Bac Hydropower plant construction Project	Vietnam / Song Bac Hydropower Joint Stock Company, and Sumitomo Mitsui Banking Corporation	Insurable Amount : USD 50 million	<a href="https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/001533.html">https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/001533.html</a>
Vietnam / Loan Insurance for Dong Nai 5 Hydropower plant construction Project	Vietnam / Vinacomin, Vietnam / Vinacomin Power, Sumitomo Mitsui Banking Corporation, Australia and New Zealand Banking Group (ANZ)	Insurable Amount : USD 200 million	<a href="https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/004062.html">https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/004062.html</a>
Vietnam / Loan Insurance for Srepok4A Hydropower plant construction Project	Vietnam / Buon Don Hydropower Joint Stock Company, and Sumitomo Mitsui Banking Corporation	Insurable Amount : USD 64.2 million	<a href="https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/004266.html">https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/004266.html</a>

Project outline	Organizations	Amount	URL
Vietnam / Loan Insurance for Vinacomin Bauxite Mining and Alumina Refinery Project	Vietnam / Vinacomin, Citibank Japan Ltd., Mizuho Corporate Bank, Ltd., Sumitomo Mitsui Trust Bank, Ltd., and The Bank of Tokyo-Mitsubishi UFJ, Ltd.	Insurable Amount: USD 300 million	<a href="https://warp.ndl.go.jp/collect/ions/info:ndljp/pid/11274643/www.nexi.go.jp/en/topics/newsrelease/004541.html">https://warp.ndl.go.jp/collect/ions/info:ndljp/pid/11274643/www.nexi.go.jp/en/topics/newsrelease/004541.html</a>
Vietnam / Loan Insurance for Bac Me Hydropower plant construction Project	Vietnam / Vietracimex, Sumitomo Mitsui Banking Corporation, The Gunma Bank Ltd., The Chugoku Bank., Ltd., and The Bank of Yokohama, Ltd.	Insurable Amount: USD 55.4 million	<a href="https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/en/topics/newsrelease/005245.html">https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/en/topics/newsrelease/005245.html</a>
Vietnam / Loan Insurance for Transmission and substation construction Project	Vietnam / National Power Transmission Corporation, Citibank Japan Ltd., Sumitomo Mitsui Trust Bank Ltd., The Shizuoka Bank., Ltd. , The Tokyo Star Bank, Ltd., The Bank of Fukuoka, The Gunma Bank Ltd. and The Chiba Bank, Ltd.	Insurable Amount: Aggregate to USD255 million	<a href="https://www.nexi.go.jp/en/topics/newsrelease/005243.html">https://www.nexi.go.jp/en/topics/newsrelease/005243.html</a>
Vietnam / Loan Insurance for Chi Khe Hydropower plant construction Project	Vietnam / Agrita-Nghe Tinh Energy Joint Stock Company, and Sumitomo Mitsui Banking Corporation	Insured Value : USED 52.5 million	<a href="https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/004539.html">https://warp.da.ndl.go.jp/info:ndljp/pid/11274643/www.nexi.go.jp/topics/newsrelease/004539.html</a>

## 5. Progress of AZEC Projects

(1) Projects supported by the Government of Japan (GoJ)

- Transitions in Power sector
- Transitions in Industry/Transport sector

(2) Projects related to MOUs in March 2023

## 5. Progress of AZEC Projects

Projects supported by the Government of Japan (GoJ) and those covered by MOUs in March 2023

- There are lots of projects in AZEC partners pursuing energy transitions. Those are related to electricity transition, energy transitions in industry/transport sector, low-carbon fuels and development of energy transition environment.

**More than 220 projects** supported by the Japanese government are listed. Among those, **around 60 projects** are presented on a single page per project.

Projects related to **28 MOUs** signed on the occasion of the AZEC Ministerial Meeting are also presented as of March, with a red square on a slide showing the progress, if any, since March.

- Transitions in Power sector
  - Renewables/Gas•Coal•Hydrogen•Ammonia power plants/Clean energy system/Energy Storage
- Transitions in Industry/Transport sector
  - Low-carbon fuels/Green hydrogen, Green Ammonia/ Biofuels/ SAF value chain/CCS/CCUS/Carbon recycling technologies/ Bio-methane/ Optimization of LNG procurement/ Visualization technologies for GHG emissions/ Carbon credit trading service



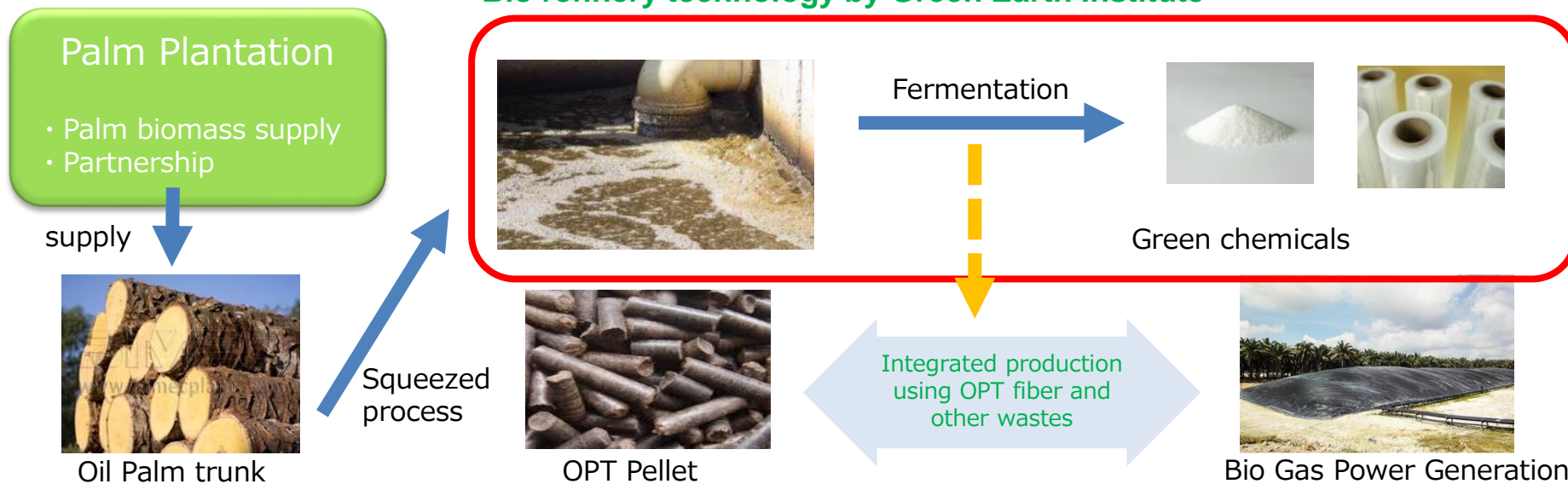
## 5. Progress of AZEC Projects

(1) Projects supported by the Government of Japan (GoJ)

- Transitions in Power sector

- **Project outline** : Palm oil is the most widely used vegetable oil in the world, with the demand increasing every year. A large amount of oil palm tree waste (OPT) has been generated in the plantation through the replanting of palm tree to keep the yield of the fruits. This initiative aims building up the integrated business model with both OPT pellets production and green chemical production from the OPT squeezed juice.
- **Funding organization, Contents, Terms** : " Feasibility Study Project for Overseas Deployment of High Quality Energy Infrastructure" by Ministry of Economy, Trade and Industry
- **URL** : <https://gei.co.jp/en/>

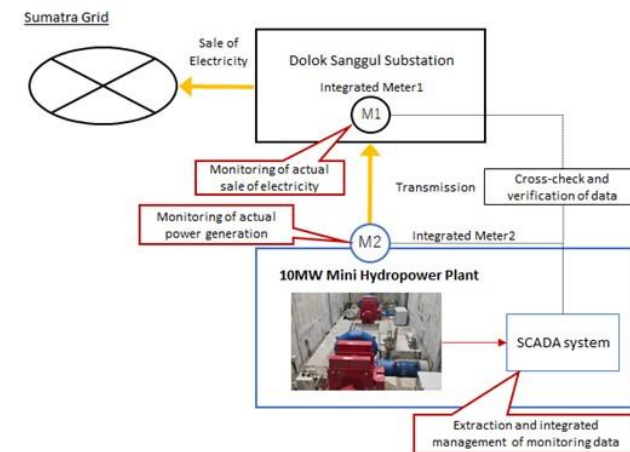
## Bio refinery technology by Green Earth Institute



- **Project outline** : A mini hydro power plant has been constructed in Humbang Hasunduran District of North Sumatra with a capacity of 10MW (5MW \* 2). The electricity generated by the plant is supplied to a power company, resulting in GHG emission reductions by replacing grid electricity (Expected GHG Emission Reductions: 32,807 tCO<sub>2</sub>/year).
- **Organization name, Partner organization name** : (Japan) Toyo Energy Farm Co., Ltd., (Indonesia) PT. Citra Multi Energi
- **Funding organization, Contents, Terms** : Ministry of the Environment Japan: JCM Model Project (FY2016)
- **URL** : [http://gec.jp/jcm/projects/16pro\\_ina\\_01/](http://gec.jp/jcm/projects/16pro_ina_01/)



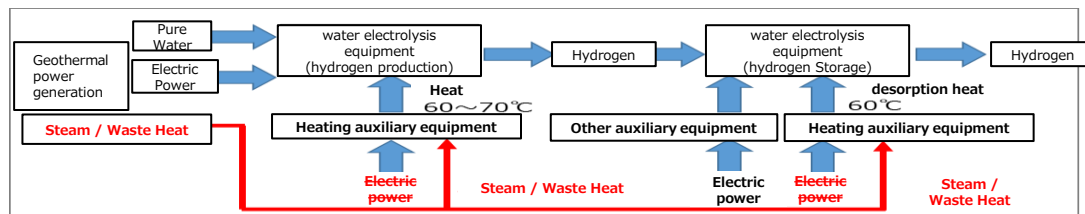
Sites of JCM Model Project



- **Project Outline** : To demonstrate efficient hydrogen production technology that utilizes surplus electricity from geothermal power generation, geothermal steam, and waste heat, and establish a viable green hydrogen production and transportation method in Indonesia with high geothermal potential.
- **Organization name, Partner organization name** : Tokyo Electric Power Company Holdings, Inc. / Yamanashi Hydrogen Company / Pertamina Power Indonesia
- **Regions** : Sulawesi Is. Lahendong
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Feasibility Study) / Sept. 2023~Sept. 2024
- **URL** : [https://www.tepco.co.jp/press/release/2023/1666102\\_8713.html](https://www.tepco.co.jp/press/release/2023/1666102_8713.html)

## <Project outline>

- ◆ Verification of hydrogen production technology that can handle fluctuating surplus electricity from geothermal power generation
- ◆ Verification of technology to reduce energy consumption by using steam and waste heat generated by geothermal power generation

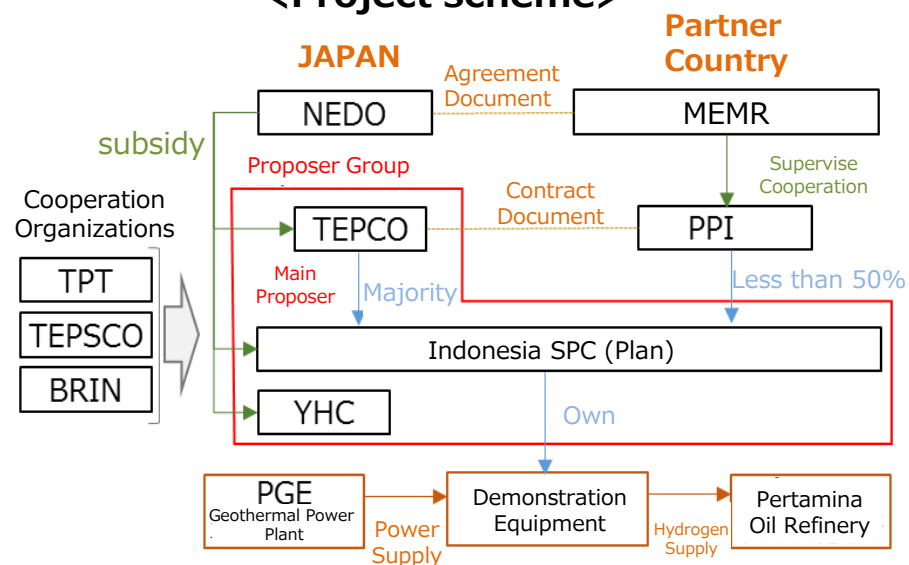


- ◆ Greenhouse gas reduction effect

① Demonstration (use Refinery) : 900 [t-CO<sub>2</sub>/y] (← H 100 Nm<sup>3</sup>/h)  
(Hydrogen production by reforming natural gas CO<sub>2</sub> emission : 1.03 kg-CO<sub>2</sub>/Nm<sup>3</sup>-H<sub>2</sub>)

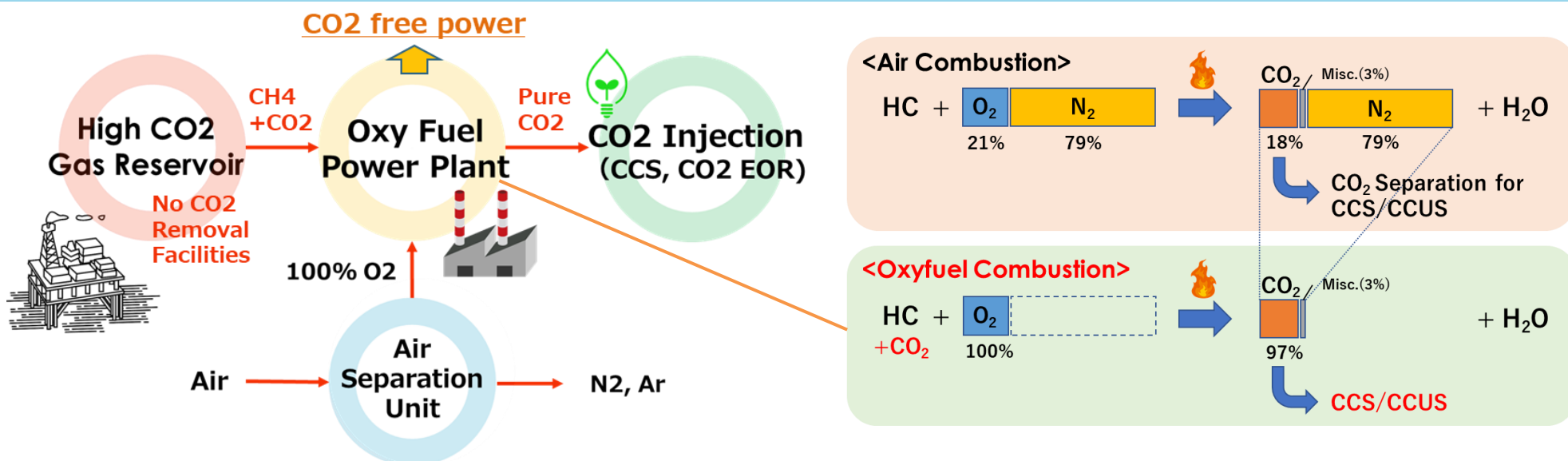
②Ammonia mixed combustion 20% : 980,000 [t-CO<sub>2</sub>/y]

## <Project scheme>



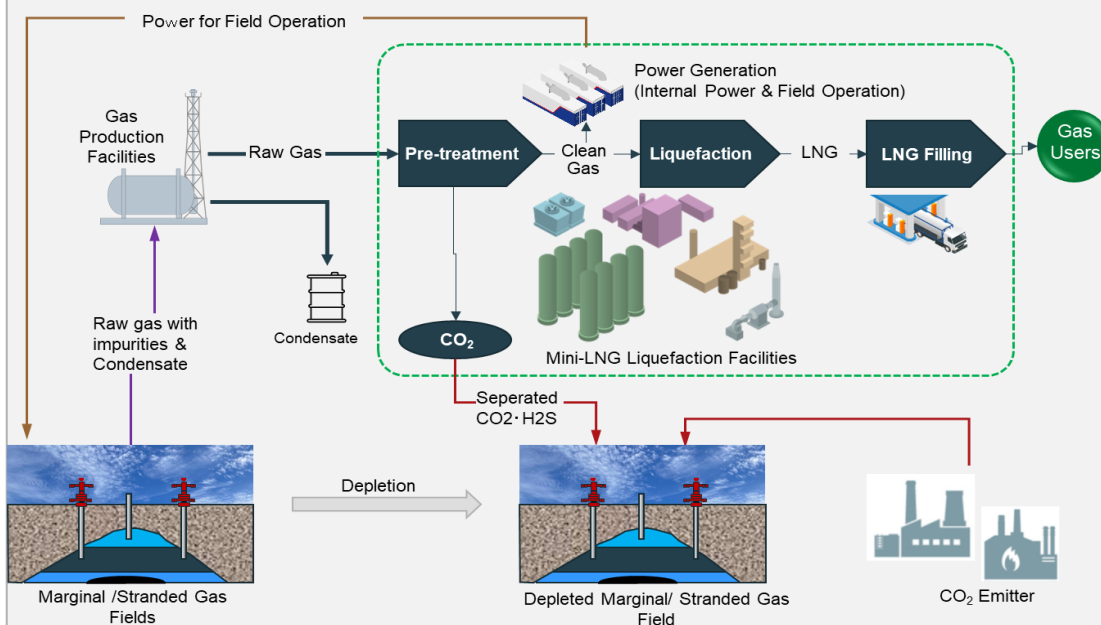


- **Project outline** : This new Blue Gas to Power concept will develop CO<sub>2</sub>-rich gas fields into CO<sub>2</sub> free electricity using oxyfuel power generation technology and CCS, making a significant contribution to GHG emission reduction and energy transition while utilizing the remaining gas resources in SE Asia.
- **Organization name** : Mitsui Oil Exploration Co., Ltd. (MOECO)
- **Funding organization, Contents, Terms** : METI Subsidy program (2023)
- **URL** : <https://www.moeco.com/en/news/2023/03/feasibility-study-for-blue-gas-to-power-concept-utilizing-oxyfuel-power-generation.html>



- **Project outline** : Supporting diesel-to-gas conversion policy, this Feasibility Study conducts mapping of stranded gas fields, demand survey and business modeling including partnering with local gas field owner.
- **Organization Name** : KRC, Maseed, MHI, PT.AMO, Bandung Institute of Technology
- **Funding organization** : METI 2023 Study on Business Opportunity of High-quality Energy Infrastructure to Overseas (Aug.2023 ~Feb.2024)

## Business Scheme Image



## Expected Implementation Schedule

- Aug. 2024: mini-LNG pilot project agreement (FID)
- Jan. 2027: mini-LNG pilot project COD
- Jul. 2027: mini-LNG project expansion agreement (FID)
- Jul. 2027: pre-agreement on CO<sub>2</sub> storage service upon pilot project field depletion. \*
- Jul. 2030 :mini-LNG expansion COD
- Dec. 2032: CO<sub>2</sub> storage service COD

\*CO<sub>2</sub> storage business implementation schedule will be reviewed based on law & regulation readiness.

- **Project outline** : To stabilize the local power grid and increase the ratio of renewable energy power generation through coordinated control of renewable energy and existing internal combustion power generation on a remote island with a population of tens of thousands of people located in the Malaysian border area of North Kalimantan.
- **Organization name, Partner organization name** : Kyudenko Corporation
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) / June. 2023~Mar. 2024
- **URL** : <https://www.kyudenko.co.jp/en/>

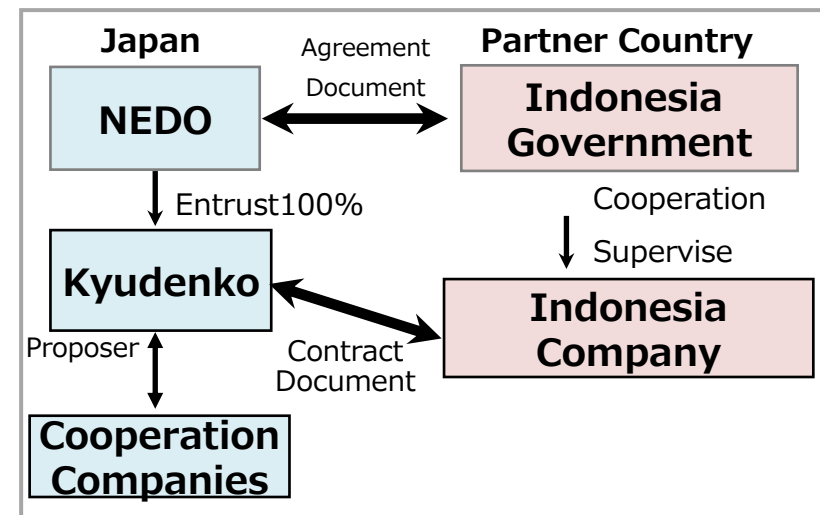
## <Project outline>

- ◆ By using an in-house developed energy management system for renewable energy generation and large-scale storage batteries, combine biomass power generation and solar power generation using locally produced and locally consumed raw materials to provide stable power transmission to the local grid 24 hours a day.
- ◆ In the future, expand the scale for commercialization and achieve 100% renewable energy ratio
- ◆ Stabilizing the grid through hybrid power generation on a remote island with a population of tens of thousands of people is unprecedented. Demonstration to be done with the cooperation of the partner country's government.



Conceptual Chart

## <Project scheme>



- **Project outline** : In order to contribute to the achievement of the decarbonization goal, the feasibility of a power supply planning and operation optimization proposal service for Indonesia and other target countries utilizing power market simulation technology and knowledge will be investigated.
- **Organization name** : Mitsubishi Heavy Industries, Ltd (Associated with Institute of Technology in Bandung for Indonesia)
- **Funding organization** : 2023 METI Feasibility Study Projects for Overseas Deployment of High Quality Infrastructure
- **URL** : <https://www.meti.go.jp/information/publicoffer/saitaku/2023/s230802001.html>

## <Overview of activities>

## <Schedule>

### MHI Market Model

Case・Assumptions

- Decarbonize Target
- Conditions
- Demand
- Fuel Price
- VRE Introduction

Asset database

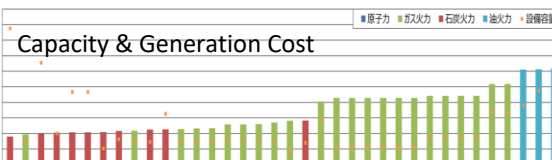
- Transmission Line
- Generation Asset
- Location
- Specification
- Cost(Fixed/Variable)

Interconnected Model  
150~500kV

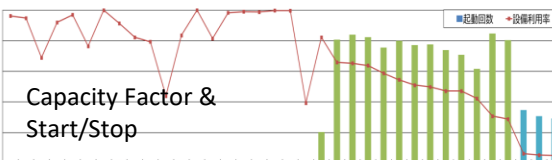


### Operation Pattern Forecast Upgrade Proposal

#### Capacity & Generation Cost



#### Capacity Factor & Start/Stop



Implementation Items	September	October	November	December	January	February
1.Implementation item a Future power supply configuration and decarbonization strategy for achieving decarbonization targets						
a-1. ITB Consultation and Hearing						
a-2. Analysis, Evaluation and Decarbonization Strategy Planning						
a-3. ITB Consultation						
a-4. Hearing						
2.Implementation item b. Consideration of utilization policy of existing thermal power generation facilities						
b-1. Proposed target countries and remodeling services						
b-2. Analysis and Evaluation						
b-3. Hearing #1						
b-4. Analysis and Evaluation						
b-5. Hearing #2						
3.Implementation item c Consideration of utilization policy of existing thermal power generation facilities						
c-1. project formulation						
c-2. Analysis and Evaluation						
c-3. Hearing #1						
c-4. Analysis and Evaluation						
c-5. Hearing #2						



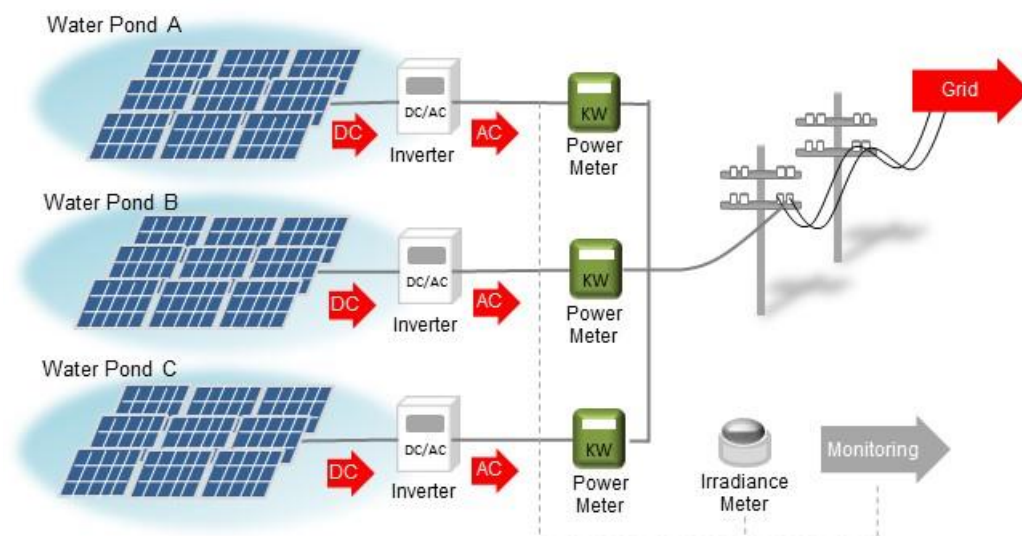
- **Project outline** : This project will install 14MW floating solar power system on three unused water ponds in Vientiane. Lower temperature on water ponds enables more efficient power generation than on land. Electricity generated by solar system replaces grid electricity to reduce GHG emission (Expected GHG Emission Reductions: 6,838 tCO<sub>2</sub>/year).
- **Organization name, Partner organization name** : (Japan) TSB Co., Ltd (Lao PDR) TPG Lao Co., Ltd
- **Funding organization, Contents, Terms** : Ministry of the Environment Japan: JCM Model Project (FY2017)
- **URL** : [https://gec.jp/jcm/projects/17pro\\_lao\\_01/](https://gec.jp/jcm/projects/17pro_lao_01/)

## Vientiane Capital Province Hatxaifong District

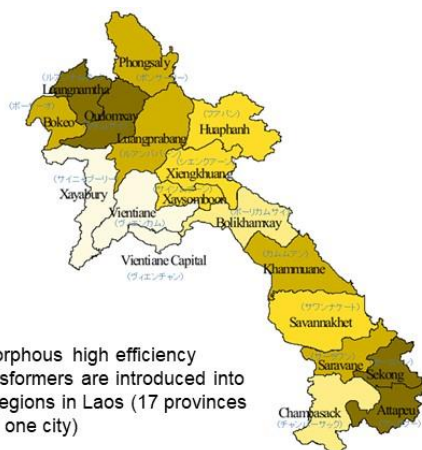


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## Sites of JCM Model Project

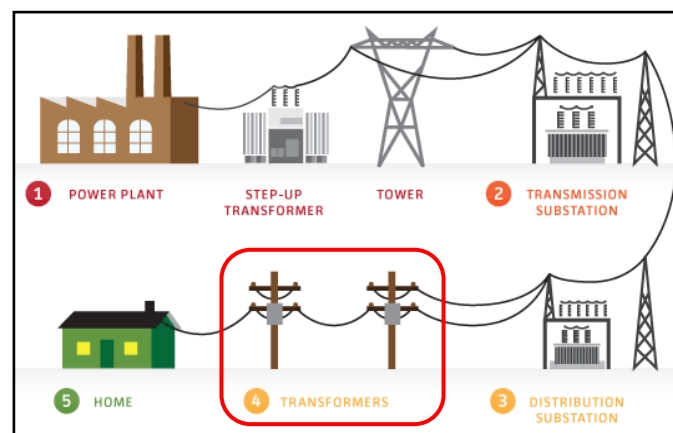


- **Project outline** : The purpose of this project is to reduce CO<sub>2</sub> emission through the introduction of amorphous high efficiency transformers instead of transformers with silicon steel core in power grid. 1,307 transformers in total are introduced to Electricite Du Laos (Expected GHG Emission Reductions: 2,109 tCO<sub>2</sub>/year).
- **Organization name, Partner organization name in AZEC countries** : (Japan) Yuko Keiso Co., Ltd., (Lao PDR) Electricite Du Laos
- **Funding organization, Contents, Terms** : Ministry of the Environment Japan: JCM Model Project (FY2017)
- **URL** : [https://gec.jp/jcm/projects/17pro\\_lao\\_02/](https://gec.jp/jcm/projects/17pro_lao_02/)



Amorphous high efficiency transformers are introduced into all regions in Laos (17 provinces and one city)

Sites of JCM Model Project



“④TRANSFORMERS” in the above are the subjects of the project.



Amorphous high Efficiency transformer

- **Project outline** : We are conducting a JCM feasibility study using integrated systems of hydrogen generators and hydrogen boilers to reduce CO<sub>2</sub> emissions and achieve less dependence on imported fossil fuels, and utilize surplus renewable electricity.
- **Funding organization, Contents, Terms** : JCM Feasibility Study by METI, FY2023
- **URL** : <https://www.meti.go.jp/information/publicoffer/kobo/2023/k230424002.html>

## [Conventional Boiler Firing]

Import of Fossil Fuels through Land Transportation from Thailand and Vietnam

Fossil Fuel

Fossil Fuel Fired Boiler

Steam

Existing Facility



- CO<sub>2</sub> Emission Reduction
- Less Dependence on Imported Foreign Fossil Fuel
- Well-Utilization of Domestic Resources (Renewable Energy)

## [Hydrogen Fired Boiler]

Renewable Energy  
Hydro Power  
/Solar Power

Electric Power

Hydrogen Generator



H<sub>2</sub>

Hydrogen Fired Boiler

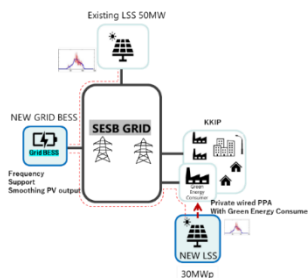
Steam

Existing Facility

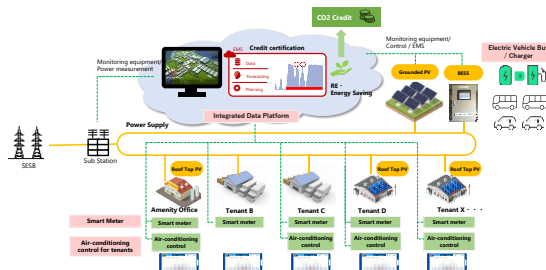
- **Project outline (Purpose, Strengthen point, Schedule)** : This project aims to demonstrate the grid Battery Energy Storage System (BESS) + Large Scale Solar generation project (LSS), and the introduction of green power supply and the smart Energy Management System (EMS) in Kota Kinabalu Industrial Park (KKIP), in Sabah State.
- **Organization name, Partner organization name** : Nippon Koei Energy Solutions Co., Ltd., Nippon Koei Co., Ltd. ,iFORCOM Co.,Ltd.
- **Regions** : Sabah
- **Funding organization, Contents, Terms** : NEDO/International Demonstration Project for Japanese Technologies Contributing to Decarbonization and Energy Transition (Basic study: Dec. 2022~Sep. 2023)
- **URL** : <https://www.n-koei.co.jp/energy/english/>  
<https://www.n-koei.co.jp/consulting/english/> <https://www.iforcom.jp/english/>

## <Project Outline>

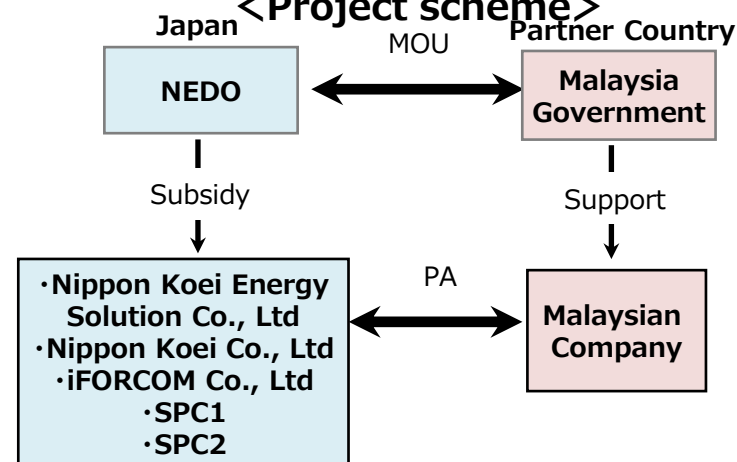
### Business component ① LSS + BESS



### Business component ② Green power supply and EMS in KKIP



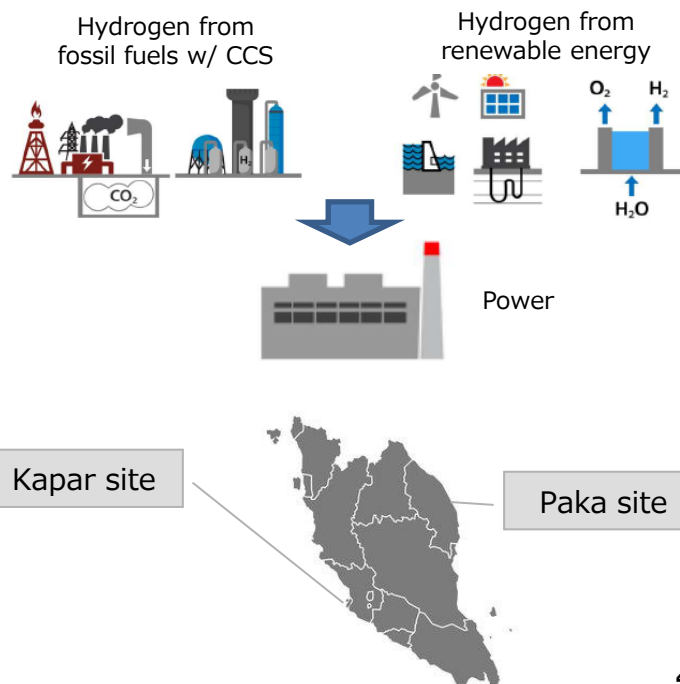
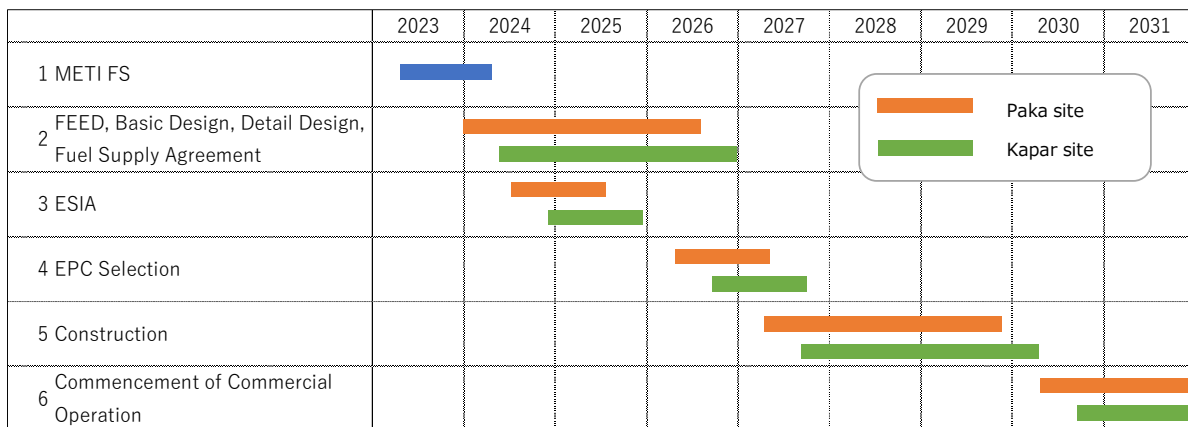
## <Project scheme>



