経済産業省

MOUs
towards AZEC leaders meeting

December 2023

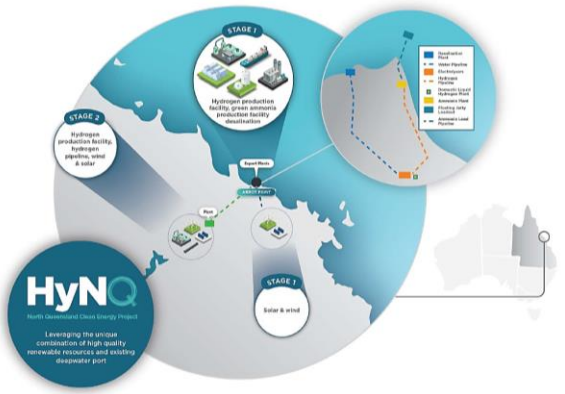
Agency for Natural Resources and Energy

HyNQ North Queensland Clean Energy Project: IHI to Join Japanese and Australian Green Ammonia Production and Export Joint Venture

- **Cooperation outline** : IHI's Australian subsidiary, IHI Engineering Australia Pty. Ltd., is a joint development partner in this project, which will produce and export 500,000 metric tons per year of green ammonia at the Abbot Point port in North Queensland.
- **Purpose** : To establish a stable ammonia value chain to accelerate decarbonization worldwide, as IHI will be a significant offtaker of the green ammonia produced in this project for distribution.
- **Other points** : The project is composed of highly credible partners including Energy Estate Pty Ltd, an Australian renewable energy developer, CS Energy, a Queensland government-owned power company, and Idemitsu Renewable Development Australia Pty Ltd.
- **URL** : IHI Unit to Join Japanese and Australian Green Ammonia Production and Export Joint Venture | 2023FY | News Articles | IHI Corporation

<Abbot Point port in North Queensland>

<Map and project site>



MOU with the Clean Energy Finance Corporation (CEFC) of Australia (October 2023)

- **Outline** : Building a cooperation framework in hydrogen, renewable energy and electricity grid sector with the CEFC, the governmental financial institution of Australia which provides financing toward energy transition of Australia.
- **Purpose and objective** : Aiming to accelerate participation of Japanese companies in hydrogen-related projects in Australia and development of hydrogen supply chains.
- **URL :** JBIC Signs MOU with the Clean Energy Finance Corporation of Australia | JBIC Japan Bank for International Cooperation

signing ceremony

MOU to contribute to Japanese investments towards projects on hydrogen, ammonia and CCS in the State of New South Wales, Australia

- **Cooperation outline ：**JOGMEC and the NSW Government have recently renewed their Memorandum of Understanding (MOU) to add hydrogen, ammonia and CCS for an agenda for collaboration on top of coal, metals and oil/natural gas. The objective of this renewal is to contribute to the decarbonization of industries in NSW state and Japan.
- **Purpose or objectives of MOU** ： The signed MOU is to promote trade and investment in NSW state by Japanese companies and to deepen the relationship between the NSW Government and JOGMEC.

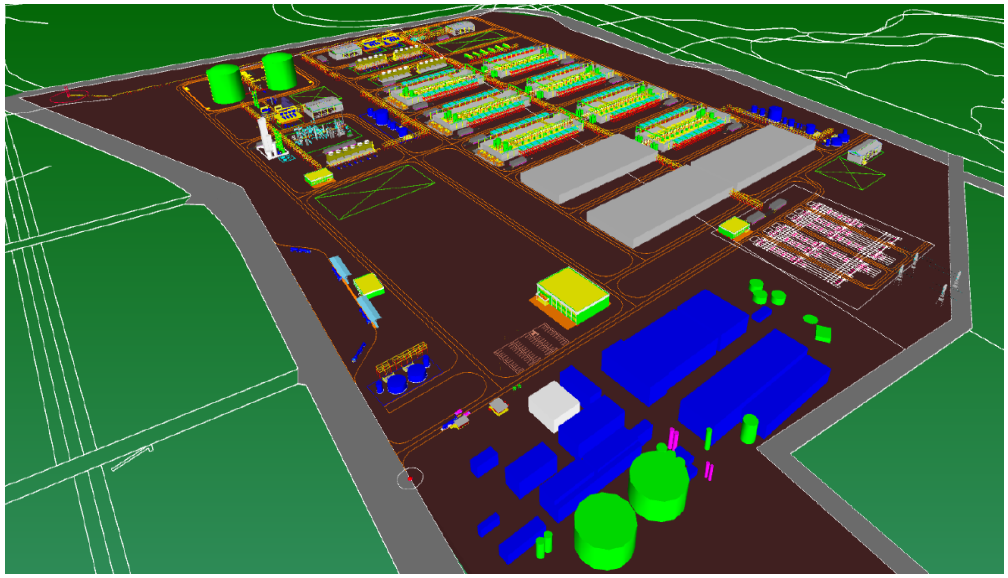
JOGMEC

Cooperation to promote Japanese trade and investment in projects on conventional energy and metal adding hydrogen, ammonia, and CCS in regard to decarbonization.

NSW GOVERNMENT

MOU for Feasibility Study of Commercial-scale Hydrogen Supply in Gladstone

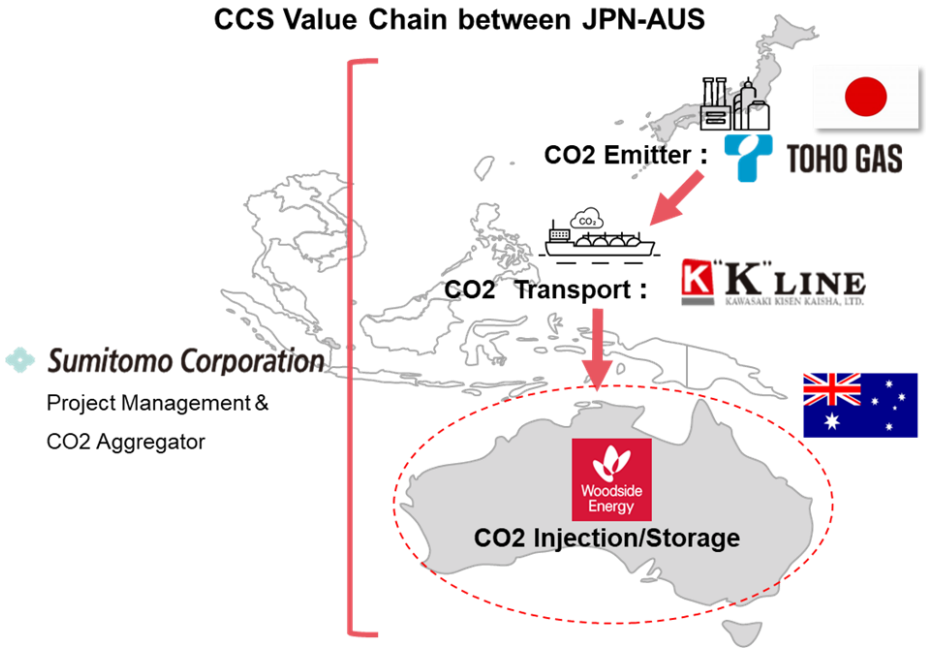
- **Cooperation outline:** Sumitomo Corporation and Rio Tinto have signed an MOU for the Feasibility Study of Commercial-scale Hydrogen Supply for alumina refining operations in Gladstone.
- **Purpose or objectives of MOU:** A pilot project to trial using hydrogen to replace natural gas in Rio Tinto's alumina refining process is underway. This MOU complements the ongoing pilot project, and Sumitomo Corporation and Rio Tinto will work together on a detailed F/S of the commercial and technical aspects of hydrogen supply to Rio Tinto refinery operations across Gladstone.

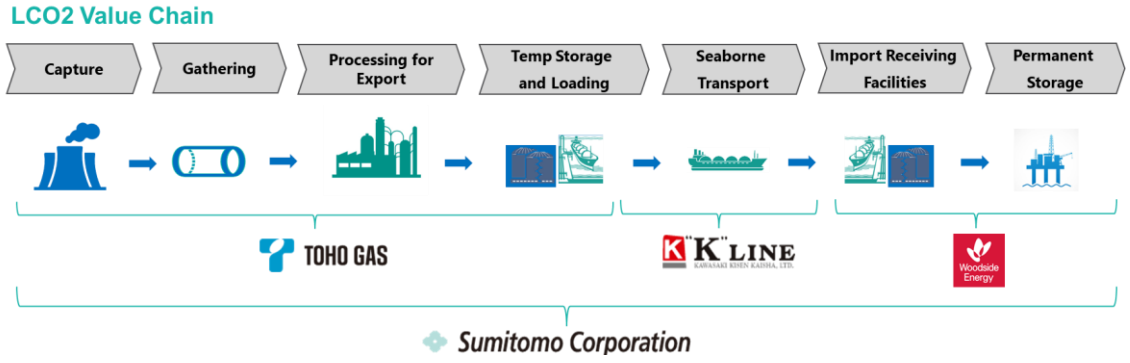


▲Image of Large-scale Hydrogen Plant

MOU for Feasibility Study to Establish a Japan-Australia CCS Value Chain

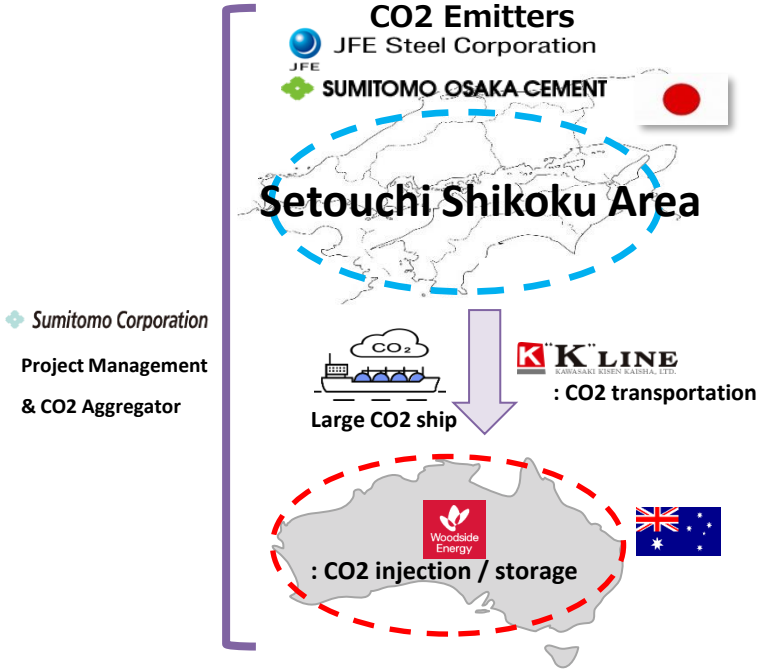
- **Cooperation Outline:** This study is to investigate the feasibility of establishing an entire CCS value chain among the four companies, whereby CO2 emissions from various industries and companies in the Chubu region, Japan, are to be captured/accumulated, and liquefied by using such technology as CO2 separation and capture using unutilized LNG Cryogenic Energy being developed by Toho Gas and transported to Australia by liquefied CO2 carriers for injection/storage at Australian storage site.
- **Purpose or Objective of MOU:** In this MOU, the four companies will identify issues in building a CCS business between Japan and Australia, and will provide recommendations for promoting the introduction of CCS. In addition, Japanese and Australian companies will jointly build a CCS business model and realize a decarbonized society throughout the Chubu region. By expanding this business model to other regions, we aim to make efforts to contribute to carbon neutrality in Japan.

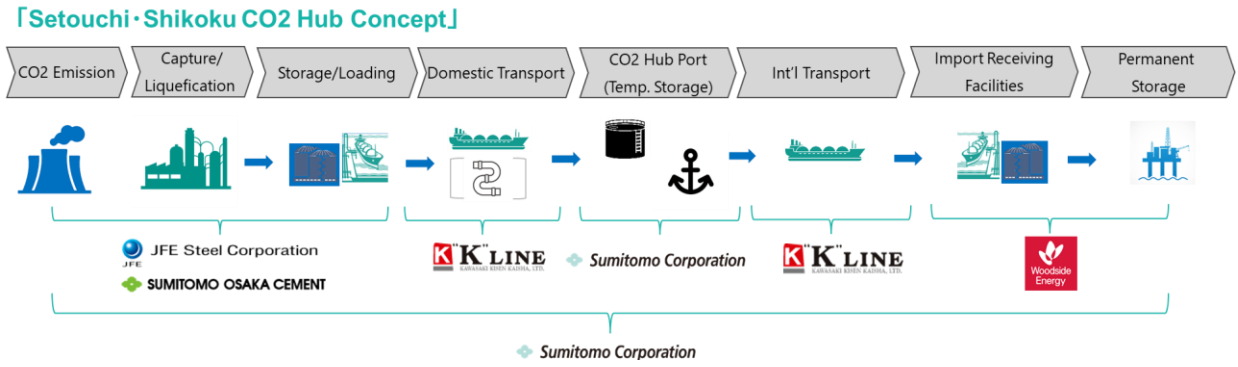




MOU for Feasibility Study to Realize "Setouchi / Shikoku CO2 Hub Concept"

- **Cooperation Outline:** Five companies will conduct a business feasibility study to aim for building an entire Japan-Australia CCS value chains with aggregating CO2 emitters in Setouchi and Shikoku regions. CO2 is collected by a small-size vessel from emitters scattered in multiple areas in Setouchi and Shikoku regions and stored temporarily at a hub port. Such CO2 is subsequently transported to Australia by a large-size vessel and sequestrated at a storage site in Australia.
- **Purpose or Objective of MOU:** Through this MOU, we will carry out a business feasibility study for the realization of this Setouchi / Shikoku CO2 Hub concept . By collectively handling CO2 emitted from multiple regions, industries, and companies in the Setouchi and Shikoku regions, we aim to scale up and reduce costs, and work together to build a CCS value chain that would be difficult for individual companies to achieve.





MOU on biomass projects between erex Co.,Ltd. and SPHP (Cambodia) Co., Ltd. and the Ministry of Mines and Energy of the Kingdom of Cambodia

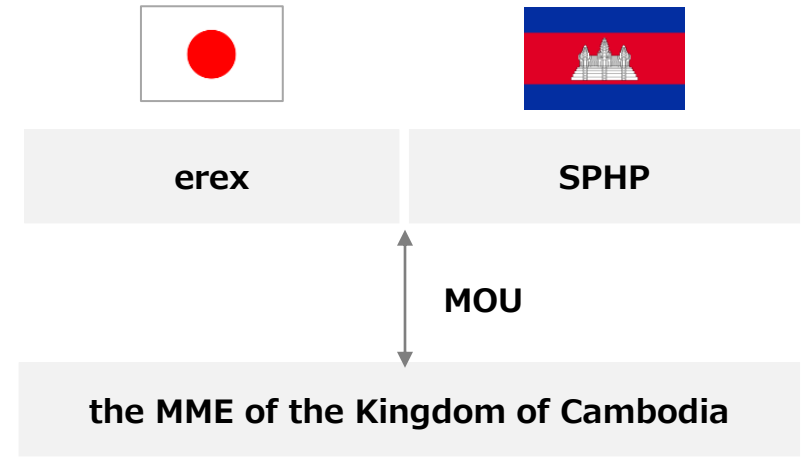
- **Cooperation outline** ： To confirm the role and cooperation with the Ministry of Mines and Energy (MME) of the Kingdom of Cambodia in the development of a biomass power plant and wood pellet factory, which erex Co.,Ltd. and SPHP (Cambodia) Co., Ltd. are considering implementing in the country in order to promote decarbonization in Cambodia.

- **Purpose or objectives of MOU** ： This MOU aims to ensure smooth project development in the future by confirming the significance of this biomass project in Cambodia and its implementation policy with the MME, in accordance with Cambodia's decarbonization policy.

Implementation overview

1. **Implementation of FS by erex and SPHP and reporting of results to MME.**
2. **Review of the project's conformity with the Cambodia Power Development Plan and MME procedures etc.**
3. **Support the approval process on request for the feasible project.**

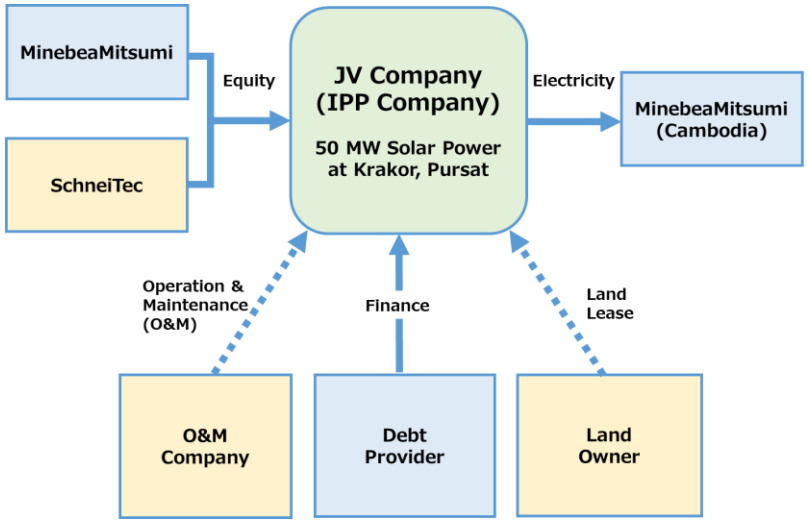
MOU Relationship Diagram



(MOU) Solar Power Generation Business at Krakor, Pursat in Kingdom of Cambodia

- **Outline** : MinebeaMitsumi Inc. plans to operates solar power generation business with SchneiTec Inc. for 20 years at Krakor, Pursat Province in Cambodia.
- **Objectives** : MinebeaMitsumi Inc. (“MMI”) shall secure the solar power oriented electricity for the existing plant as well as the case for future expansion in Cambodia. MMI enhances competitiveness further by so-called “ultimate vertical integration”.
- **Other Points** : A scheduled COD is during 2025.