- **Project outline** : Study the development plan of gas turbine combined cycle plant with the future option of H2 application as carbon neutral fuel including import facility and supply chain information.
- **Organization name** : PACIFIC CONSULTANTS CO., LTD./ TOKYO ELECTRIC POWER SERVICES CO., LTD.
- **Country or Regions** : Kapar site and Paka site
- **Funding organization, Contents, Terms** : Cooperation with TNB Genco (Plant Owner) from 2021

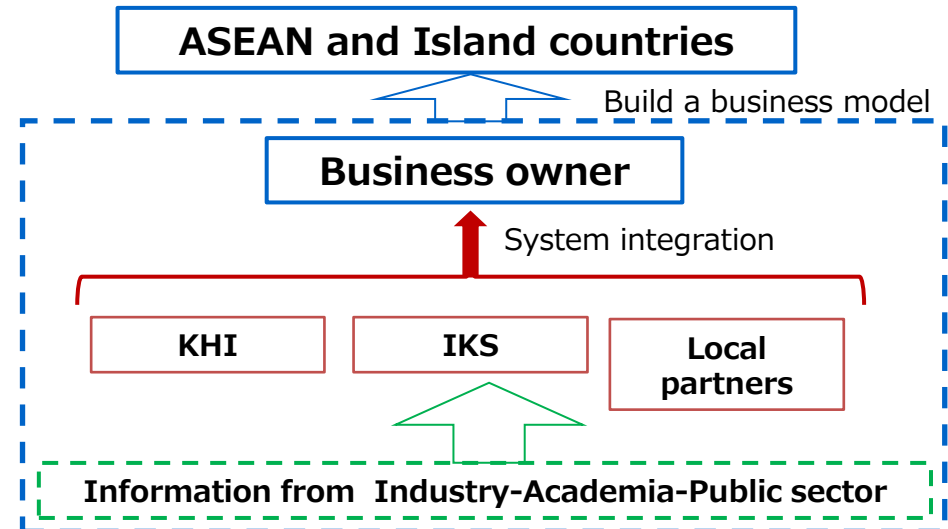
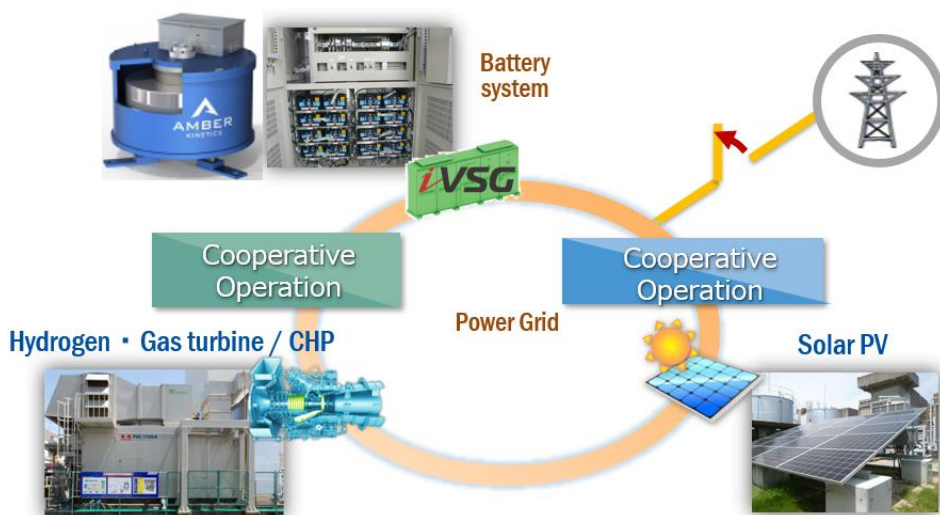
## <FS Item>

- ✓ H2 supply chain study (literature and hearing)
- ✓ H2 application study onto Peninsular power development plan (cost, H2 import volume, CO2 reduction impact)
- ✓ H2 & NH3 safety and environmental consideration
- ✓ Hearing to Malaysian Authorities about H2-ready development





- **Project outline (Purpose, Strengthen point, Schedule)** : Low inertia problem will become an obstacle for huge deployment of renewable energy. Kawasaki's iVSG software with storage system can provide inertia instead of using power plants. The purpose of the project is to build a next generation renewable energy model and to expand it starting from the Philippines.
- **Organization name, Partner organization name** : Kawasaki Heavy Industries, IKS
- **Funding organization, Contents, Terms** : FY2023 Feasibility Study Project for Overseas Deployment of High Quality Infrastructure program
- **URL** : <https://www.khi.co.jp/> <https://iks-jp.co.jp/>

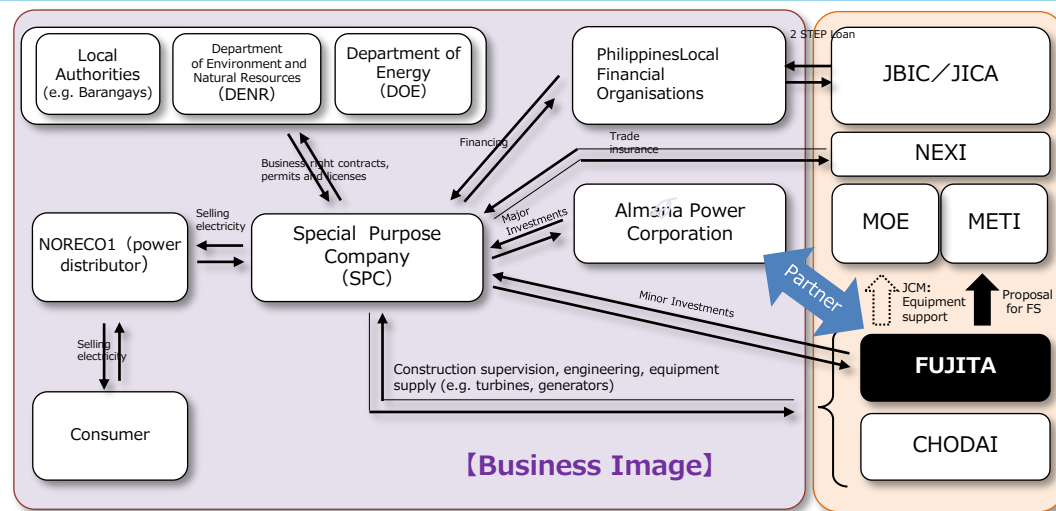


- **Project outline** : This Feasibility Study aims to contribute to decarbonization and the solution of electricity shortages, as well as to mutually expand business through a partnership between the general contractors of Japan and Philippines.
- **Organization name:** Fujita Corporation
- **Partner organization name** : Philippine Almanac Group companies (Almanac C&D and Almanac Power), local electricity distribution cooperatives, CHODAI CO., LTD. etc.
- **Regions** : Negros Occidental
- **Funding organization, Contents, Terms:** METI (Ministry of Economy, Trade and Industry)
- **URL** : <https://www.meti.go.jp/information/publicoffer/saitaku/2023/s230802001.html>

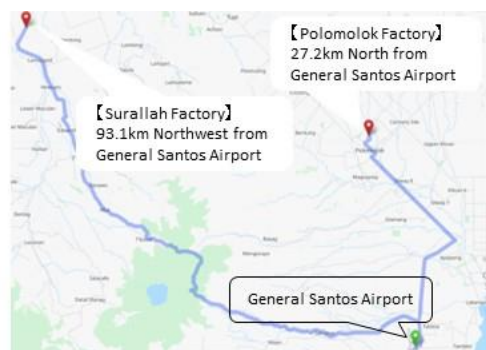


### <FS schedule>

Flow observation and geological surveys are currently underway to develop the power generation plan and finalize the provisional design conditions.  
Early 2024: Completion of the FS study.

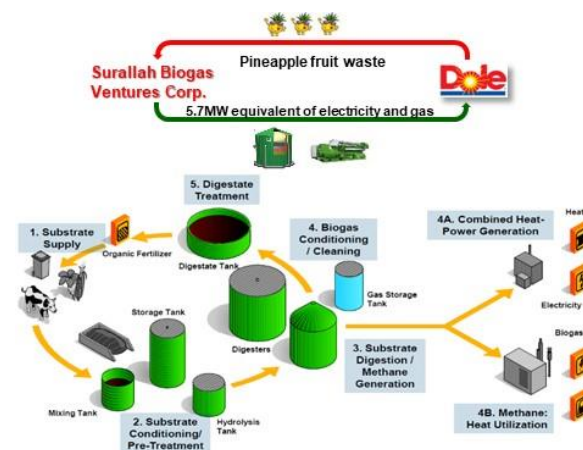


- **Project outline** : In this project, biogas derived from pineapple residue is utilized as fuel for gas engines and boilers to generate power and steam at the two pineapple canning factories (Surallah and Polomolok) of Dole Philippines, Inc. This project contributes to reducing GHG emissions as well as lowering electricity cost for Dole Philippines, Inc. (Expected GHG Emission Reductions: 54,167 tCO<sub>2</sub>/year).
- **Organization name, Partner organization name in AZEC countries** : (Japan) ITOCHU Corporation (Philippines) METPower Venture Partners Holdings, Inc. / Surallah Biogas Ventures Corporation
- **Funding organization, Contents, Terms** : Ministry of the Environment Japan: JCM Model Project (FY2019)
- **URL** : [https://gec.jp/jcm/projects/19pro\\_phl\\_03/](https://gec.jp/jcm/projects/19pro_phl_03/)



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Sites of JCM Model Project



- **Project outline** : Study for installation of roof-top solar panels and bioenergy systems with chicken manure and storage battery to replace grid electricity
- **Organization name** : Electric Power Development Co., Ltd.
- **Regions** : Province of Bataan
- **Funding organization, Contents, Terms** : FY2023 JCM Feasibility Study supported by METI
- **URL** : [https://www.jpowers.co.jp/english/news\\_release/pdf/news230929-2e.pdf](https://www.jpowers.co.jp/english/news_release/pdf/news230929-2e.pdf)

## 1. Survey site :



## 2. Survey period : Sep 2023 - Feb 2024

## 3. Business Scheme :

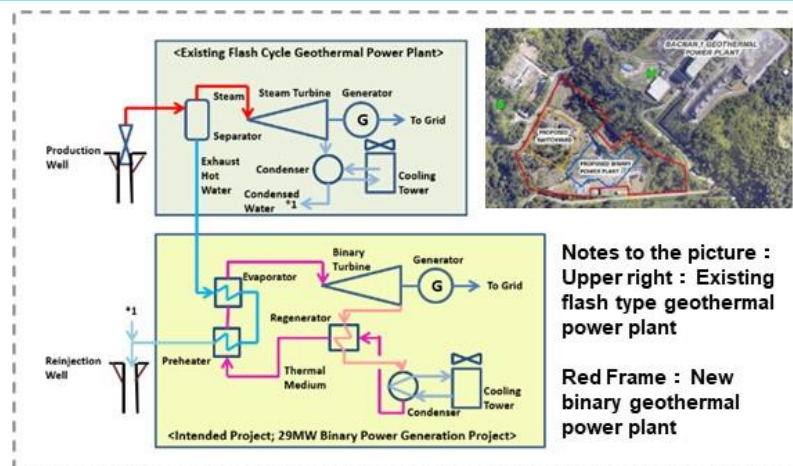
Replacement of grid power and supply of surplus power to the grid by CO2-free electricity



- **Project outline** : This project introduces a new 29 MW binary geothermal power plant with the Organic Rankine Cycle (ORC) system to the existing 120MW flash type geothermal power plant owned and operated by Bac-Man Geothermal Inc. This project replaces the grid power produced by fossil fuel with renewable energy and reduces GHG emissions (Expected GHG Emission Reductions: 72,200 tCO<sub>2</sub>/year).
- **Organization name, Partner organization name** : (Japan) Mitsubishi Heavy Industries, Ltd. (Philippines) Bac Man Geothermal Inc.
- **Funding organization, Contents, Terms** : Ministry of the Environment Japan: JCM Model Project (FY2020)
- **URL** : [https://gec.jp/jcm/projects/20pro\\_phl\\_01/](https://gec.jp/jcm/projects/20pro_phl_01/)



Sites of JCM Model Project

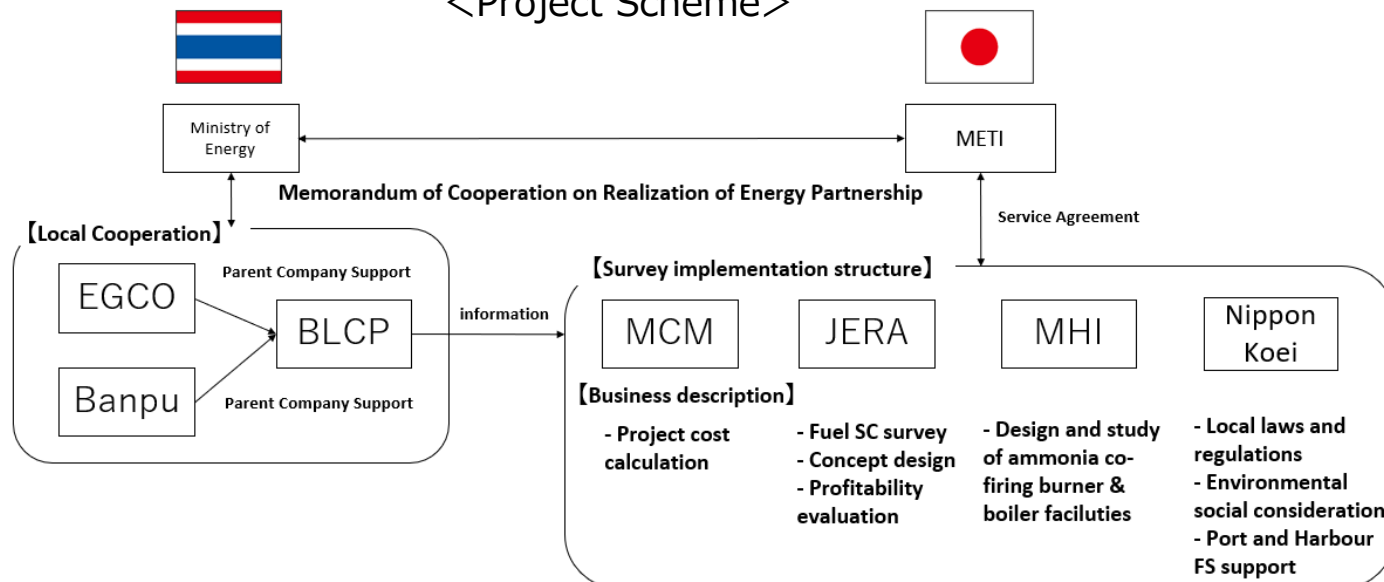




- **Project outline:** Feasibility study including ①Ammonia 20% co-firing at BLCP Power Plant ②Establishment of supply chain for ammonia procurement ③Economics and carbon reduction benefits of the entire ammonia value chain
- **Organization name:** JERA, MHI, MC Machinery (MCM), Nippon Koei, <sup>1</sup>EGCO, <sup>2</sup>Banpu, <sup>3</sup>BLCP
- **Funding organization, Contents, Terms:** FY2023 Feasibility Study for Overseas Development of High-Quality Energy Infrastructure (METI), Assistance with study expenses, October 2023 – February 2024
- **URL :** [Adoption of Feasibility Study for Overseas Development of High-Quality Energy Infrastructure \(FY2023\)](#)

1: Electricity Generating Public Company Limited, 2: Banpu Power Public Company Limited, 3: BLCP Power Limited

## <Project Scheme>



## <BLCP Coal-fired Power Plant>

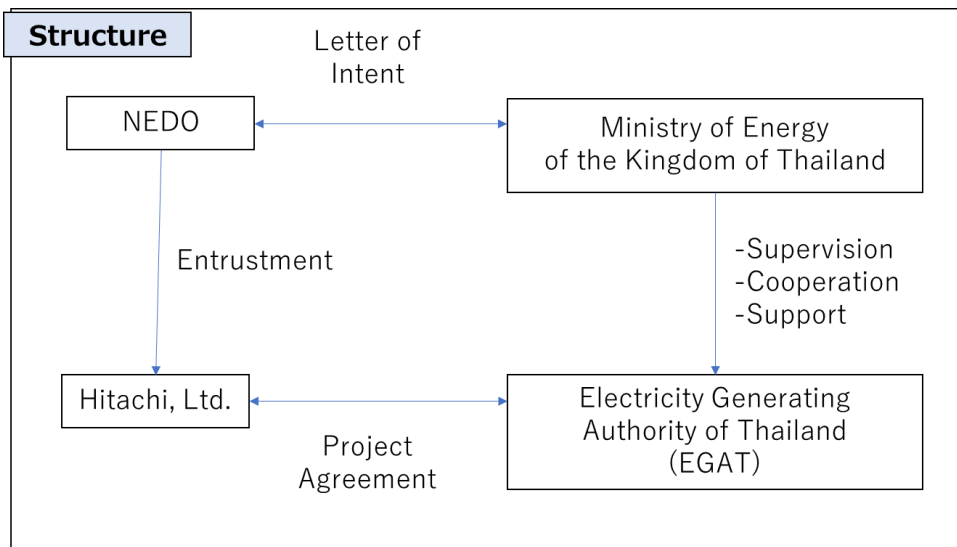


- **Project Outline** : In order to reduce CO2 emissions, the Project will introduce online optimal control system, named OPENVQ to the transmission system of the Electricity Generating Authority of Thailand (EGAT). OPENVQ can reduce CO2 emissions by reducing transmission loss and contribute to an increase of renewable energy through increasing transmission capacity.
- **Project Participant** : HITACHI, Electricity Generating Authority of Thailand (EGAT)
- **Site** : Territory of Northeastern Control Center of EGAT grid
- **Funding organization, Contents Terms**: NEDO, JCM Low-carbon Demonstration Project. From October 2020 to March 2024

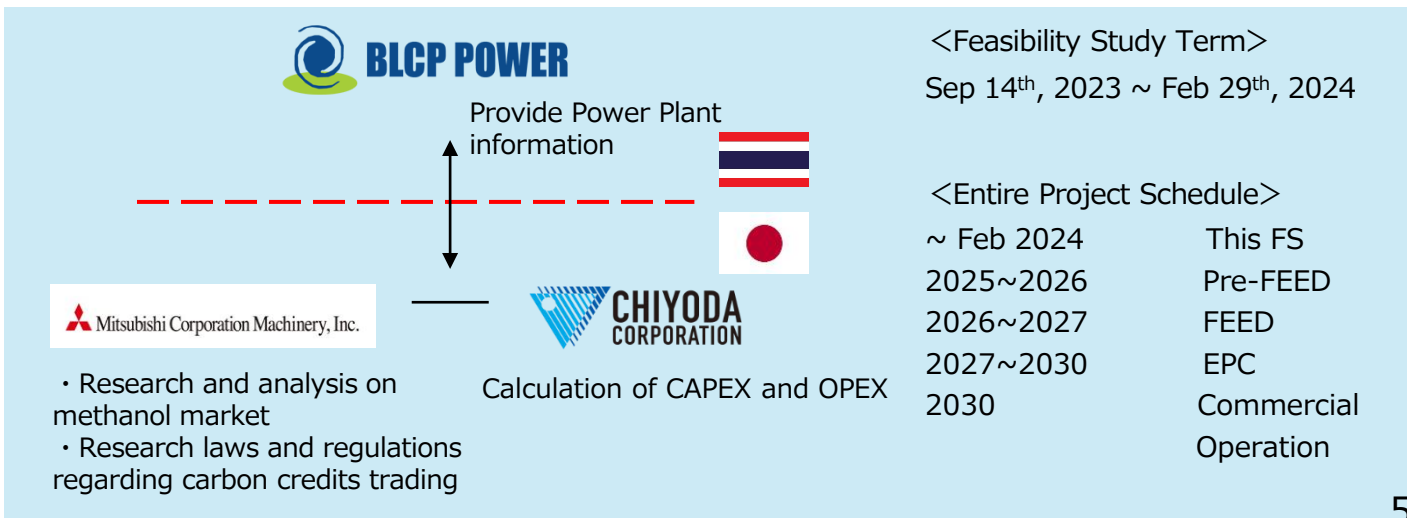
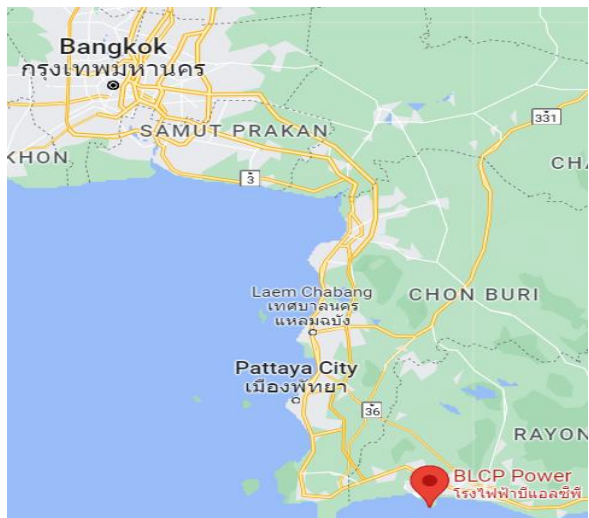
## Demonstration site



## Structure



- **Project outline** : Feasibility study for the incorporation of Chiyoda's CO2 reforming technology at BLCP power plant and economic evaluation after calculating CAPEX/OPEX and revenue from selling CO2 recycling methanol, which is an expected product after CCU process
- **Organization name** : Mitsubishi Corporation Machinery, Chiyoda Corporation
- **Funding organization, Contents, Terms** : " Feasibility Study Project for Overseas Deployment of High Quality Energy Infrastructure" by Ministry of Economy, Trade and Industry
- **URL** : <https://www.meti.go.jp/information/publicoffer/saitaku/2023/s230802002.html>

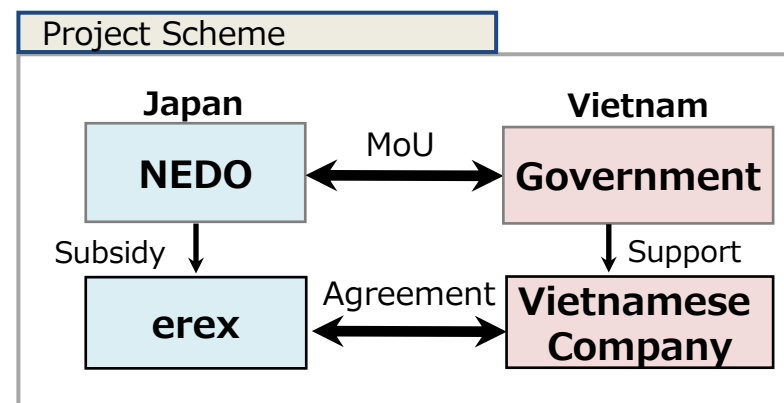




- **Project outline** : Stable operation of the coal-fired circulating fluidized bed (CFB) boiler power generation facility with a high-ratio of biomass fuel co-firing will be achieved using erex's operation control technology and planning of facility optimization.
- **Organization name** : erex Co.,Ltd.
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) / Dec.2023-Sep.2024)
- **URL** : <https://www.erex.co.jp/> , <https://www.erex.co.jp/news/information/2537/>

Applied technology:

- ① Operation and control technology for stable operation at high ratio co-firing by combining the measures against high temperature corrosion due to biomass co-firing with the maintenance of power generation efficiency.
- ② Optimization technology for facility planning to reduce the scope of additional biomass facilities and modification of existing facilities.



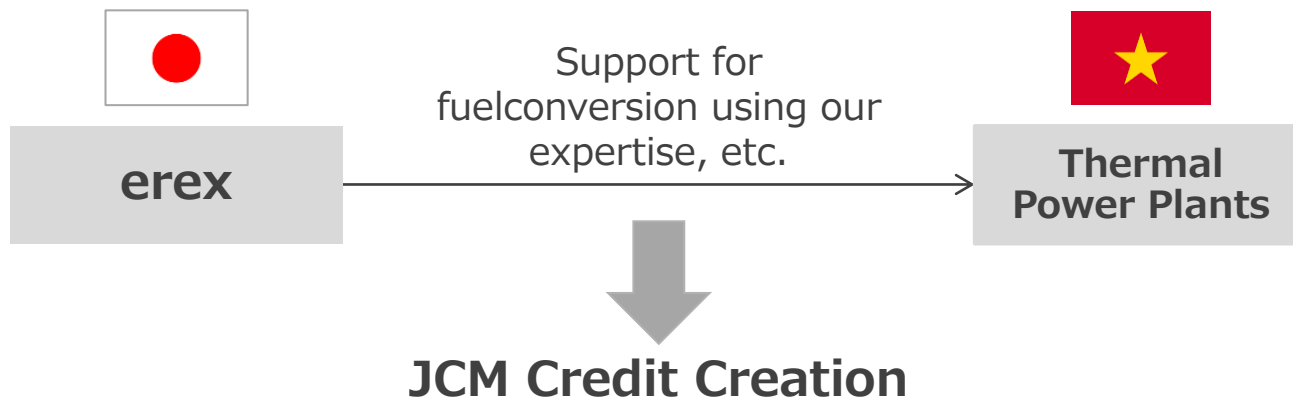


# Feasibility Study on JCM Credit Creation Through Fuel Conversion



- **Project Outline:** Based on Vietnam's PDP8, fuel conversion for thermal power generation is essential in order to balance the increase in power demand with economic growth and the achievement of carbon neutrality in 2050. In this project, fuel conversion of an existing thermal power plant using biomass fuels existing in Vietnam will be implemented, and carbon credits will be generated through this project. Vietnam plans to develop an ETS market from FY2028 onward, and the creation of carbon credits will contribute to the achievement of Vietnam's NDC as well as to the revitalization of the ETS market.
- **Organization Name:** erex Co., Ltd.
- **Funding Organization, Contents, Terms:** JCM feasibility study by Ministry of Economy, Trade and Industry, FY2023
- **URL :** <https://www.pacific.co.jp/news/2023/20230922-001143.html>

## Assumed Scheme

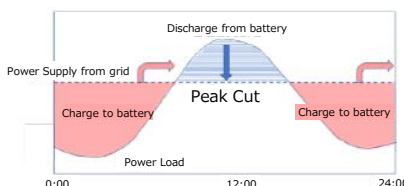
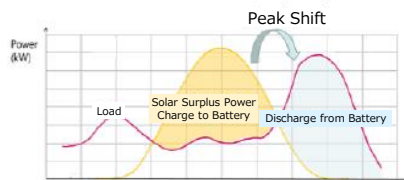
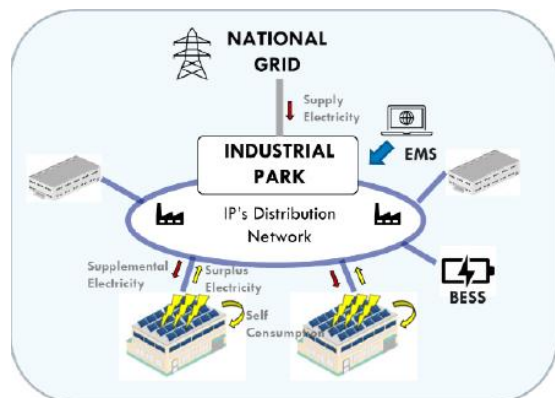




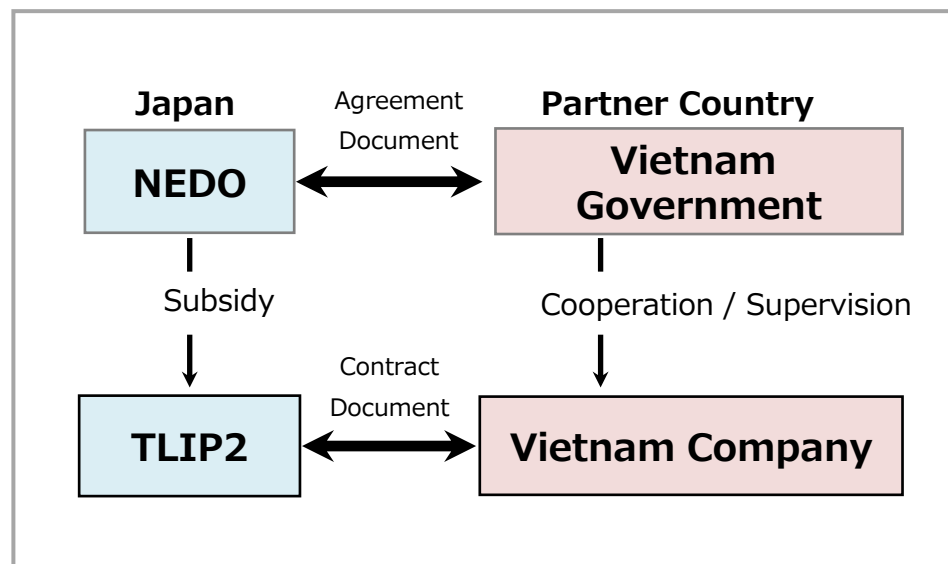
- **Project outline** : Demonstrate and achieve grid stabilization, peak shift, adaptation to instantaneous voltage fluctuation, etc., by utilizing storage batteries in conjunction with the expansion of roof-mounted solar power generation in Thang Long Industrial Park II.
- **Organization name, Partner organization name** : Sumitomo Corporation / Thang Long Industrial Park II Corporation / Nippon Koei Energy Solutions Co., Ltd.
- **Regions** : Hung Yen Province
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) / Oct. 2023~Mar. 2024
- **URL** : <https://www.sumitomocorp.com/ja/jp/news/topics/2022/group/20220309>

## <Project outline>

- To establish a green industrial park by expanding rooftop solar power and utilizing storage batteries and realize stable operation of tenant companies during power shortages. To contribute to Vietnam's electricity market by supporting peak shifts.
- Identify the details and frequency of system instability in a status of 100MWp solar power deployment. Consider the type and capacity of storage batteries that can accommodate this.



## <Project scheme>



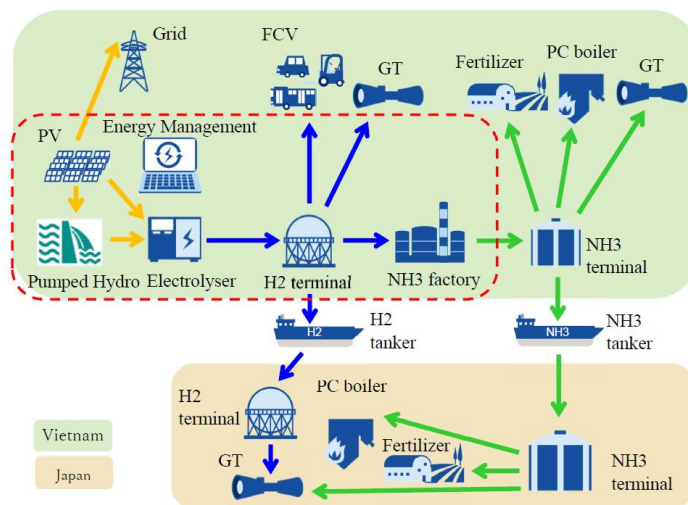
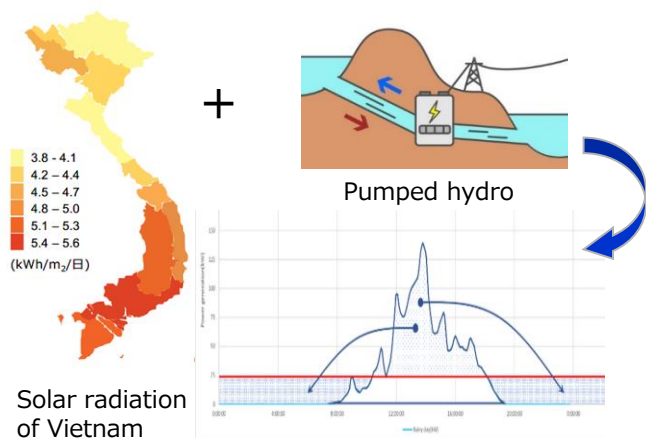


# Feasibility study on Green H2 and Ammonia produced by Renewable energy

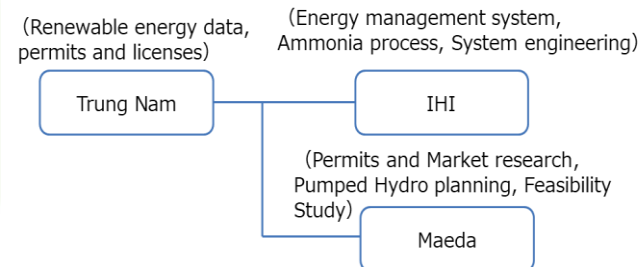
GoJ  
Support

- **Project outline** : Investigation the technical and economic feasibility of stable production of green hydrogen and ammonia in Vietnam by combining renewable energy, pumped mini-hydropower, and energy management.
- **Organization name, Partner organization name** : IHI Corporation, Maeda Corporation, Trung Nam group
- **Funding organization, Contents, Terms** : 2023 FS by METI subsidy, after 2024 Proposal for demonstration PJ

## <PJ image>



## <PJ organization>



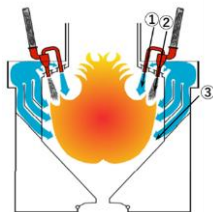
Using Green Ammonia produced in Vietnam from renewable energy in Vietnam and exporting and using in Japan will be contributing to decarbonization in both countries.