Expected PJ Scheme

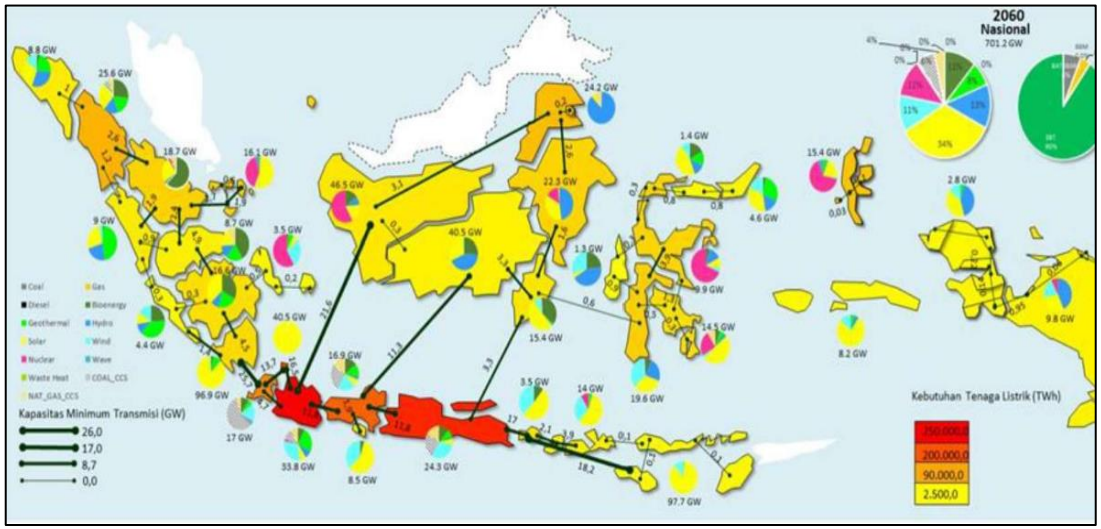


Target PJ Site

Memorandum of Cooperation regarding the feasibility study of electricity transmission business between Kansai /Kansai TD , the Ministry of Energy and Mineral Resources of Indonesia (BBSP/ MEMR), and PT PLN

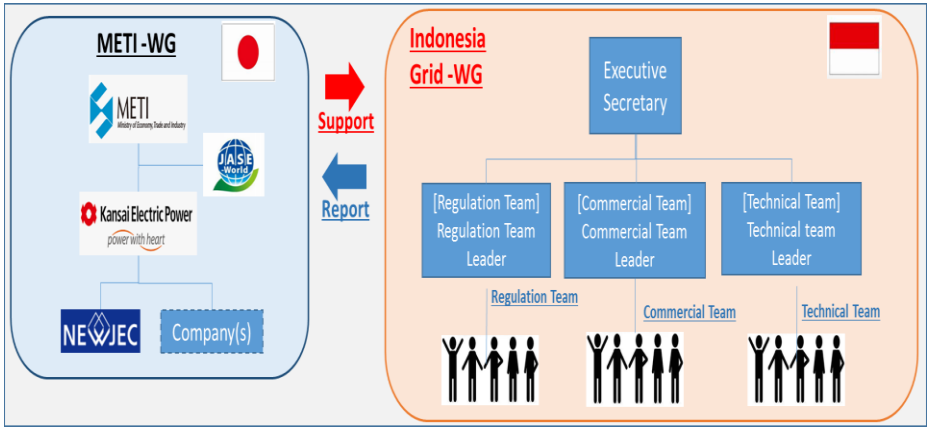
- **Cooperation outline** : To explore various business schemes for the electricity transmission business in Indonesia.
- **Purpose or objectives of MOU** : To promote decarbonization through the development of inter-island transmission lines using various business schemes, to achieve carbon neutrality in Indonesia.
- **Other points** : Discussions on the pilot project have been conducted among the stakeholders, and a decision has been made regarding the pilot project.

Image of Inter-island transmission line



Reference : RUKN2023 2060 Scenario

Organizational structure



Establishment of stable supply for Indonesian solid biomass by diversifying of biomass materials and realization of multi-shipment

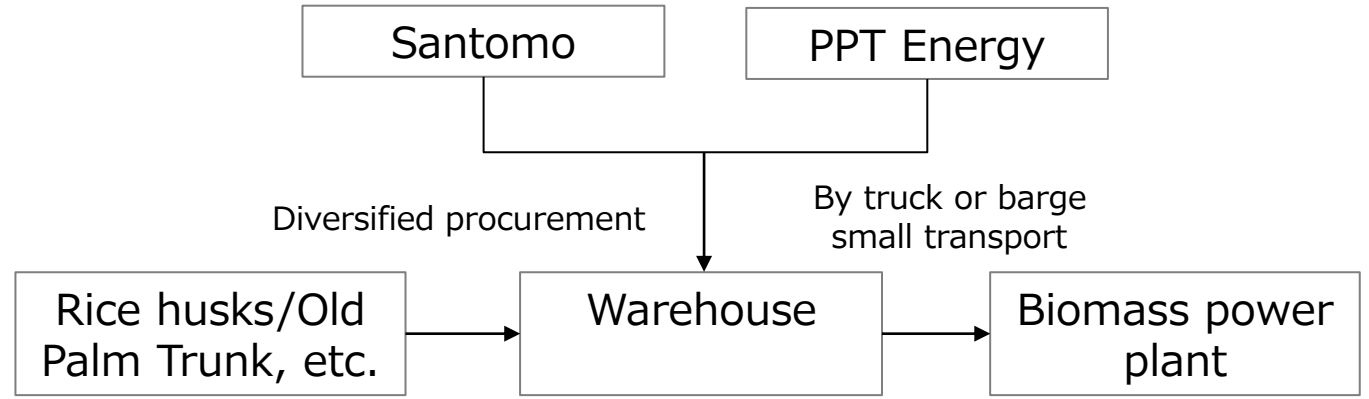
SANTOMO

PPT ENERGY TRADING CO.,LTD

- **Corporation outline**: To commercialize pellets made from rice husks and other materials in Indonesia and to establish a supply chain for storage and small-lot transportation.
- **Purpose or objectives of MOU**: To realize a diversified portfolio of solid biomass products in Indonesia and supply with smaller quantities to power plants in shorter delivery period.

Concept

Scheme



Rice husk pellets

Old Palm Trunk

MOU between JICA and PT PLN (Persero) for Capacity Building to promote Energy Transition in Indonesia

- **Cooperation outline** : Both JICA and PLN confirm the importance of collaborative efforts on energy transition to achieve net zero target by 2060 in Indonesia. Particularly capacity building of PLN staffs is the key to enhance energy transition.
- **Purpose and objectives of MOU** : Both parties will collaborate on capacity building in the field of renewable energy(geothermal, wind, solar, and biomass), grid stability/battery storage and smart grid, CCUS, new energy (hydrogen and ammonia), carbon credit etc. Such collaboration will enable PLN to incorporate cutting edge technology and policy trends from Japan and the world, which will contribute long term capacity development of PLN for the multi-pathway approach to realize net zero.
- **Other points** : The training program is under consideration to start from 2024.

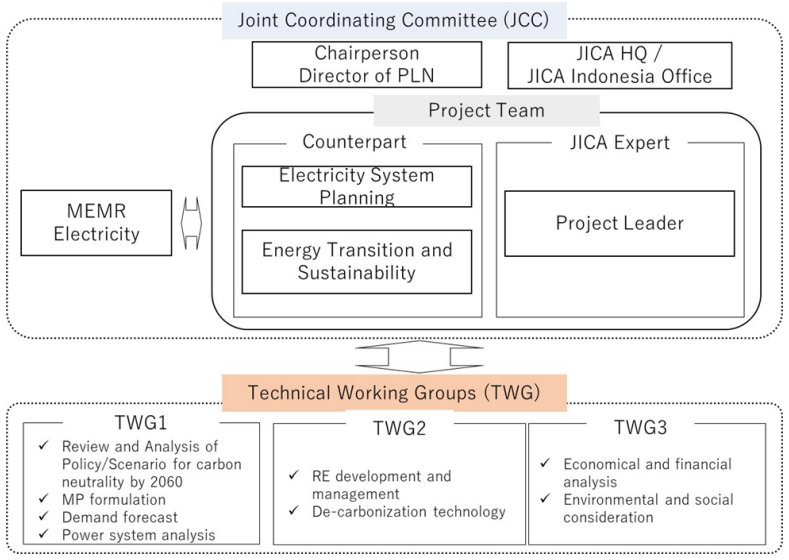
Capacity Building to promote Energy Transition in Indonesia

Master Plan for Energy Management Project in Indonesia （PT PLN（Persero）and JICA）

- **Cooperation outline** : It aims to strengthen the capacity of PLN to plan associated with energy transition toward carbon neutrality by 2060 in Indonesia, contributing to socio-economic development by providing stable, affordable and sustainable power supply.
- **Purpose or objectives of MOU** : In order to promote smooth decarbonization in Indonesia, the project will support the development of a flexible and realistic long-term plan that could take into consideration a variety of decarbonization technology options, based on the latest trends in decarbonization technologies in Japan and around the world.
- **Other points** : Cooperation, in cooperation with MEMR (Electricity), is scheduled to start from February next year, and TWG will be established.

Project Image

Scheme



MOU with PT Pupuk Indonesia(Persero) of Indonesia (May 2023)

- **Outline** : Building a cooperation framework for hydrogen and ammonia supply chain creation with Pupuk, the Indonesia's state- owned fertilizer company, which strives to decarbonize its operations and to export clean ammonia.
- **Purpose and objective** : Aiming to accelerate participation of Japanese companies in clean ammonia production projects in Indonesia and development of hydrogen and ammonia supply chains.
- **URL :** JBIC Signs MOU with PT Pupuk Indonesia (Persero) of Indonesia | JBIC Japan Bank for International Cooperation

<signing ceremony>

MOU with Nusantara Capital Authority of Indonesia (May 2023)

- **Outline** : Enhancing relations between JBIC and the Nusantara National Capital Authority for promoting the development of the new capital of Indonesia.
- **Purpose and objective** :

✓ Indonesia is planning to move its capital from Jakarta to Nusantara on the island of Kalimantan for multiple reasons, including easing the overpopulation and the over concentrated industrialization on the island of Java. The NNCA is playing a key role in promoting the plan. The relocation of the capital city will also serve to resolve Indonesia's social issues, such as traffic congestion and air pollution attributable to overpopulation in Jakarta.

✓ In the Fourth Medium-term Business Plan released in June 2021, JBIC aims to support projects that contribute toward resolving social issues. The signing of the MOU is in line with the plan.

- **URL :** JBIC Signs MOU with Nusantara Capital Authority of Indonesia | JBIC Japan Bank for International Cooperation

NUSANTARA

MOU between Pertamina and JCCP
- Capability development and technical cooperation in the energy sector -

- **Agreement** :
  Memorandum of understanding between pt PERTAMINA and JCCP concerning collaboration in the field of capability development and technical cooperation in the energy sector

- **Cooperation outline** :
  PERTAMINA and JCCP intend to strengthen the existing partnership, expand annual cooperation program, explore the possibility of collaboration in contributing to the energy security and the energy transition to the sustainable society in Indonesia and Japan.

- **Purpose or objectives of MOU** :

  1. Expanding cooperation in conducting capability development program related to the needs and expertise of both of them.

  2. Expanding collaboration opportunities through Technical Cooperation Program with Japanese company nominated and/or collaborated by JCCP or a consortium of Japanese companies supported by JCCP

  3. Sharing experience and knowledge of each Party through information gathering, collaborative discussions, technical analysis, personnel exchange program, international symposium seminar, and others.

  4. Exchange views and information regarding energy outlook, potential projects, available technology and solutions

- **Other points** :
  High-level meetings between both CEOs are planned annually.

JCCP-Indonesia Cooperation Plan for FY2023-2024 - Capability development and technical cooperation in the energy sector -

- **Agreement** :
  JCCP-Indonesia Cooperation Plan for FY2023-2024

- **Cooperation outline** :
  Indonesia (ESDM and PERTAMINA) and JCCP intend to strengthen the existing partnership, expand annual cooperation program, share FY2023-2024' s concrete programs in contributing to the energy security and the energy transition to the sustainable society in Indonesia and Japan.

- **Purpose or objectives of Cooperation Plan（MOU）** :

  1. Sharing concrete cooperation in conducting capability development program related to the needs and expertise of both of them.

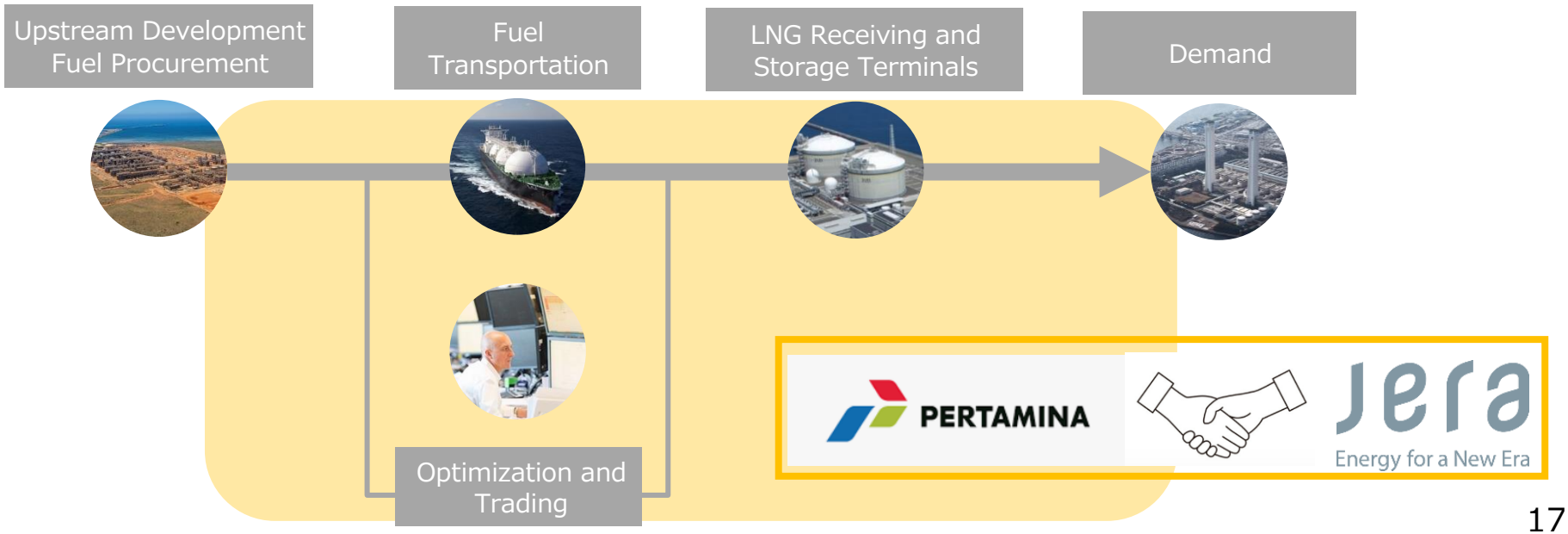
  2. Expanding collaboration opportunities through concrete Technical Cooperation Program with Japanese company nominated and/or collaborated by JCCP or a consortium of Japanese companies supported by JCCP

  3. Sharing experience and knowledge of each Party through information gathering, collaborative discussions, technical analysis, personnel exchange program, international symposium seminar, and others.

- **Other points** :
  High-level meetings between both CEOs are planned.

MOU between JERA and PERTAMINA on LNG/LCF Value Chain Collaboration

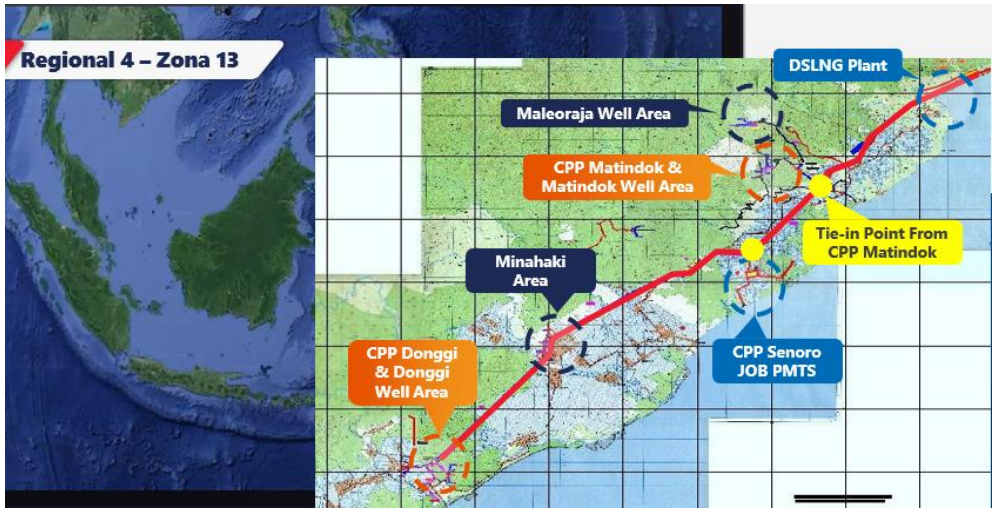
- **Cooperation outline** : To explore collaboration with Pertamina for LNG/LCF value chain as a key Energy Transition factor to achieve Indonesian Net Zero Emission in 2060. Area of interests are (1) Potential LNG/LCF value chain investment, (2) value addition through optimization/trading, (3) CC(U)S, (4) Other decarbonization activities and (5) Capacity building through training and/or exchange.
- **Purpose or objectives of MOU** : With value addition through optimization/trading, to create potential LNG/LCF value chain opportunities, which eventually will contribute to NZE in Indonesia.
- **Other points** : JERA and Pertamina Sub-holdings will have in-depth regular discussion.



MOU on Methane emission measurement and CI quantification project between Pertamina and JOGMEC

- **Cooperation outline** : JOGMEC and Pertamina agree to consider joint research on methane emission measurement and carbon intensity quantification.
- **Purpose or objectives of MOU** : JOGMEC and Pertamina will contribute to cleaner natural gas brought into Japan by working together to build Pertamina's methane emission measurement system.
- **Other points** : Project will be started at operation facilities in Indonesia from 2024.

Map of Project



Sulawesi, Indonesia

Scheme

PERTAMINA ⟷ JOGMEC

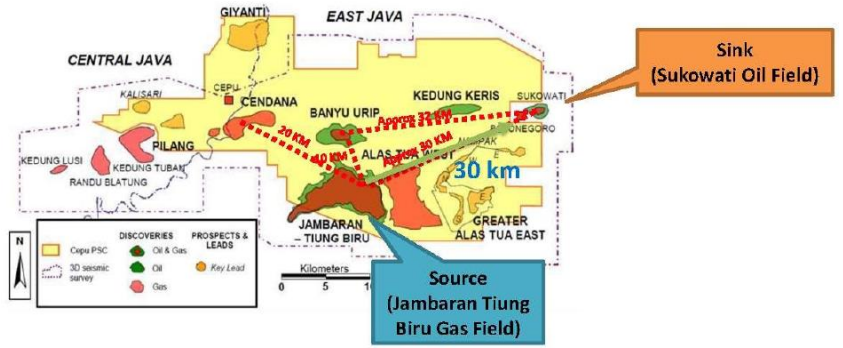
Collaboration towards a role model project for Pertamina's methane emission measurement and carbon intensity quantification

Joint Study towards Implementing CO2 Injection Field Test in Sukowati Field in Indonesia

- **Project outline（Purpose、Strengthen point、Schedule）** : JOGMEC, PT PERTAMINA, PEP and JAPEX have signed a Joint Study Agreement (“JSA”) aiming for implementing CO2 injection field test in the Sukowati oil field in East Jawa, Republic of Indonesia.
- **Organization name, Partner organization name in AZEC countries** : PERTAMINA, PEP
- **Country or Regions** : Indonesia
- **Funding organization, Contents, Terms** : The party intends to demonstrate and verify the effectiveness of CO2-EOR (Enhanced Oil Recovery) and CO2 underground storage in the Sukowati oil field by using the CO2 Huff and Puff method. The feasibility study of the commercial CO2-EOR project including the JCM scheme is undergoing.
- **URL** : https://www.jogmec.go.jp/english/news/release/news_10_00043.html

Signing Ceremony

Sukowati CO2-EOR Project

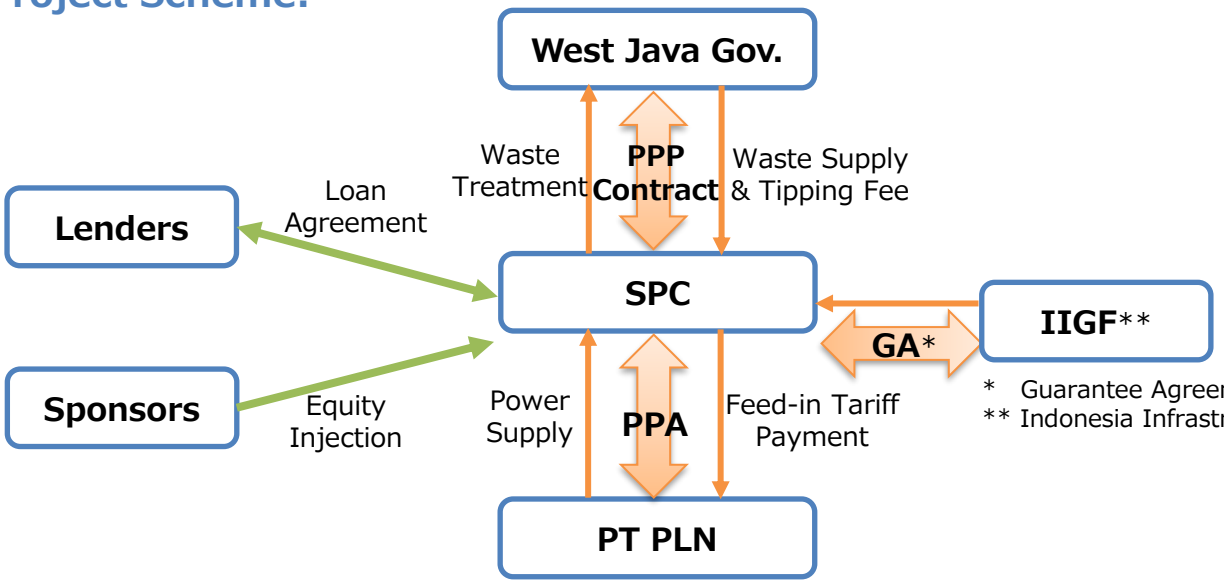


Source: CCUS Activities in Indonesia presented at JAPAN-ASIA CCUS FORUM 2020

Joint Commitment for Plan on the Signing of PPP Agreement for Legok Nangka WTE Project

- **Cooperation outline** : West Java Government and Consortium to confirm necessary actions and its schedule for achieve PPP Agreement signing between West Java Government and SPC.
- **Purpose or objectives of MOU** : To achieve PPP Agreement signing by the end of March 2024.

Project Scheme:



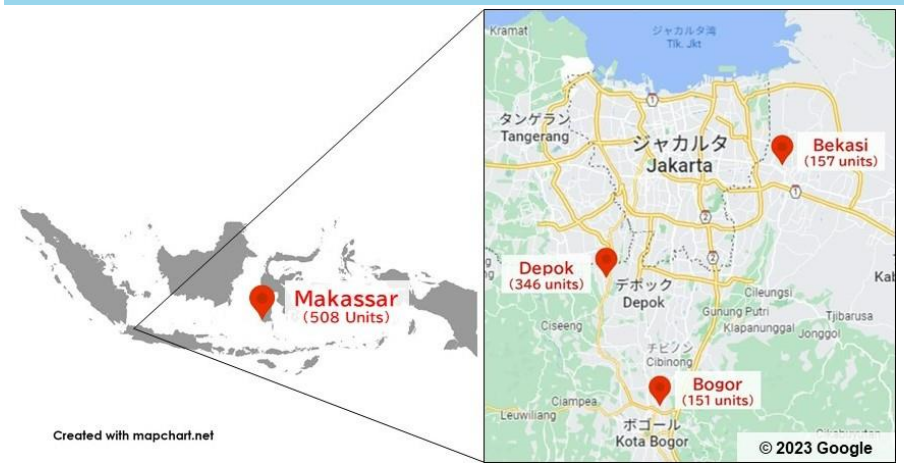
* Guarantee Agreement
** Indonesia Infrastructure Guarantee Fund

Schedule:

- Letter of Award : End of July 2023
- Joint Commitment MOU with GCA : End of August 2023
- PPP Contract, PPA, GA Signing : End of March 2024
- Financial Close / Start Construction : End of 2024

PT. Olympic Bangun Persada and Sumitomo Forestry Signed a JV Agreement to Build Detached Housing Project Equipped with Solar Panel as a Standard Feature

- **Project Overview** : Located at Bogor City, near Jakarta, Indonesia and collaborating with a local developer, PT. Olympic Bangun Persada, in this project we will develop and market detached housing units equipped with solar panel as a standard feature. There will be a total of 151 units. Construction is expected to start on December 2024, and handover will be completed in 2027.
- **Goal and Purpose of JV** : Through “Net Zero Emission” by 2060, Indonesian government is currently promoting improvement of construction industry standards and regulations. By providing solar panel installation as a standard feature in every unit and obtaining environmental certification (EDGE certification), this project will be an environmentally friendly development and contribute to the Indonesian government effort to achieve the goal.
- **Others** : This is our 4th project after Bekasi, Makassar and Depok. With this, the total housing units we developed in Indonesia will be 1,162 units. With rapid economic and stable population growth, Indonesia will have an ample demand for housing. Meanwhile, there are also problems such as traffic congestion and water pollution. We will provide safe and secure housing and contribute to the improvement of people’s living environment.

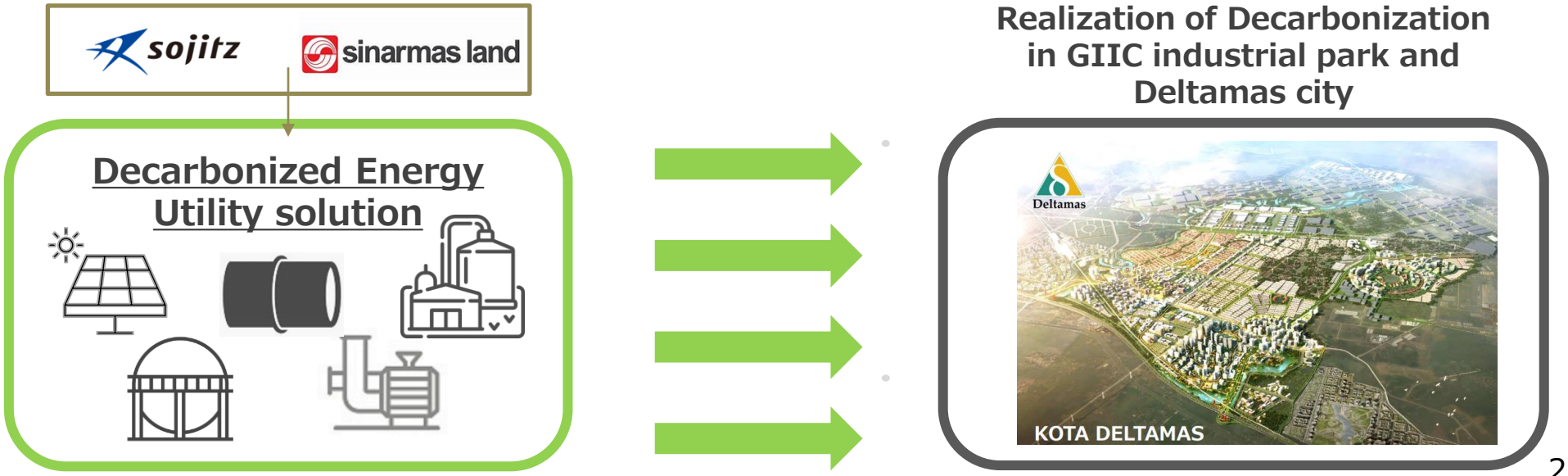



Project Illustration (Depok Project)

*Quoted from Sumitomo Forestry Press Release

MOU on decarbonization in GIIC industrial park and Deltamas City

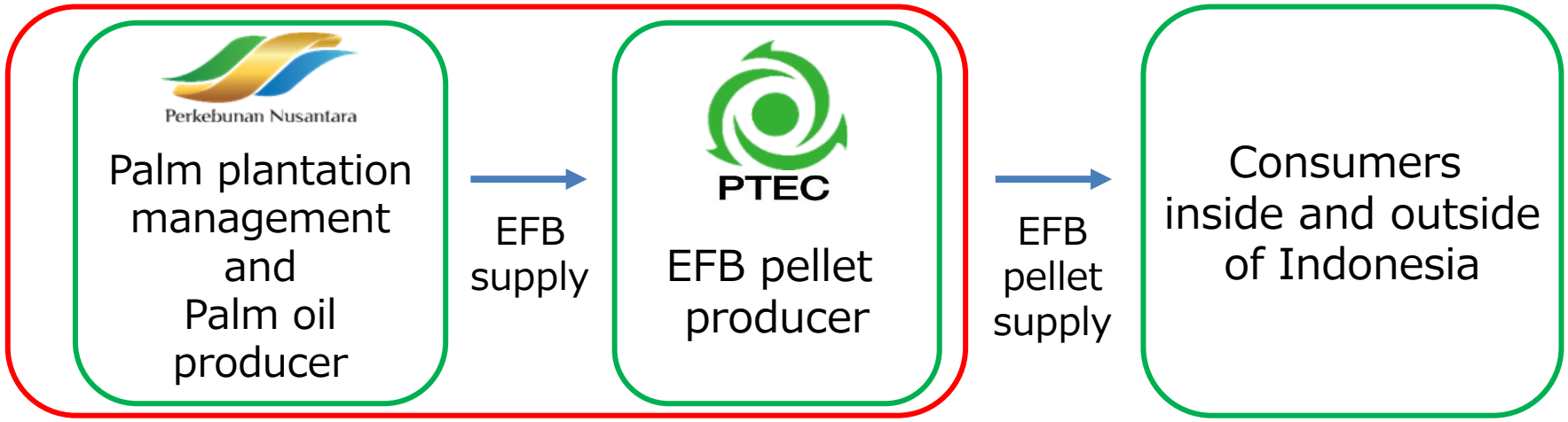
- **Cooperation outline** : Sinar Mas Land (ID) and Sojitz Corporation (JPN) will collaborate on studying energy solution projects for decarbonization (decarbonized cold water supply, utilization of renewable electricity, biogas, water recycling, etc.) in Deltamas City and GIIC Industrial Park, which are owned and operated by the two companies.
- **Purpose or objectives of MOU** : Sojitz and Sinar Mas Land aim to decarbonize Deltamas City and GIIC Industrial Park by leveraging Sojitz's expertise in renewable energy and decarbonized energy projects, along with Sinar Mas Land's proficiency in urban development, industrial park development, and real estate—including accommodation facilities.



Basic agreement on carbon credit creation associated with EFB pellet production

- **Cooperation Outline**: PTPN, an Indonesian state-owned palm oil production company, and PTEC, and the owner of EFB pellet manufacturing technology, mutually agree to explore the feasibility of carbon credits creation in Indonesia. This initiative aims to reduce methane gas emissions by efficiently utilizing EFB waste discharged from palm plantations.
- **Purpose or Objectives of MOU**: Bearing mind that Indonesia is the world's largest palm oil producer, the conversion of EFB waste discharged during the palm oil production process into pelletized fuel, will contribute not only to optimize waste utilization but also to achieve carbon neutrality in Indonesia through creation of carbon credits.
- **Steps of Development**: PTPN and PTEC plan to establish EFB pellet manufacturing factories and generate carbon credits in the regions of Java (Cikasungka: EFB raw material 50,000t/year) and Sumatra (Sei Mangkei: EFB raw material 1,000,000t/year).