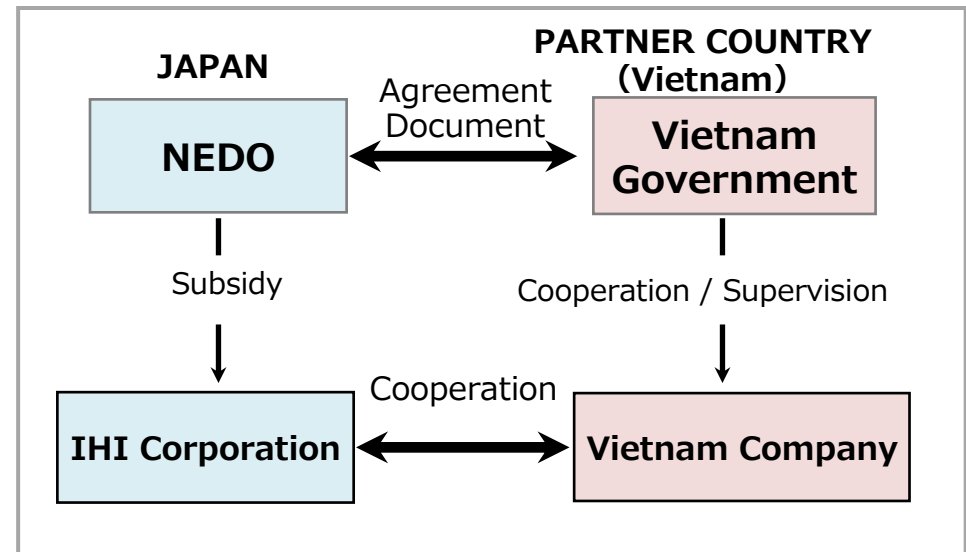
- **Project outline** : Demonstrate ammonia combustion at an anthracite-fired power plant owned by the state-run electricity company Vietnam Electricity (EVN), for the contribution to the decarbonization of coal-fired power generation as outlined in Vietnam's National Power Development Plan.
- **Organization name, Partner organization name** : IHI corporation
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) / Oct. 2023~Mar. 2024
- **URL** : <https://www.ihico.jp/en/>

## <Project outline>

- ◆ To demonstrate ammonia combustion in the world's first anthracite-fired power plant by utilizing the ammonia combustion technology established by IHI. In Vietnam, different coal (anthracite) is used than in Japan (bituminous coal), and the core technology to be applied is ammonia combustion to the power plant specified to the anthracite coal.
- ◆ If this technology is applied to EVN's anthracite-fired power plant, a reduction of 2.75 million tons of CO<sub>2</sub>/year is expected (5% ammonia combustion case).



## <Project scheme>





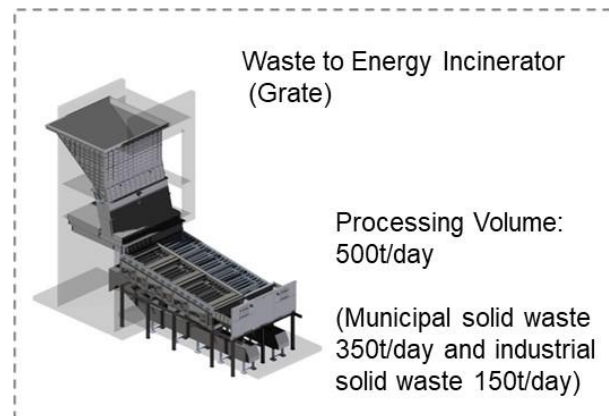
- **Project outline** : In this project, a waste-to-energy plant is introduced in Bac Ninh province. This plant incinerates and generates electricity from 230 tons/day of municipal solid waste, which has been disposed of as landfill. The plant also incinerates and generates electricity from 120 tons/day of municipal solid waste and 150 tons/day of industrial solid waste, which were previously incinerated. This project reduces methane emissions from landfill sites and GHG emissions by replacing grid electricity (Expected GHG Emission Reductions: 41,804 tCO<sub>2</sub>/year).
- **Organization name, Partner organization name** : (Japan) JFE Engineering Corporation (Vietnam) T&J Green Energy Company Limited
- **Funding organization, Contents, Terms** : Ministry of the Environment Japan: JCM Model Project (FY2021)
- **URL** : [https://gec.jp/jcm/projects/21pro\\_vnm\\_01/](https://gec.jp/jcm/projects/21pro_vnm_01/)

Project site:  
Bac Ninh  
Province  
(Approx. ~30km  
east of Hanoi  
City)  
Approx. 50km  
southeast of  
Noi Bai Airport



Map data©2021Google

Sites of JCM Model Project





# Study on Private Investment Scheme for Grid Interconnection Facilities

GoJ  
Support

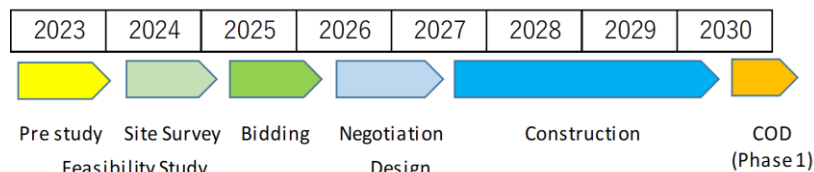
- **Project outline** : To study public-private partnerships and private investment schemes for grid-connected facilities in order to further promote renewable energy in Vietnam, a country with a fragile power system.
- **Organization name, Partner organization name** : Kumagai Gumi Co., Ltd.
- **Partner** : INPEX CORPORATION, Mitsubishi Research Institute, Inc. Truong Thanh Vietnam Group Joint Stock Company, Baker & McKenzie (Vietnam) Ltd.
- **Regions** : Area around Tra Vinh province
- **Funding organization, Contents, Terms** : METI/"Feasibility Study for Overseas Development of High-Quality Energy Infrastructure"/ Until 29<sup>th</sup> Feb. 2024
- **URL**: [https://www.meti.go.jp/policy/external\\_economy/cooperation/oda/r5\\_yosan\\_6.html](https://www.meti.go.jp/policy/external_economy/cooperation/oda/r5_yosan_6.html)



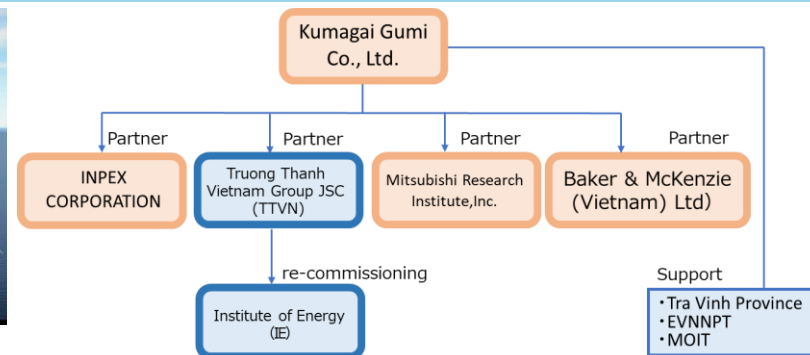
Location



Offshore Wind Power Project(Image)



Estimated Project Schedule



Organization chart



## 5. Progress of AZEC Projects

(1) Projects supported by the Government of Japan (GoJ)

- Transitions in Industry/Transport sector

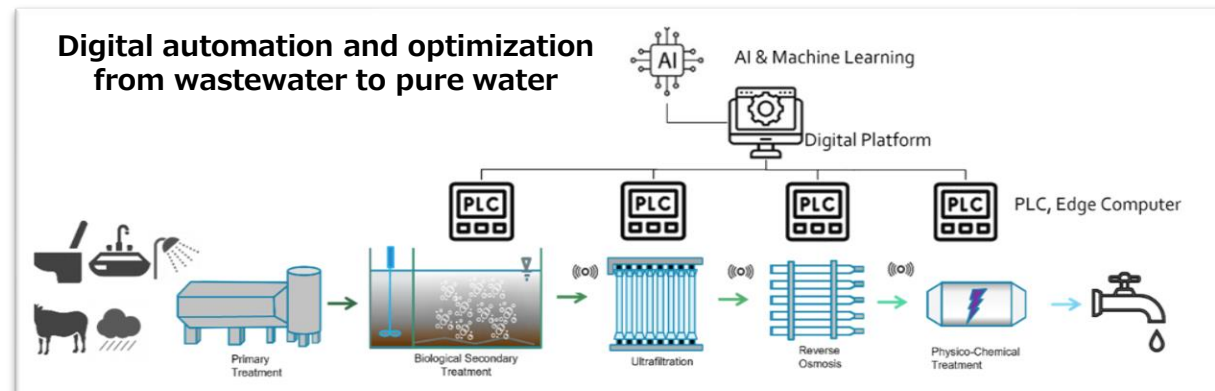
- **Project outline:** Evaluate the effects of reducing operation cost and CO2 emissions through autonomous and optimization by AI, Machine learning and digital application technologies in Water Reuse Infrastructure.
- **Organization name, Partner organization name :** Yokogawa Electric Corporation, Yokogawa Engineering of Asia Pte. Ltd., Yokogawa Australia Pty. Ltd.
- **Funding organization, Contents, Terms :** METI, FY2023 Subsidy-Based Infrastructure FS Project for Overseas Expansion



- Collaborative studies with water utilities in New South Wales.
- Shifting to water reuse and evaluate CO2 emission reduction.
- Develop the collaboration towards commercialization.

Timeline from Study to Commercialization

	FY23	FY24	FY25
Feasibility Study			
Off-line Demo	●	●	
Online Demo		●	●
Commercialization			● →



- **Project outline** : Mitsubishi Corporation conducted the PoC of ondemand shared mobility service from multiple different perspectives, with an aim to solve the social problems such as chronic traffic congestion and a shortage of parking spaces in Brunei.
- **Organization name, Partner organization name** : Mitsubishi Corporation, Dart Logistics Sdn. Bhd.
- **Regions** : The city center of Brunei
- **Funding organization, Contents, Terms** : JETRO, subsidy of "Asia Digital Transformation (ADX) Promotion Projects", August 2021 - January 2023
- **URL** :  
[https://www.jetro.go.jp/ext\\_images/News/announcement/2021/d38074f8efc798ae/Mitsubishi\\_Corporation\\_en.pdf](https://www.jetro.go.jp/ext_images/News/announcement/2021/d38074f8efc798ae/Mitsubishi_Corporation_en.pdf)

【App logo and Initial registration screen】



【Operation overview】



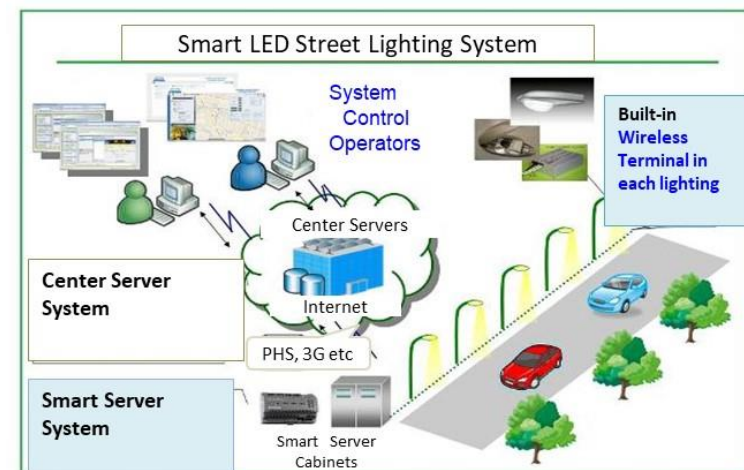
【Grand launch ceremony】



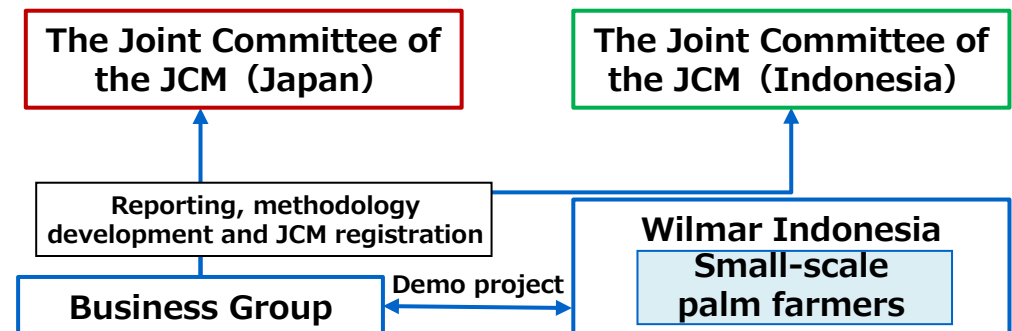
- **Project outline** : The project aims to reduce energy consumption and GHG emissions by introducing total of 5,672 units of high efficiency LED Lighting utilizing wireless network technology(Expected GHG Emission Reductions: 559 tCO<sub>2</sub>/year). Also, using smart lighting system with wireless network reduces energy consumption.
- **Organization name, Partner organization name** : (Japan) MinebeaMitsumi Inc.(Cambodia) Overseas Cambodian Investment Corporation / Siem Reap Provincial Hall / APSARA
- **Funding organization, Contents, Terms** : Ministry of the Environment Japan: JCM Model Project (FY2015)
- **URL** : [https://gec.jp/jcm/projects/15pro\\_cam\\_01/](https://gec.jp/jcm/projects/15pro_cam_01/)



Sites of JCM Model Project



- **Project outline:** Though introducing AI technology that can judge and sort the maturity of palm FFB collected as raw material for biodiesel from the palm plantation to the biodiesel production plant in Indonesia, achieving CO2 emission reduction by improving and increasing the yield of palm oil extraction quantity and biodiesel production. In the future, commercialization of the project as a programme-type JCM project will be considered (FY2025).
- **Organization name, Partner organization name:** Kanematsu Corporation, Kabuku Inc, Climate Experts CO., Ltd, PT. Daemeter Consulting, PT. Dharma Karyatama Mulia
- **Funding organization, Contents, Terms :** JCM Feasibility Study by METI
- **URL :** <https://www.pacific.co.jp/news/2023/20230710-001117.html>





# Experimental Study of "Production Technology of Bio Coke to Realize the Same Effect as Coal Coke"

- **Project outline** : By focusing on coconut shells (PKS), which is a country of origin for palm plants but has few uses, to developed a fuel using PKS as a raw material (bio-briquette coal) to achieve carbon neutrality in cupola melting, and replace existing fuels (coal coke). In order to achieve, to conduct empirical research on producing bio-briquette coal that meets the required quantity and required quality for one cupola.
- **Organization name, Partner organization name** : Aisin Takaoka Co., Ltd.
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) / Dec. 2023~Mar. 2024
- **URL** : <https://www.at-takaoka.co.jp/news/detail.php?id=111>

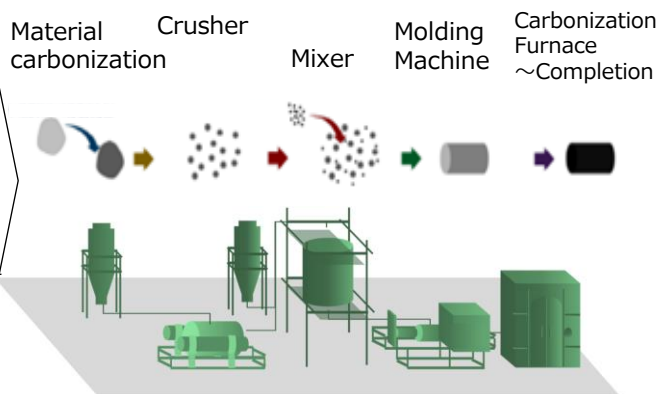
## <Project outline>

- ◆ In Japan, approximately 800,000 t-CO<sub>2</sub>/year is emitted through cupola melting for cast iron melting.  
(approximately 150,000 t-CO<sub>2</sub>/year at our company)

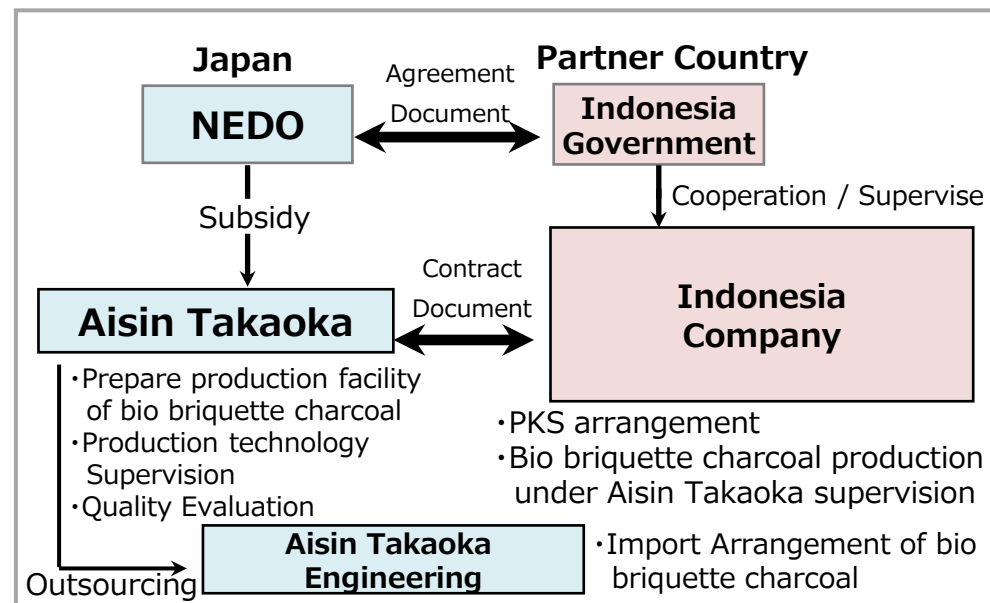
### 【Required Quality】

- Prevent damage when charging  
Cold Strength >95%
- Stable Heat  
More than 30MJ
- Sustaining combust for carbon absorptio into the molten metal  
Hot Strength 55-85%
- Volatile matter not present in the molten metal  
Below 3%

### 【Production Technology】



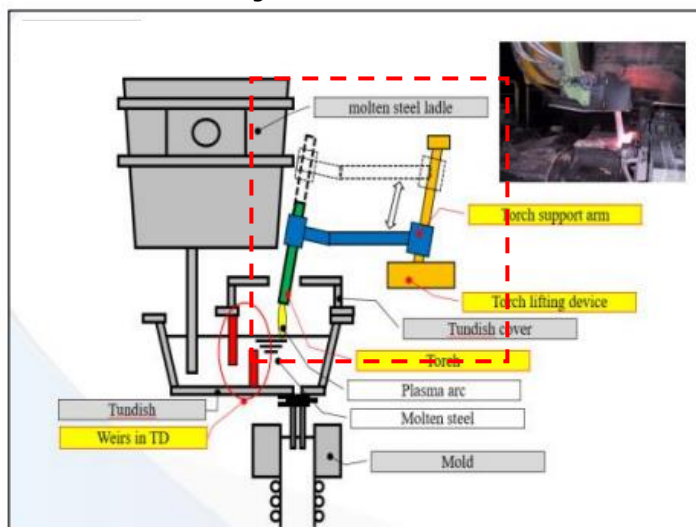
## <Project scheme>



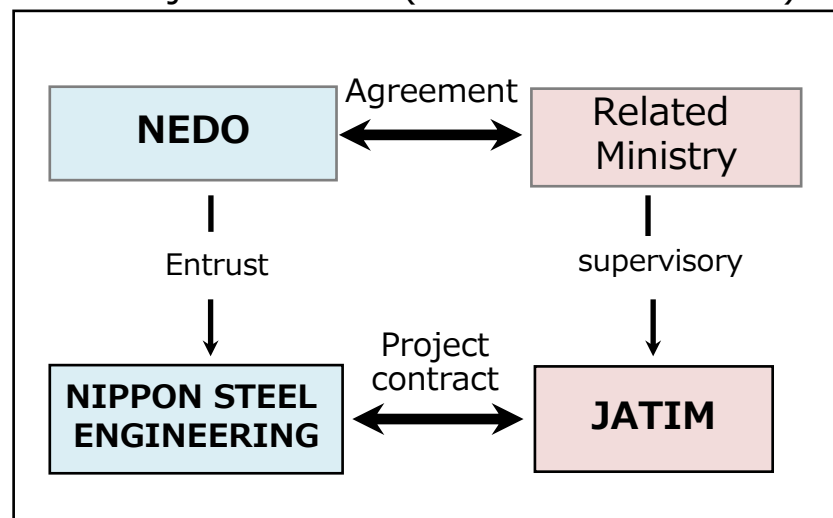


- **Project outline** : This demonstration project will introduce a plasma heating device (TPH) to the tundish of a continuous casting machine at an electric furnace steel factory and demonstrate its effectiveness in reducing GHG emissions. Under the JCM system, this demonstration project will carry out JCM procedure toward issuance of JCM credit.
- **Organization name** : NIPPON STEEL ENGINEERING CO., LTD (JAPAN)  
PT. JATIM TAMAN STEEL MFG. (INDONESIA)
- **Funding organization, Contents, Terms** : NEDO. JCM Low-carbon Demonstration Project. From September 2023 to August 2024

< Project outline >



<Project scheme (Under consideration)>



## ● Project outline :

- SFC aims to significantly reduce CO<sub>2</sub> emissions from peatlands in Central Kalimantan province (former the Mega Rice Project site), caused by peat fires and improper peatland management, through its stock-based peatland water management technology. SFC will also show a peatland management model that not only ensures economic viability but also contributes to community development.
- As part of the project, SFC will conduct a feasibility study which includes those activities such as peatland management and CO<sub>2</sub> emission reductions through a stable supply of woody biomass fuel. It will aim for various outputs including to develop a draft JCM methodology that will quantify CO<sub>2</sub> emission reduction.

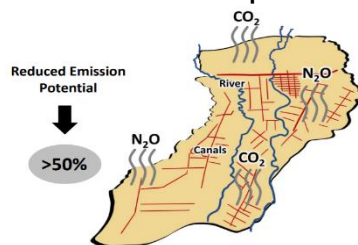
● **Organization name** : Sumitomo Forestry Co.,Ltd. (SFC)

● **Regions** : Central Kalimantan Province

● **Funding organization, Contents, Terms** : JCM Feasibility Study by METI

● **URL** : <https://www.pacific.co.jp/news/2023/20230922-001143.html>

<SFC's vision for a peatland management model in Central Kalimantan Province>



The site, where peat fires occurs frequently, is required for environmental protections and CO<sub>2</sub> emissions reduction.



An image of harmony of economic activities and CO<sub>2</sub> emission reduction including peat fire prevention.

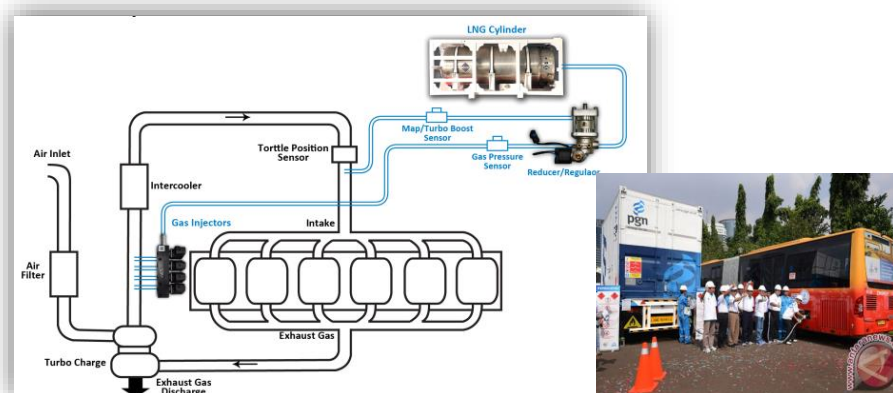


Afforestation and forest management based on stock-based peatland water management

- **Project outline** : Based on the cooperation agreement between Toyama city and Semarang city, this project aims to reduce GHG emissions through fuel switch from diesel to CNG. In the project, 72 diesel buses owned by Trans Semarang, including 25 large-sized buses and 47 mid-sized buses, are retrofitted from diesel engine to hybrid engine with CNG system available (Expected GHG Emission Reductions: 2,667 tCO<sub>2</sub>/year).
- **Organization name, Partner organization name** : (Japan) Hokusana Co.,Ltd.  
(Indonesia) BLU UPTD Trans Semarang
- **Funding organization, Contents, Terms** : Ministry of the Environment Japan: JCM Model Project (FY2018)
- **URL** : [http://gec.jp/jcm/projects/18pro\\_ina\\_03/](http://gec.jp/jcm/projects/18pro_ina_03/)



Sites of JCM Model Project



- **Project outline** : Contribute to decarbonization of the Asian region by realizing the CCS hub concept consisting of decarbonization of a Malaysian LNG terminal and receipt of CO<sub>2</sub> from domestic Malaysia and other countries including Japan and starting CO<sub>2</sub> storage in late 2028, the earliest in Asia.
- **Organization name, Partner organization name** : Petroliaam Nasional Berhad (Petronas)
- **Funding organization, Contents, Terms** : METI Subsidy program(FY2022、FY2023)
- **URL** : [https://www.enecho.meti.go.jp/appli/public\\_offer\\_result/2022/0617\\_01.htm](https://www.enecho.meti.go.jp/appli/public_offer_result/2022/0617_01.htm)  
[https://www.enecho.meti.go.jp/appli/public\\_offer\\_result/2022/0306\\_01.html](https://www.enecho.meti.go.jp/appli/public_offer_result/2022/0306_01.html)

## 【Project Map】



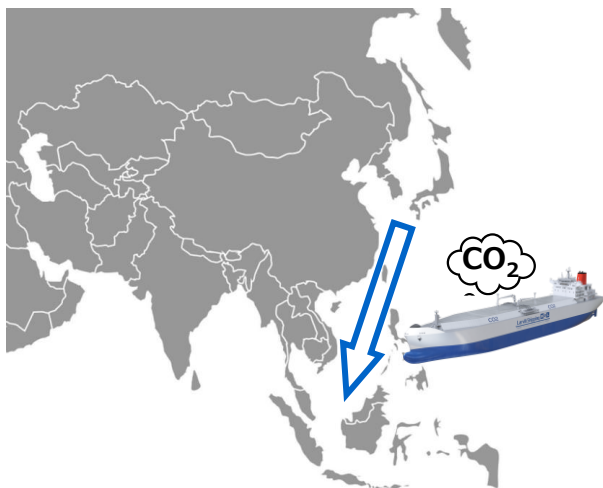
## 【Project Background and Schedule】

- Start a joint FS from 2022 by Petronas and a Japanese consortium (JAPEX, JGC, and Kline.)
- In September 2023, Petronas and the Japanese consortium signed a key principle agreement on early commercialization of CCS for a specific promising area, and FEED work is scheduled to start from April 2024 with the aim of starting CCS operations by the end of 2028.
- In addition to CO<sub>2</sub> from the LNG terminal in Malaysia, large scale CO<sub>2</sub> shipping is being considered for this CCS project with several CO<sub>2</sub> emitters in Japan, including JFE Steel.



- **Project outline** : Joint development of liquefied CO<sub>2</sub> carriers which play a key role in the Carbon Capture and Storage value chain, with the aim of enabling cross border collaboration in CCS and establishing Malaysia as a leading CCS hub in the region.
- **Organization name, Partner organization name** : Mitsui O.S.K. Lines, Ltd. , Petroliam Nasional Berhad (PETRONAS) and MISC Berhad
- **Funding organization, Contents, Terms** : METI Subsidy program (FY 2022, 2023)
- **URL** : <https://www.mol.co.jp/en/pr/2022/22019.html> / <https://www.mol.co.jp/en/pr/2023/23115.html>

<Outline of the Project (image)>



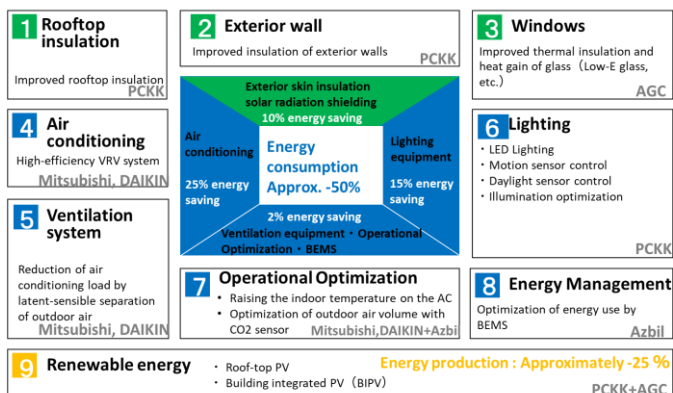
<Liquefied CO<sub>2</sub> Carrier at Terminal (image)>



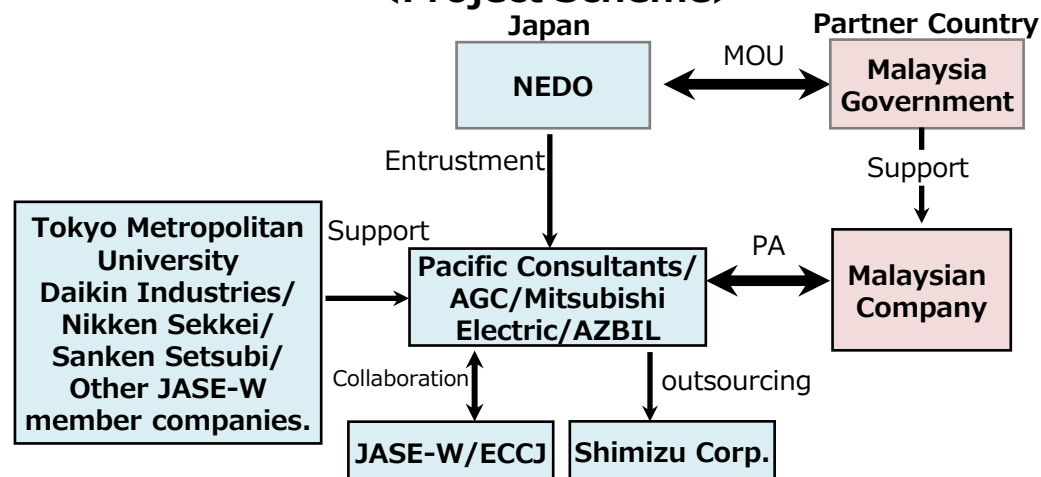
- **Project outline:** This project aims to demonstrate a Nearly ZEB in hot and humid area for an existing building of SEDA, a Malaysian government agency. The ZEB concept based on ISO/TS23764 will be applied to achieve both energy efficiency and comfort in air conditioning, and is expected to change user behavior by preventing overcooling, etc.
- **Organization name:** Pacific Consultants, Mitsubishi Electric, AGC, AZBIL
- **Funding organization, Contents, Terms :** International Demonstration Project on Japan's Technologies for Decarbonization and Energy Transition (Basic study: Dec 2022~Sep 2023)
- **URL :** <https://www.pacific.co.jp/> <https://www.agc.com/>  
<https://www.mitsubishielectric.co.jp/> <https://www.azbil.com/jp/>

## <Project Outline>

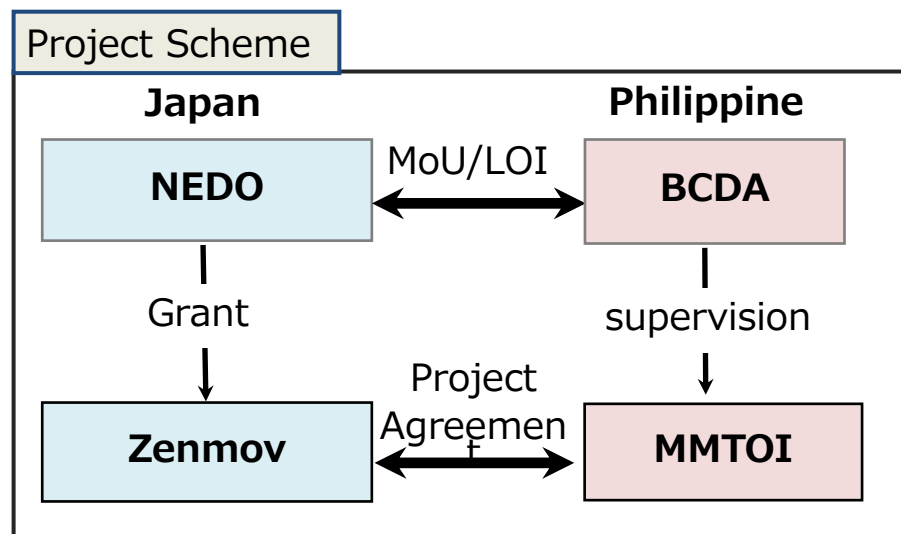
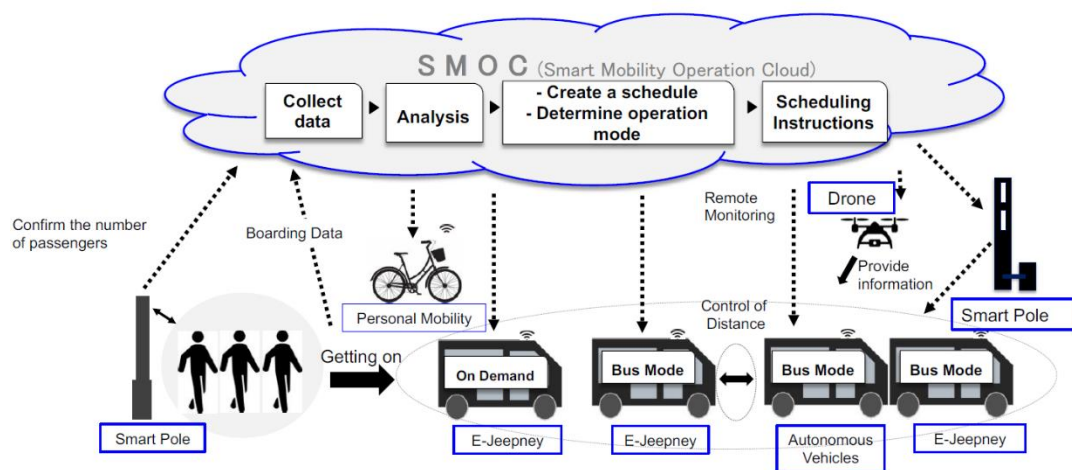
Total energy consumption : Approx. 75% reduction (Target) Aiming for 「Nearly ZEB」



## <Project Scheme>



- **Project outline** : The aim of this project is to contribute to solve issues which are inconvenience, economic losses, air pollution, and wasteful energy consumption through the Smart Mobility Operation Cloud (SMOC) system at Clark Area
- **Organization name** : Zenmov Inc.
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Demonstration) / Dec.2020-Mar.2025
- **URL** : <https://zenmov.com/>



- **Project outline** : GHG reduction as much as 40% will be achieved by applying Asahi Kasei's New Dyeing Process in Thailand. Existing dyeing machine can mostly be used and the private-sector JCM will be perused.
- **Partner organization** : Asahi Kasei Corporation, collaboration with local dyeing companies
- **Funding organization, Contents, Terms** : JCM Feasibility Study by METI



Asahi Kasei



Thai Dyeing  
Company

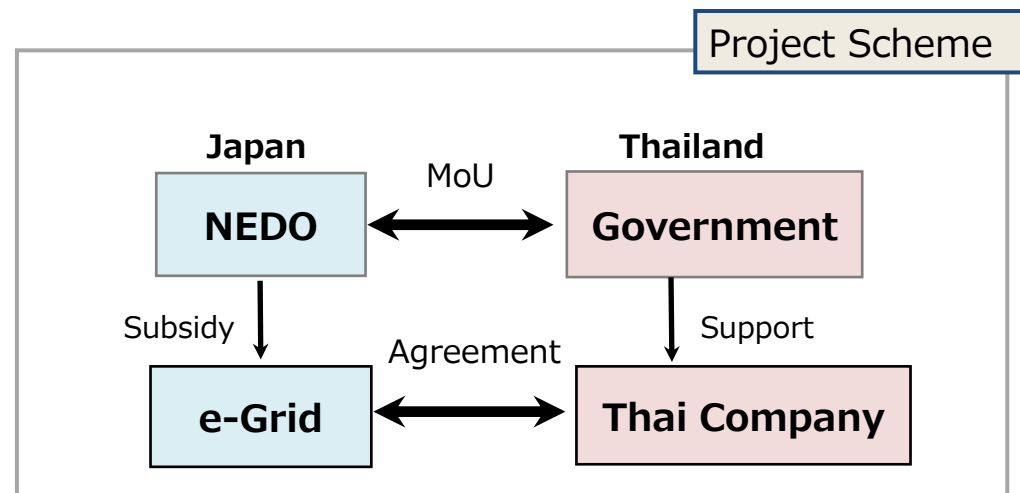
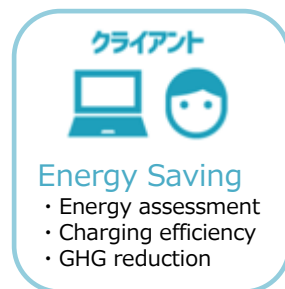
Private-sector JCM will be perused between Asahi Kasei and Thai dyeing company.