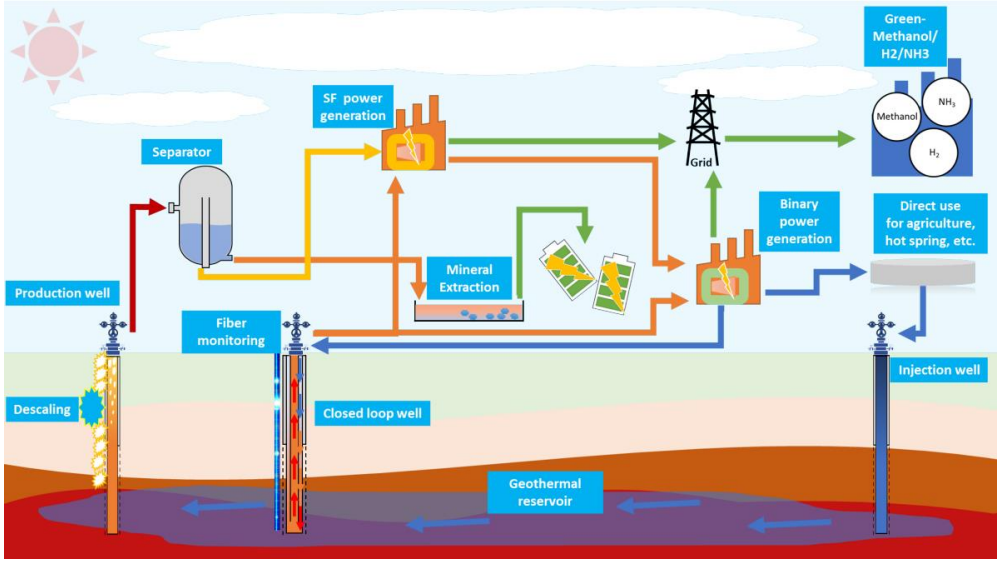
Project scheme



MoU for Joint Study on the Full-scale Geothermal Utilization between PT Geo Dipa Energi (GDE) and TOYO Engineering Corporation (TOYO)

- **Cooperation outline** : Joint study on the full-scale geothermal utilization, including geothermal closed-loop technology, mineral extraction from geothermal brine, and green hydrogen production, etc.
- **Purpose of MOU** : Execution of joint study and field tests in Indonesia, to contribute the realization of a sustainable society and the economic development.
- In future, such technologies to be proven in Indonesia will also enhance the full-scale geothermal power generation in Japan.
- **URL** : https://prtimes.jp/main/html/rd/p/000000043.000107878.html

Image of Full-scale Geothermal Utilization



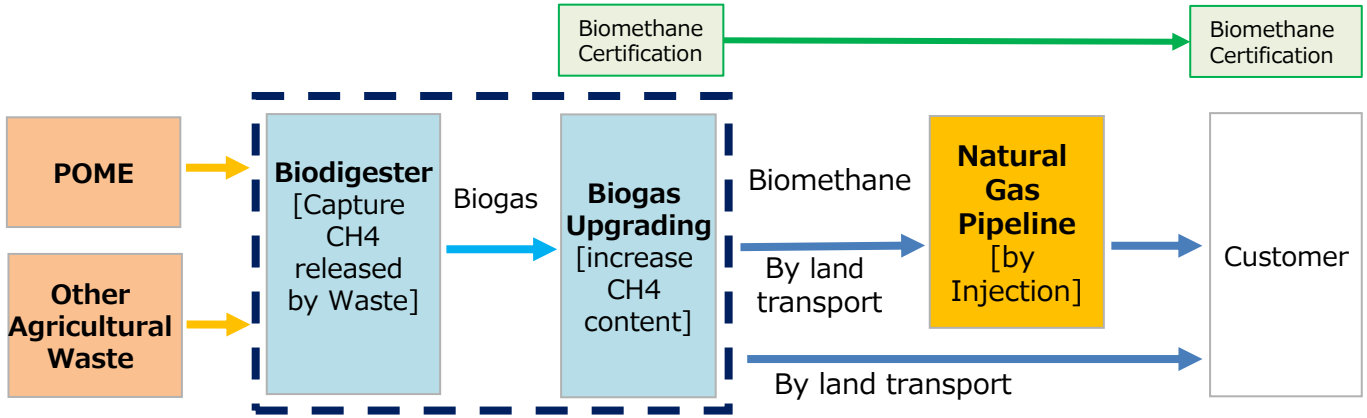
Signing Ceremony with GDE in Indonesia (IIGCE*)

*IIGCE: Indonesia International Geothermal Convention & Exhibition

MOU on joint development of Renewable Natural Gas Projects between PT. Toyota Tsusho Indonesia (TTI) and PT. Perusahaan Gas Negara Tbk (PGN)

- **Cooperation outline** : Both parties jointly develop comprehensive projects which produce, delivery and sell RNG sourced from palm oil mill effluent to be discharged in the way of crude palm oil production and other sources to industrial customers in order to commercialize and realize their projects.
- **Purpose or objectives of MOU** : Both parties aim at promotion & deployment of RNG projects in Indonesian country to contribute to carbon neutrality target and national energy security as well as reduction of GHG from industrial fuel & heat usage for private company.
- **Other points** : This MOU was executed on Oct, 22 (duration 1 year), but it is to be extended for one more year at this timing.

Project scale (assumed):
Approximately 1.6 million MMBTU/year
(Over 15 projects to be planned in total)

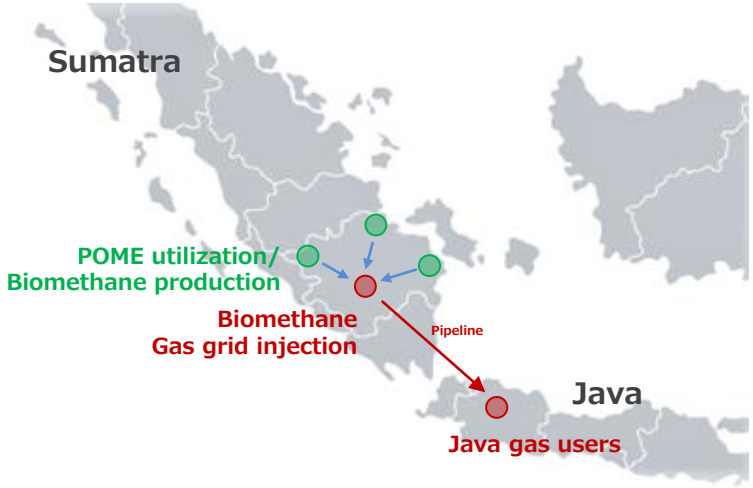


Timeline/progress:
Construction is planned to start in 2024 and RNG production and supply in 2026.
(Current situation: under joint feasibility study)

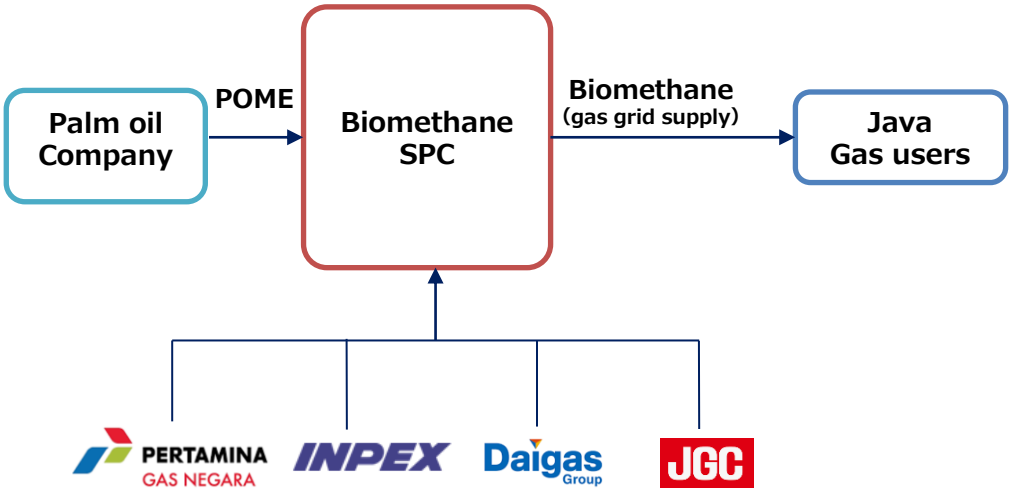
Heads of Agreement on the Development of Biomethane from Palm Oil Waste

- **MOU outline** : Through the detailed commercialization development, PGN, JGC HD, Osaka Gas, and INPEX will pursue an opportunity to collaborate toward the realization of a biomethane fuel supply via gas grid by utilizing palm oil waste.
- **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 joint study of this project began in April 2022. A new detailed study agreement has now been signed to begin detailed studies for commercialization, with plans to complete the feasibility study in 2024, and to decide on the establishment of an SPC.

Project outline



Business scheme

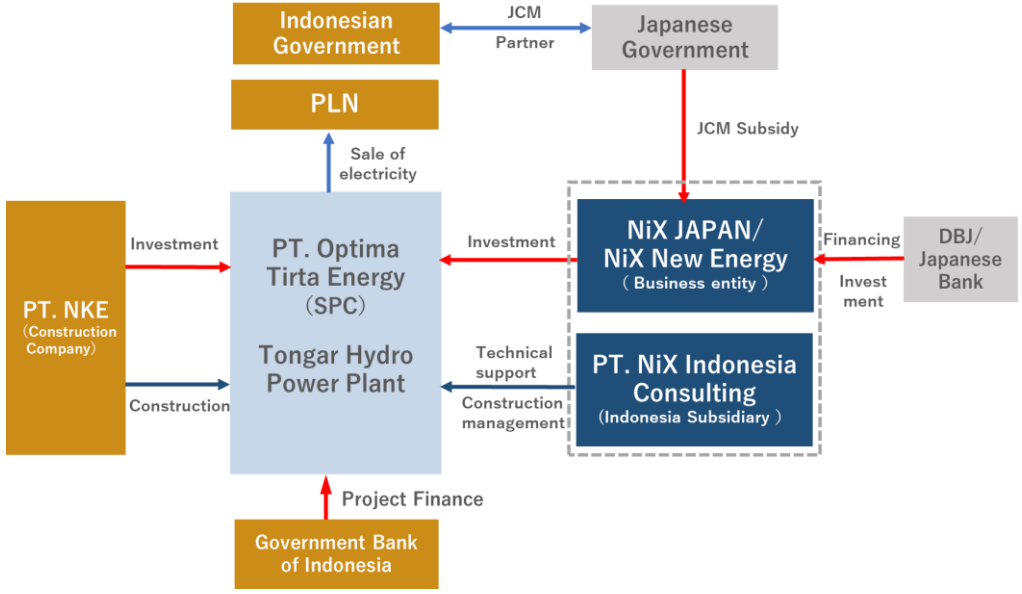


Commercial operation contract signed with PT. PLN, Indonesia's state-owned power company, for Tongar Hydro Power Plant

- **Outline of MOU/Corporate Tie-up**: NiX Group has signed a contract with PT. PLN, an Indonesian state-owned power company, for commercial operation of the 6.2 MW Tongar Hydro Power Plant developed by NiX Group as its own hydro power plant in West Pasaman Province, West Sumatra, Indonesia, and has already started commercial operation. The power generated will be sold to PT. PLN for the next 25 years.
- **Significance and Aim of the Cooperation**: This cooperation is expected to increase renewable energy in Indonesia and contribute to realistic energy transition in the country, while enhancing Japan's energy and technology infrastructure exports.
- **Others**: This project has been selected by the Ministry of the Environment,Japan for Financing Program for the Joint Crediting Mechanism (JCM) Model Projects in FY2020, and the amount of greenhouse gas emission reductions estimated from this project will contribute to the achievement of Japan's and Indonesia's greenhouse gas emission reduction target.

Project Location Map

Project scheme

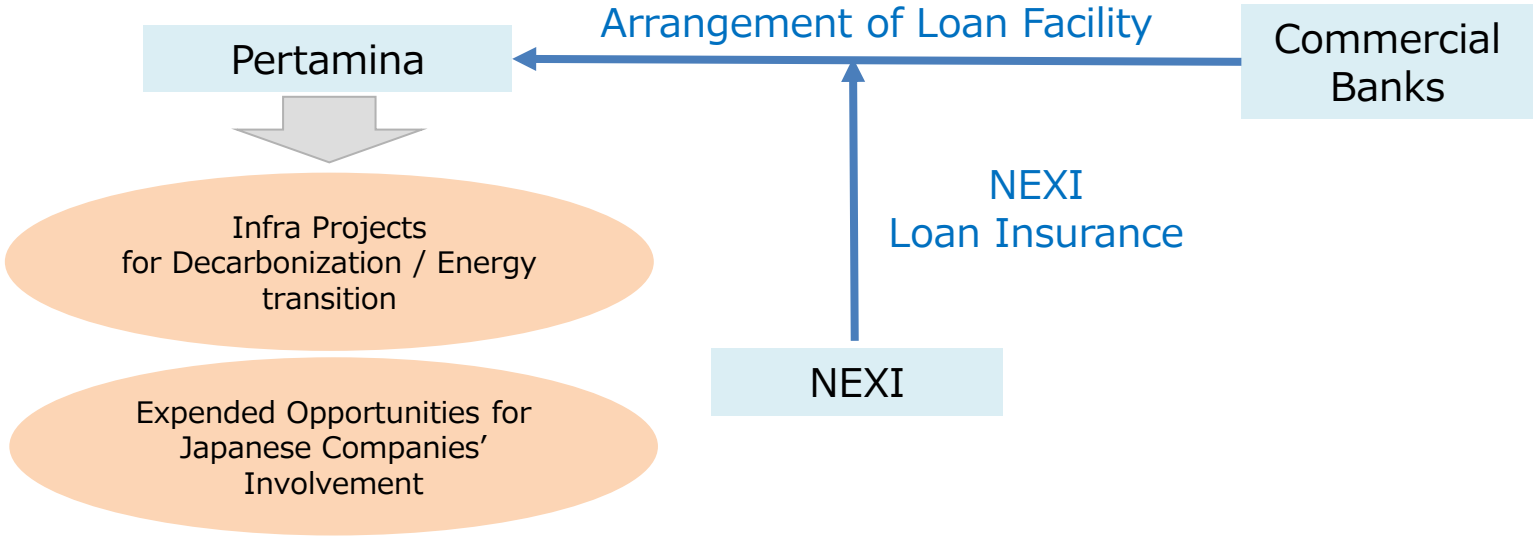


Tongar Hydro Power Plant	
Output	6,200kW
Equipment	3,100kW×2 unit (Horizontal Francis Turbine)
Annual power generation	38.7GWh
Maximum flow rate	16.0m³/s
Net head	44.4m
Construction period	Around 3 years (started 2020)
COD	November 1, 2023

MOU between PERTAMINA and NEXI

- **Cooperation outline:** PT Pertamina (Persero) and NEXI agree to explore the potential utilization of NEXI Insurance for energy transition related projects and to cooperate for wider opportunities for Japanese companies to get involved in.
- **Purpose of MOU** : Japan Interest/strong bilateral relationship in energy transition, decarbonization, energy security, as well as energy procurement in Indonesia and opportunities for Japanese companies & their technologies.
- **Other points** : Both parties intend to discuss the potential of NEXI loan facility arranged for Pertamina which is based upon this MOU.

Potential Scheme

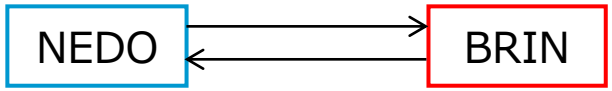


Memorandum of Understanding with BRIN（Indonesia National Research and innovation agency）for cooperation in carbon neutral contribution technology

- **Outline of MOU** : Due to the reorganization of the Indonesian government, NEDO has concluded an MOU with the Indonesian National Agency for Research and Innovation (BRIN) who is the successor to the organization of the previous MOU signing organization named Indonesian Agency for Technology Research, Development and Applications (BPPT).
- **Meaning of MOU** :
  - To strengthen the relationship with BRIN, which has become a highly influential organization
  - To exchange information to find joint projects with Indonesia for project implementation.
- **URL** :https://www.nedo.go.jp/ugoki/ZZ_101214.html

Director Wada (at the time, right) and Vice-Minister Hendrian (left) presenting the MOU.)

Scheme

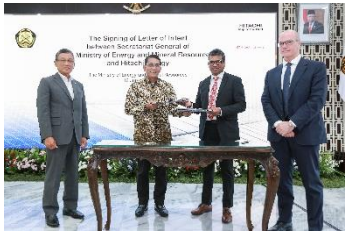


【Forms of cooperation】

1. Exchange of information and experts related to Carbon Neutral Contribution Technology
2. Cooperative and collaborative research and innovation in the field of Carbon Neutral Contribution Technology
3. Utilization of facilities and infrastructure as part of the activities under MOU
4. Capacity building
5. Other forms of cooperation as agreed by the NEDO and BRIN.

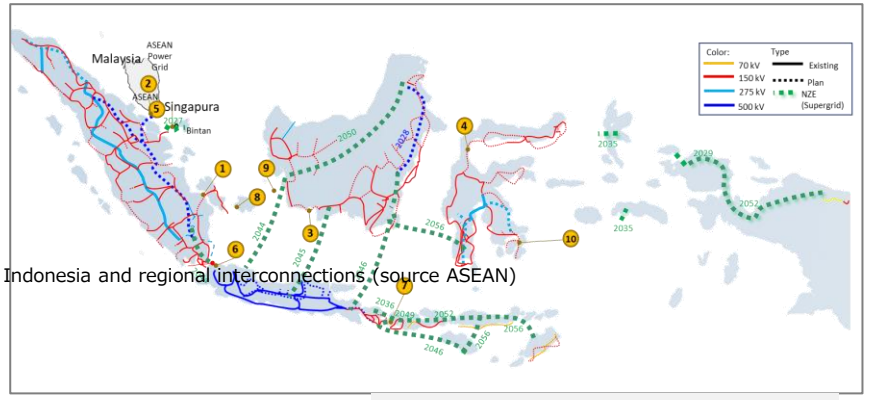
Indonesia's Energy Transition - Net Zero

- **Cooperation outline** : Collaboration on Indonesia's Energy transition with Green and Clean Energy as part of its Net-Zero target
- **Objectives of MOU** : 1) Conduct knowledge sharing regarding energy transition planning for Indonesian energy stakeholders; 2) Carry out macro-level technical studies for electric energy systems and techno-economic analysis for project feasibility
- **Other points** : Hitachi Energy can have follow-up MOUs/agreements with utilities and institutions in specific areas of focus and projects
- **URL** : 1) LoI with ESDM ; 2) MOU with PLN



19-Jun-2023: MOU signed between Indonesia Ministry of Energy & Mineral Resources & Hitachi Energy

14-Nov-2023: MOU signed between Indonesia electric utility PLN (Perusahaan Listrik Negara) & Hitachi Energy



Indonesia and regional interconnections (source ASEAN)

2023 Activities

May-2023: Technical Colloquium on “Energy Transition pathway to reach NZE by 2060 - Technologies for Sustainable Grid of Future“ for PLN

Jun-2023: 1) MOU Event with theme “Grid of the Future in the energy transition”; 2) Deep dive sessions on Grid Technologies for Sustainable Energy future; 3) CIGRE-Indonesia seminar on HVDC technologies for renewable energy interconnections.