Example of dyeing machine  
<https://www.hisaka.co.jp/textile/product/index.html>

Existing dyeing machine such as Jetting type can mostly be used.

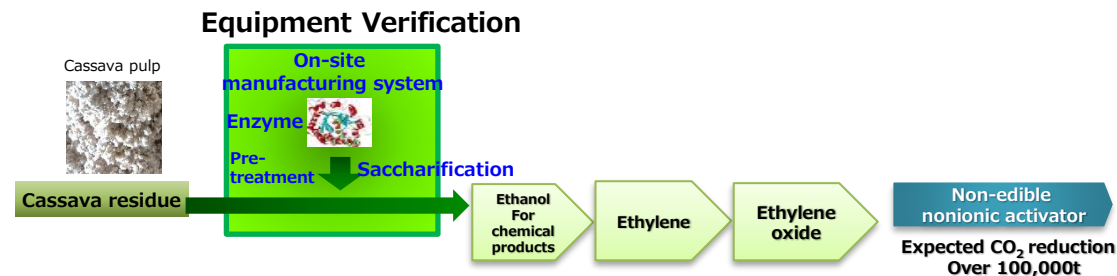
- **Project outline** : Contributing to Efficient Energy Consumption / Demonstration Research for the Compliance Requirements / Driver Behavior Analysis for Efficient Energy Consumption of Electric Motorcycles and Empirical Research on Battery Cell State Analysis.
- **Organization name** : e-Grid Inc.
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) / Dec. 2022-Sep. 2023 (Awaiting Stage Gate Screening)
- **URL** : <https://www.e-grid.co.jp/pressrelease/20230214/>



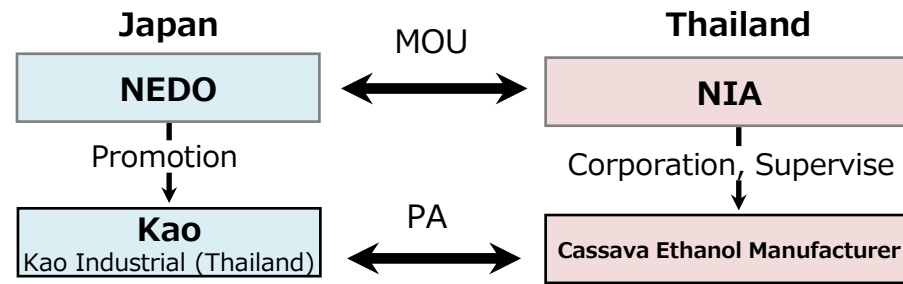


- **Project outline** : Demonstrate a low LC-CO2 on-site production system for saccharification enzymes developed with a composition optimized for cassava pulp residue from Thai agricultural waste, and demonstrate an integrated production model up to non-edible biononionic surfactant using economical utilization technology.
- **Organization name**, : Kao, Kao Industrials (Thailand)
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Feasibility Study) / Sep. 2023-Feb. 2025
- **URL** : <https://chemical.kao.com/content/dam/sites/kao/chemical-kao-com/jpja/topics/2023/20230906-001.pdf>

## <Project outline>



## <Project scheme>



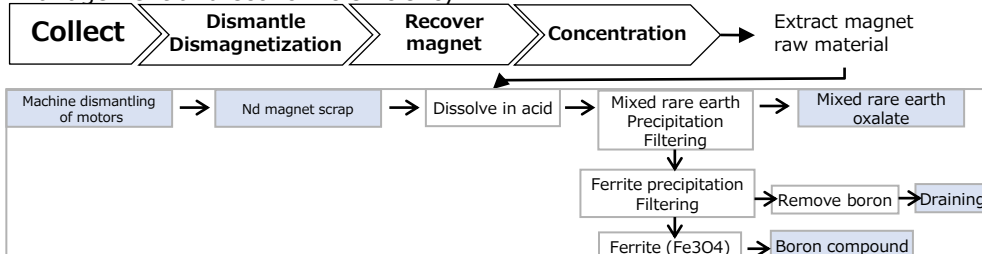
- **Project outline** : Establish a technology to recover and purify neodymium magnets from used motor scraps received from Asia, EU, North America, and Japan in Thailand, and aim to spread the recovery technology to other countries in the world.
- **Organization name** : Suzuki Shokai, NTT Data Institute of Management Consulting
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) / Nov. 2023–Mar. 2024
- **URL** : <https://www.suzuki-shokai.co.jp/> <https://www.nttdata-strategy.com/>

## <Project outline>

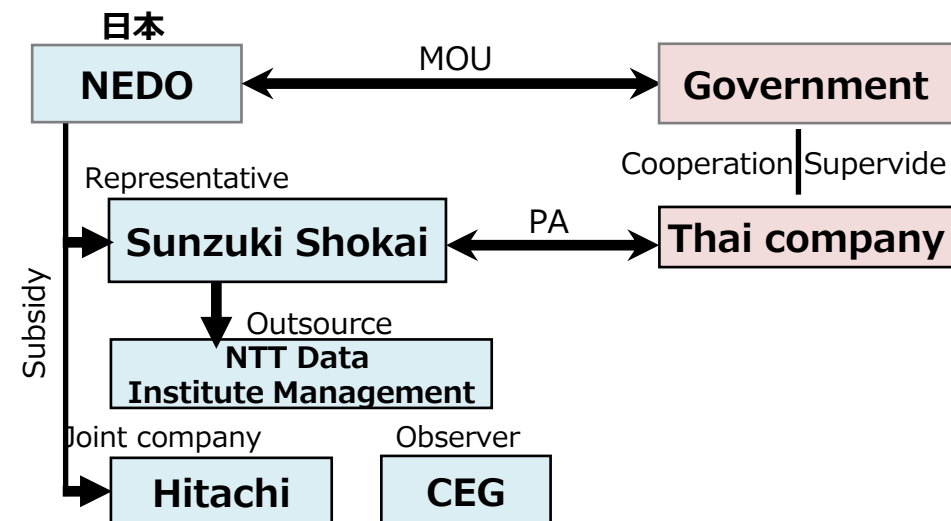
The target technology is a series of processes to recycle and extract magnet raw materials to recover and concentrate rare metals by dismantling waste motors and extracting neodymium magnets.

Particularly important technologies are as follows.

- ◆ Establishment of demagnetization methods during dismantling to recover neodymium magnets.
- ◆ Establishment of safe processing technology based on the impact on heat treatment and chemical treatment of coated and plated materials, etc.
- ◆ Establishment of DX technology to ensure quality control (component stabilization) management and economic efficiency.

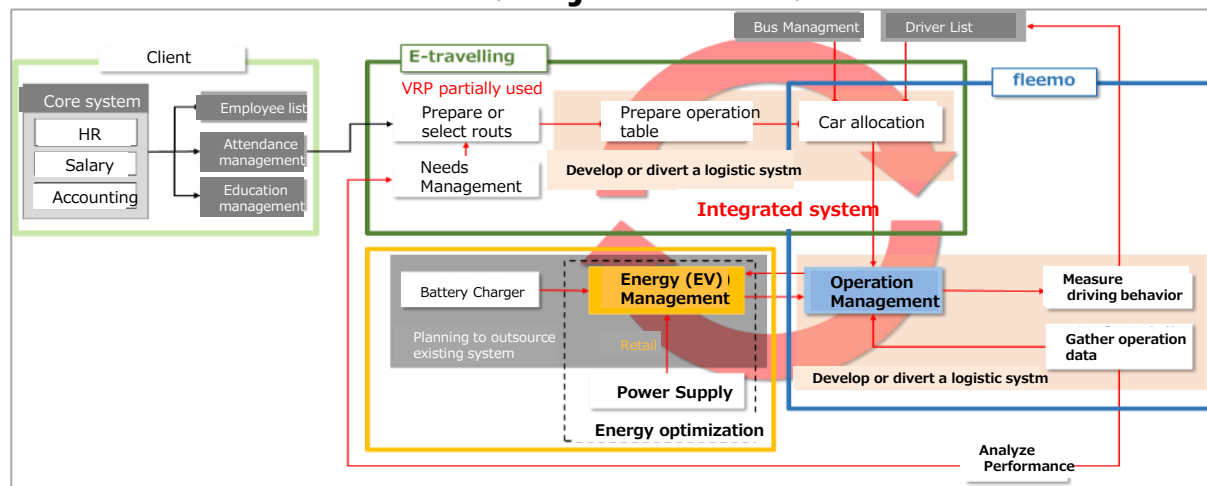


## <Project scheme>

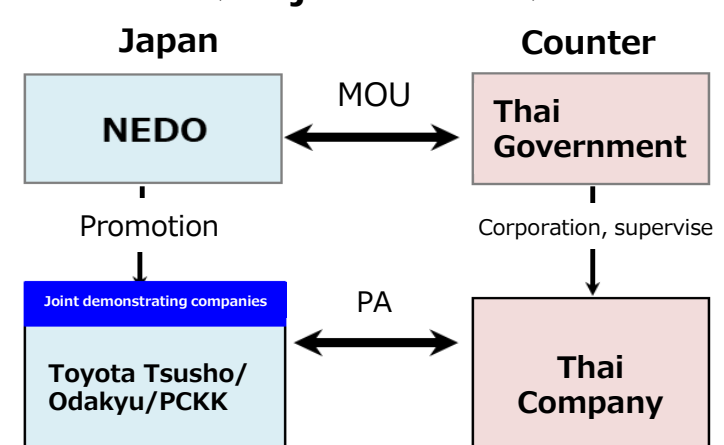


- **Project outline** : In the area centered on AMATA City Chonburi, a technical demonstration to promote modal shift to public transportation using advanced bus operation management system will be conducted to alleviate traffic congestion and to reduce CO2 emissions in the future.
- **Organization name** : Toyota Tsusho Corporation, Odakyu Electric Railway, Pacific Consultants
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) / Nov. 2022–Sep. 2023 (Awaiting Stage Gate Screening)
- **URL** : <https://www.toyota-tsusho.com/> <https://www.odakyu.jp/> <https://www.pacific.co.jp/>

## <Project outline>

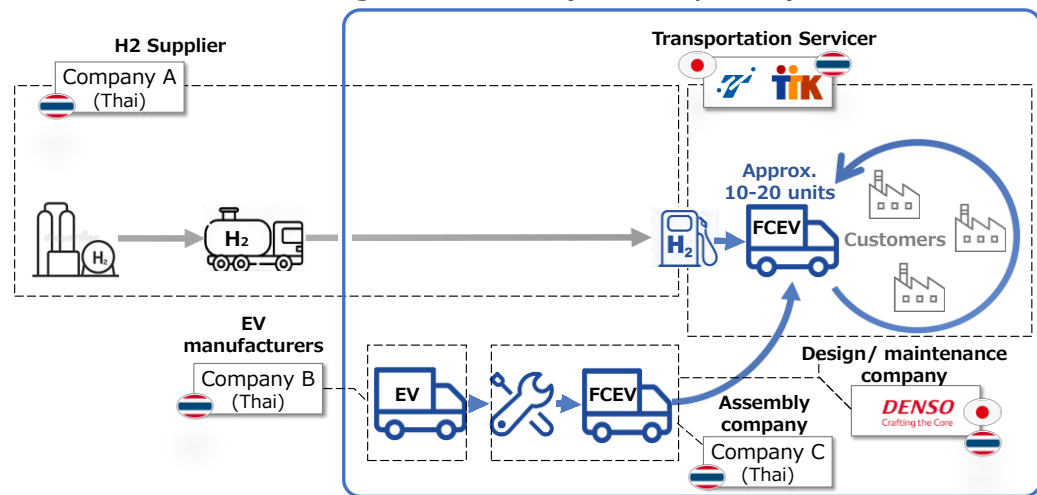


**<Project scheme>**

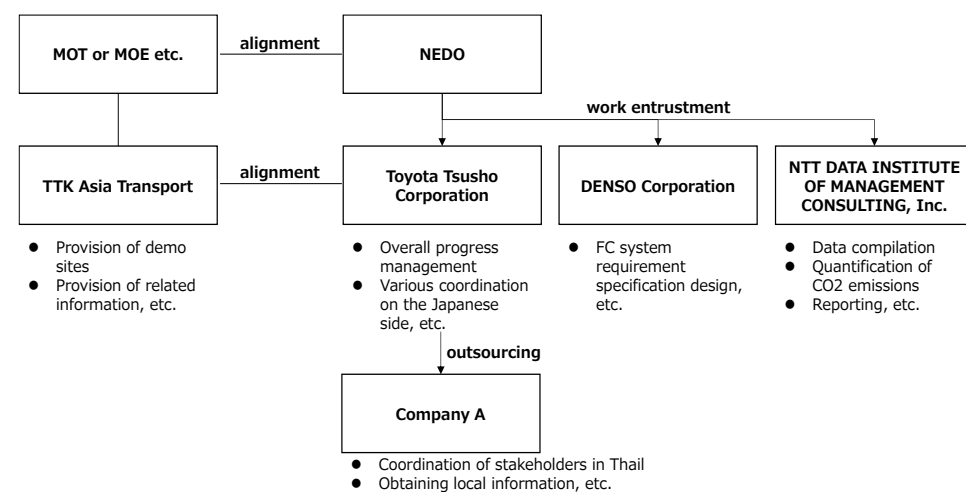


- **Project outline** : F/S for demo of FC trucks in Thai by installing FC modules and H2 tank system on EV 6-wheel trucks. By converting EV trucks to FC trucks and extending the driving range, aiming for decarbonize medium- to long-distance transportation.
- **Organization name, Partner organization name** : Toyota Tsusho Corporation, DENSO Corporation, NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc.
- **Funding organization, Contents, Terms** : NEDO、F/S for overseas demo using JCM.  
From August 2023 to July 2024

<Image of demo(assumption)>



<Scheme of F/S for demo>

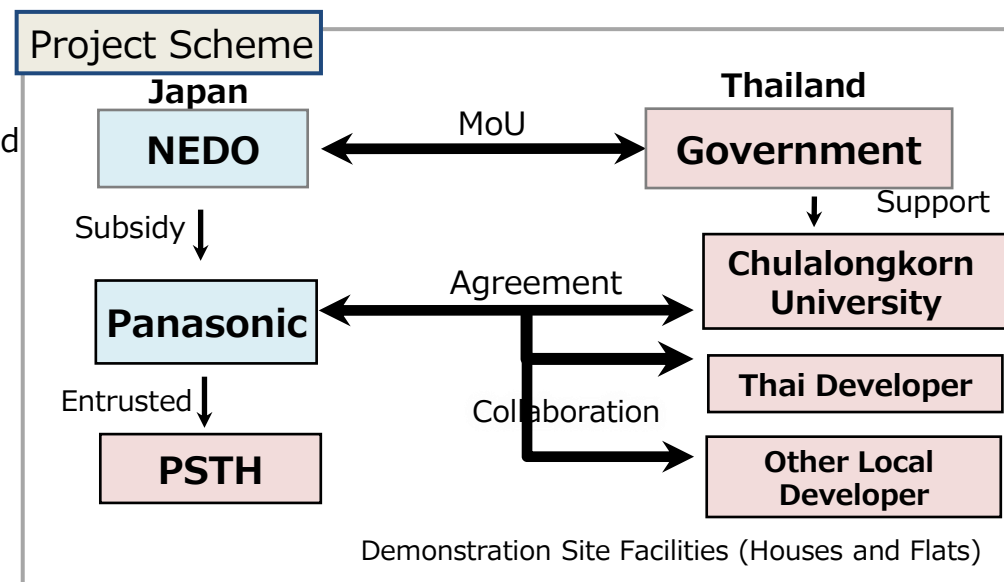
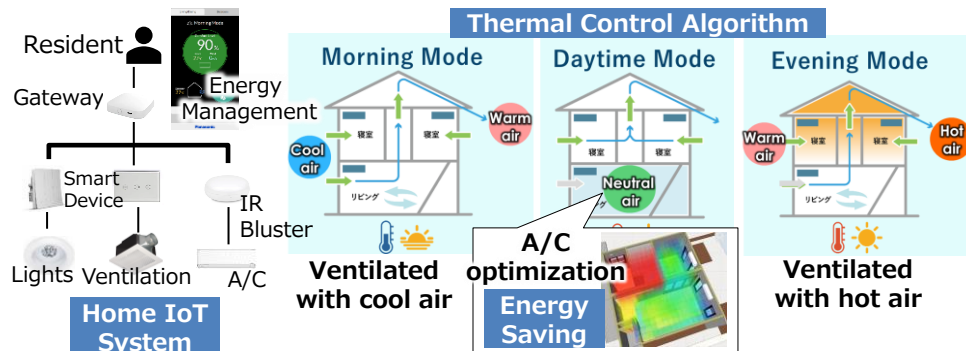




# Actual proof of thermal control Home IoT system and living space design technology that achieves both comfort and energy saving in Thailand houses

- **Project outline** : Demonstration experiments with the aim of implementing it in Home IoT and establishing spatial performance design technology.
- **Organization name** : Panasonic Corporation
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) / July 2023-Sep. 2023 (Awaiting Stage Gate Screening)
- **URL** : <https://www.panasonic.com/jp/about.html>

An IoT system that predicts the thermal environment based on outside temperature and room temperature information, balances heat through coordinated control of air conditioners and ventilation and reduces cooling load while maintaining comfort.



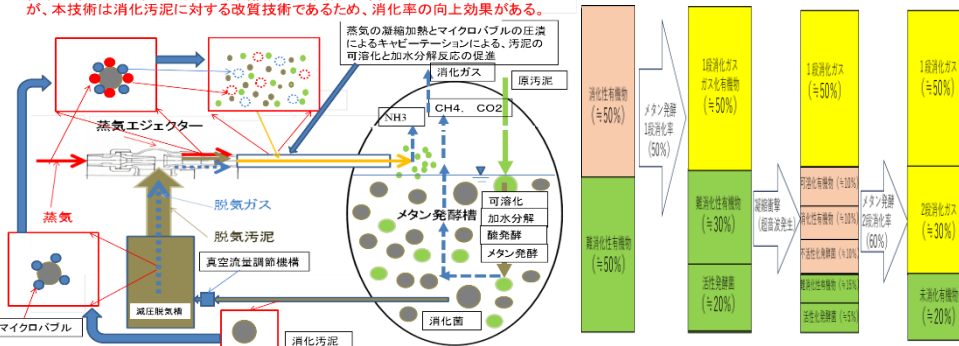


- **Project outline** : demonstration study on a service business that allows rental of fermentation accelerators using steam ejectors at existing methane fermentation facilities in Thailand.
- **Organization name** : Tohkemy Corporation (prime), Technoplan Inc. (sub)
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) /Dec. 2023-Sep. 2024
- **URL** : <https://www.tohkemy.co.jp/>

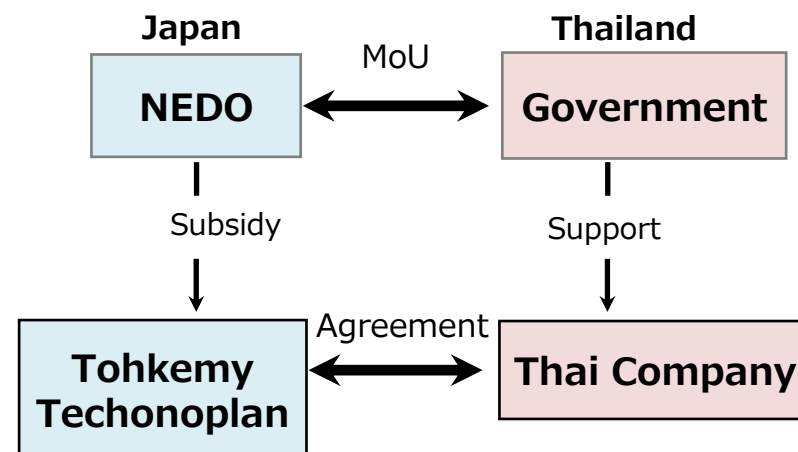
By attaching a steam ejector to the existing methane fermentation tank and solubilizing the fermented digestive fluid, we can improve the organic matter gasification rate and fermentation speed through two-stage fermentation.

蒸気エジェクターの減圧脱気と凝縮衝撃による消化汚泥の加水分解促進の原理

従来の原汚泥に対する汚泥の改質技術では、消化速度が速くなるメリットであったが、本技術は消化汚泥に対する改質技術であるため、消化率の向上効果がある。

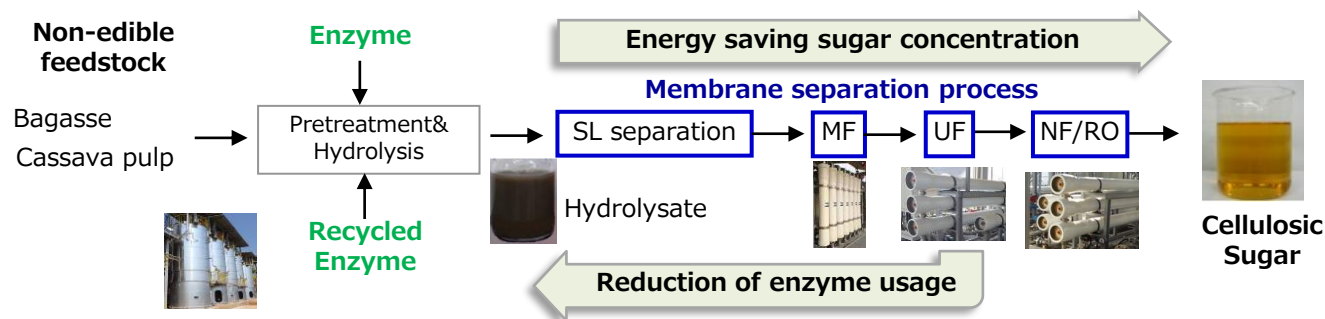


## Project Scheme



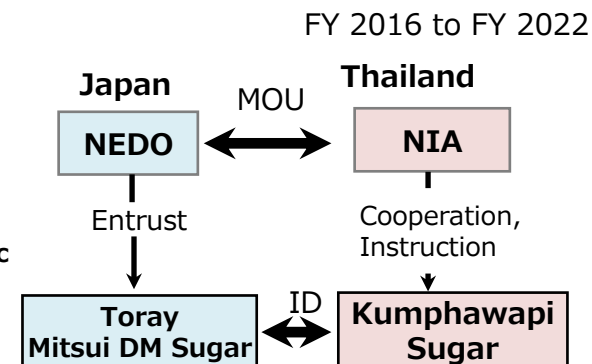
- **Project outline** : The demonstration project for the production of Cellulosic Sugar and high value-added products (Oligosaccharide and Polyphenol) from bagasse and the independent production of cellulosic sugars derived from cassava pulp as the other raw materials was conducted from FY 2016 to FY 2022. As a follow-up, a survey of Thai raw material companies, a cellulose sugar conversion technology, a cellulose sugar LCA evaluation, and a survey on obtaining external certification will be conducted.
- **Organization name** : TORAY
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Follow-up) / May 2023-Mar. 2024
- **URL** : <https://www.toray.co.jp/news/details/20230410162320.html>

## <Project outline>

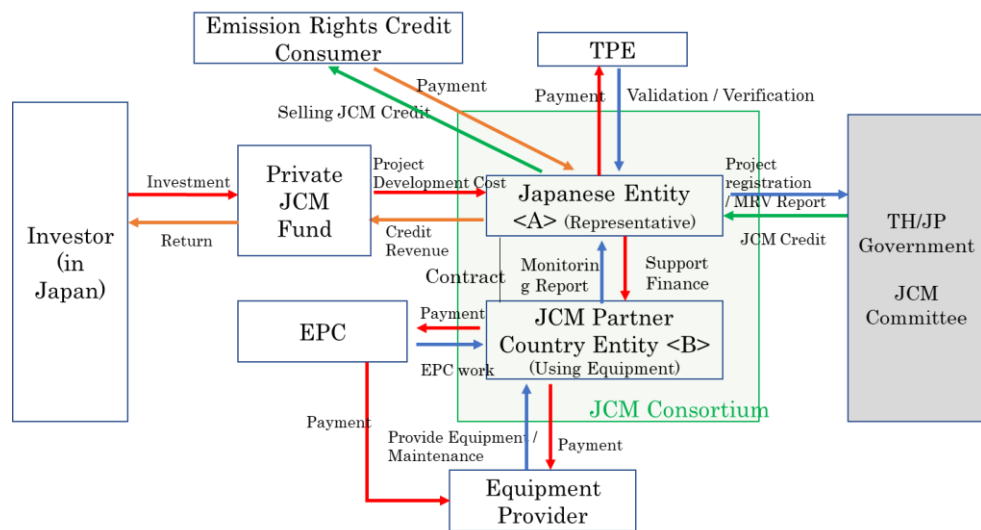


Plant owner : Cellulosic Biomass Technology Co., Ltd. (Toray and Mitsui Sugar Co., Ltd., set up)

## <Project scheme>



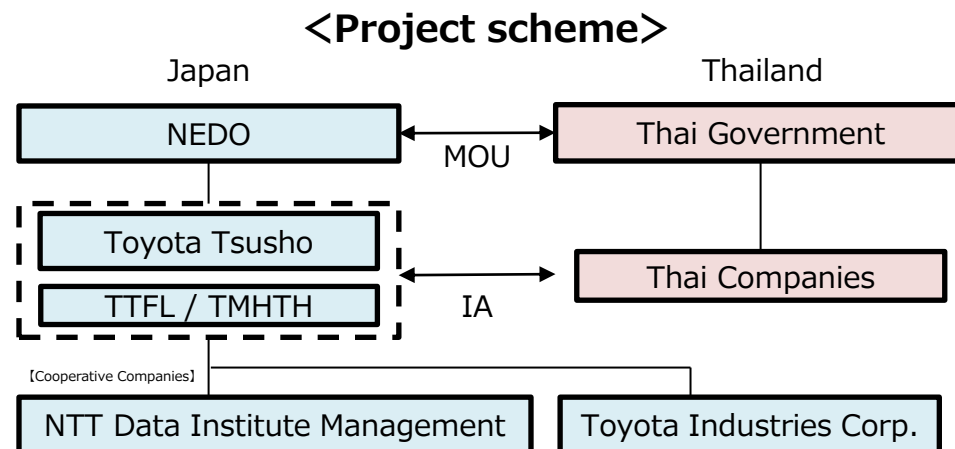
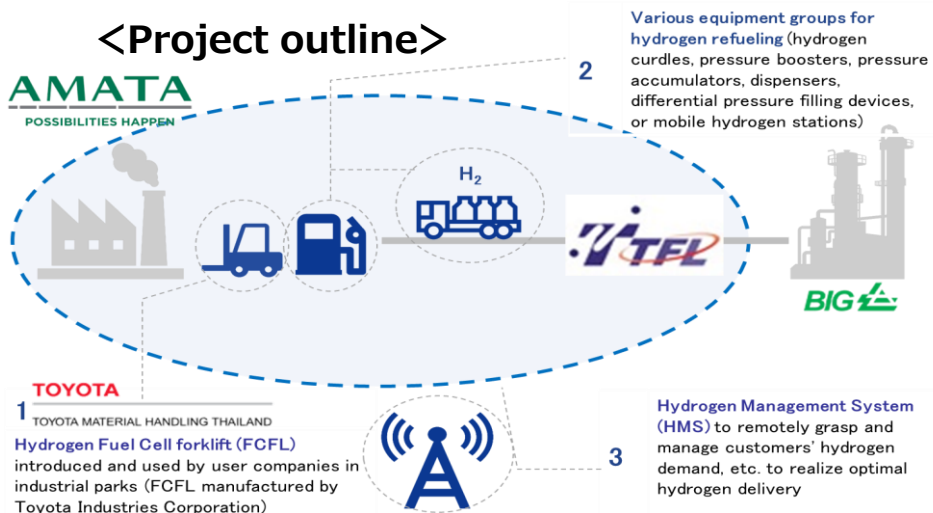
- **Project outline:** Introduce biomass boiler for factories with using a private sector funding JCM in Thailand. A JCM fund will be established by Japanese investors, providing financial support for the installation and operation of the equipment, as a part of contributions by Japan.
- **Organization name :** Tepia Corporation Japan, Company in Partner country (TBD)
- **Funding organization, Contents, Terms :** JCM Feasibility Study by METI
- **URL :** <https://www.pacific.co.jp/news/2023/20230922-001143.html>



## <The benefits of private sector JCM>

- ◆ By assuming investment with private funds, possible to generate more projects.
- ◆ Allows for a higher degree of flexibility in project design, including the amount, methods, implementation period, and timing of fund allocation to partner-country companies.

- **Project outline** : In the Amata City Chonburi Industrial Estate in Thailand, we will (1) study the optimal method of hydrogen distribution to FCFLs and (2) conduct a demonstration study on the feasibility of establishing a hydrogen management system (HMS) that remotely assesses customer hydrogen demand and performs optimal hydrogen distribution.
- **Organization name** : Toyota Tsusho Corporation, NTT Data Institute of Management Consulting
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) / Jul. 2023–Sep. 2023 (Awaiting Stage Gate Screening)
- **URL** : <https://www.toyota-tsusho.com> <https://www.nttdata-strategy.com/>



- **Project outline** : The introduction of an electric track maintenance vehicle, manufactured and sold in Thailand, could contribute to achieve energy savings and reduce greenhouse gas (GHG) emissions.
- **Organization name** : Toyo Machinery Corporation
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) / Oct. 2022–Sep. 2023 (Awaiting Stage Gate Screening)
- **URL** : <https://www.toyo-kikai.co.jp/index.html>

This study aims to investigate the feasibility of adopting individual drive technology, represented by in-wheel motors, to convert diesel engine-driven Track Maintenance Vehicles (TMVs) into electric vehicles (EVs).

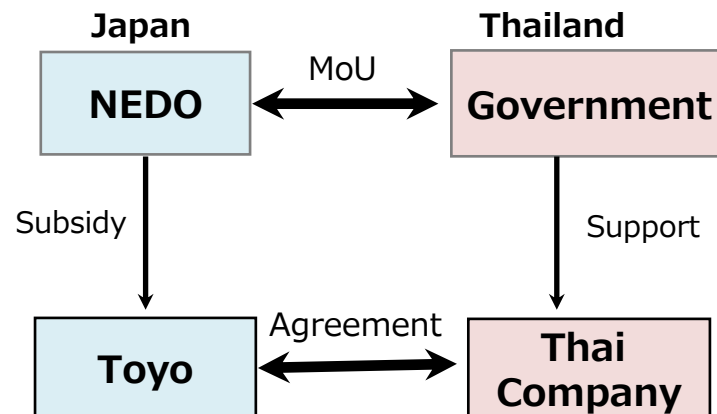
Before : No power drive system



After : IWM power drive system



## Project Scheme



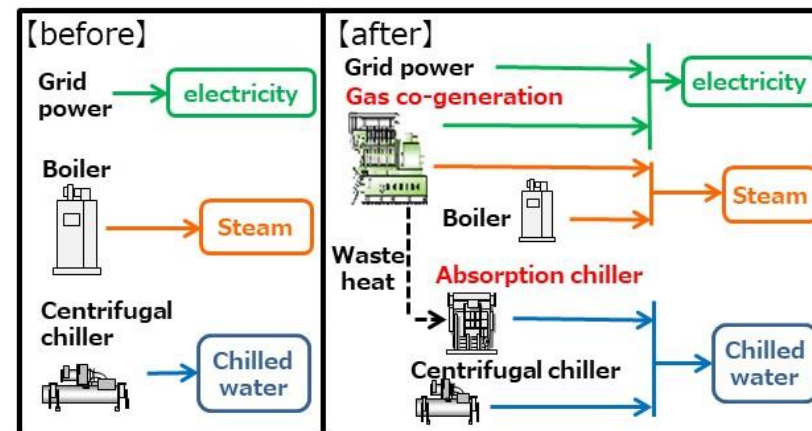


- **Project outline** : This project reduces CO<sub>2</sub> emissions by introducing gas co-generation system (5 MW class x 2set) and absorption chiller (800 USRT class) to fiber factory. These gas co-generation system and absorption chiller contribute to energy saving and cost reduction, and can improve reliability for power supply (Expected GHG Emission Reductions: 16,158 tCO<sub>2</sub>/year).
- **Organization name, Partner organization name** : (Japan) Kansai Electric Power Co., Inc., (Thailand) Kansai Energy Solutions (Thailand) Co., Ltd
- **Funding organization, Contents, Terms** : Ministry of the Environment Japan: JCM Model Project (FY2018)
- **URL** : [https://gec.jp/jcm/projects/18pro\\_tha\\_01/](https://gec.jp/jcm/projects/18pro_tha_01/)



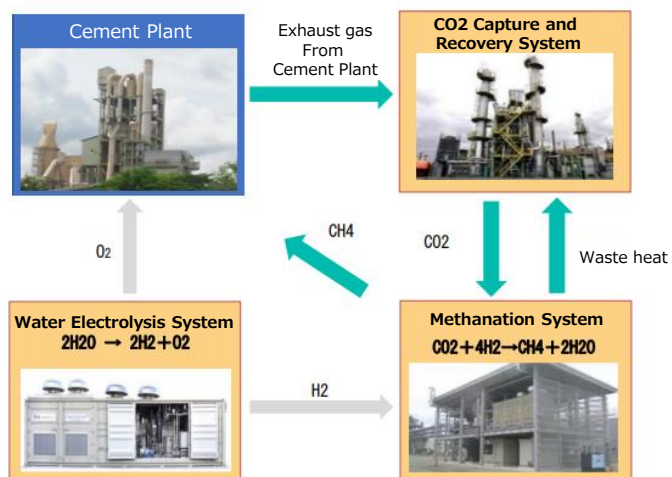
©OpenStreetMap contributors. Tiles courtesy of Andy Allan.

Sites of JCM Model Project

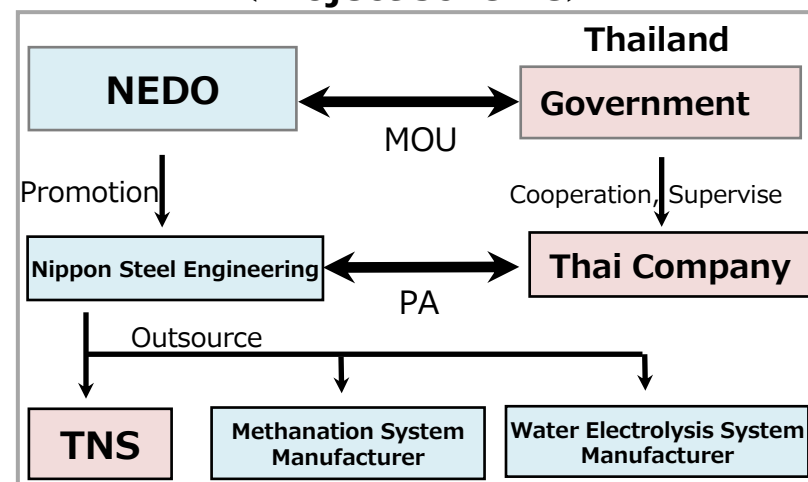


- **Project outline** : In Thailand, we will apply our CO2 capture and recovery technology to build a CO2 capture and utilization (methanation) model that can handle cement plant exhaust gas, as well as a CO2 capture and utilization system that effectively uses waste heat from the methanation facility to save energy.
- **Organization name** : Nippon Steel Engineering
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) / Oct. 2022–Jul. 2023 (Awaiting Stage Gate Screening)
- **URL** : [https://www.eng.nipponsteel.com/news/release\\_20230112.pdf](https://www.eng.nipponsteel.com/news/release_20230112.pdf)

## <Project outline>

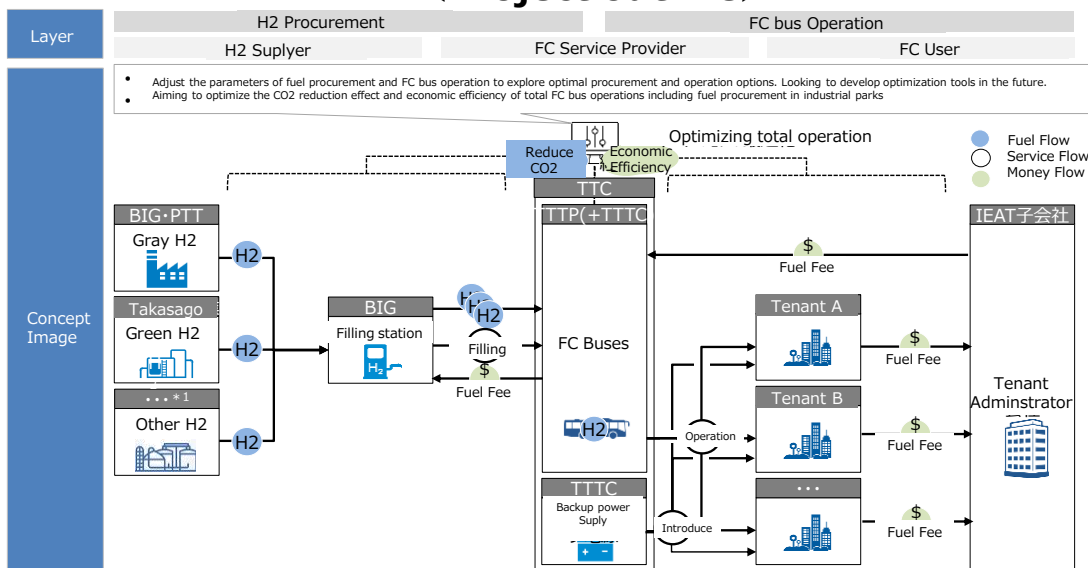


## <Project scheme>

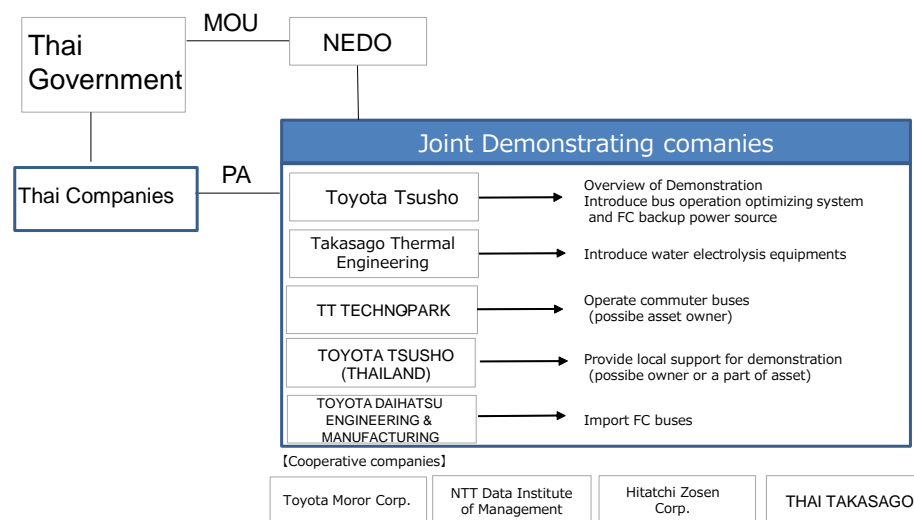


- **Project outline** : Construct a series of operation systems (from hydrogen generation and procurement to optimization of bus operation) for Thailand's first FC bus service at Map Ta Phut New Smart Industrial Estate, and verify performance, safety, and operation through long-term and continuous operation in the Thai environment.
- **Organization name** : NTT Data Institute of Management Consulting, Toyota Tsusho Corporation, Takasago Thermal Engineering
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Basic Study) / Jul. 2023–Mar. 2024
- **URL** : <https://www.nttdata-strategy.com/> <https://www.toyota-tsusho.com/>  
<https://www.tte-net.com/index.html>

## <Project outline>



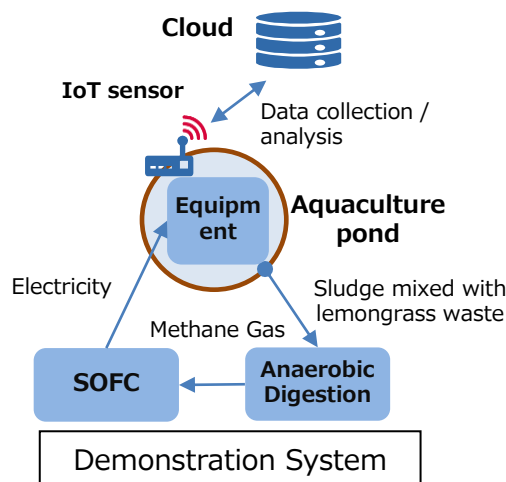
## <Project scheme>



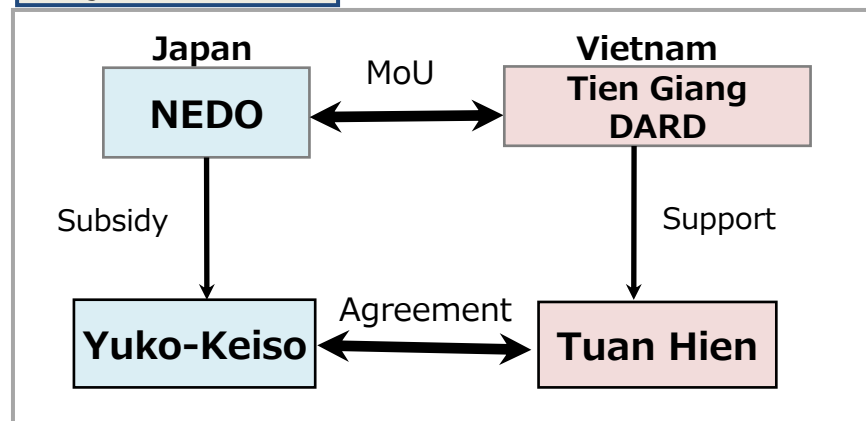


- **Project outline** : The demonstration examined the technological requirements and economic aspects of a packaged shrimp aquaculture pond system, assuming introduction in the Mekong Delta region of southern Vietnam.
- **Organization name** : Yuko-Keiso Corporation Limited
- **Regions** : Tien Giang Province
- **Funding organization, Contents, Terms** : NEDO / International Demonstration Project on Japan's Energy Efficiency Technologies (Demonstration) / Jul.2020-Dec.2025
- **URL** : <http://www.yukokeiso.com/> , <http://www.yukokeiso.com/news/3293/>

The demonstration research would incorporate biogas-fed SOFC and IoT for enhancing productivity, whereby such biogas will be produced from the shrimp pond sludge mixed with lemongrass waste collected from local farms.



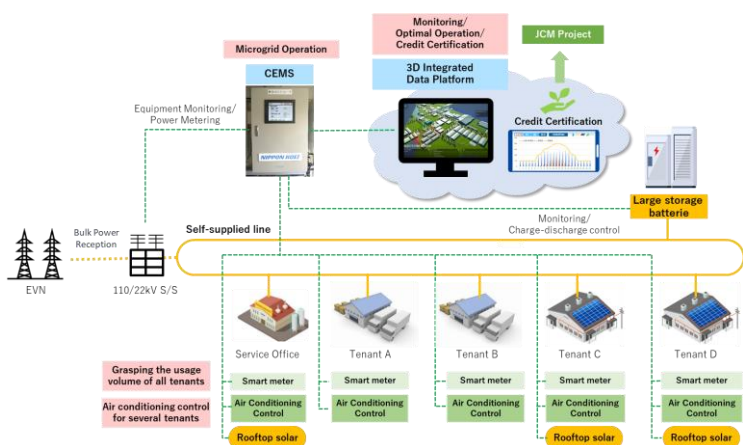
## Project Scheme





- **Project outline** : In an industrial park in Vietnam, the project aims to realize integrated energy management by installing smart meters for all tenants, controlling air conditioning at individual tenants, operating micro-grids with expansion of rooftop solar panels, storage batteries, and CEMS, and integrating them into a data platform.
- **Organization name** : Sojitz Corporation, Nippon Koei Co., Ltd.
- **Region** : Dong Nai Province
- **Funding organization, Contents, Terms** : JCM Feasibility Study by METI
- **URL** : [https://www.sojitz.com/en/business/infra\\_health.php](https://www.sojitz.com/en/business/infra_health.php)

## < Image of Project Outline >



## < Project Schedule >

Project	2022	2023	2024	2025
① Introduction of Smart meters / Integrated Data PF		Business study/ Demonstration test	JCM project (Several tenants)	Business Expansion/ Collaboration with CEMS JCM project (All tenants)
② Introduction of air conditioning control		Business study/ Candidate selection	JCM project (A few tenants)	Business Expansion/ JCM project (Several tenants)
③-1 Expand introduction of solar power	Solar power generation business (existing)			Expansion of existing business Introduction of storage batteries, CEMS JCM project (Several tenants)
③-2 Microgrid Operation with Storage Battery/CEMS		Business study		





- **Project outline** : Introducing Wastewater Heat Recovery and Geothermal Heat Utilization Technology into the food manufacturing factories (3 locations) in Vietnam. Then applying the Joint Crediting Mechanism (JCM) to quantify the obtained GHG emission reduction effect.
- **Organization name, Partner organization name** : Asano Taiseikiso Engineering Co., Ltd., C.P.Vietnam Corporation
- **Funding organization, Contents, Terms** : NEDO, JCM Low-carbon Demonstration Project. From September 2023 to September 2024.

## <Planned Demonstration Sites>

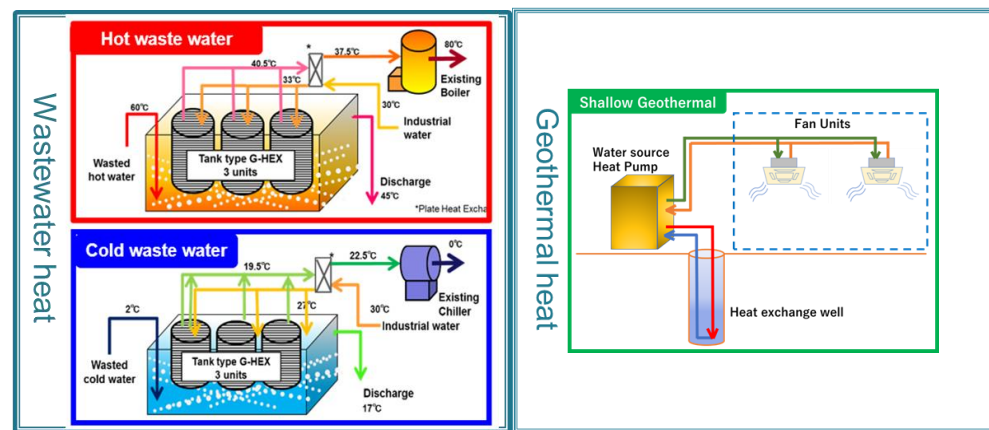


Resin heat exchanger  
G-HEX



Developed in NEDO  
Projects in 2014~2018  
and 2019~2020

## <Image of Introduced Technology>



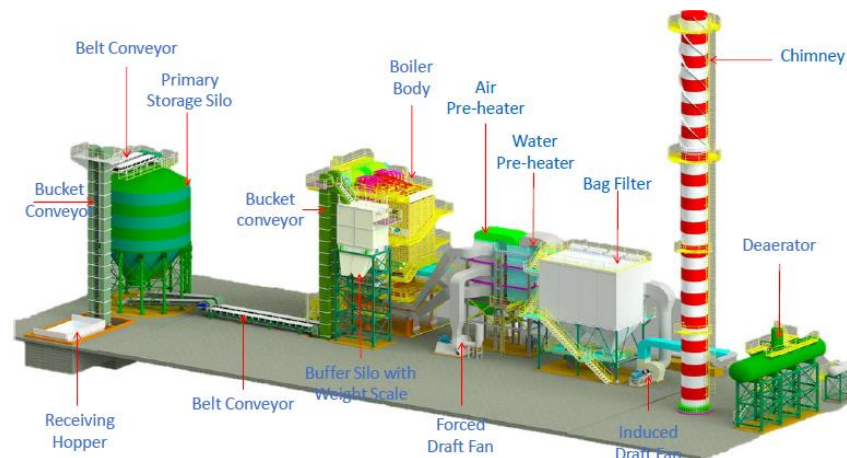


- **Project outline** : This project introduces biomass (rice husk) -fueled steam boilers to supply steam to a chemical factory located in Phu My 3 Specialized Industrial Park in Ba Ria Vung Tau Province. The project contributes to the achievement of the country's Vision by 2030 and Green Growth Strategy through achieving decarbonization by introducing biomass-fueled steam boilers instead of fossil fuel-fired boilers (Expected GHG Emission Reductions: 12,086 tCO<sub>2</sub>/year).
- **Organization name, Partner organization name** : (Japan) Daiichi Jitsugyo Co., Ltd. (Vietnam) THUAN HAI CORPORATION
- **Funding organization, Contents, Terms** : Ministry of the Environment Japan: JCM Model Project (FY2019)
- **URL** : [https://gec.jp/jcm/projects/19pro\\_vnm\\_03/](https://gec.jp/jcm/projects/19pro_vnm_03/)



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Sites of JCM Model Project





# Feasibility Study on “energy service (ES) with BCP function” in an industrial park (IP) that enables the supply of high-quality LNG and the succession of operational and safety skills

- **Project outline** : To evaluate the feasibility of ES business at an IP, incl. high-quality LNG supply with HV\* adjustments via LPG, and high-efficiency gas equipment introduction (also considering about energy saving and CO<sub>2</sub> reduction, inheritance of Japanese operational & safety skills, and BCP)
- **Organization name, Partner organization name** : Japan Petroleum Exploration Co. Ltd.
- **Funding organization, Contents, Terms** : “Feasibility Study Project for Overseas Deployment of High Quality Energy Infrastructure” by Ministry of Economy, Trade and Industry
- **URL** : [https://www.japex.co.jp/en/news/detail/20230810\\_02/](https://www.japex.co.jp/en/news/detail/20230810_02/)

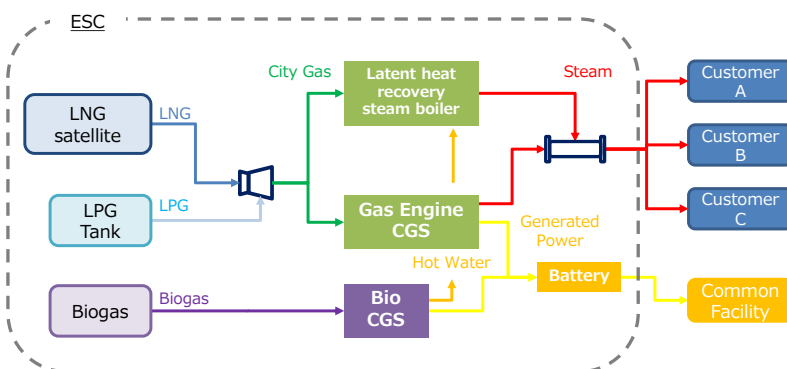
## <Project Outline>

- Targeting an IP in northern Vietnam, an energy service center (ESC) within such park is established, and heat or city gas energy service is provided to multiple customers.

### Northern Vietnam LNG receiving terminal



LNG Supply



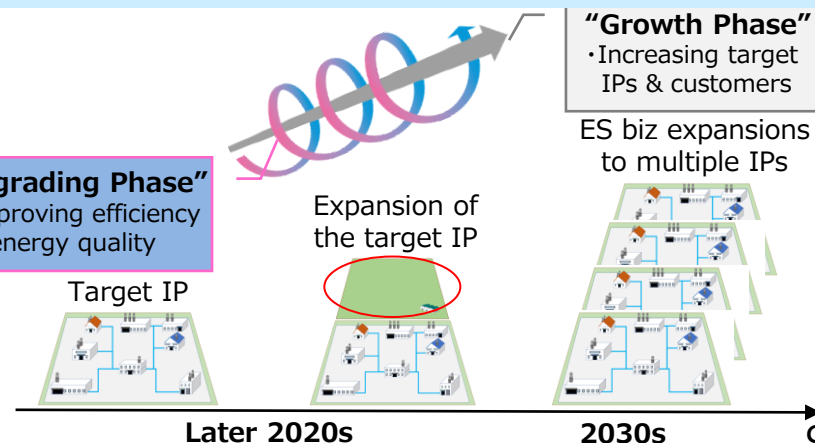
## <ES Project Growth> \* HV: Heat Value

- To start ES business in the targeted industrial park(including its expansion area) in the late 2020s.
- To expand ES business to multiple IPs in the 2030s.

### “Upgrading Phase”

- Improving efficiency & energy quality

Target IP



# JCM Projects in AZEC partners by MOEJ ( 1 /22)

- The Ministry of the Environment, Japan (MOEJ) provide financial support for 175 JCM projects in AZEC partners in the field of Energy Efficiency, Effective Use of Energy, Renewable Energy, Waste Handling and Disposal.

List of JCM Projects in AZEC partners by MOEJ As of November 17, 2023

Project outline	Organization	URL
Cambodia / Introduction of 0.9MW Solar Power System at International School	Asian Gateway Corporation	<a href="https://gec.jp/jcm/projects/19project_khm_02/">https://gec.jp/jcm/projects/19project_khm_02/</a>
Cambodia / Introduction of High Efficiency LED Lighting Utilizing Wireless Network	MinebeaMitsumi Inc.	<a href="https://gec.jp/jcm/projects/15project_cam_01/">https://gec.jp/jcm/projects/15project_cam_01/</a>
Cambodia / Introduction of Ultra-lightweight Solar Panels for Power Generation at International School	Asian Gateway Corporation	<a href="https://gec.jp/jcm/projects/15project_cam_02/">https://gec.jp/jcm/projects/15project_cam_02/</a>
Cambodia / Introduction of 1MW Solar Power System and High Efficiency Centrifugal Chiller in Large Shopping Mall	AEON MALL Co., Ltd.	<a href="https://gec.jp/jcm/projects/16project_cam_01/">https://gec.jp/jcm/projects/16project_cam_01/</a>
Cambodia / Energy Saving by Inverters for Distribution Pumps in Water Treatment Plant	METAWATER Co., Ltd.	<a href="https://gec.jp/jcm/projects/16project_cam_03/">https://gec.jp/jcm/projects/16project_cam_03/</a>
Indonesia / Energy Saving for Air-conditioning and Process Cooling at Textile Factory 1	EBARA REFRIGERATION EQUIPMENT & SYSTEMS CO., LTD.	<a href="http://gec.jp/jcm/projects/13project_indonesia_01_1/">http://gec.jp/jcm/projects/13project_indonesia_01_1/</a>
Indonesia / Energy Saving for Air-conditioning and Process Cooling at Textile Factory 2	EBARA REFRIGERATION EQUIPMENT & SYSTEMS CO., LTD.	<a href="http://gec.jp/jcm/projects/13project_indonesia_01_2/">http://gec.jp/jcm/projects/13project_indonesia_01_2/</a>
Indonesia / Installation of Inverter-type Air Conditioning System LED Lighting and Separate Type Fridge Freezer Showcase to Grocery Stores in Republic of Indonesia	Lawson, Inc.	<a href="http://gec.jp/jcm/projects/13project_indonesia_02/">http://gec.jp/jcm/projects/13project_indonesia_02/</a>

# JCM Projects in AZEC partners by MOEJ ( 2 /22)

Project outline	Organization	URL
Indonesia / Energy Efficient Refrigerants to Cold Chain Industry	Mayekawa Manufacturing Co., Ltd.	<a href="http://gec.jp/jcm/projects/13pro_in_a_03/">http://gec.jp/jcm/projects/13pro_in_a_03/</a>
Indonesia / Energy Saving by Installation of Double Bundle-type Heat Pump	Toyota Tsusho Corporation	<a href="http://gec.jp/jcm/projects/13pro_in_a_04/">http://gec.jp/jcm/projects/13pro_in_a_04/</a>
Indonesia / Power Generation by Waste-heat Recovery in Cement Industry	JFE Engineering Corporation	<a href="http://gec.jp/jcm/projects/14pro_in_a_02/">http://gec.jp/jcm/projects/14pro_in_a_02/</a>
Indonesia / Energy Saving through Introduction of Regenerative Burners to the Aluminum Holding Furnace of the Automotive Components Manufacturer	Toyotsu Machinery Corporation	<a href="http://gec.jp/jcm/projects/14pro_in_a_03/">http://gec.jp/jcm/projects/14pro_in_a_03/</a>
Indonesia / Energy Saving for Textile Factory Facility Cooling by High Efficiency Centrifugal Chiller	EBARA REFRIGERATION EQUIPMENT & SYSTEMS CO., LTD.	<a href="http://gec.jp/jcm/projects/14pro_in_a_04/">http://gec.jp/jcm/projects/14pro_in_a_04/</a>
Indonesia / Installation of Solar Power System and Storage Battery to Commercial Facility	Itochu Corporation	<a href="http://gec.jp/jcm/projects/14pro_in_a_05/">http://gec.jp/jcm/projects/14pro_in_a_05/</a>
Indonesia / Reducing GHG emission at textile factories by upgrading to air-saving loom	Toray Industries, Inc.	<a href="http://gec.jp/jcm/projects/14pro_in_a_06/">http://gec.jp/jcm/projects/14pro_in_a_06/</a>
Indonesia / Introduction of high efficient Old Corrugated Cartons Process at Paper Factory	KANEMATSU CORPORATION	<a href="http://gec.jp/jcm/projects/14pro_in_a_07/">http://gec.jp/jcm/projects/14pro_in_a_07/</a>



# JCM Projects in AZEC partners by MOEJ ( 3 /22)

Project outline	Organization	URL
Indonesia / Energy Saving for Air-Conditioning at Shopping Mall with High Efficiency Centrifugal Chiller	NTT FACILITIES, INC.	<a href="http://gec.jp/jcm/projects/15pro_in_a_01/">http://gec.jp/jcm/projects/15pro_in_a_01/</a>
Indonesia / Energy Saving for Industrial Park with Smart LED Street Lighting System	NTT FACILITIES, INC.	<a href="http://gec.jp/jcm/projects/15pro_in_a_02/">http://gec.jp/jcm/projects/15pro_in_a_02/</a>
Indonesia / Introduction of High Efficiency Once-through Boiler System in Film Factory	Mitsubishi Chemical Corporation	<a href="http://gec.jp/jcm/projects/15pro_in_a_03/">http://gec.jp/jcm/projects/15pro_in_a_03/</a>
Indonesia / Installation of Gas Co-generation System for Automobile Manufacturing Plant	Toyota Tsusho Corporation	<a href="http://gec.jp/jcm/projects/15pro_in_a_04/">http://gec.jp/jcm/projects/15pro_in_a_04/</a>
Indonesia / Introduction of High Efficiency Once-through Boiler in Golf Ball Factory	Sumitomo Rubber Industries, Ltd.	<a href="http://gec.jp/jcm/projects/15pro_in_a_05/">http://gec.jp/jcm/projects/15pro_in_a_05/</a>
Indonesia / 1.6MW Solar PV Power Plant Project in Jakabaring Sport City	Sharp Energy Solutions Corporation	<a href="http://gec.jp/jcm/projects/15pro_in_a_06/">http://gec.jp/jcm/projects/15pro_in_a_06/</a>
Indonesia / 10MW Mini Hydro Power Plant Project in North Sumatra	Toyo Energy Farm Co., Ltd.	<a href="http://gec.jp/jcm/projects/16pro_in_a_01/">http://gec.jp/jcm/projects/16pro_in_a_01/</a>
Indonesia / Introduction of LED Lighting to Sales Stores	FAST RETAILING CO., LTD.	<a href="http://gec.jp/jcm/projects/16pro_in_a_02/">http://gec.jp/jcm/projects/16pro_in_a_02/</a>

# JCM Projects in AZEC partners by MOEJ ( 4 /22)

Project outline	Organization	URL
Indonesia / Introduction High Efficiency Looms in Weaving Mill	Nisshinbo Textile Inc.	<a href="http://gec.jp/jcm/projects/16pro_in_a_03/">http://gec.jp/jcm/projects/16pro_in_a_03/</a>
Indonesia / Energy Saving in Industrial Wastewater Treatment System for Rubber Industry	EMATEC:Environmental Management and Technology Center	<a href="http://gec.jp/jcm/projects/16pro_in_a_05/">http://gec.jp/jcm/projects/16pro_in_a_05/</a>
Indonesia / Introduction of 0.5MW Solar Power System to Aroma and Food Ingredients Factory	Next Energy & Resources Co., Ltd.	<a href="http://gec.jp/jcm/projects/16pro_in_a_06/">http://gec.jp/jcm/projects/16pro_in_a_06/</a>
Indonesia / Introduction of Gas Co-generation System and Absorption Chiller to Motor Parts Factory	DENSO CORPORATION	<a href="http://gec.jp/jcm/projects/17pro_in_a_03/">http://gec.jp/jcm/projects/17pro_in_a_03/</a>
Indonesia / Introduction of Absorption Chiller to Chemical Factory	Tokyo Century Corporation	<a href="http://gec.jp/jcm/projects/17pro_in_a_04/">http://gec.jp/jcm/projects/17pro_in_a_04/</a>
Indonesia / Energy Saving by Introducing High Efficiency Autoclave to Infusion Manufacturing Factory1	Otsuka Pharmaceutical Factory, Inc.	<a href="http://gec.jp/jcm/projects/18pro_in_a_02/">http://gec.jp/jcm/projects/18pro_in_a_02/</a>
Indonesia / Introduction of CNG-Diesel Hybrid Equipment to Public Bus in Semarang	Hokusan Co., Ltd.	<a href="http://gec.jp/jcm/projects/18pro_in_a_03/">http://gec.jp/jcm/projects/18pro_in_a_03/</a>
Indonesia / Rehabilitation Project of Power Generation System at Karai 7 Mini Hydro Power Plant	Voith Fuji Hydro K. K.	<a href="http://gec.jp/jcm/projects/18pro_in_a_05/">http://gec.jp/jcm/projects/18pro_in_a_05/</a>

# JCM Projects in AZEC partners by MOEJ ( 5 /22)

Project outline	Organization	URL
Indonesia / Introduction of High Efficiency Injection Molding Machine to Plastic Parts Factory	Tokyo Century Corporation	<a href="http://gec.jp/jcm/projects/18pro_id_n_07/">http://gec.jp/jcm/projects/18pro_id_n_07/</a>
Indonesia / 2MW Mini Hydro Power Plant Project in East Nusa Tenggara Province	AURA-Green Energy Co., Ltd.	<a href="http://gec.jp/jcm/projects/19pro_id_n_01/">http://gec.jp/jcm/projects/19pro_id_n_01/</a>
Indonesia / Introduction of High Efficiency Boiler System to Carton Box Factory	Japan Pulp and Paper Company Limited	<a href="http://gec.jp/jcm/projects/19pro_id_n_02/">http://gec.jp/jcm/projects/19pro_id_n_02/</a>
Indonesia / 10MW Hydro Power Project in Bengkulu Province	Voith Fuji Hydro K.K.	<a href="http://gec.jp/jcm/projects/19pro_id_n_03/">http://gec.jp/jcm/projects/19pro_id_n_03/</a>
Indonesia / 6MW Hydro Power Project in West Sumatera Province	Voith Fuji Hydro K.K.	<a href="http://gec.jp/jcm/projects/19pro_id_n_04/">http://gec.jp/jcm/projects/19pro_id_n_04/</a>
Indonesia / 6MW Mini Hydro Power Plant Project in West Pasaman, West Sumatra	NiX JAPAN Co., Ltd.	<a href="http://gec.jp/jcm/projects/20pro_id_n_01/">http://gec.jp/jcm/projects/20pro_id_n_01/</a>
Indonesia / 5MW Hydro Power Project in Bengkulu Province	Voith Fuji Hydro K.K.	<a href="http://gec.jp/jcm/projects/20pro_id_n_02/">http://gec.jp/jcm/projects/20pro_id_n_02/</a>
Indonesia / 4.2MW Rooftop Solar Power Project to Pharmaceutical Factories, Vehicles Dealers, and Timber Factories	Alamport Inc.	<a href="http://gec.jp/jcm/projects/20pro_id_n_03/">http://gec.jp/jcm/projects/20pro_id_n_03/</a>

# JCM Projects in AZEC partners by MOEJ ( 6 /22)

Project outline	Organization	URL
Indonesia / 8MW Mini Hydro Power Plant Project in Maluku Province	AURA-Green Energy Co., Ltd.	<a href="http://gec.jp/jcm/projects/20pro_idn_04/">http://gec.jp/jcm/projects/20pro_idn_04/</a>
Indonesia / REDD+ project in Boalemo District	KANEMATSU CORPORATION	<a href="https://gec.jp/jcm/projects/16red_dina_01/">https://gec.jp/jcm/projects/16red_dina_01/</a>
Indonesia / Introduction of 3.3MW Rooftop Solar Power System in Woodworking Factories	Sumitomo Forestry Co., Ltd.	<a href="https://gec.jp/jcm/projects/21pro_idn_01/">https://gec.jp/jcm/projects/21pro_idn_01/</a>
Indonesia / Introduction of High-Efficiency Thermal Oil Heater System in Chemical Factory	FUMAKILLA LIMITED	<a href="https://gec.jp/jcm/projects/21pro_idn_02/">https://gec.jp/jcm/projects/21pro_idn_02/</a>
Indonesia / 6MW Mini Hydro Power Plant Project in Besay River, Lampung Province	WWS-JAPAN Co.	<a href="https://gec.jp/jcm/projects/21pro_idn_03/">https://gec.jp/jcm/projects/21pro_idn_03/</a>
Indonesia / Energy Saving by Introducing High Efficiency Autoclave to Infusion Manufacturing Factory 2	Otsuka Pharmaceutical Factory, Inc.	<a href="https://gec.jp/jcm/projects/21pro_idn_04/">https://gec.jp/jcm/projects/21pro_idn_04/</a>
Indonesia / 2.3 MW Mini Hydro Power Plant Project in Melesom River, Lampung Province	WWS-JAPAN Co.	<a href="https://gec.jp/jcm/projects/21pro_idn_05/">https://gec.jp/jcm/projects/21pro_idn_05/</a>
Indonesia / Introduction of High-efficiency Once-through Boiler System to Chemical Factory	DIC Corporation	<a href="https://gec.jp/jcm/projects/22pro_idn_01/">https://gec.jp/jcm/projects/22pro_idn_01/</a>