Nov-2023: Indonesia National Electric Day - Enlit Asia 2023, technology presentations & knowledge sharing panel sessions on energy transition & future grid

Plan for 2024

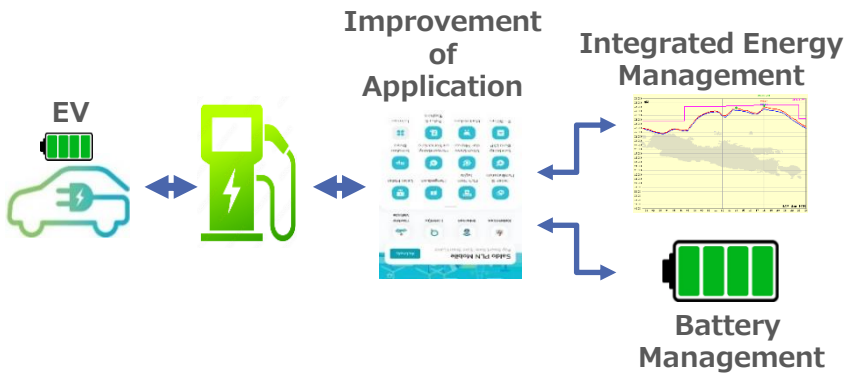
1) Techno-economic study of HVDC interconnections between Indonesian islands and with ASEAN countries; 2) Grid & Digital technologies knowledge sharing workshops for Indonesian education and workforce for energy transition

MOU related with Energy Management Utilizing Battery

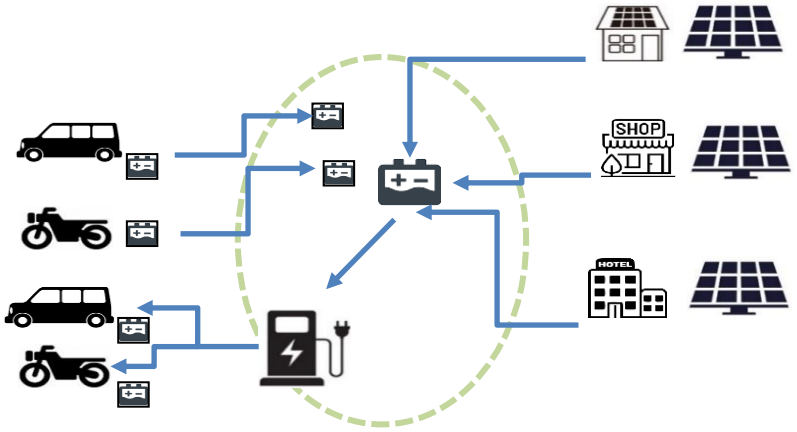
- **Cooperation Outline:** Mitsubishi Corporation and PT Indonesia Comnets Plus, subholding of Indonesia's state-run electricity company, have agreed to explore collaboration related to utilization of renewable energy and energy management systems in Indonesia.
- **Purpose and Objectives of MOU:** Considering the characteristics of renewable energy which is being increasingly implemented in Indonesia, we will study energy management using batteries and pursue efficient energy utilization.

<Energy Management Image >

■ Image of energy management utilizing battery charging station



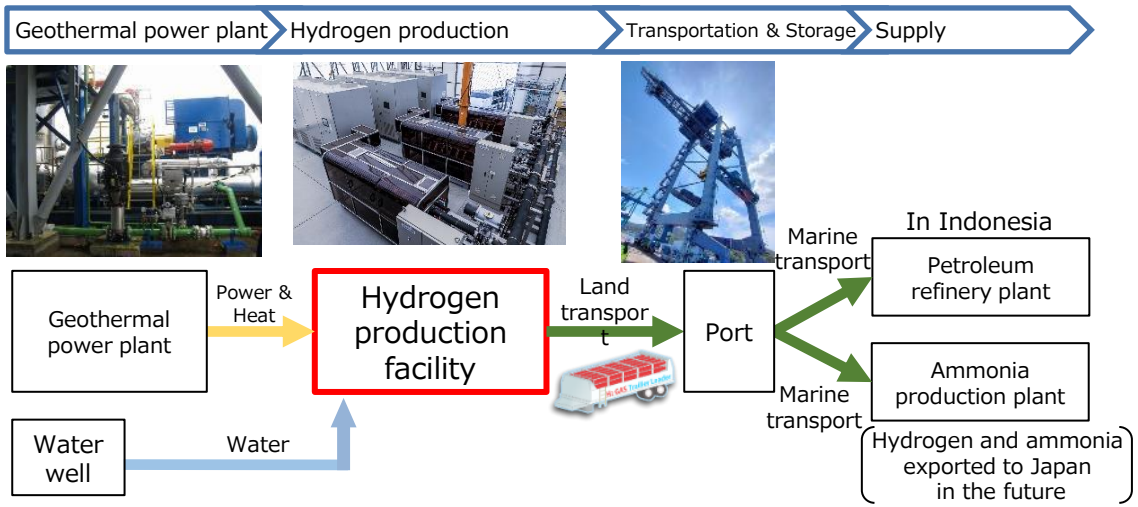
■ Image of energy management utilizing battery



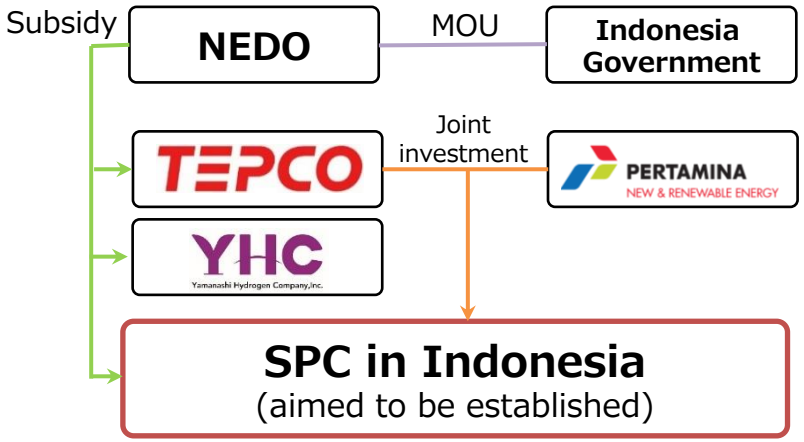
Joiunt Development Agreement on pilot scale development of green hydrogen and green ammonia

- **Outline:** In order to achieve energy transition and net zero emissions in Asia, TEPCO HD and Pertamina New and Renewable Energy (PNRE) will jointly develop a demonstration study on green hydrogen and green ammonia using renewable energy (mainly geothermal power generation) in Indonesia. TEPCO HD is in charge of hydrogen production technology, and PNRE is in charge of negotiations within Indonesia.
- **Significance/Aim:** This study aims to build a value chain for green hydrogen, and is being conducted under NEDO's "International demonstration of Japanese technology that will contribute to decarbonization and energy conversion". Under this Joint Development Agreement (JDA), we will clarify the structure and schedule, and prepare for the start of the demonstration project from 2024. In the future, we will investigate commercialization and aim to sell hydrogen within and outside of Indonesia.

Business flow



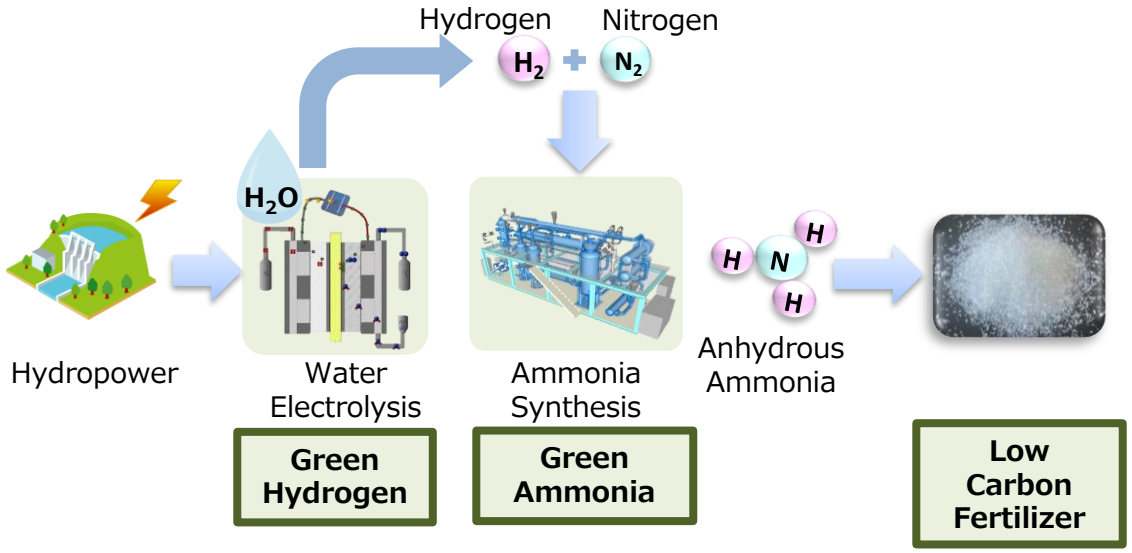
Scheme



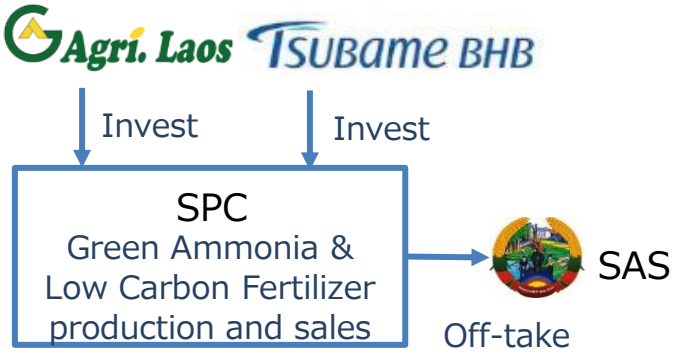
LOI on Low Carbon Fertilizer Off-take Agreement

- **Project outline** : Agri Laos Co., Ltd and Tsubame BHB Co., Ltd intend to develop Low Carbon Fertilizer Project in Laos. State Enterprise for Agriculture Service (SAS) intends to take the Product from the Project. Three parties agree to sign Letter of Intent on Law Carbon Fertilizer Off-take Agreement.
- **Purpose of the Project** : The first chemical fertilizer local production using hydropower and renewable energy will substitute the imported fertilizer and improve the agricultural productivity and foreign currency reserve.
- **URL** : Tsubame BHB Co., Ltd. (tsubame-bhb.co.jp)

Green Ammonia and Low Carbon Fertilizer Project



Project Scheme

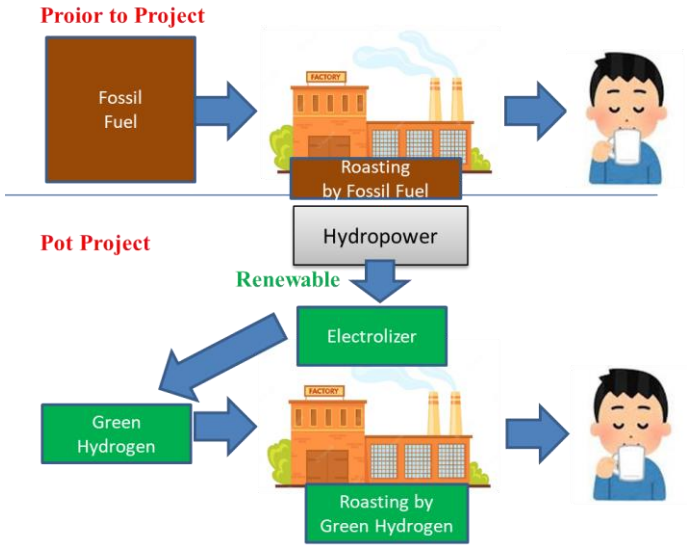


Coffee Roasting using Green Hydrogen in Pakse-Japan SME SEZ, Champasak Province, Lao PDR

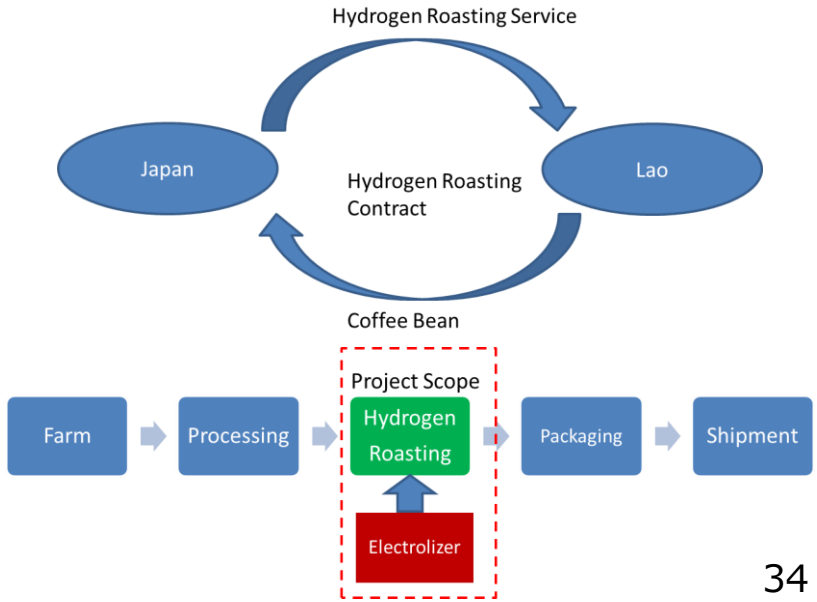
- **Cooperation outline** : Phetsavangjoint, a Lao Coffee company, and TTCL to study for Industrial Coffee Roasting at Pakse-Japan SME SEZ, Champasak Province, Lao using Green Hydrogen from Renewable including Hydropower
- **Purpose or objectives of MOU** : Fuel Switch from Fossil Fuel to Green Hydrogen to realize Decarbonization at Coffee Factory, and this application of Green Hydrogen to other industry and transportation at Pakse-Japan SME SEZ.
- **Other points** : To achieve Decarbonization and improve Trade Balance, Utilization of Green Hydrogen for coffee roasting, the first in ASEAN

Champasak Province in Lao

Concept



Scheme



MoU to develop global green ammonia value chain and commercial demonstration of fully ammonia-powered gas turbine

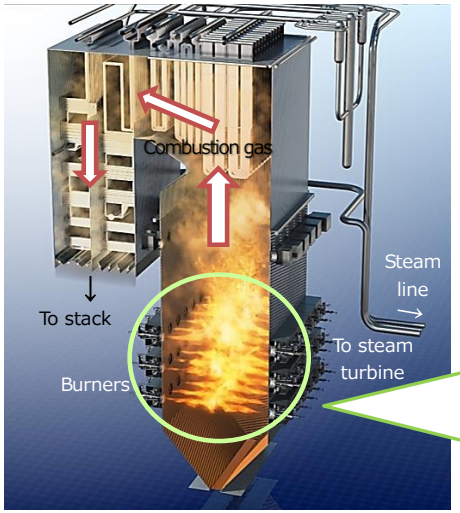
- **Collaboration Outline** : IHI Corporation and Gentari Hydrogen Sdn Bhd, a subsidiary of PETRONAS' clean energy arm Gentari Sdn Bhd (Gentari), signed a memorandum of understanding to co-invest in the development of green ammonia value chain from production, transportation, storage and utilization. This includes the commercial demonstration of IHI's ammonia-powered gas turbine, developed with NEDO's Green Innovation Fund.
- **Purpose** : The objective of the collaboration is to co-develop a competitive, global green ammonia supply chain and demonstrate the commercial utilization of ammonia as fuel to support the decarbonization of Asia Pacific's power sector.

Ammonia Gas Turbine (IM270)

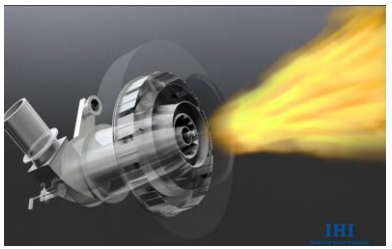
MoU between IHI and TNB Power Generation Sdn Bhd regarding basic design for small scale ammonia and/or biomass mix-firing

- **Cooperation outline** : IHI and TNB Power Generation Sdn Bhd, a wholly-owned subsidiary of government linked electricity utility, Tenaga Nasional Berhad, collaborates on completion of basic design for small scale ammonia and/or biomass mix-firing to implement gradually decarbonization roadmap
- **Purpose of MOU** : Realizing an early start to the energy transition by completing basic design for combining fuel ammonia with biomass fuel at multiple power stations in Peninsular Malaysia
- **Other points** : By middle of 2024, basic design will be completed.

ammonia firing image



Boiler


Outline Diagram of Ammonia Mix-firing burner

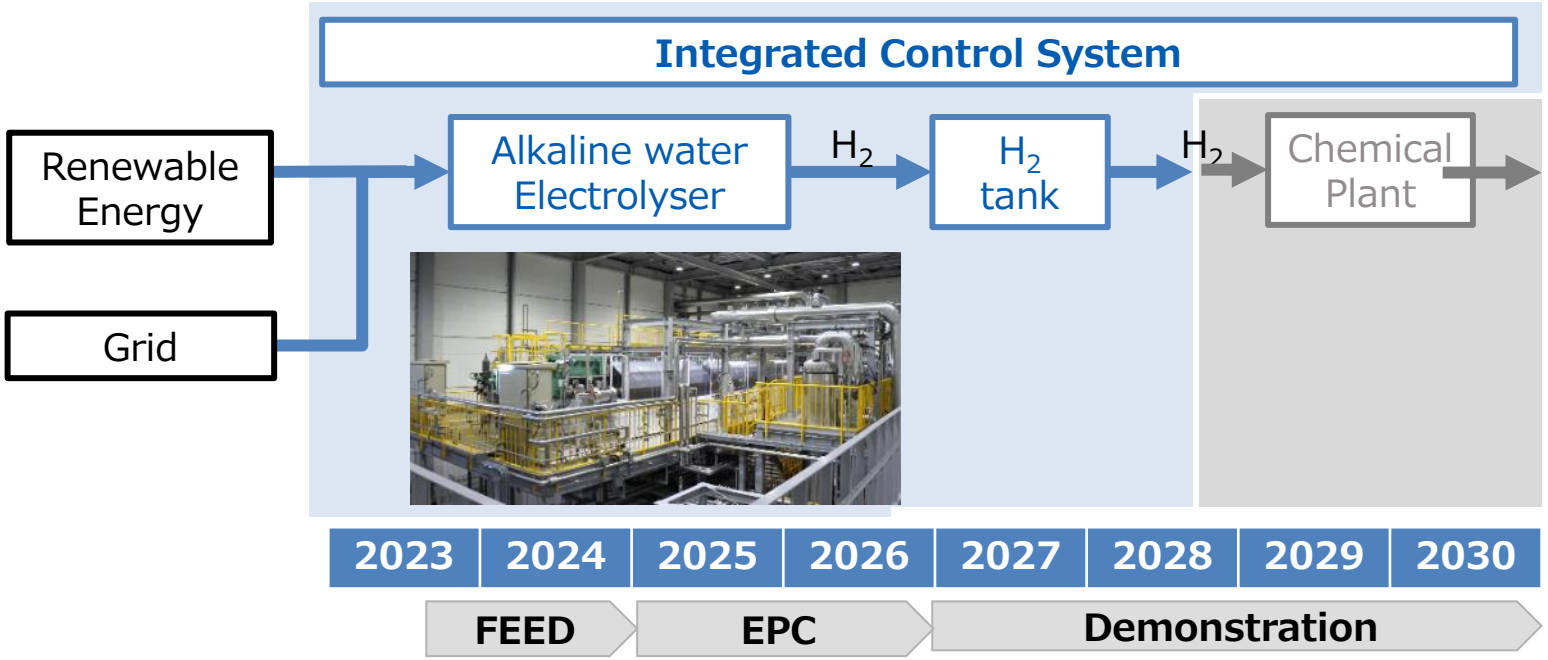
Target power stations


TNB Janamanjung


Jimah East Power

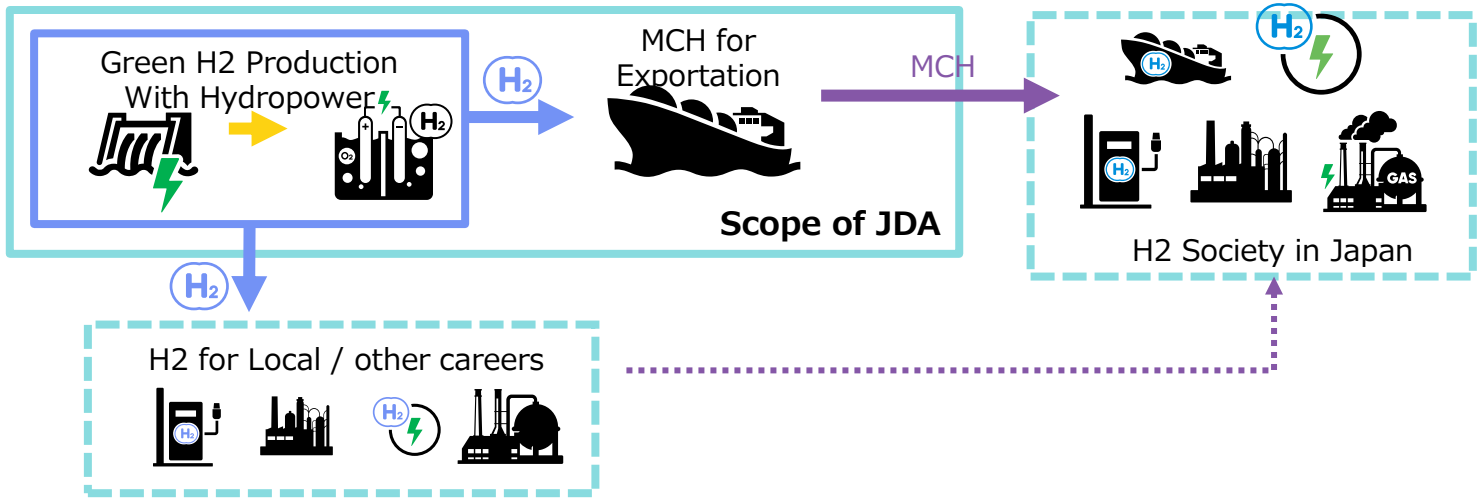
MOU on FEED study for 60 MW class alkaline water electrolyser to produce green hydrogen in Malaysia

- **Cooperation outline:** a front-end engineering design (FEED) study for production of up to 8,000 tonnes per year of green hydrogen using a 60 megawatt (MW) class alkaline water electrolyser system
- **Purpose or objectives of MOU:** This commercial-scale project demonstrates the companies' commitment to fostering markets for green hydrogen and establishing a foundation for regional green hydrogen production, aligning with the broader mission of decarbonisation in Japan, Malaysia, and across Southeast Asia.
- **URL** : https://www.asahi-kasei.com/jp/news/2023/ze231115.html



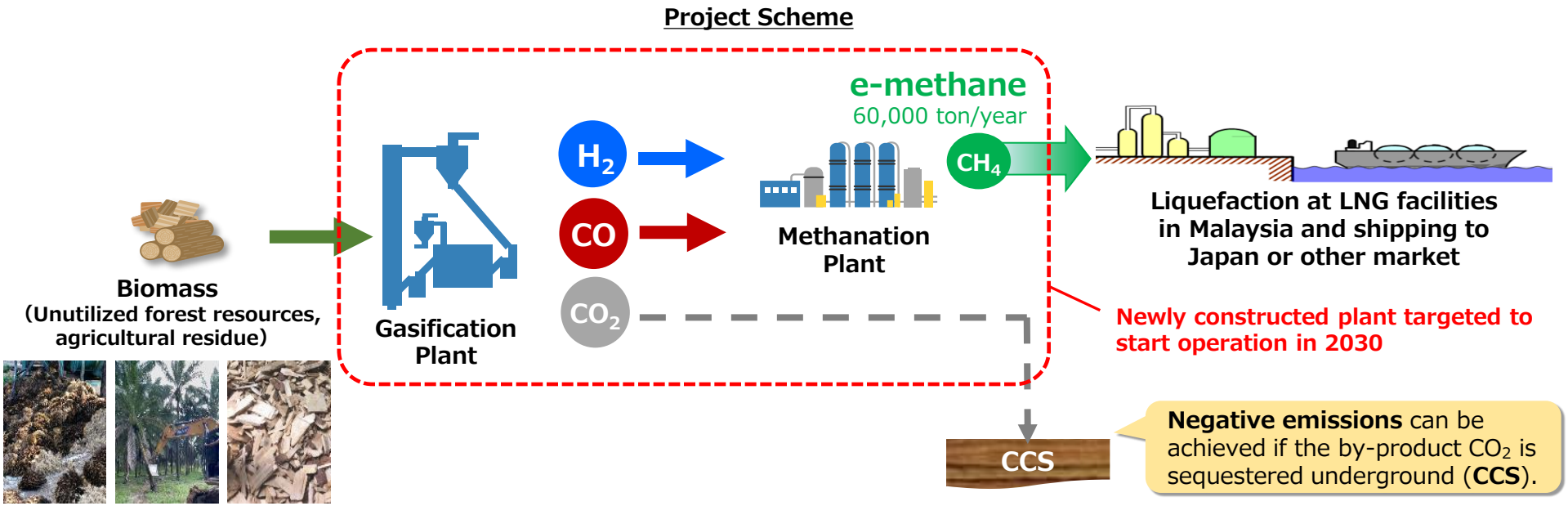
Joint Development Agreement (JDA) for Production and Exportation of Green Hydrogen/MCH in Sarawak, Malaysia

- **Overview** : SEDC Energy Sdn. Bhd., ENEOS Corporation, and Sumitomo Corporation conducted Feasibility Study for Green Hydrogen/MCH Production and Exportation in Sarawak since 2020, and successfully signed the JDA in October 2023 to execute the FEED (Front-End Engineering Design).
- **Purpose** : This project will play an important role to materialize “Sarawak Hydrogen Hub” (a regional green hydrogen hub) and will also contribute to the energy security and decarbonization in Japan.
- **Remarks** : This project is planned to commence its commercial operation by 2030 with <100KTPA-H2 production.



e-methane Production in Malaysia using Biomass

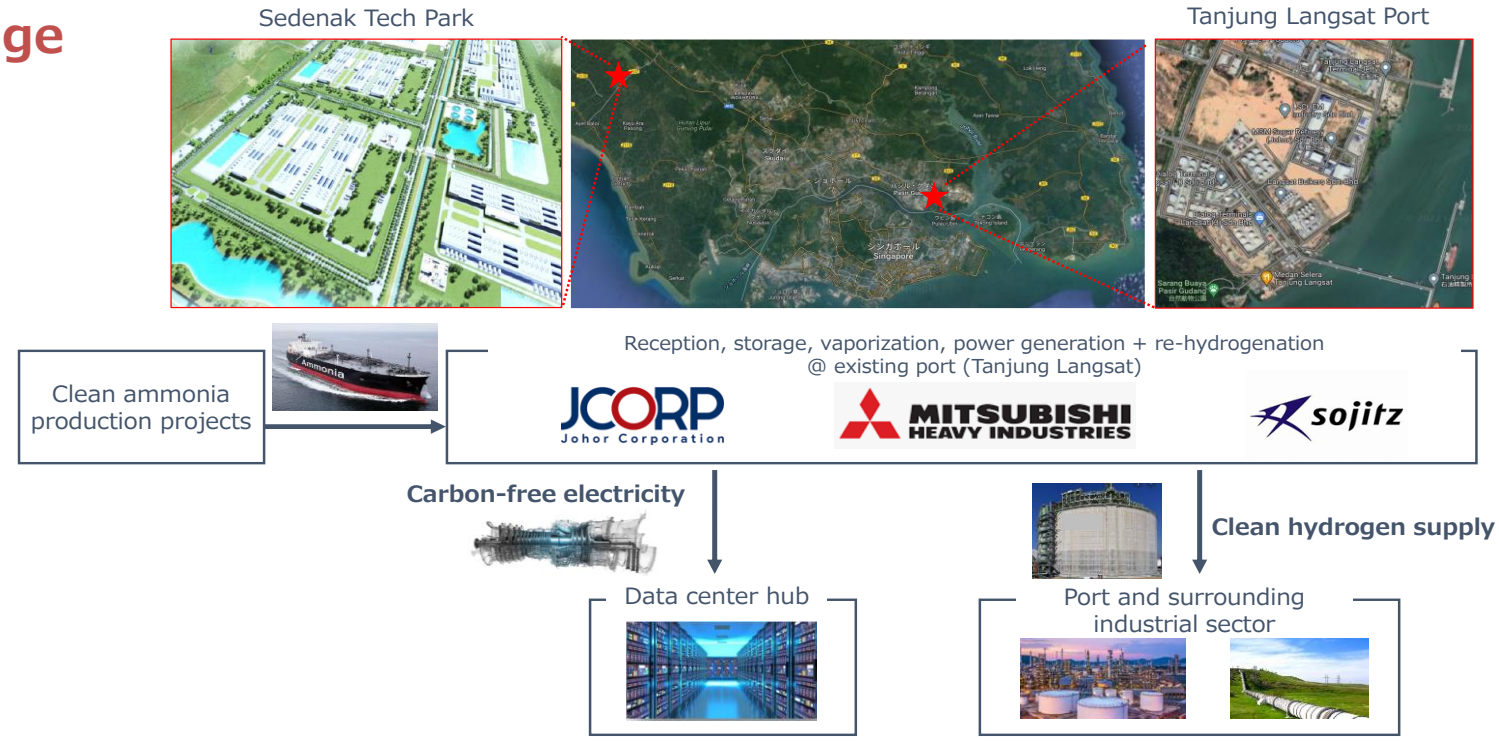
- **Outline :** Osaka Gas and IHI and PETRONAS Global Technical Solutions, the technical solutions arm of PETRONAS, signed MOU for joint feasibility study on a project to produce e-methane using biomass in Malaysia.
- **Significance/Aim :** e-methane is synthesized from hydrogen and CO produced by the gasification of biomass such as unutilized forest resources and agricultural residues. It is also noteworthy that biomass-derived CO2 is obtained as a by-product, and negative emissions through CCS of this CO2 will be studied in the future.
- **URL** : https://www.osakagas.co.jp/en/whatsnew/__icsFiles/afieldfile/2023/04/10/230410.pdf



MOU for hydrogen and ammonia and other utilization projects in Johor, Malaysia

- **Cooperation outline** : Johor Corporation(Malaysia), Mitsubishi Heavy Industries Ltd (Japan) and Sojitz Corporation (Japan) signed a MOU to jointly conduct a feasibility study to realize a decarbonized society in Johor, Malaysia, utilizing hydrogen, ammonia and other resources.
- **Purpose or objectives of MOU** : (i) Development of ammonia receiving terminal and ammonia-fired gas turbine thermal power plant. (ii) Supply of ammonia for marine fuel. (iii) Carbon-neutral ports that utilizes hydrogen from existing ports.

Project image



Strategic Technology Partnership between TNB Power Generation SDN. BHD (“TNB GENCO”) and Toshiba Energy Systems & Solutions Corporation ("TESS") for TNB GENCO CCUS pilot plant facility

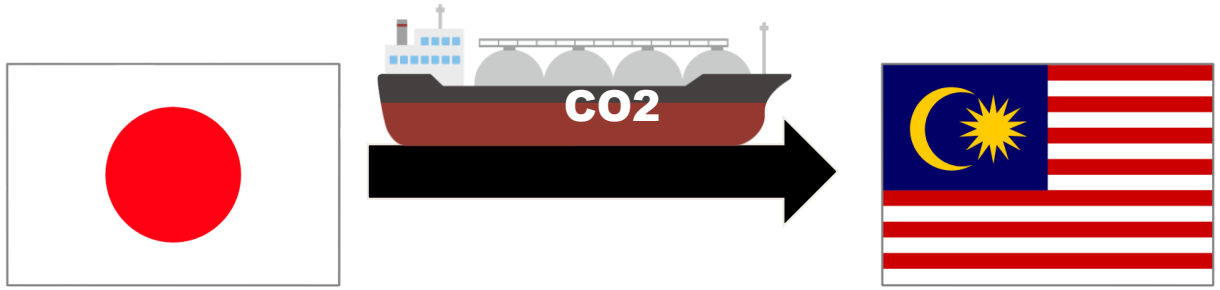
- **Brief of the MOU** : TNB is targetting to achieve Net Zero by 2050. Towards this target, TNB GENCO is seeking the opportunity to introduce CCUS technology to it’s facilities by utilizing TESS’s Carbon Capture related knowledge and technology. This MOU is to establish the framework of the strategic technology partnership for future introduction of CCUS facility between TNB GENCO and TESS.
- **Aim of this MOU** : TNB GENCO has recognized the possibility of introduction of Carbon Capture technology to achieve Net Zero by 2050. By utilizing TESS's Carbon Capture technology, both companies believe they could contribute more to the achievement of Malaysia's decarbonization under this MOU.