# JCM Projects in AZEC partners by MOEJ ( 7 /22)

Project outline	Organization	URL
Indonesia / Introduction of 3.1MW Rooftop Solar Power System to Fast-Moving Consumer Goods and Printing Factories in Java Island	Alamport Inc.	<a href="https://gec.jp/jcm/projects/22pro_idn_03/">https://gec.jp/jcm/projects/22pro_idn_03/</a>
Indonesia / Introduction of 2.1MW Solar Power System to Steel Wire Products and Aluminum Factories	Tokyo Century Corporation	<a href="https://gec.jp/jcm/projects/22pro_idn_04/">https://gec.jp/jcm/projects/22pro_idn_04/</a>
Indonesia / 3.5MW Mini Hydro Power Plant at Pungga River in North Sumatra	SDG Impact Japan Inc.	<a href="https://gec.jp/jcm/projects/22pro_idn_05/">https://gec.jp/jcm/projects/22pro_idn_05/</a>
Indonesia / Installation of Energy Saving Equipment and Solar Power System to Complex Building in Jakarta	Yuko Keiso Co., Ltd.	<a href="https://gec.jp/jcm/projects/22pro_idn_06/">https://gec.jp/jcm/projects/22pro_idn_06/</a>
Indonesia / Introduction of 5MW Solar Power System to Vehicle and Engine Plants	Toyota Motor Corporation	<a href="https://gec.jp/jcm/projects/22pro_idn_02/">https://gec.jp/jcm/projects/22pro_idn_02/</a>
Indonesia / Patuha Unit-2 55MW Geothermal Power Generation Project	PT Geo Dipa Energi	<a href="https://gec.jp/jcm/projects/23jfcm_idn_01/">https://gec.jp/jcm/projects/23jfcm_idn_01/</a>
Indonesia / 12MW Biomass Power Plant Project in Aceh Province, Sumatera	AURA Green Energy Co.,Ltd	<a href="https://gec.jp/jcm/projects/23pro_idn_01/">https://gec.jp/jcm/projects/23pro_idn_01/</a>
Indonesia / Improvement of Combustion Method and Furnace Shapes in Flat Glass Production Melting Furnace	AGC Inc.	<a href="https://gec.jp/jcm/projects/23pro_idn_02/">https://gec.jp/jcm/projects/23pro_idn_02/</a>



# JCM Projects in AZEC partners by MOEJ ( 8 /22)

Project outline	Organization	URL
Indonesia / Introduction of 3MW Rooftop Solar Power System to Paper Factory in Java Island	Alamport Inc.	<a href="https://gec.jp/jcm/projects/23pro_idn_03/">https://gec.jp/jcm/projects/23pro_idn_03/</a>
Lao PDR / REDD+ project in Luang Prabang Province through controlling slash-and-burn	Waseda University	<a href="https://gec.jp/jcm/projects/16redd_lao_01/">https://gec.jp/jcm/projects/16redd_lao_01/</a>
Lao PDR / Introduction of 14MW floating solar power system in Vientiane	TSB Co., Ltd.	<a href="https://gec.jp/jcm/projects/17pro_lao_01/">https://gec.jp/jcm/projects/17pro_lao_01/</a>
Lao PDR / Introduction of Amorphous High Efficiency Transformers in Power Grid	Yuko Keiso Co., Ltd.	<a href="https://gec.jp/jcm/projects/17pro_lao_02/">https://gec.jp/jcm/projects/17pro_lao_02/</a>
Lao PDR / 11MW Solar Power Project in Savannakhet Province	Sharp Energy Solutions Corporation	<a href="https://gec.jp/jcm/projects/18pro_lao_01/">https://gec.jp/jcm/projects/18pro_lao_01/</a>
Lao PDR / 15MW Solar Power Project in Xiangkhouang Province	Liberal Solution Co., Ltd.	<a href="https://gec.jp/jcm/projects/21pro_lao_01/">https://gec.jp/jcm/projects/21pro_lao_01/</a>
Lao PDR / Introduction of Amorphous High Efficiency Transformers in Power Grid II	Yuko Keiso Co., Ltd.	<a href="https://gec.jp/jcm/projects/22pro_lao_01/">https://gec.jp/jcm/projects/22pro_lao_01/</a>
Philippines / Introduction of 1.53MW Rooftop Solar Power System in Auto Parts Factories	Tokyo Century Corporation	<a href="https://gec.jp/jcm/projects/17pro_phl_03/">https://gec.jp/jcm/projects/17pro_phl_03/</a>

# JCM Projects in AZEC partners by MOEJ ( 9 /22)

Project outline	Organization	URL
Philippines / Introduction of 1MW Rooftop Solar Power System in Vehicle Assembly Factory	Toyota Motor Corporation	<a href="https://gec.jp/jcm/projects/17project_phl_04/">https://gec.jp/jcm/projects/17project_phl_04/</a>
Philippines / Installation of 1.2MW Rooftop Solar Power System in Refrigerating Warehouse	Tokyo Century Corporation	<a href="https://gec.jp/jcm/projects/17project_phl_05/">https://gec.jp/jcm/projects/17project_phl_05/</a>
Philippines / Introduction of 4MW Rooftop Solar Power System in Tire Factory	Sharp Energy Solutions Corporation	<a href="https://gec.jp/jcm/projects/18project_phl_02/">https://gec.jp/jcm/projects/18project_phl_02/</a>
Philippines / 9.6MW Solar Power Project in Collaboration with Power-supply Company	Tokyo Century Corporation	<a href="https://gec.jp/jcm/projects/19project_phl_02/">https://gec.jp/jcm/projects/19project_phl_02/</a>
Philippines / Biogas Power Generation and Fuel Conversion Project in Pineapple Canneries	ITOCHU Corporation	<a href="https://gec.jp/jcm/projects/19project_phl_03/">https://gec.jp/jcm/projects/19project_phl_03/</a>
Philippines / 29MW Binary Power Generation Project at Palayan Geothermal Power Plant	Mitsubishi Heavy Industries, Ltd.	<a href="https://gec.jp/jcm/projects/20project_phl_01/">https://gec.jp/jcm/projects/20project_phl_01/</a>
Philippines / Development of a Fluorocarbon Collection and Destruction Model Project in Metro Manila, Philippines Utilizing Mixed Combustion Technologies	Marubeni Corporation	<a href="https://gec.jp/jcm/projects/21fgas_phl_01/">https://gec.jp/jcm/projects/21fgas_phl_01/</a>
Philippines / Tanawon 20MW Flash Geothermal Power Plant Project	Mizuho-Toshiba Leasing Company Ltd.	<a href="https://gec.jp/jcm/projects/21project_phl_02/">https://gec.jp/jcm/projects/21project_phl_02/</a>

# JCM Projects in AZEC partners by MOEJ (10/22)

Project outline	Organization	URL
Philippines / 28MW Binary Power Generation Project at Mahanagdong Geothermal Power Plant	JGC CORPORATION	<a href="https://gec.jp/jcm/projects/22pro_phl_01/">https://gec.jp/jcm/projects/22pro_phl_01/</a>
Philippines / 14.5MW Mini Hydro Power Plant Project in Siguil River in Mindanao	Toyota Tsusho Corporation	<a href="https://gec.jp/jcm/projects/22pro_phl_02/">https://gec.jp/jcm/projects/22pro_phl_02/</a>
Philippines / Energy Supply Project by 9MW Solar Power System to Ceramic Factory and Cement Plant	Marubeni Corporation	<a href="https://gec.jp/jcm/projects/22pro_phl_03/">https://gec.jp/jcm/projects/22pro_phl_03/</a>
Philippines / Introduction of 0.8MW Solar Power System to Aluminum Products, Packaging Materials and Automotive Parts Factories (JCM Eco Lease Scheme)	Tokyo Century Corporation	<a href="https://gec.jp/jcm/projects/22pro_phl_04/">https://gec.jp/jcm/projects/22pro_phl_04/</a>
Philippines / 5.6MW Geothermal Binary Power Generation Project in Northern Negros	JGC CORPORATION	<a href="https://gec.jp/jcm/projects/22pro_phl_05/">https://gec.jp/jcm/projects/22pro_phl_05/</a>
Philippines / Introduction of 6MW Power Generation System by Waste Heat Recovery for Cement Plant	Global Engineering Co., Ltd.	<a href="https://gec.jp/jcm/projects/23pro_phl_01/">https://gec.jp/jcm/projects/23pro_phl_01/</a>
Philippines / 27MW Solar Power Project in Dagohoy, Bohol Island	Kyuden International Corporation	<a href="https://gec.jp/jcm/projects/23pro_phl_02/">https://gec.jp/jcm/projects/23pro_phl_02/</a>
Philippines / Introduction of 1.2MW Rooftop Solar Power System to Electronic Equipment Assembly Factory (JCM Eco Lease Scheme)	Tokyo Century Corporation	<a href="https://gec.jp/jcm/projects/23pro_phl_03/">https://gec.jp/jcm/projects/23pro_phl_03/</a>

# JCM Projects in AZEC partners by MOEJ (11/22)

Project outline	Organization	URL
Thailand / Introduction of 2MW Rooftop Solar Power System to University	SHIZUOKA GAS CO., LTD.	<a href="http://gec.jp/jcm/projects/20pro_tha_06/">http://gec.jp/jcm/projects/20pro_tha_06/</a>
Thailand / Introduction of 32MW Rooftop and Floating Solar Power System to Factories	Shizen Energy Inc.	<a href="http://gec.jp/jcm/projects/20pro_tha_07/">http://gec.jp/jcm/projects/20pro_tha_07/</a>
Thailand / Energy Saving at Convenience Stores with High Efficiency Air-Conditioning and Refrigerated Showcase	FamilyMart Co., Ltd.	<a href="https://gec.jp/jcm/projects/15pro_tha_01/">https://gec.jp/jcm/projects/15pro_tha_01/</a>
Thailand / Reducing GHG Emission at Textile Factory by Upgrading to Airsaving Loom (Samutprakarn)	Toray Industries, Inc.	<a href="https://gec.jp/jcm/projects/15pro_tha_02/">https://gec.jp/jcm/projects/15pro_tha_02/</a>
Thailand / Energy Saving for Semiconductor Factory with High Efficiency Centrifugal Chiller and Compressor	Sony Semiconductor Manufacturing Corporation	<a href="https://gec.jp/jcm/projects/15pro_tha_03/">https://gec.jp/jcm/projects/15pro_tha_03/</a>
Thailand / Introduction of Solar PV System on Factory Rooftop	Pacific Consultants Co., Ltd.	<a href="https://gec.jp/jcm/projects/15pro_tha_04/">https://gec.jp/jcm/projects/15pro_tha_04/</a>
Thailand / Installation of Co-Generation Plant for On-Site Energy Supply in Motorcycle Factory	NIPPON STEEL & SUMIKIN ENGINEERING CO., LTD.	<a href="https://gec.jp/jcm/projects/15pro_tha_05/">https://gec.jp/jcm/projects/15pro_tha_05/</a>
Thailand / Installation of High Efficiency Air Conditioning System and Chillers in Semiconductor Factory	Sony Semiconductor Manufacturing Corporation	<a href="https://gec.jp/jcm/projects/15pro_tha_06/">https://gec.jp/jcm/projects/15pro_tha_06/</a>

# JCM Projects in AZEC partners by MOEJ (12/22)

Project outline	Organization	URL
Thailand / Energy Saving for Air-Conditioning in Tire Manufacturing Factory with High Efficiency Centrifugal Chiller	Inabata & Co., Ltd.	<a href="https://gec.jp/jcm/projects/15projectha_07/">https://gec.jp/jcm/projects/15projectha_07/</a>
Thailand / Introduction of High Efficiency Ion Exchange Membrane Electrolyzer in Caustic Soda Production Plant	AGC Inc.	<a href="https://gec.jp/jcm/projects/16projectha_01/">https://gec.jp/jcm/projects/16projectha_01/</a>
Thailand / Introduction of LED Lighting to Sales Stores	FAST RETAILING CO., LTD.	<a href="https://gec.jp/jcm/projects/16projectha_02/">https://gec.jp/jcm/projects/16projectha_02/</a>
Thailand / Introduction of High Efficiency Chilled Water Supply System in Milk Factory	TEPIA Corporation Japan Co., Ltd.	<a href="https://gec.jp/jcm/projects/16projectha_03/">https://gec.jp/jcm/projects/16projectha_03/</a>
Thailand / Introduction of 12MW Power Generation System by Waste Heat Recovery for Cement Plant	NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc.	<a href="https://gec.jp/jcm/projects/16projectha_04/">https://gec.jp/jcm/projects/16projectha_04/</a>
Thailand / Introduction of Co-generation System to Motor Parts Factory	DENSO CORPORATION	<a href="https://gec.jp/jcm/projects/16projectha_05/">https://gec.jp/jcm/projects/16projectha_05/</a>
Thailand / Introduction of Energy Saving Refrigerator and Evaporator with Mechanical Vapor Recompression in Amino Acid Producing Plant	KYOWA HAKKO BIO CO., LTD.	<a href="https://gec.jp/jcm/projects/16projectha_06/">https://gec.jp/jcm/projects/16projectha_06/</a>
Thailand / Introduction of 3.4MW Rooftop Solar Power System to Air-conditioning Parts Factories	Sharp Energy Solutions Corporation	<a href="https://gec.jp/jcm/projects/16projectha_07/">https://gec.jp/jcm/projects/16projectha_07/</a>



# JCM Projects in AZEC partners by MOEJ (13/22)

Project outline	Organization	URL
Thailand / Introduction of 2MW Rooftop Solar Power System for Power Supply in Factory	Finetech Co., Ltd.	<a href="https://gec.jp/jcm/projects/16protha_08/">https://gec.jp/jcm/projects/16protha_08/</a>
Thailand / Introduction of Energy Efficient Refrigeration System in Industrial Cold Storage	KANEMATSU CORPORATION	<a href="https://gec.jp/jcm/projects/16protha_09/">https://gec.jp/jcm/projects/16protha_09/</a>
Thailand / Introduction of Heat Recovery Heat Pumps to Food Processing Factory	CPF JAPAN CO., LTD.	<a href="https://gec.jp/jcm/projects/16protha_10/">https://gec.jp/jcm/projects/16protha_10/</a>
Thailand / Introduction of 5MW Floating Solar Power System on Industrial Water Reservoir	TSB Co., Ltd.	<a href="https://gec.jp/jcm/projects/16protha_11/">https://gec.jp/jcm/projects/16protha_11/</a>
Thailand / Introduction of 30MW Rooftop Solar Power System to Large Supermarkets	Sharp Energy Solutions Corporation	<a href="https://gec.jp/jcm/projects/16protha_12/">https://gec.jp/jcm/projects/16protha_12/</a>
Thailand / Introduction of High-efficiency Boiler System to Rubber Belt Plant	BANDO CHEMICAL INDUSTRIES, LTD.	<a href="https://gec.jp/jcm/projects/16protha_13/">https://gec.jp/jcm/projects/16protha_13/</a>
Thailand / Energy Saving by Air-Conditioning Control System in Precision Parts Factories	YUASA Trading CO., Ltd.	<a href="https://gec.jp/jcm/projects/16protha_14/">https://gec.jp/jcm/projects/16protha_14/</a>
Thailand / Introduction of Biomass Co-Generation System to Food Factory	Fuji-Foods Corporation	<a href="https://gec.jp/jcm/projects/17protha_01/">https://gec.jp/jcm/projects/17protha_01/</a>

# JCM Projects in AZEC partners by MOEJ (14/22)

Project outline	Organization	URL
Thailand / Project on Introduction of Scheme for Fluorocarbons Recovery and Destruction with Utilization of Existing Waste Incineration Plant	DOWA ECO-SYSTEM CO., LTD.	<a href="https://gec.jp/jcm/projects/18fgas_tha_01/">https://gec.jp/jcm/projects/18fgas_tha_01/</a>
Thailand / Introduction of Gas Co-generation System and Absorption Chiller to Fiber Factory	The Kansai Electric Power Company, Incorporated	<a href="https://gec.jp/jcm/projects/18pro_t_ha_01/">https://gec.jp/jcm/projects/18pro_t_ha_01/</a>
Thailand / 17.8MW Rooftop and Floating Solar Power Project in Industrial Park	Tokyo Century Corporation	<a href="https://gec.jp/jcm/projects/18pro_t_ha_02/">https://gec.jp/jcm/projects/18pro_t_ha_02/</a>
Thailand / Introduction of 3.4 MW Rooftop Solar Power System in Technical Center and Office Buildings	Toyota Motor Corporation	<a href="https://gec.jp/jcm/projects/18pro_t_ha_03/">https://gec.jp/jcm/projects/18pro_t_ha_03/</a>
Thailand / Introduction of Biomass Boiler to Cooking Oil Factory	TEPIA Corporation Japan Co.,Ltd.	<a href="https://gec.jp/jcm/projects/18pro_t_ha_04/">https://gec.jp/jcm/projects/18pro_t_ha_04/</a>
Thailand / Introduction of 0.8MW Solar Power System and High Efficiency Refrigerator to Food Factory	Kanematsu KGK Corp.	<a href="https://gec.jp/jcm/projects/18pro_t_ha_05/">https://gec.jp/jcm/projects/18pro_t_ha_05/</a>
Thailand / Introduction of 37 MW Solar Power System and High Efficiency Melting Furnace in Vehicle & Engine Factory	Toyota Motor Corporation	<a href="https://gec.jp/jcm/projects/19pro_t_ha_01/">https://gec.jp/jcm/projects/19pro_t_ha_01/</a>
Thailand / Efficiency Improvement of Co-generation System by Installation of Heat Exchanger in Fiber Factory	NIPPON STEEL ENGINEERING CO., LTD.	<a href="https://gec.jp/jcm/projects/19pro_t_ha_02/">https://gec.jp/jcm/projects/19pro_t_ha_02/</a>

# JCM Projects in AZEC partners by MOEJ (15/22)

Project outline	Organization	URL
Thailand / Introduction of 8.1MW Rooftop Solar Power System in Motorcycle Factory and Fiber Factory	The Kansai Electric Power Company, Incorporated	<a href="https://gec.jp/jcm/projects/20protha_01/">https://gec.jp/jcm/projects/20protha_01/</a>
Thailand / Introduction of Energy Saving Centrifugal Chillers to Machinery Factory	The Kansai Electric Power Company, Incorporated	<a href="https://gec.jp/jcm/projects/20protha_02/">https://gec.jp/jcm/projects/20protha_02/</a>
Thailand / Introduction of 5MW Rooftop Solar Power System to Aluminum Building Materials Factory	Sumitomo Mitsui Finance and Leasing Company, Limited	<a href="https://gec.jp/jcm/projects/20protha_03/">https://gec.jp/jcm/projects/20protha_03/</a>
Thailand / Introduction of 2.6MW Rooftop Solar Power System to Semiconductor Factory	The Kansai Electric Power Company, Incorporated	<a href="https://gec.jp/jcm/projects/20protha_04/">https://gec.jp/jcm/projects/20protha_04/</a>
Thailand / 2.7MW Solar Power Project with Blockchain Technology in Chiang Mai University Town Community	Inabata Co., Ltd.	<a href="https://gec.jp/jcm/projects/20protha_05/">https://gec.jp/jcm/projects/20protha_05/</a>
Thailand / Introduction of High Efficiency Once Through Boiler to Garment Factory	Osaka Gas Co., Ltd.	<a href="https://gec.jp/jcm/projects/21protha_01/">https://gec.jp/jcm/projects/21protha_01/</a>
Thailand / 35MW Solar Power and Storage Battery Project in Suphanburi Province	Kanematsu KGK Corp.	<a href="https://gec.jp/jcm/projects/21protha_03/">https://gec.jp/jcm/projects/21protha_03/</a>
Thailand / Introduction of 23MW Rooftop Solar Power System to Tire Factories	Sharp Energy Solutions Corporation	<a href="https://gec.jp/jcm/projects/21protha_04/">https://gec.jp/jcm/projects/21protha_04/</a>

# JCM Projects in AZEC partners by MOEJ (16/22)

Project outline	Organization	URL
Thailand / Introduction of High Efficiency Boiler, High Efficiency Chiller, and Solar PV System to Textile Factory and Food Factory	The Kansai Electric Power Company, Incorporated	<a href="https://gec.jp/jcm/projects/21project/tha_05/">https://gec.jp/jcm/projects/21project/tha_05/</a>
Thailand / Introduction of 2MW Rooftop Solar Power System to Non-ferrous Metal Factory	The Kansai Electric Power Company, Incorporated	<a href="https://gec.jp/jcm/projects/21project/tha_06/">https://gec.jp/jcm/projects/21project/tha_06/</a>
Thailand / Introduction of 1.3MW Solar Power System to Food Factories (JCM Eco Lease Scheme)	Tokyo Century Corporation	<a href="https://gec.jp/jcm/projects/21project/tha_07/">https://gec.jp/jcm/projects/21project/tha_07/</a>
Thailand / Introduction of 0.13MW Solar Power System to Auto Parts Factory (JCM Eco Lease Scheme)	Tokyo Century Corporation	<a href="https://gec.jp/jcm/projects/21project/tha_08/">https://gec.jp/jcm/projects/21project/tha_08/</a>
Thailand / Introduction of Gas Co-generation System and 22MW Rooftop Solar Power System to Tire Factory	The Kansai Electric Power Company, Incorporated	<a href="https://gec.jp/jcm/projects/22project/tha_01/">https://gec.jp/jcm/projects/22project/tha_01/</a>
Thailand / Introduction of ORC Waste Heat Recovery Power Generation System to Flat Glass Factory	AGC Inc.	<a href="https://gec.jp/jcm/projects/22project/tha_02/">https://gec.jp/jcm/projects/22project/tha_02/</a>
Thailand / Energy Supply Project by 4.0MW Rooftop Solar Power System to Parts and Tools Factories	The Kansai Electric Power Company, Incorporated	<a href="https://gec.jp/jcm/projects/22project/tha_03/">https://gec.jp/jcm/projects/22project/tha_03/</a>
Thailand / Energy Supply Project by 2.9MW Rooftop Solar Power System to Metal Factories and Refrigerating Warehouse	Osaka Gas Co., Ltd.	<a href="https://gec.jp/jcm/projects/22project/tha_04/">https://gec.jp/jcm/projects/22project/tha_04/</a>

# JCM Projects in AZEC partners by MOEJ (17/22)

Project outline	Organization	URL
Thailand / Energy Supply Project by 0.9MW Rooftop Solar Power System to Metal Recycling and Automotive Parts Factories	Marubeni Corporation	<a href="https://gec.jp/jcm/projects/22pro_t ha_05/">https://gec.jp/jcm/projects/22pro_t ha_05/</a>
Thailand / Thermal Energy Supply and Methane Avoidance Project Utilizing Biomass mixed with Biogas from Wastewater in Fruit Processing Factory	Dole Japan, Inc.	<a href="https://gec.jp/jcm/projects/22pro_t ha_06/">https://gec.jp/jcm/projects/22pro_t ha_06/</a>
Thailand / Introduction of 1.6MW Solar Power System to Plastic Bottles and Cosmetics Factories (JCM Eco Lease Scheme)	Tokyo Century Corporation	<a href="https://gec.jp/jcm/projects/22pro_t ha_07/">https://gec.jp/jcm/projects/22pro_t ha_07/</a>
Vietnam / Energy Saving in Acid Lead Battery Factory with Container Formation Facility	Hitachi Chemical Company, Ltd.	<a href="http://gec.jp/jcm/projects/15pro_vie_03/">http://gec.jp/jcm/projects/15pro_vie_03/</a>
Vietnam / Energy Saving in Factories with Air-Conditioning Control System	Yuko Keiso Co., Ltd.	<a href="http://gec.jp/jcm/projects/15pro_vie_04/">http://gec.jp/jcm/projects/15pro_vie_04/</a>
Vietnam / Installation of High Efficiency Kiln in Sanitary Ware Manufacturing Factory	TOTO LTD.	<a href="http://gec.jp/jcm/projects/15pro_vie_06/">http://gec.jp/jcm/projects/15pro_vie_06/</a>
Vietnam / Introduction of High Efficiency Water Pumps in Da Nang City	Yokohama Water Co., Ltd.	<a href="http://gec.jp/jcm/projects/16pro_vie_01/">http://gec.jp/jcm/projects/16pro_vie_01/</a>
Vietnam / Installation of Energy Saving Equipment in Lens Factory	HOYA CORPORATION	<a href="http://gec.jp/jcm/projects/16pro_vie_02/">http://gec.jp/jcm/projects/16pro_vie_02/</a>

# JCM Projects in AZEC partners by MOEJ (18/22)

Project outline	Organization	URL
Vietnam / Introduction of Amorphous High Efficiency Transformers in Northern, Central and Southern Power Grids	Yuko Keiso Co., Ltd.	<a href="http://gec.jp/jcm/projects/16pro_vie_03/">http://gec.jp/jcm/projects/16pro_vie_03/</a>
Vietnam / Introduction of Energy Saving Equipment to Automotive Wire Production Factory	YAZAKI PARTS CO., LTD.	<a href="http://gec.jp/jcm/projects/16pro_vie_04/">http://gec.jp/jcm/projects/16pro_vie_04/</a>
Vietnam / Introduction of 2MW Solar Power System for Pellet Factory	Idemitsu Kosan Co., Ltd.	<a href="http://gec.jp/jcm/projects/20pro_vnm_06/">http://gec.jp/jcm/projects/20pro_vnm_06/</a>
Vietnam / Eco-Driving by Utilizing Digital Tachograph System	Nippon Express Co., LTD.	<a href="https://gec.jp/jcm/projects/14pro_vie_02/">https://gec.jp/jcm/projects/14pro_vie_02/</a>
Vietnam / Introduction of Amorphous high efficiency transformers in power distribution systems	Yuko Keiso Co., Ltd.	<a href="https://gec.jp/jcm/projects/14pro_vie_03/">https://gec.jp/jcm/projects/14pro_vie_03/</a>
Vietnam / Introduction of High Efficiency Air-conditioning in Hotel	NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc.	<a href="https://gec.jp/jcm/projects/15pro_vie_01/">https://gec.jp/jcm/projects/15pro_vie_01/</a>
Vietnam / Introduction of Energy-Efficient Air Conditioners in a Lens Factory	Ricoh Company, Ltd.	<a href="https://gec.jp/jcm/projects/15pro_vie_02/">https://gec.jp/jcm/projects/15pro_vie_02/</a>
Vietnam / Introduction of Amorphous High Efficiency Transformers in Southern and Central Power Grids	Yuko Keiso Co., Ltd.	<a href="https://gec.jp/jcm/projects/15pro_vie_05/">https://gec.jp/jcm/projects/15pro_vie_05/</a>



# JCM Projects in AZEC partners by MOEJ (19/22)

Project outline	Organization	URL
Vietnam / Introduction of Solar PV System at Shopping Mall in Ho Chi Minh City	AEON RETAIL Co., Ltd.	<a href="https://gec.jp/jcm/projects/15project/vie_08/">https://gec.jp/jcm/projects/15project/vie_08/</a>
Vietnam / Introduction of Amorphous High Efficiency Transformers in Southern and Central Power Grids II	Yuko Keiso Co., Ltd.	<a href="https://gec.jp/jcm/projects/17project/vie_01/">https://gec.jp/jcm/projects/17project/vie_01/</a>
Vietnam / Introduction of High Efficiency Centrifugal Chiller to Rubber Products Factory	YUASA Trading CO., Ltd.	<a href="https://gec.jp/jcm/projects/17project/vie_02/">https://gec.jp/jcm/projects/17project/vie_02/</a>
Vietnam / Introduction of Energy Saving Equipment to Brewery	Sapporo International Inc.	<a href="https://gec.jp/jcm/projects/17project/vie_03/">https://gec.jp/jcm/projects/17project/vie_03/</a>
Vietnam / Development of Collection Scheme and Introduction of Dedicated System for Destruction of Used Fluorocarbons	Marubeni Corporation	<a href="https://gec.jp/jcm/projects/18fgas/vie_01/">https://gec.jp/jcm/projects/18fgas/vie_01/</a>
Vietnam / Modal Shift from Truck to Cargo Ship with Freshness Preservation Reefer Container	Nihon Crant Co. Ltd.	<a href="https://gec.jp/jcm/projects/18project/vie_01/">https://gec.jp/jcm/projects/18project/vie_01/</a>
Vietnam / Energy Saving by Introduction of Inverters for Raw Water Intake Pumps	Yokohama Water Co., Ltd.	<a href="https://gec.jp/jcm/projects/18project/vie_02/">https://gec.jp/jcm/projects/18project/vie_02/</a>
Vietnam / Introduction of Biomass Boiler to Chemical Factory	DAIICHI JITSUGYO CO., LTD.	<a href="https://gec.jp/jcm/projects/19project/vnm_03/">https://gec.jp/jcm/projects/19project/vnm_03/</a>

# JCM Projects in AZEC partners by MOEJ (20/22)

Project outline	Organization	URL
Vietnam / Introduction of Air Cooled Chiller to Office Building	Hitachi-Johnson Controls Air Conditioning, Inc.	<a href="https://gec.jp/jcm/projects/19pro_vnm_04/">https://gec.jp/jcm/projects/19pro_vnm_04/</a>
Vietnam / 49MW Solar Power Project in An Giang Province	Kanematsu KGK Corp.	<a href="https://gec.jp/jcm/projects/19pro_vnm_05/">https://gec.jp/jcm/projects/19pro_vnm_05/</a>
Vietnam / 57MW Solar Power Project in An Giang Province	Kanematsu KGK Corp.	<a href="https://gec.jp/jcm/projects/20pro_vnm_01/">https://gec.jp/jcm/projects/20pro_vnm_01/</a>
Vietnam / Introduction of Biomass Boiler to Soluble Coffee Manufacturing Plant	Marubeni Corporation	<a href="https://gec.jp/jcm/projects/20pro_vnm_03/">https://gec.jp/jcm/projects/20pro_vnm_03/</a>
Vietnam / Introduction of High Efficiency Boiler System to Food Factory	Acecook Co., Ltd.	<a href="https://gec.jp/jcm/projects/20pro_vnm_04/">https://gec.jp/jcm/projects/20pro_vnm_04/</a>
Vietnam / Introduction of High Efficiency Air-conditioning System to Hotel in Ho Chi Minh City	Hitachi-Johnson Controls Air Conditioning, Inc	<a href="https://gec.jp/jcm/projects/20pro_vnm_05/">https://gec.jp/jcm/projects/20pro_vnm_05/</a>
Vietnam / Development of Fluorocarbons collection scheme and installation of mixed combustion decomposition facility in Vietnam	Marubeni Corporation	<a href="https://gec.jp/jcm/projects/21fgas_vnm_01/">https://gec.jp/jcm/projects/21fgas_vnm_01/</a>
Vietnam / Waste to Energy Project in Bac Ninh Province	JFE Engineering Corporation	<a href="https://gec.jp/jcm/projects/21pro_vnm_01/">https://gec.jp/jcm/projects/21pro_vnm_01/</a>

# JCM Projects in AZEC partners by MOEJ (21/22)

Project outline	Organization	URL
Vietnam / Introduction of 9MW Rooftop Solar Power System to Factories	Sharp Energy Solutions Corporation	<a href="https://gec.jp/jcm/projects/21pro_vnm_03/">https://gec.jp/jcm/projects/21pro_vnm_03/</a>
Vietnam / Introduction of High Efficiency LED Lighting with Dimming and Tunable Function to Office Building in Ho Chi Minh City	ENDO Lighting Corporation	<a href="https://gec.jp/jcm/projects/21pro_vnm_04/">https://gec.jp/jcm/projects/21pro_vnm_04/</a>
Vietnam / Introduction of 12MW Rooftop Solar Power System to Commercial and Industrial Customers	Marubeni Corporation	<a href="https://gec.jp/jcm/projects/21pro_vnm_05/">https://gec.jp/jcm/projects/21pro_vnm_05/</a>
Vietnam / Introduction of 9.8MW Rooftop Solar Power System in Industrial Park	Osaka Gas Co., Ltd.	<a href="https://gec.jp/jcm/projects/21pro_vnm_06/">https://gec.jp/jcm/projects/21pro_vnm_06/</a>
Vietnam / Introduction of 5.8MW Rooftop Solar Power System to Beverage Factory	Asian Gateway Corporation	<a href="https://gec.jp/jcm/projects/21pro_vnm_07/">https://gec.jp/jcm/projects/21pro_vnm_07/</a>
Vietnam / Introduction of 2.5MW Rooftop Solar Power System to Food Factory and Garment Factory	The Kansai Electric Power Company, Incorporated	<a href="https://gec.jp/jcm/projects/21pro_vnm_08/">https://gec.jp/jcm/projects/21pro_vnm_08/</a>
Vietnam / Introduction of High Efficiency Chiller and High Efficiency LED Lighting with Dimming Function to Shopping Center	Tokyu Corporation	<a href="https://gec.jp/jcm/projects/21pro_vnm_09/">https://gec.jp/jcm/projects/21pro_vnm_09/</a>
Vietnam / 20MW Biomass Power Plant Project in Hau Giang Province	eREX Co.,Ltd.	<a href="https://gec.jp/jcm/projects/22pro_vnm_01/">https://gec.jp/jcm/projects/22pro_vnm_01/</a>

# JCM Projects in AZEC partners by MOEJ (22/22)

Project outline	Organization	URL
Vietnam / 16MW Mini Hydro Power Plant Project in Binh Thuan Province	Kanematsu KGK Corp.	<a href="https://gec.jp/jcm/projects/22pro_vnm_02/">https://gec.jp/jcm/projects/22pro_vnm_02/</a>
Vietnam / Energy Supply Project by 7.9MW Rooftop Solar Power System to Automotive and Garment Factories	The Kansai Electric Power Company, Incorporated	<a href="https://gec.jp/jcm/projects/22pro_vnm_03/">https://gec.jp/jcm/projects/22pro_vnm_03/</a>
Vietnam / Introduction of 0.4MW Rooftop Solar Power System to Aluminum Wheel Manufacturing Factory (JCM Eco Lease Scheme)	Sumitomo Mitsui Trust Panasonic Finance Co., Ltd.	<a href="https://gec.jp/jcm/projects/22pro_vnm_04/">https://gec.jp/jcm/projects/22pro_vnm_04/</a>
Vietnam / Introduction of 5.7MW Rooftop Solar Power System to Fastener and Aluminum Factories	Marubeni Corporation	<a href="https://gec.jp/jcm/projects/22pro_vnm_05/">https://gec.jp/jcm/projects/22pro_vnm_05/</a>
Vietnam / 48MW Offshore Wind Power Generation Project in Duyen Hai District, Tra Vinh Province	Shizen Energy Inc.	<a href="https://gec.jp/jcm/projects/22pro_vnm_06/">https://gec.jp/jcm/projects/22pro_vnm_06/</a>
Vietnam / Energy Supply Project by 1.8MW Rooftop Solar Power System to Automotive Parts Factory and Construction Materials Factory	The Kansai Electric Power Company, Incorporated	<a href="https://gec.jp/jcm/projects/22pro_vnm_07/">https://gec.jp/jcm/projects/22pro_vnm_07/</a>
Vietnam / Energy Supply Project by 0.8MW Rooftop Solar Power System to Chemical Factory	The Kansai Electric Power Company, Incorporated	<a href="https://gec.jp/jcm/projects/22pro_vnm_08/">https://gec.jp/jcm/projects/22pro_vnm_08/</a>

## 5. Progress of AZEC Projects

### (2) Projects related to MOUs in March 2023

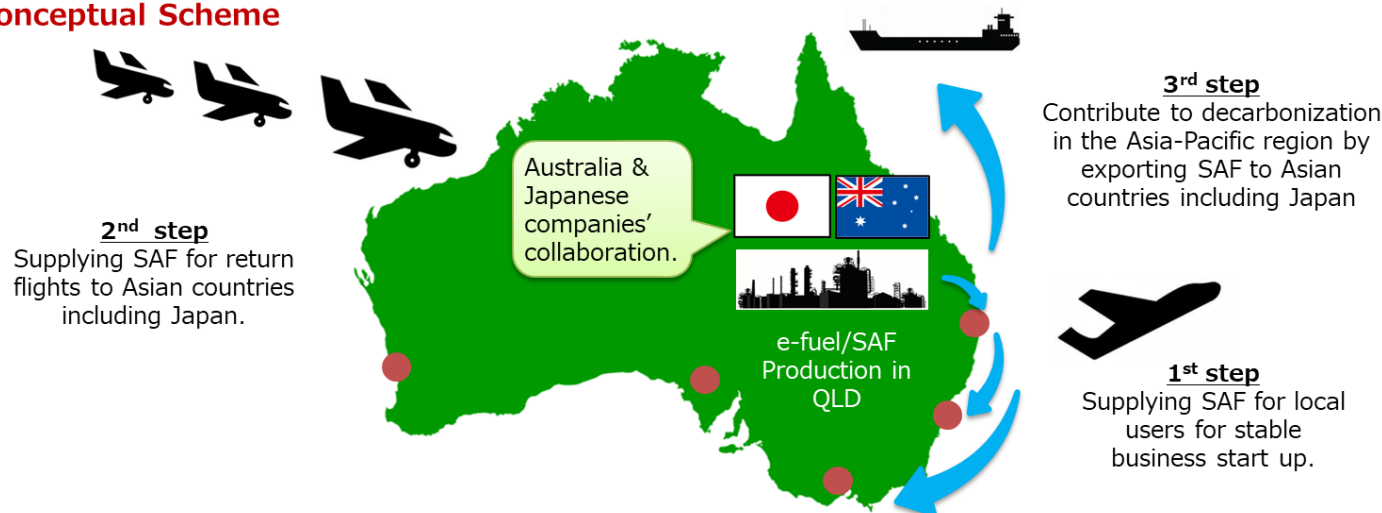
Projects related to 28 MOUs signed on the occasion of the AZEC Ministerial Meeting are also presented as of March, with a red square on a slide showing the progress, if any, since March.