Malaysia National Electrical Company "Tenaga Nasional Berhad"
Dato’ Seri Baharin Din (President/CEO TNB, Chairman of TNB GENCO) (Right), and
Toshiba Energy Systems & Solutions Corporation
Mr. Tadasu Yotsuyanagi (President & CEO) (Left)

TNB GENCO engineers participate in training event at CCS pilot plant

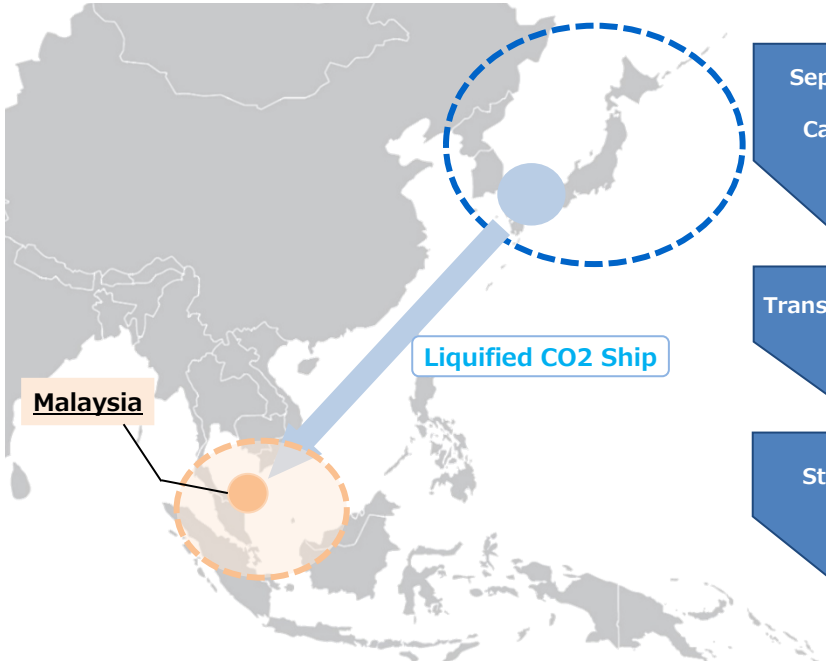
MOC on the cross-border of CO2 transportation between METI, JOGMEC and PETRONAS

- **Outline** : In order to undertake CO2 transboundary to Malaysia, it is necessary to discuss the establishment of rules and a method for calculating CO2 reductions between the two countries. METI, JOGMEC, and PETRONAS signed the MOC to promote discussions on CO2 transboundary transport and storage.
- **Purpose of MOU** : The signed MOC aims to promote discussions on the bilateral cross-border of CO2 transportation and storage, which will contribute to greenhouse gas reduction.
- **URL** : https://www.meti.go.jp/english/press/2023/1006_002.html



Offshore Peninsular Malaysia CCS Value Chain

- **Outline** : Mitsui, PETRONAS and TotalEnergies signed an agreement called CCS Development Agreement in June this year for the joint development of CCS value chain to ship and store industrial CO2 from Asian countries, mainly Japan, in offshore Peninsular Malaysia. The project is awarded JOGMEC's Advanced CCS program and aims for first CO2 injection by 2030.
- **Purpose of Agreement** : The sub-surface structure is well known through oil and gas exploration and development activities in the past. Given its good maritime access from Asian countries, Malaysia is strategically located as an excellent potential CCS hub. This partnership also paves the way for the first of its kind integrated CCS solution for industries in the Asia Pacific region.



Separation · Capture

Target Industry : Cement, Steel, Refinery、Power generation
⇒Aim to found emitter hub & cluster and realize competitive separation and capture facility/system

Transportation

Scope of Development : LCO2 Ship
⇒Design, construction, ownership, operation and institutional framework design

Storage

Scope of Development : Depleted gas field, Aquifer
⇒Securing overseas storage capacity, development of promising site, storage, monitoring

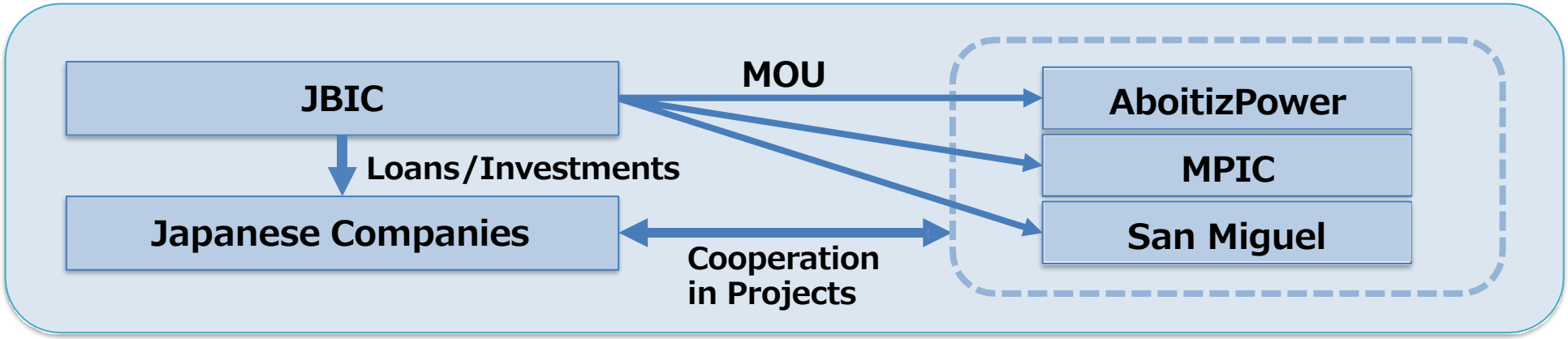
Project Structure

MITSUI&CO. PETRONAS TotalEnergies

CCS Development Agreement

MOU for AZEC promotion in the Philippines (October 2023)

- **Outline:** JBIC signed MOU with AboitizPower and MPIC, and is working with San Miguel to sign MOU, mainly to find cooperative projects that involves Japanese business in the certain fields stipulated below.
- **Purpose and objective:** Due to the highly privatized infrastructure sector's nature, the local conglomerates have strong presence in the field and strengthening the connection with them is a key factor for the success. Through these MOU, we aim to promote implementation of concrete projects, which contribute to improve energy efficiency and/or GHG emission reduction together with Japanese corporates.
- **URL**: JBIC Signs MOU with Aboitiz Power Corporation of Philippines | JBIC Japan Bank for International Cooperation, JBIC Signs MOU with Metro Pacific Investments Corporation of Philippines | JBIC Japan Bank for International Cooperation

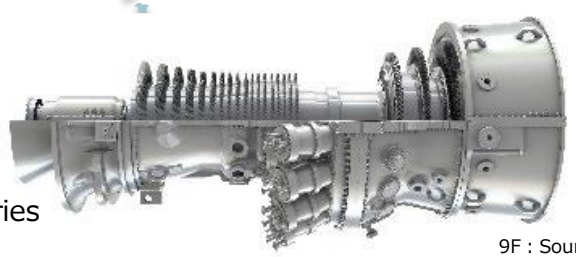


Tri-parties' MOU to study retrofitting with ammonia combustion by Sembcorp, IHI and GE in Singapore

- **Cooperation outline** : Study to retrofit Sembcorp's gas turbine combined cycle power plant with ammonia combustion system at Sakra, Jurong island in Singapore.
- **Purpose or objectives of MOU**: Potentially assist Sembcorp to generate low-carbon energy from its existing power plant assets, support Singapore's efforts to diversify its energy sources and decarbonise the power sector.
- **URL** : https://www.ihi.co.jp/all_news/2023/resources_energy_environment/1200364_3538.html

Right : Jun Kobayashi, Board Director/Managing Executive Officer
Center : Wong Kim Yin, Group President and CEO, Sembcorp Industries
Left : María Victoria Zingoni Domínguez GE Power CEO

Sembcorp Cogeneration Power Plant, Jurong Island, Singapore



Retrofitting GE Gas Turbine

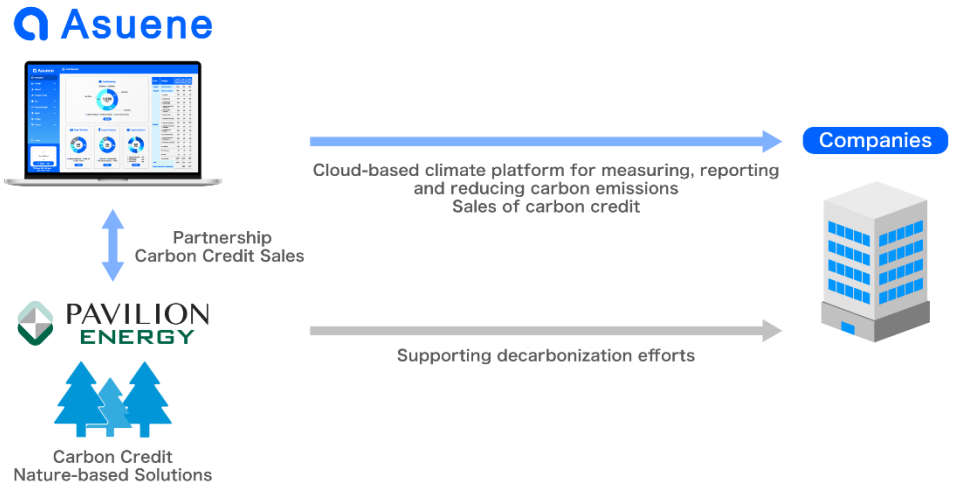
9F : Source : GE

Asuene partnering with Pavilion Energy

- **Partnership summary** :
  Asuene will be providing Pavilion Energy's voluntary carbon credits to support companies aiming to reduce CO2 emissions and achieve net zero.

- **Purpose of the MOU** :
  1. Create new business opportunities outside of Singapore and Japan
  2. Cooperative sales of carbon credits
  3. Cooperative marketing of carbon credits and environmental products
  4. Establish a committee to facilitate the exchange of information and processes.

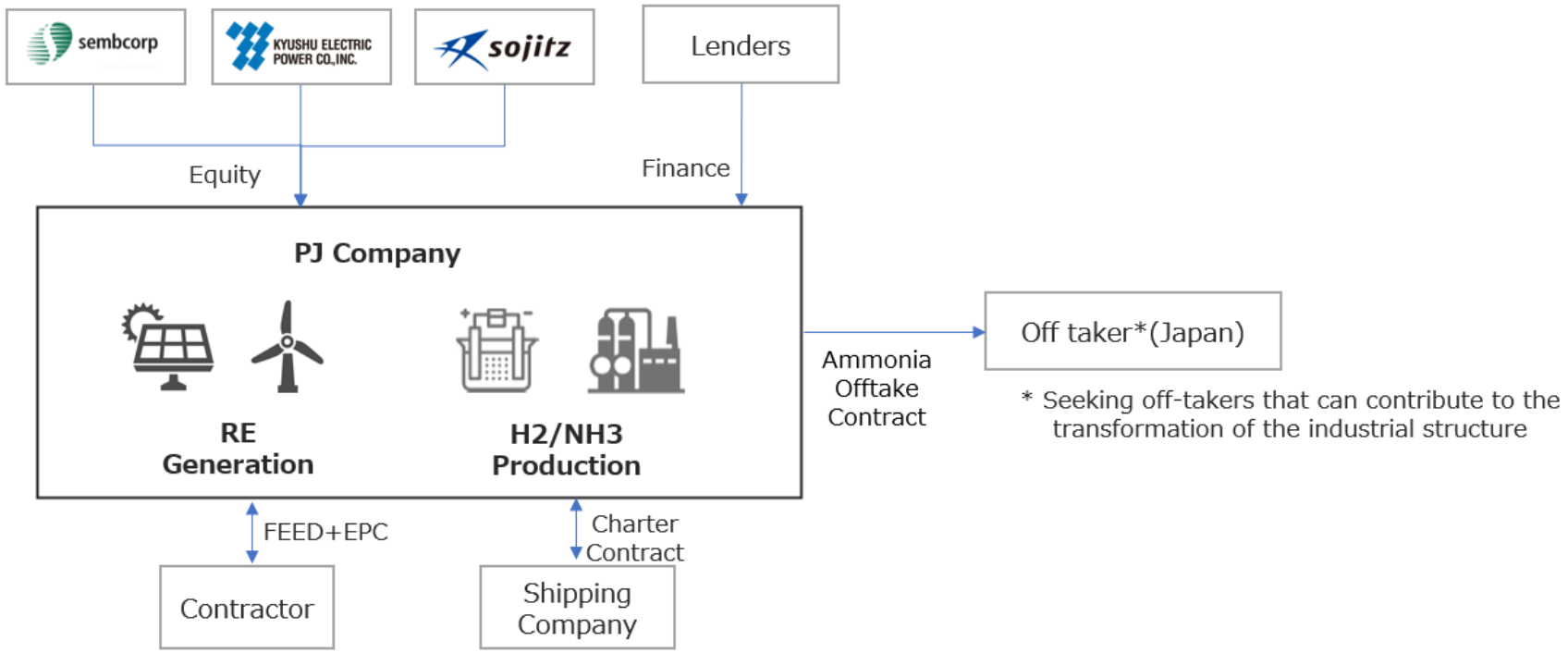
- **URL** : https://www.pavilionenergy.com/en/media/Pavilion-Energy-partners-with-Japan-Asuene-to-promote-decarbonization-solutions



India/ MOU of Green Ammonia Production Business

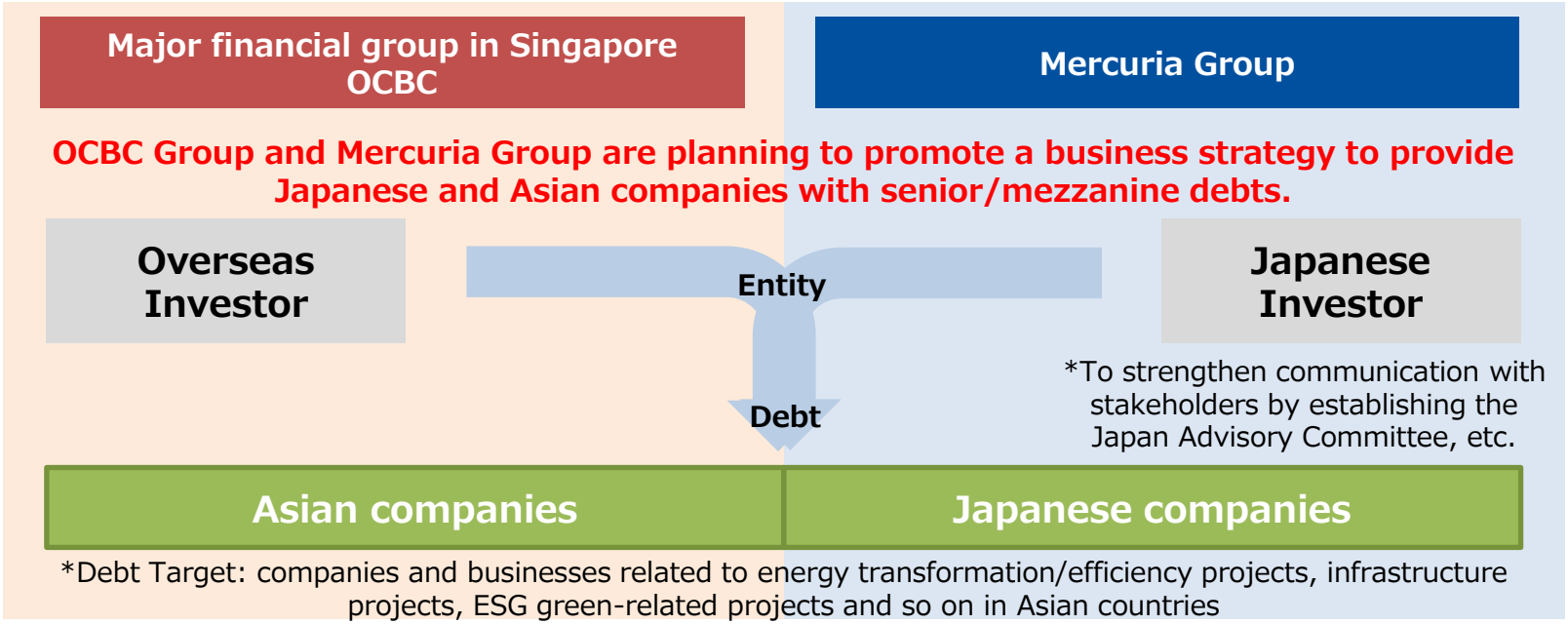
- **Cooperation outline** : To consider collaboration for development of green ammonia production project in India between Sembcorp(SG), Kyushu Electric(JP) and Sojitz(JP)
- **Purpose or objectives of MOU** : (1) To contribute to the decarbonization of Japan by producing low-cost green ammonia in India which has high competitiveness in renewable energy. (2) To contribute to Japan's energy security by producing green ammonia which will not be affected by fluctuations in gas prices and establishing new supply chain from India, a non-traditional energy supplier for Japan.

Planned Scheme



Business partnership to create a credit fund with the theme of ASEAN sustainability

- **Cooperation outline** : It is a MOU for business collaboration between OCBC and Mercuria towards the creation of credit fund. The credit fund will provide debt to projects and businesses that are expected to contribute to improving sustainability in Asia, including decarbonization.
- **Purpose or objectives of MOU** : We aim to provide financial support to improve sustainability, including carbon neutrality in ASEAN. Furthermore, by providing a platform where Japanese and Asian companies involved in these funds and activities can strengthen their business relationship, we aim to strengthen and promote the ecosystem that includes Japan and ASEAN.