## MOU

- **Overview:** CS Energy (Queensland government-owned corporation, Australia), Toyo Engineering Corporation (Japan), and Sojitz Corporation (Japan) have agreed to cooperate on establishing an e-fuel/SAF value chain in Queensland, Australia (QLD), with the aim of realizing carbon neutrality in the aviation industry and decarbonization in the Asia-Pacific region.
- **Purpose and Goals:** (1) To realize synthetic fuel (e-fuel/SAF) production from renewable hydrogen and carbon dioxide. (2) To establish a competitive e-fuel/SAF value chain in QLD, a region with immense potential for renewable hydrogen production. (3) To contribute to decarbonization in the Asia-Pacific region through the stable supply of e-fuel/SAF.

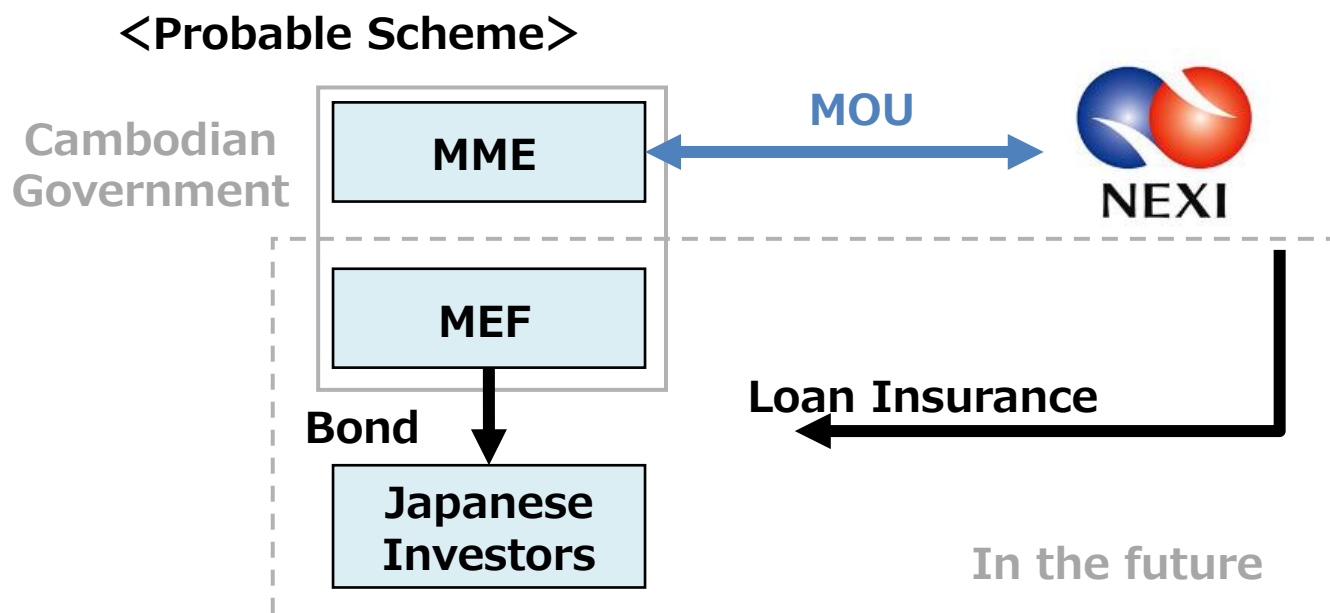
- **Progress Update:** In July 2023, we promoted the project at a panel discussion at the Decarbonising Australia Business Summit. Following site visits, we assessed potential locations and scenarios and have now begun our Pre-Feasibility Study (Pre-FS). This Pre-FS is scheduled to be completed within the next few months.

### Conceptual Scheme



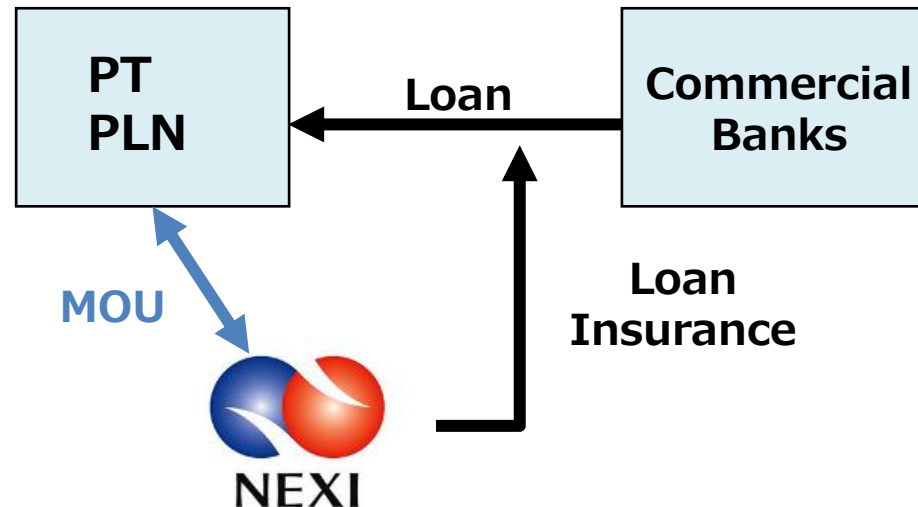


- **Summary:** Nippon Export and Investment Insurance (NEXI) has concluded a Memorandum of Understanding (MOU) with Ministry of Mines and Energy (MME) in Kingdom of Cambodia.
- **Purpose:** This MOU further strengthens the cooperation in the power sector between NEXI and MME in Cambodia.
- **Miscellaneous:** NEXI will contribute to supporting MME's efforts in achieving realistic energy transitions and to creating potential business opportunities for Japanese companies in Cambodia.



- **Summary:** Nippon Export and Investment Insurance (NEXI) will provide financing support of a maximum of USD 500 million for PT PLN, state-owned utility company in the Republic of Indonesia, as a part of Asian Zero Emissions Community (AZEC) Concept. Furthermore, NEXI will introduce Japanese technologies to PT PLN.
- **Purpose:** This MOU further strengthens the cooperation in the power sector between NEXI and PT PLN in Indonesia.
- **Miscellaneous:** NEXI has signed the MOU with PT PLN in April 2022, and has amended it in November. In March 2023, NEXI and PT PLN will amend this MOU again along with the progress on their discussion.

## <Scheme>



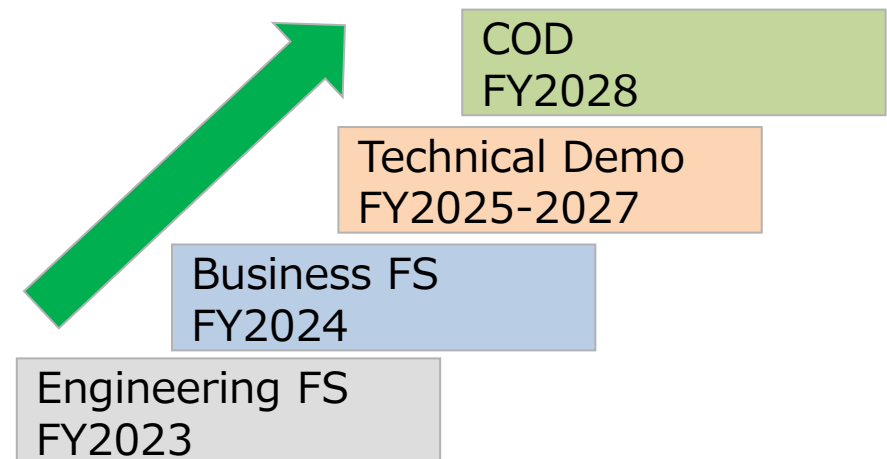
- **Summary** : In Indonesia, to increase the ratio of renewable energy generation is important policy. Through “Kyudenko EMS” which is an Energy management system of renewable energy, Indonesia power and Japan companies can try together for achievement.
- **Scope** : PT. Indonesia Power is a group company of PT. PLN and is core company of domestic power business area. They are best partner for the business of Stabilization technology for renewable energy.
- **Others** : As pilot project, co-working at remote islands of North Kalimantan is under discussing base on the MoU.

- **Updated Progress:** Feasibility Study on the NEDO Project on hybrid power generation targeting 100% supply by Renewable energy in North Kalimantan has been started from July 2023. In the future, Kyudenko and PT. Indonesia power will work together to Demonstration in FY2025 and commercialize this project (COD2028).

<Image of Big scale Lead-acid Battery for stabilization>



<Targeting Milestone>



- **Overview** : Toward decarbonization of energy in Indonesia, PT. PLN Nusantara Power (PNP), a subsidiary of Indonesia's state-owned electricity company, and Mitsubishi Heavy Industries, Ltd.(MHI) will commence discussions on feasibility studies co-firing less carbon intensive fuels at power plants owned and operated by PNP.
- **Aim of the cooperation** : This MOU will allow us to explore innovative solutions by MHI decarbonization technology in order to achieve sustainable environmental goals, while responding to the country's critical energy demand.
- **Detail of the cooperation** : To discuss the potential collaboration for materializing hydrogen co-firing in gas turbines, ammonia co-firing in gas-fired boilers, and biomass co-firing in coal-fired boilers at two existing power plants in Indonesia.

- **Updated Progress**: Discussions are ongoing with PNP regarding the implementation of feasibility study at the power plants covered by the MOU.

<Location of Power Plant to be covered in MOU>



Muara Karang Power Plant



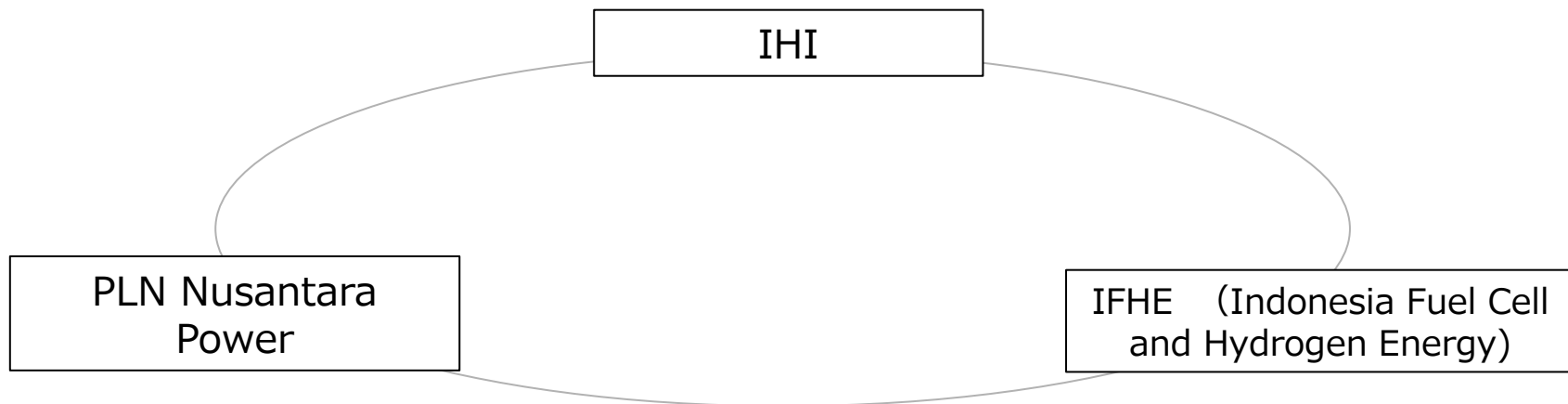
- ① Hydrogen co-firing in gas turbines
- ② Ammonia co-firing in gas-fired boilers

Paiton Power Plant



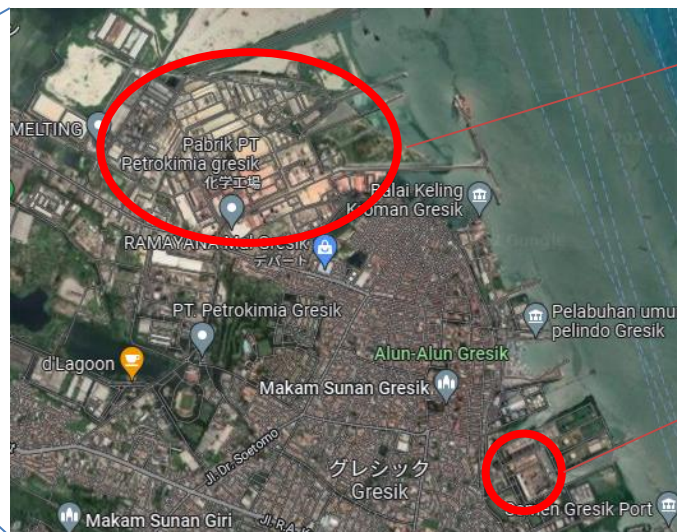
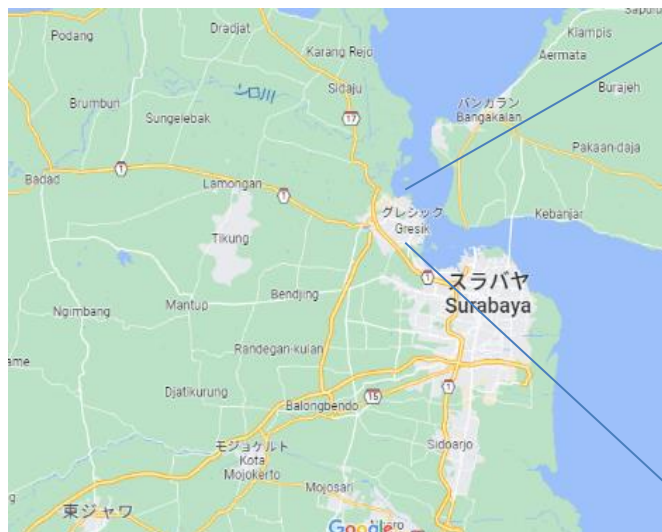
- ③ Biomass co-firing in coal-fired boilers

- **Partners:** PLN Nusantara Power, IFHE (Indonesia Fuel Cell and Hydrogen Energy)
- **Outline:** To form a comprehensive cooperative framework for the construction of a clean energy-based power system in Indonesia. Contents include the production and utilization of hydrogen & ammonia, biomass co-firing & mono-firing, and performance improvements of existing thermal power plants.
- **Purpose/Aims:** To pursue realistic, economical solutions by involving utility companies and research institutes on the consideration of utilizing new energy sources such as hydrogen, ammonia and biomass, and for the improvement of existing power plants.





- **Partner:** PT Pupuk Indonesia (Persero)
- **Outline:** Conduct technical study and feasibility assessment for the construction of a stand-alone green ammonia production plant on the site of an existing fertilizer facility, and for a technical study on ammonia co-firing in the same facility's existing coal-fired power plant.
- **Purpose/Aims:** To promote the production and utilization of new fuel ammonia contributing to the decarbonization of Indonesia and abroad.
- **Other:** Conduct the Feasibility Study by March, 2024.



Study to introduce the green ammonia production and ammonia co-firing in existing fertilizer company (Petrokimia Gresik, subsidiary company of Pupuk Indonesia)

(Reference)

In Oct.2022, IHI conducted ammonia co-firing in Gresik Power Plant, PLN Nusantara Power, which is located near to Petrokimia Gresik.



- **Overview:** Joint Study Agreement between Chiyoda Corporation and PT Pertamina(Persero) regarding developing of decarbonization Technology – CO2 Reforming of Methane and CCU Technology in Pertamina's Upstream Field to produce value added chemical products. This Joint Study is a concrete development from the memorandum of understanding regarding cooperation in the field of decarbonization toward the realization of net zero with PT Pertamina(Persero) in January 2022.
- **Purpose and Goals:** Propose a CCU or carbon recycling technology for utilizing Gas from Pertamina's stranded fields with high CO2 content and Conduct a Feasibility Study on the applicability of Chiyoda's CO2 Reforming Technology.
- Chiyoda and Pertamina executed a Feasibility Study of CCS in South Sumatra jointly in 2022 as well.

- **Updated Progress:** Pertamina and Chiyoda started Joint Feasibility Study in April 2023 supported by FY 2023 JCCP's Project Formation Study scheme.

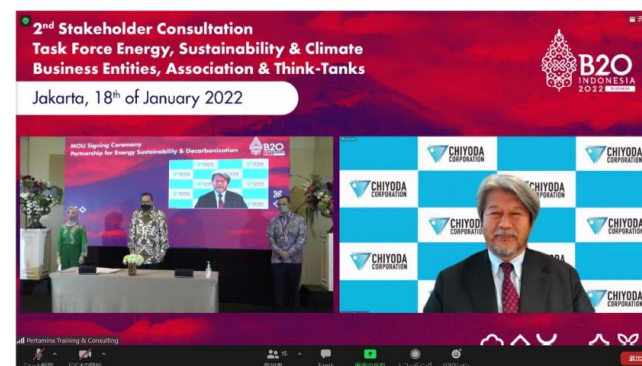
## <Corporation history between Chiyoda and Pertamina>

Jan 2022 Signed MOU of collaboration for decarbonization technologies (photo shown in right)

Sep 2022 Signed JSA for CCS project in South Sumatra

Mar 2023 Concluded JSA for carbon recycling technology (CCU/CO2 Reforming of Methane)

MOU with PT Pertamina, Indonesia to Collaborate in Technical Developments Aiming for Net Zero Carbon Emissions

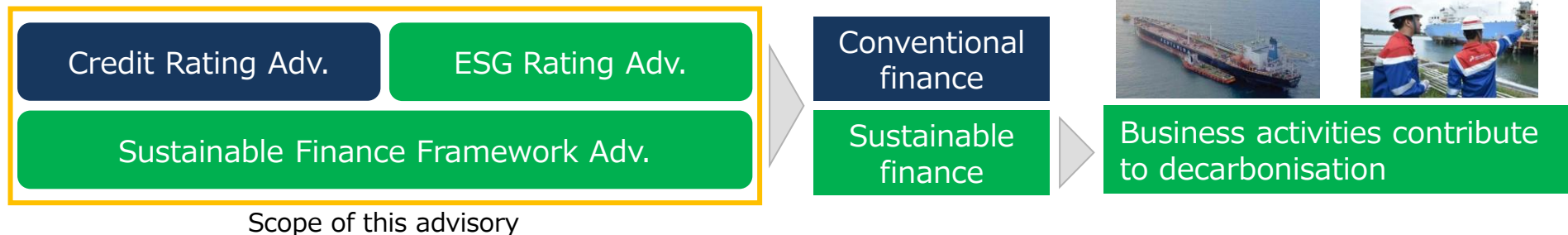


Online signing ceremony at Task Force event in Business 20\* Indonesia 2022

- **Outline** : Mizuho assists Pertamina International Shipping (“PIS”) in its decarbonisation initiative by broadening its capital sources including sustainable finance through ESG advisory. Specifically, improving transparency of governance through advice on credit rating accreditation, and strengthening ESG initiatives through advice on ESG rating accreditation and setting sustainable finance framework.
- PIS is the group company of Indonesia state owned oil & gas company, PT Pertamina (Persero), and strives to decarbonise its business.
- **Significance** : This advisory aims to contribute to the decarbonisation of Pertamina Group and Indonesia from financial side by leveraging Mizuho’s expertise on the corporate finance, decarbonisation and ESG.

**Updated Progress:** Mizuho commenced and is close to completion for the advisory work for PIS over accreditation of credit rating and ESG rating. The process is progressing steadily for setting PIS' sustainable finance framework.

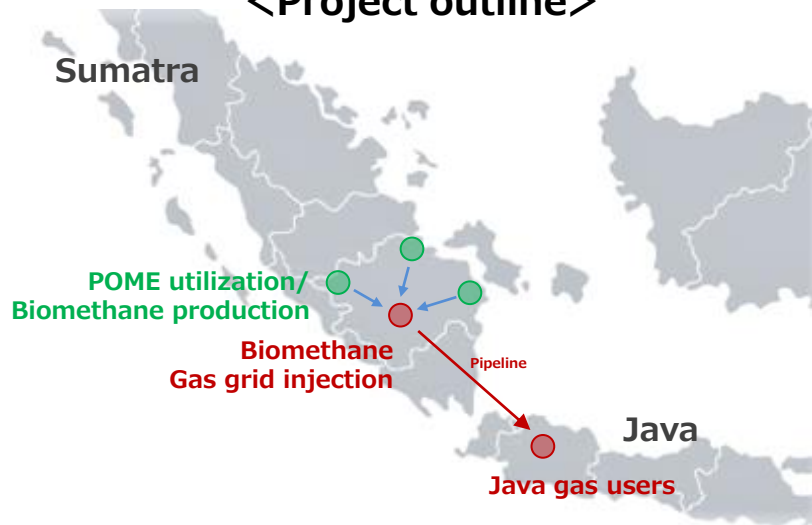
## <Contribute to the decarbonisation of Pertamina Group from financial side>



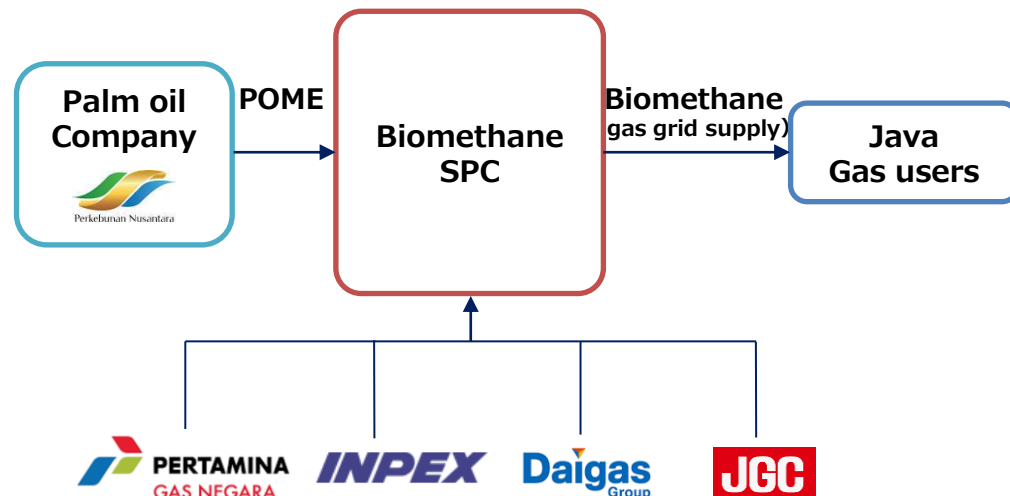
- **Outline** : PGN, JGC HD, Osaka Gas, and INPEX, together with PTPN, a major state-owned palm oil company in Indonesia, will pursue an opportunity to collaborate toward the realization of a biomethane fuel supply via gas grid by utilizing biomass resources.
- **Aim of Cooperation** : Contributing to carbon neutrality by recovering methane emitted from the palm oil industry, a key sector in Indonesia, and promoting the use of clean biomethane fuel.
- **Schedule** : A detailed feasibility assessment will be concluded by the end of 2023 and a decision will be made on SPC establishment, etc.

- **Updated Progress**: The joint detailed study to conclude a raw materials transaction agreement was initiated.

## <Project outline>

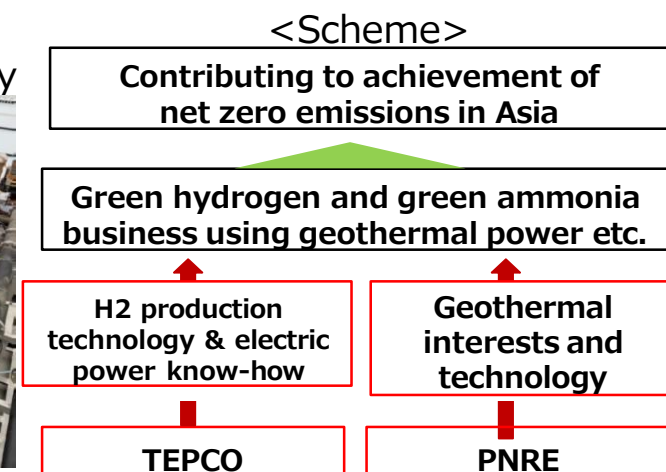
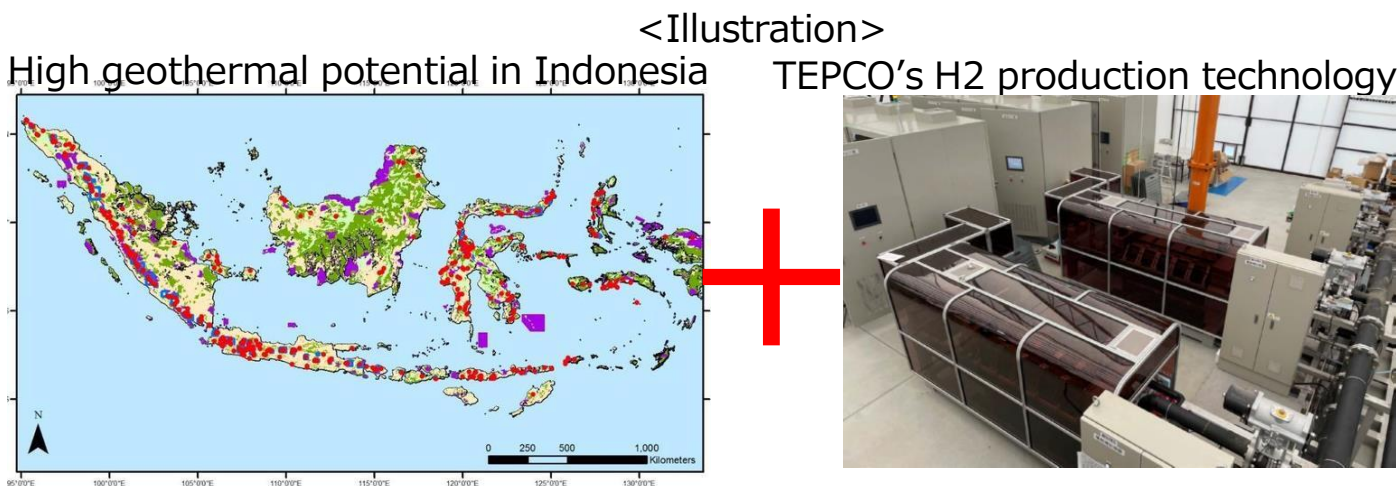


## <Business scheme>



## MOU

- **Outline:** In order to achieve energy transition and net zero emissions in Asia, TEPCO HD and Pertamina New and Renewable Energy (PNRE) will explore the commercial production, transportation and sale of green hydrogen and green ammonia using renewable energy (mainly geothermal power generation) in Indonesia.
- **Significance/Aim:** In promoting this project, we have already concluded a Joint Study Agreement with PNRE, and are proceeding with the NEDO "International Demonstration Project on Japan's Energy Efficiency Technologies". Under this MOU, using the results of the NEDO demonstration project, TEPCO's hydrogen production technology and electric power business know-how will be combined with PNRE's geothermal interests and technology to realize cost-competitive green hydrogen and green ammonia business, and help achieve net zero emissions in Asia.
- **Updated Progress:** Feasibility Study on the NEDO Project on hydrogen from geothermal power generation started on September 1 2023. In the future, TEPCO and PNRE will work together to commercialize the findings from this joint research in accordance with the Memorandum of Understanding. [https://www.tepco.co.jp/en/hd/newsroom/press/archives/2023/20230906\\_01.html](https://www.tepco.co.jp/en/hd/newsroom/press/archives/2023/20230906_01.html)

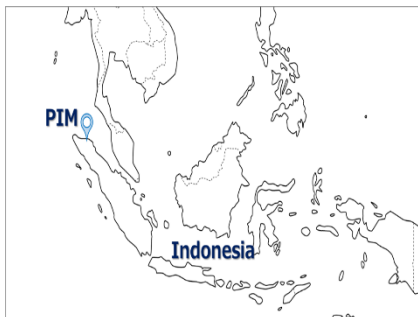




# Green Ammonia Project at Pupuk Iskandar Muda (PIM) under Pupuk Indonesia Holding Co. (PIHC)

- **Outline :** TOYO proposed the concept to produce green ammonia by utilizing the existing facilities of ammonia process plant, and got award from METI to implement the Feasibility Study through its energy infrastructure support program. TOYO accordingly implemented the Feasibility Study and generally agreed with PIHC to jointly pursue the project development.
- **Purpose and Aim by the collaboration :** By adopting the aforementioned concept, it becomes possible to produce the green ammonia in prompt and competitive manner, which will contribute to the carbon neutralization in Japan and Asian countries, and to the development of clean industry in Indonesia. TOYO, PIHC and PIM would like to jointly proceed the project development with targeting the production start in year 2025. Furthermore, Toyo and PIHC will pursue to extend the green ammonia production by applying same methodology to the other plants under PIHC group.

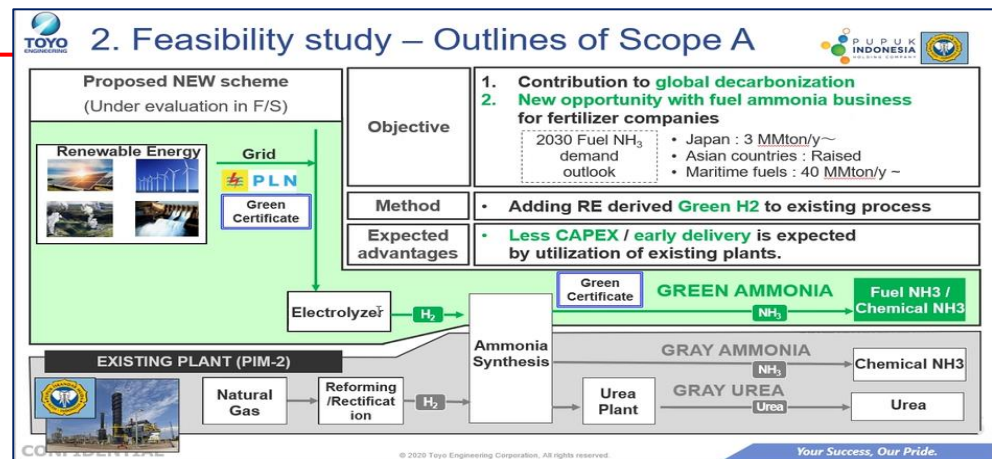
- **Updated Progress:** ①Agreed on Mitsui & Co.'s participation in the project, as a partner for off-taking the product. ② CAPEX and electricity price reduction studies, bidding for electrolyzer, major procurement item, are ongoing. ③Started the discussion for gaining ISCC certificate. ④Business expansion to Gresik, Kujang, etc. has been discussed with Mr. Rahmad Pribadi, the new president of PIHC, on 21 Aug.



Location of the site (PIM)



PIM existing plant



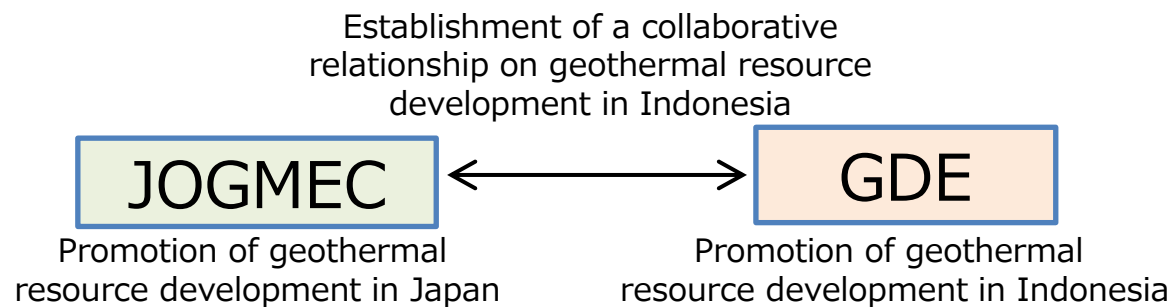
Project Scheme

- **Outline** : JOGMEC and GDE will work on an establishment of a collaborative relationship in the technical field of geothermal resource survey and exploration in Indonesia.
- **Objectives** : To establish a collaborative relationship between JOGMEC and GDE on geothermal resource development in Japan and Indonesia for the promotion of energy transition to secure the stable supply of energy which is crucial in realization of sustainable economic growth, and implementing measures against climate change simultaneously.

<Image of geothermal resource development>



<Scheme>



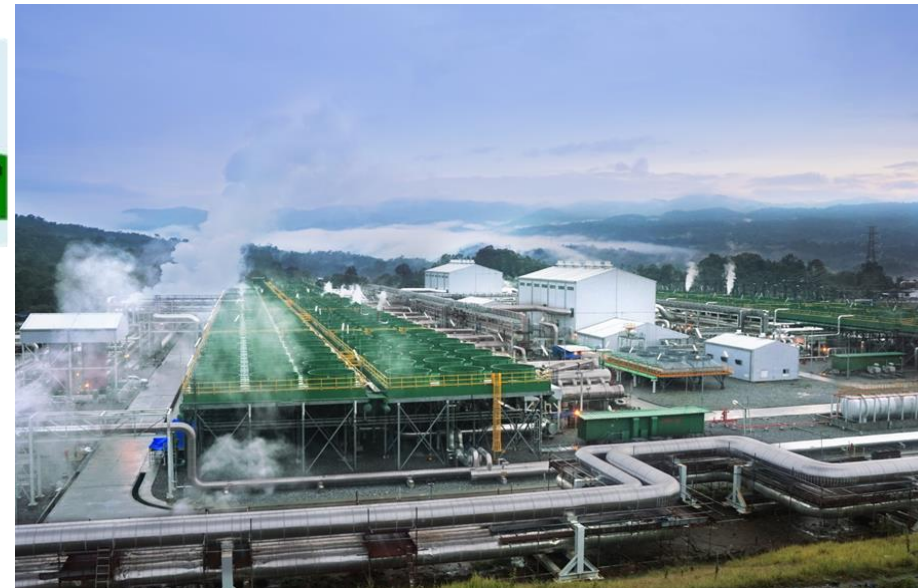


- **Outline** : ITOCHU Corporation, Kyushu Electric Power Co., Inc., INPEX CORPORATION , Medco Power Indonesia, Ormat Geothermal Indonesia will collaborate to engage in discussions and to explore on the possibility of expansion of the Sarulla Geothermal, considering also the successful recovery of the financial and operational conditions of the existing project.
- **Significance of collaboration** : Through the development of the geothermal project which has a high contribution to the GHG reduction as base load renewable energy and both Indonesia and Japan have resources for geothermal, it will lead the energy transition in Indonesia and serve as parts of the AZEC concept.

<Project Site>



<Existing Project>



## MOU

- **Outline** : JGC and Gas Malaysia have agreed to conduct to Feasibility Study on the production and sales of biofuels and biochemicals through the effective utilization of unused waste materials (POME, EFB, wood waste, etc.) generated from the palm oil industry.
- **Aim of Cooperation** : JGC and Gas Malaysia will cooperate to explore joint business opportunities and conduct joint studies with a view to future commercialization, thereby contributing to making the palm oil industry sustainable and the country carbon neutral.
- **Other** : A detailed project plan and scheme will be developed by the end of 2023, with a view to establishing an SPC.

### Updated Progress:

1. held workshop for opportunity of unutilized waste generated by the palm oil industry
2. Study for commercialization started through workshops



<Scheme>  
Introduction of palm oil mills and potential PJs

←  
Share technical Info



Selection and FS of cooperative projects

Scheme development, partner consideration, and project execution

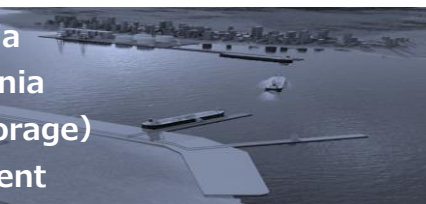
- **The Outline** : PETRONAS and JOGMEC have agreed to conduct joint research on projects targeting carbon-neutral fields such as clean energy such as hydrogen/ammonia, GHG emissions management in energy projects, and various CCS projects.
- **The Significance of the collaboration** : To enhance PETRONAS and JOGMEC collaboration to promote and develop sustainable energy sources and technologies to achieve respective mutual energy transition and decarbonization targets. This joint-effort also aims to spur business opportunities and provide technical and financial supports for Japanese companies to participate in PETRONAS projects, both inside and outside of Malaysia.

**Updated Progress:** Discussions was held in June 2023 the details of the collaboration. Methane reduction flagship project has been launched covering quantitative methane surveys and viable solutions towards achieving zero routine flaring.

<https://www.petronas.com/media/media-releases/petronas-collaborates-partners-accelerate-methane-emissions-reduction>

## <Area of Cooperation>

Blue Hydrogen/ Ammonia  
Green Hydrogen/ Ammonia  
CCS (Carbon Capture Storage)  
GHG emission management



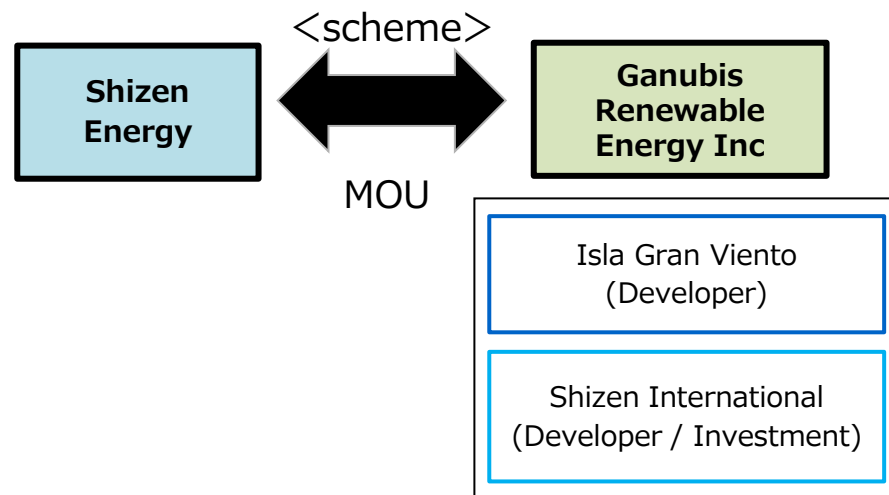
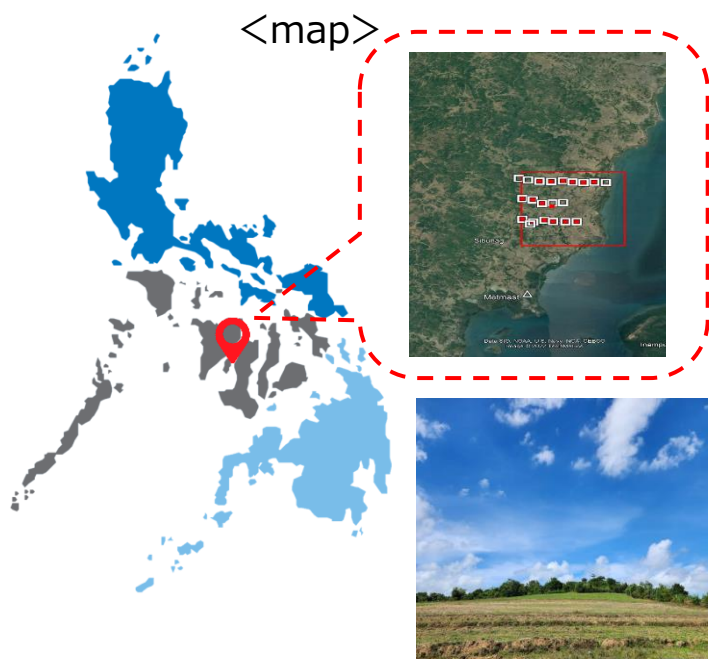
## <Scheme>



<Cooperation such as joint research>

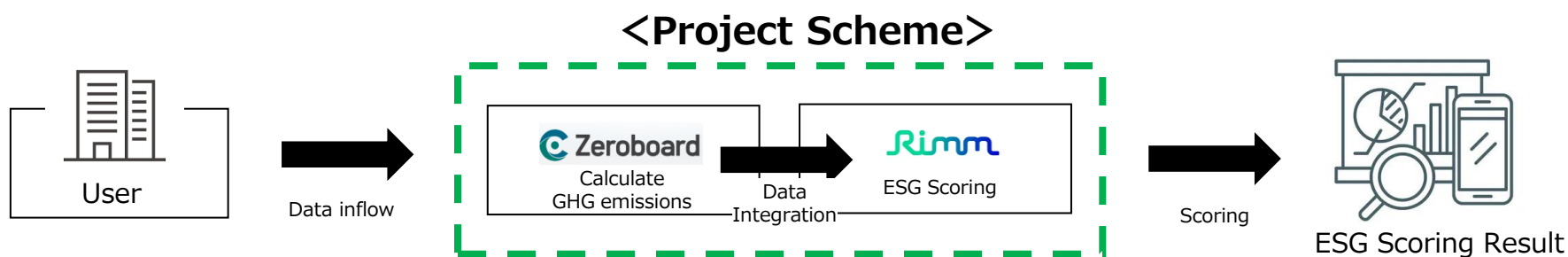
# Shizen Energy and Ganubis Renewable Energy Inc. Agree to Jointly Develop a 96 MW On-shore Wind Power Plant in the Philippines

- **Summary:** Shizen Energy will agree with Ganubis Renewable Energy Inc., which is a partnership between Shizen International and Isla Gran Viento, outlines a joint effort to develop an on-shore wind power plant in the Philippines with a capacity of up to 96 MW.
- **Significance and Aim of the Cooperation:** The successful execution of the project outlined in the MOU will make the Philippines the proud host of one of the largest on-shore wind power plant in Southeast Asia. This landmark achievement will contribute the country's green technology initiatives and the nation's zero-carbon goals.



- **Summary** : Zeroboard, provider of a cloud service for calculating and visualizing GHG emissions, has formed a business alliance with RIMM, a provider of ESG scoring services, to build an advanced ESG management support service.
- **Aim** : RIMM will integrate with and leverage Zeroboard's carbon calculating function to provide an advanced ESG scoring service, aimed at promoting ESG management in Asia.

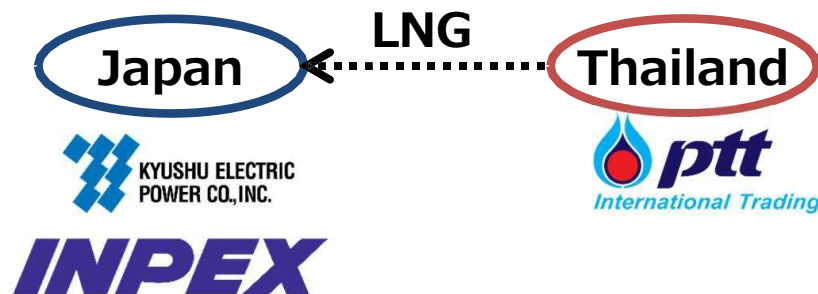
- **Updated Progress**: From November, 2023, Zeroboard / RIMM implements "customer referral scheme" and begins sending referrals to other company.



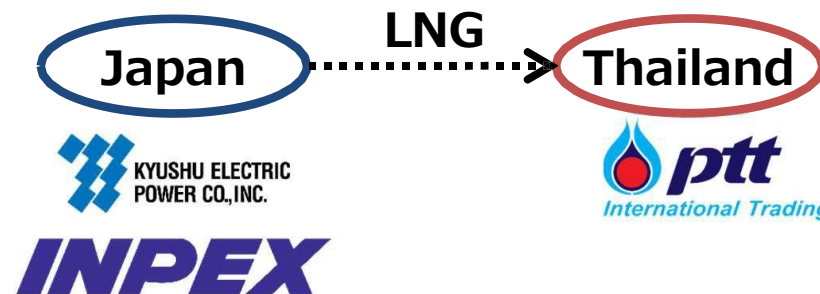
- **Overview:** Collaboration/cooperation between Kyushu Electric Power, PTT International Trading, and INPEX in LNG business
- **Goal:** Three companies, which have different LNG demand seasonality and location, will collaborate and cooperate through LNG trading in order to optimize inventory management

## <example of collaboration>

**Tight inventory**



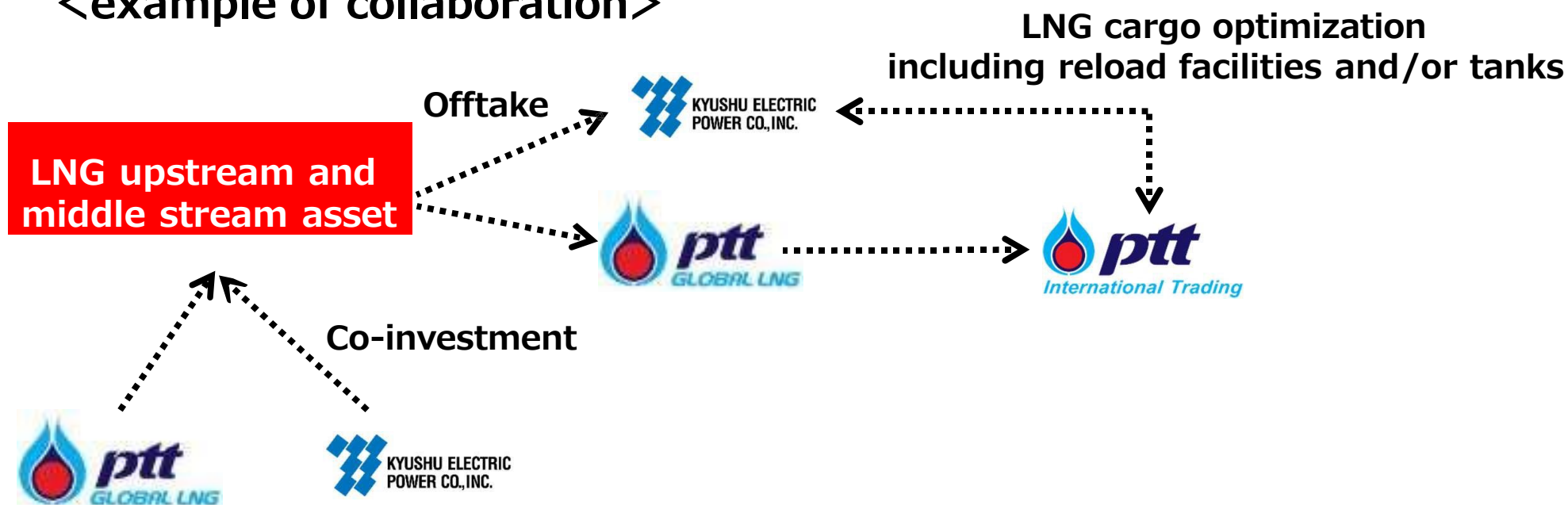
**Tight inventory**





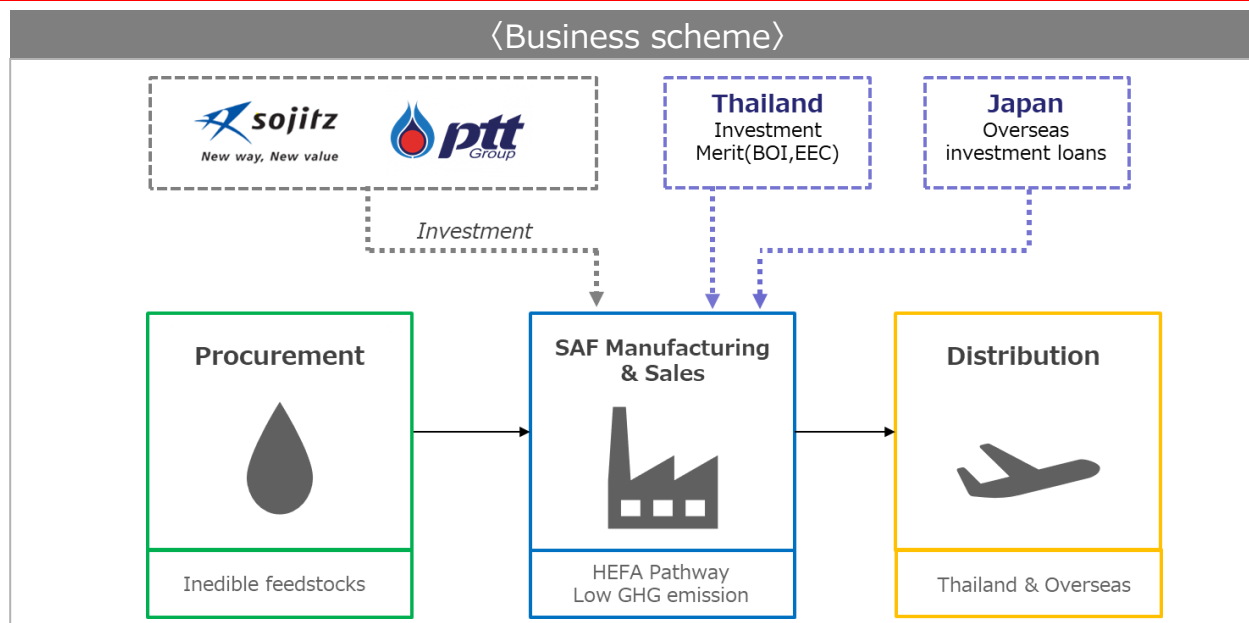
- **Overview:** Collaboration/cooperation between Kyushu Electric Power, PTT Global LNG Company and PTT International Trading in LNG business
- **Goal:** Kyushu and PTT Group, which have similar ambitious to have more LNG upstream and middle stream asset + utilize reload facilities and/or tanks, will collaborate and cooperate through short to long term area.

## <example of collaboration>



- **Outline** : PTT Group (Thailand), and Sojitz Corporation (Japan) agree to discuss the potential collaboration to jointly develop the business opportunity in Sustainable Aviation Fuel (“**SAF**”) project utilizing a hydroprocessed esters and fatty acids (“**HEFA**”) process in Thailand to contribute carbon neutrality in the aviation industry.
- **Aim** : ① Realization of competitive SAF manufacturing utilizing the strengths of each company. ② Substantial reduction in greenhouse gas emissions through SAF production using inedible feedstocks. ③ Realization of stable supply of SAF in Asia.

- **Updated Progress**: Following the MOU signed in March 2023 at AZEC, PTT Group and Sojitz corporation signed a Term Sheet on September 1, 2023, for joint development of SAF project utilizing HEFA process in Thailand. Both companies jointly proceeded to the engineering phase.

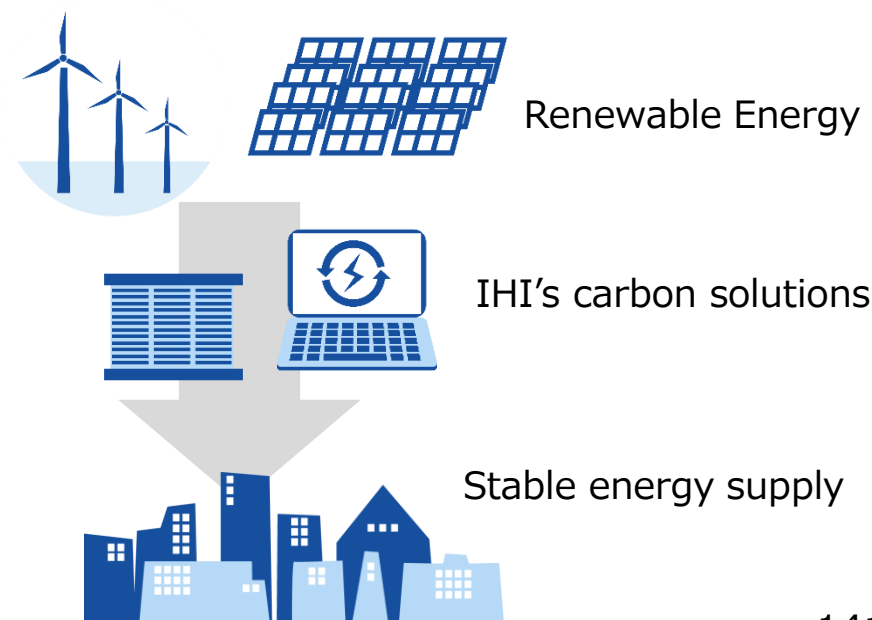


- **Outline:** Thailand is promoting decarbonization efforts to achieve GHG emission reduction targets of 40% by 2030, and Net ZERO by 2065. EGAT plays an important role in this process, and this MOU establishes a framework for discussion and business matching platform to promote the study and realization of measures to achieve these goals.
- **Purpose/Aims:** To kickstart discussions and information exchange regarding several applicable decarbonization and energy storage solutions. Ultimately, the aim is to reach a common understanding on a comprehensive decarbonization and energy transition roadmap for Thailand and EGAT.

Sirindhorn Dam Hydro & Floating PV by EGAT



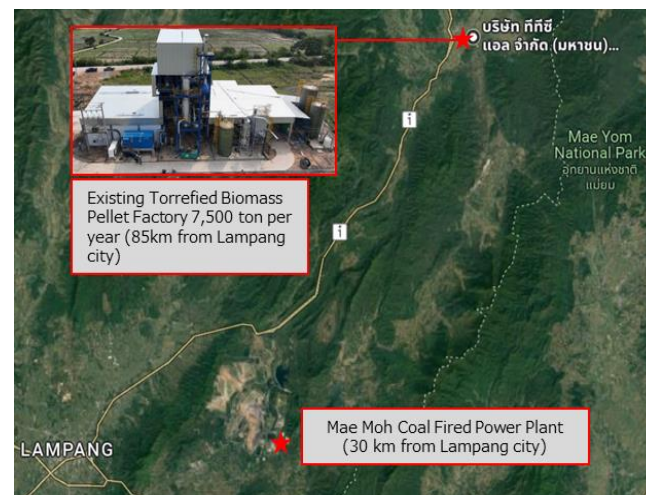
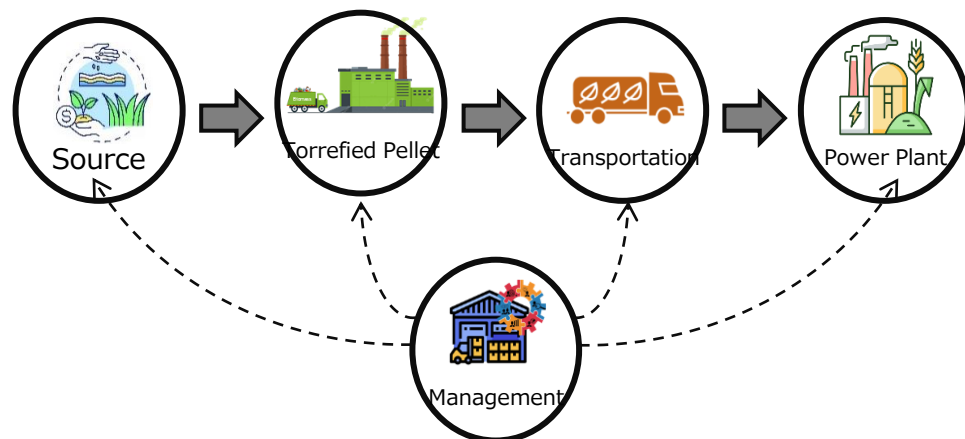
<https://www.egat.co.th/home/en/20211103-pre/>



# Development of Biofuel Technology and Value Chain Management for Power Generation

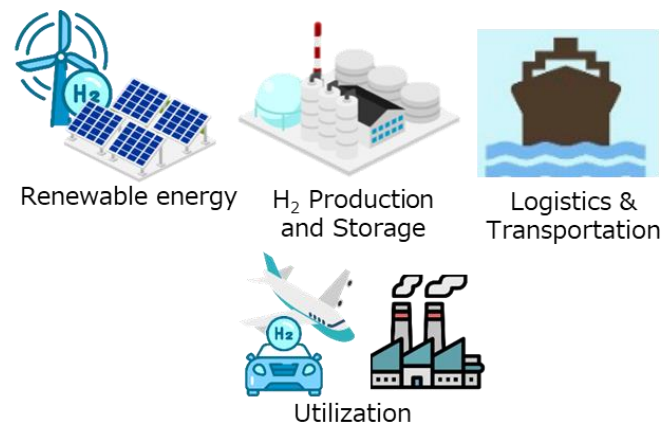
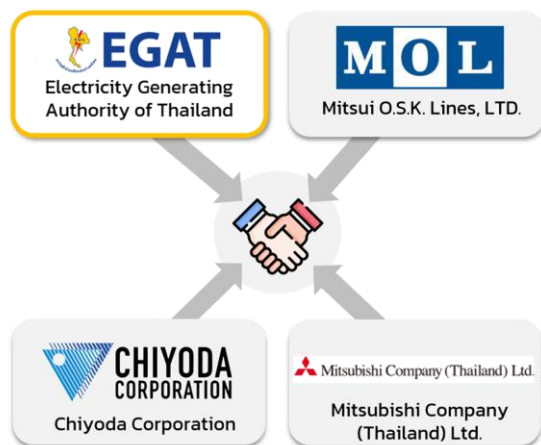
- **Overview** : Development of project focusing on biofuel technology and value chain management for power generation in Thailand and/or any other area in order to trade it to domestic and/or international industries for the utilization throughout the value chain as a fuel for power generation.
- **Purpose** : Toward the realization of decarbonization target in Thailand, TTCL Public Company Limited (TTCL) and Electricity Generating Authority of Thailand (EGAT) wish to strengthen their relationship and cooperate with each other in order to study and exchange the information and ideas relating the potential business opportunity, joint investment, market targeting, procurement, and the supply chain of biofuel cycle within the area including source of biofuel, biofuel processing/production, management, storage, transportation, and client.
- **Contribution to SDGs** : Other than reducing GHG, this project can contribute the solving air pollution problem by preventing open burning, the reducing poverty by additional income to farmers and the introducing torrefaction and/or other innovated technology.

- **Updated Progress**: EGAT proposed 7 kinds of biomass as feedstock candidate, and currently preliminary study for this project in terms of technology and commercial aspects. We can start the detail study after confirmation of Mae Moh Decarbonization policy by Thai Government.



- **Project Overview** : Development of project focusing on producing clean hydrogen/ clean ammonia from renewable energy in southern provinces of Thailand in order to trade it to domestic and/or international industries for the utilization throughout the value chain.
- **Purpose** : Toward the realization of decarbonization target in Thailand, Chiyoda Corporation, Mitsui O.S.K. Lines, and Mitsubishi Company (Thailand) Limited aims to study and provide expertise to Electricity Generating Authority of Thailand (EGAT), the Thailand's leading state-owned enterprise, to cooperate and exchange the ideas relating the supply chain of clean hydrogen/ clean ammonia in southern provinces of Thailand, including the production, storage, transportation and utilization.

- **Updated Progress:** Selected as METI's Subsidy Project Feasibility Study in October 2023. Kick-off Meeting and Site survey will be conducted at the end of November and aim to complete the Study in February 2024.



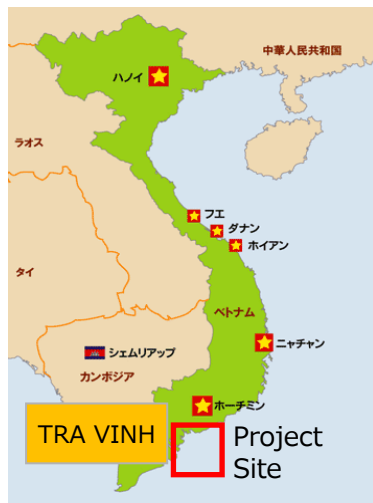




# MOU for the development of the Project Truong Thanh Wind Farm with a total expected capacity of 2.0 GW in Tra Vinh province, Vietnam

- **Outline** : TTVN and a group of Japanese companies led by Kumagaigumi and participated by INPEX and Kansai Electric Power signed MOU to cooperate in the development of a 2GW offshore wind power generation project in the offshore of Tra Vinh Province in Vietnam.
- **Purpose and Objectives** : The project is the first large-scale offshore wind power project in Vietnam, planned to generate 2 GW in total, 800 MW in Phase 1. Through the promotion of this project, Vietnam's economic development and Japan's energy infrastructure exports are expected to be further promoted.
- **Others** : “Feasibility Study for Overseas Development of High-Quality Energy Infrastructure”, “Asia Green Growth Promotion Project ” surveys underway supported by METI and ANRE.

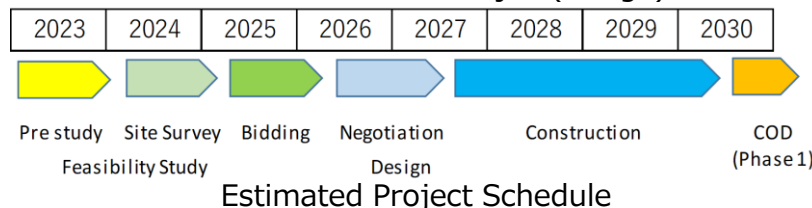
- **Updated Progress**: A new MOU is scheduled to be concluded in December with local company REE (REFRIGERATION ELECTRICAL ENGINEERING CORPORATION) joining as a new consortium member in order to be selected as a project to start operations by 2030 in the PDP8 implementation plan. An application for a sea area survey was filed in September, and the five companies continue to study the feasibility of commercializing the project.



Location



Offshore Wind Power Project(Image)



MOU Contracting Party



Meeting with TRA VINH Provincial People's Committee, Nov. 2022





## MOU

- **Summary:** The MOU confirms mutual cooperation to develop biomass fuels in existing in Tuyen Quang and Yen Bai provinces in Vietnam and to realize projects to utilize unused resources from agriculture and forestry
- **Significance and Aim of the Cooperation:** erex Co., Ltd. aims to construct biomass power plants in both provinces, and both provinces aim to develop biomass resources from the perspective of regional revitalization and carbon neutrality. Through the MOU, erex and the two provinces will cooperate to develop unused biomass resources, aiming to achieve CO2 reduction targets and sustainable developments
- **Others:** A task force team will be formed this spring among the two provinces and erex to accelerate the study.

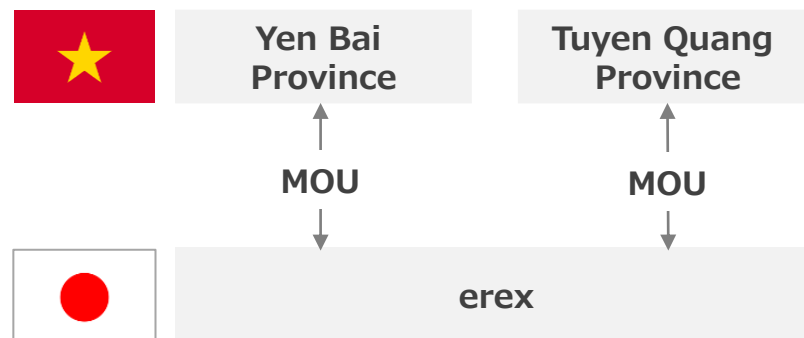
[https://www.jbic.go.jp/ja/information/press/press-2023/press\\_00104.html](https://www.jbic.go.jp/ja/information/press/press-2023/press_00104.html)

- **Updated Progress:** erex has signed loan agreements with JBIC and SMBC for production and sale of biomass fuel through EREX TQ and EREX YB. ( US\$4.6 mil. for each. )

The following surveys and researches will be conducted by each province and erex

- ① Surveys to attract investments in the biomass sector
- ② Research on sustainable supply of biomass resources in each province
- ③ Survey on wood pellet plant investment feasibility in each province

## MOU Relationship Diagram





- **Outline:** Japan Organization for Metals and Energy Security (“JOGMEC”) has signed a Memorandum of Understanding (MOU) with PetroVietnam (“PVN”) to discuss the continuation of joint study to realize a CCS project in Vietnam.
- **Purpose :** The Parties have studied the feasibility of CCS in Vietnam since February 2022. By conducting succeeding studies, we aim to contribute to the launch of a CCS project in the 2030s, and ultimately to the carbon neutrality of both countries.

- **Updated Progress:** Discussions are underway for succeeding studies to actualize CCS project in Vietnam.



Signing for MOU to discuss further collaboration on CCS study

From Left to right : Mr. HOSONO Tetsuhiro, former Chairman & CEO, JOGMEC, NISHIMURA Yasutoshi, Minister of Economy, Trade and Industry in Japan, ASAWA Satoshi, Executive Vice President, Energy Business Unit, JOGMEC, Mr. Le Ngoc Son, Vice President, PVN, Dr. Trinh Xuan Cuong, General Manager, Exploration division, PVN



Rough location of the study area (within Vietnamese territorial waters)