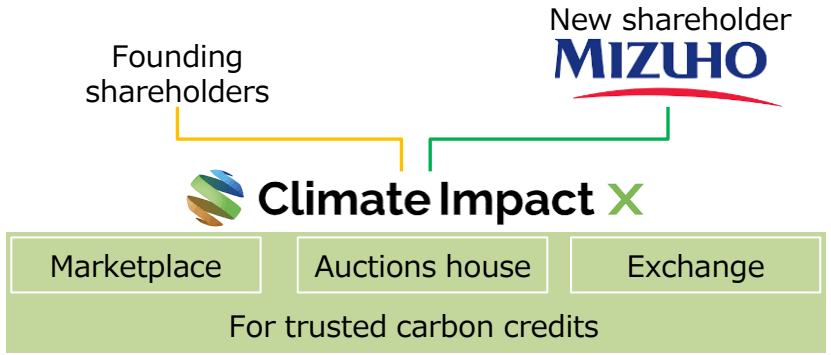


Mizuho and Climate Impact X join forces to scale carbon credit market in Asia

- **Cooperation outline** : Mizuho Financial Group agreed to invest in Climate Impact X ("CIX"), a Singaporean entity that operates a marketplace, auctions house and exchange for trusted carbon credits.
- **Purpose or objectives of MOU** : Carbon credits enable companies to contribute to reducing CO_2 emissions outside their own value chains, thereby directing funds towards emissions reduction efforts in emerging countries etc. Mizuho, CIX and CIX's four founding shareholders (Temasek, DBS Bank, SGX Group, Standard Chartered) shared the vision of the significant role that carbon credit play in decarbonisation efforts globally. The investment by Mizuho will be utilized to expand CIX's business and further strengthen CIX platform with the aim of scaling carbon credit market in Asia.
- **URL :** https://www.mizuhogroup.com/binaries/content/assets/pdf/mizuhoglobal/news_release/2023/20231128release_eng.pdf

Mizuho and CIX

Shareholder structure



Zeroboard(Japan) / Summit Auto Body Industry Co., Ltd. (Thailand) MOU

- **Cooperation outline :** Zeroboard has signed an MOU with Summit Group, Thailand's largest auto parts manufacturer, to support decarbonization management. Through this collaboration, both companies support Summit Group's supply chain partners to calculate and visualize their GHG emissions using cloud services, and then take action to reduce their emissions.
- **Purpose or objectives of MOU :** As a leading manufacturing company in Thailand, Summit Group will maximize Zeroboard's knowledge and expertise in decarbonization to provide decarbonization support to its supply chain partners and help strengthen the international competitiveness of the Thai manufacturing industry.
- **URL** : https://zeroboard.jp/, http://summitautobody.co.th/

Zeroboard (Japan)/Innopower (Thailand) MoU

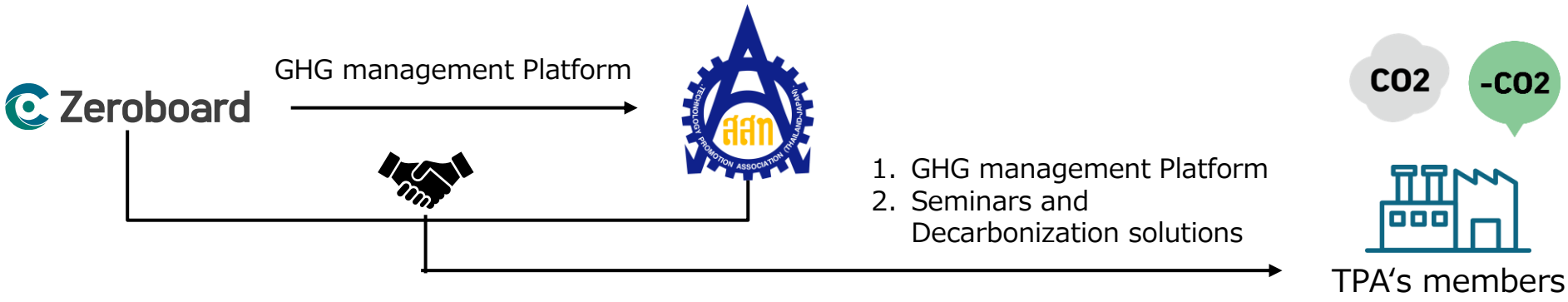
- **Cooperation outline** : Zeroboard, provider of a cloud service for calculating and visualizing GHG emissions, has formed a business alliance with Innopower, an energy innovation and technology company under EGAT (Electricity Generating Authority of Thailand).
- **Purpose or objectives of MOU** : The collaboration will involve INNOPOWER's clients in calculating and visualizing their GHG emissions using Zeroboard, and then taking action to further reduce their emissions. The two companies will co-create innovations including GHG emission reduction solutions such as trading of renewable energy certificates (I-RECs), solar projects, and electric vehicle (EV) fleets with both companies to expand their decarbonization management services.
- **URL** : https://zeroboard.jp/ https://www.INNOPOWER.co.th/

Zeroboard (Japan)/SENA Development (Thailand) MoU

- **Cooperation outline** : Zeroboard, provider of a cloud service for calculating and visualizing GHG emissions, has formed a business alliance with SENA, a property developer and provider of decarbonization technologies in Thailand.
- **Purpose or objectives of MOU** : SENA implements Zeroboard to calculate the GHG emissions of its own organization and buildings to promote decarbonization. In time, SENA will introduce Zeroboard to their supply chain companies. Providing comprehensive decarbonization support to Thai companies, including actions to reduce emissions.
- **URL** : https://zeroboard.jp/, https://www.sena.co.th/en

Zeroboard(Japan) / TPA (Thailand)MOU

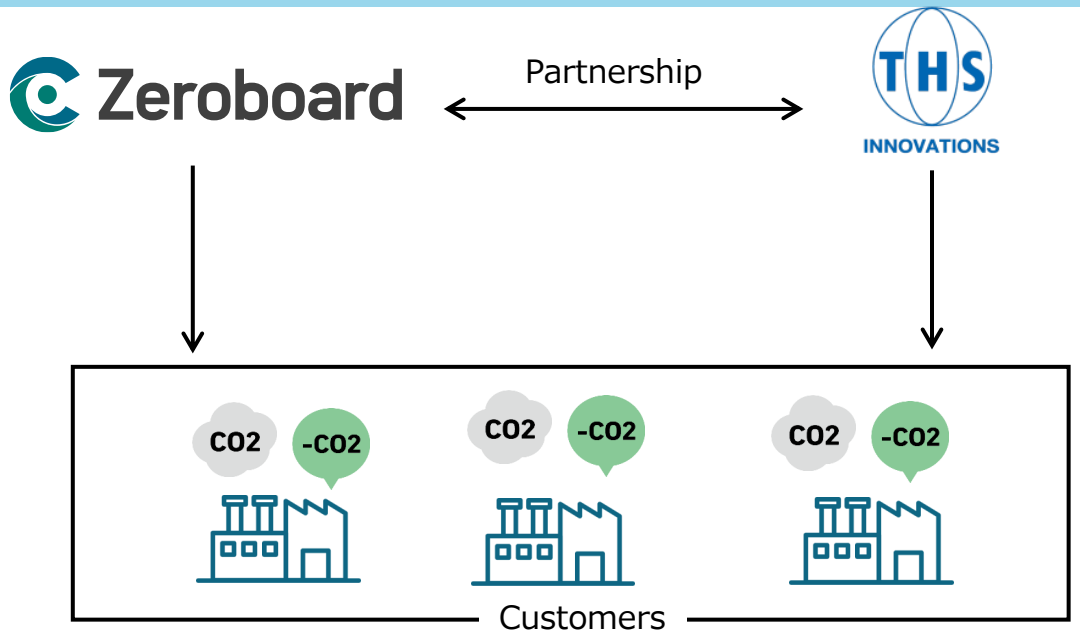
- **Cooperation outline :** Zeroboard Signs MOU with TPA (Technology Promotion Association (Thailand-Japan)) for Decarbonization in Thailand. With the conclusion of this MOU, the two organizations will expand their support for decarbonization management by leveraging TPA's member network throughout Thailand, especially in the manufacturing industry.
- **Purpose or objectives of MOU :** TPA will hold events and seminars for its member companies and promote the introduction of the Zeroboard service. Through the provision of "Zeroboard," we support TPA and TPA member companies to calculate and visualize their GHG emissions and support them in taking action to reduce their emissions.
- **URL** : https://zeroboard.jp/, https://www.tpa.or.th/

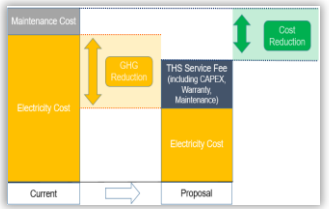


Zeroboard (Japan)/ THS Innovations (Thailand) MoU

- **Cooperation outline :** Zeroboard has partnered with THS Innovations, a company that provides energy-saving and decarbonization solutions for factories and other buildings.
- **Purpose or objectives of MOU :** Leveraging the networks and solutions of both companies, both companies will expand their support for decarbonization management not only to Japanese companies in Thailand, but also to Thai companies. Zeroboard will support the visualization of GHG emissions, while THS Innovations will provide energy management solutions that lead to decarbonization, aiming to meet a wide range of customer needs.
- **URL** : https://zeroboard.jp/, https://www.thsi.co.th

GHG Calc. & Visualization

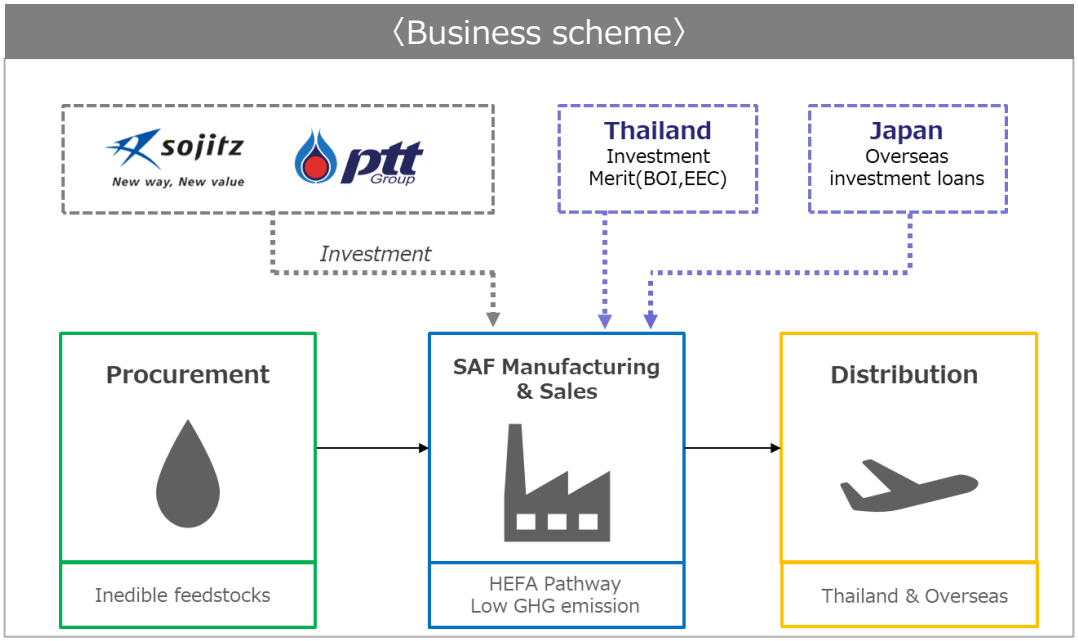




Energy Management Solution

Signing a Term Sheet for Producing Bio Jet Fuel from Inedible feedstocks

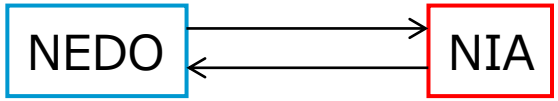
- **Outline** ： PTT Group (Thailand), and Sojitz Corporation (Japan) agree to discuss the potential collaboration to jointly develop the business opportunity in Sustainable Aviation Fuel (“**SAF**”) project utilizing a hydroprocessed esters and fatty acids (“**HEFA**”) process in Thailand to contribute carbon neutrality in the aviation industry. Both companies signed a Term Sheet in September 2023 for joint development of SAF project. Both companies jointly proceeded to the engineering phase.
- **Aim** ： ① Realization of competitive SAF manufacturing utilizing the strengths of each company. ②Substantial reduction in greenhouse gas emissions through SAF production using inedible feedstocks. ③ Realization of stable supply of SAF in Asia.



Memorandum of Understanding on Cooperation in Innovation and Technology Research and Development

- **Outline of MOU** : It is to establish a comprehensive cooperative relationship with NIA, which is responsible for promoting Thailand's innovation policy, for cooperation in innovation and technology research and development.
- **Purpose of MOU** : To promote innovation in both countries through information exchange and joint projects in a wide range of fields with NIA.
- **Other points** : This comprehensive MOU has been the basis for maintaining a cooperative relationship between the two parties and has led to the demonstration project.
- **URL** : https://www.nedo.go.jp/ugoki/ZZ_101207.html

Director Wada of NEDO (at the time, left) Dr. Pun-Arj Chairatana, Executive Director of NIA (right) presenting the MOU.)



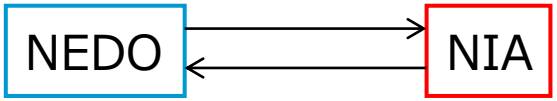
Forms of Cooperation

1. The sharing of written documents, materials and reports which describe the activities of NEDO and NIA.
2. The exchange of scientists, engineers, other personnel for mutually agreed periods of time.
3. Facilitation of cooperative research and development and/or innovation projects between entities from Japan and Thailand.

Memorandum of Understanding on Cooperation in Development of a Startup Ecosystem

- **Outline of MOU** : It is to establish a cooperative relationship with NIA, which provides funding to Thai companies and research institutions to promote Thailand's innovation policy, in order to foster startups in Japan and Thailand in the future.
- **Purpose of MOU** : To foster startups in both countries through information exchange and joint projects in a wide range of fields with NIA.
- **Other points** : Based on this MOU, NEDO is also participating in "Startup Thailand," an event aimed at fostering an ecosystem for startup companies.
- **URL** : https://www.nedo.go.jp/ugoki/ZZ_101208.html

Mr. Kawamura, Chief Representative of NEDO Bangkok Office, giving an opening speech at the Startup pitch of Startup Thailand.



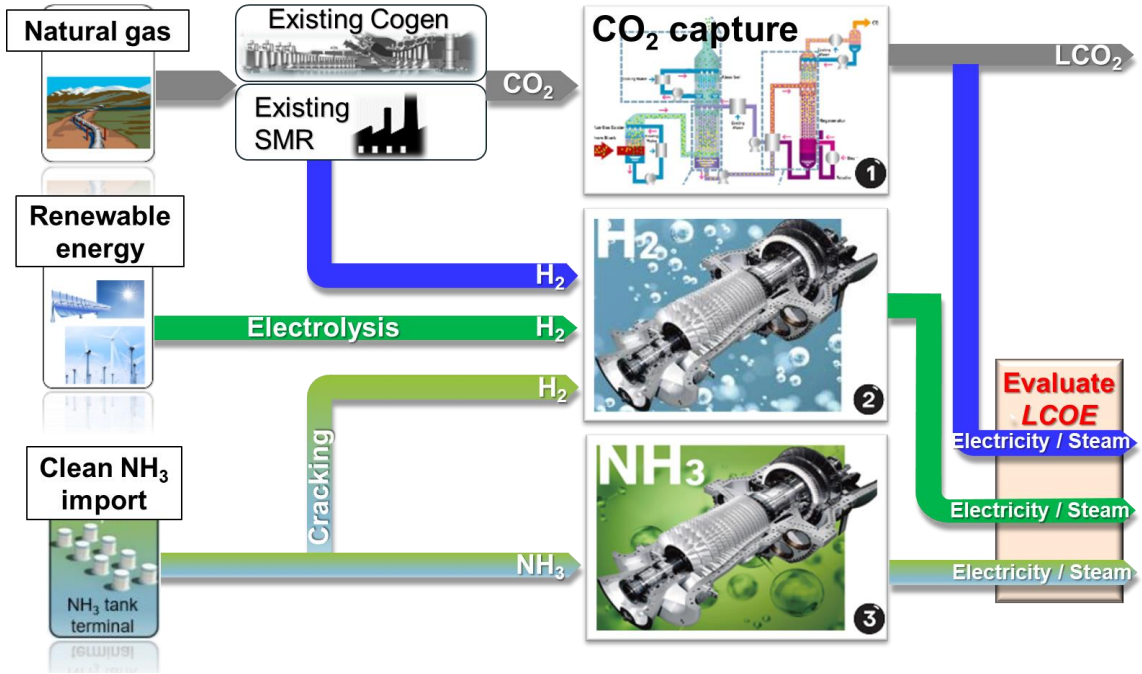
Forms of Cooperation

1. Collaboration in hosting seminars and events for startup support.
2. Promotion of an exchange of experts and other personnel in fields related to a startup ecosystem.
3. Facilitation and support of startup business entities from Japan and Thailand to create business opportunities

MOU for the utilization of hydrogen, ammonia and CCS to de-carbonize petrochemical plant in Thailand

- **Cooperation outline** : PTT Global Chemical(GC) and Mitsubishi Heavy Industries Asia Pacific(MHI-AP) signed MoU to utilize hydrogen, ammonia and CCS to de-carbonize GC's existing petrochemical plant in Thailand
- **Purpose or objectives of MOU** : Joint study to ① compare the economy of using hydrogen and ammonia as fuels for gas turbines, as well as CCS ② assess how CCS technologies can be applied and optimized for the SMR process

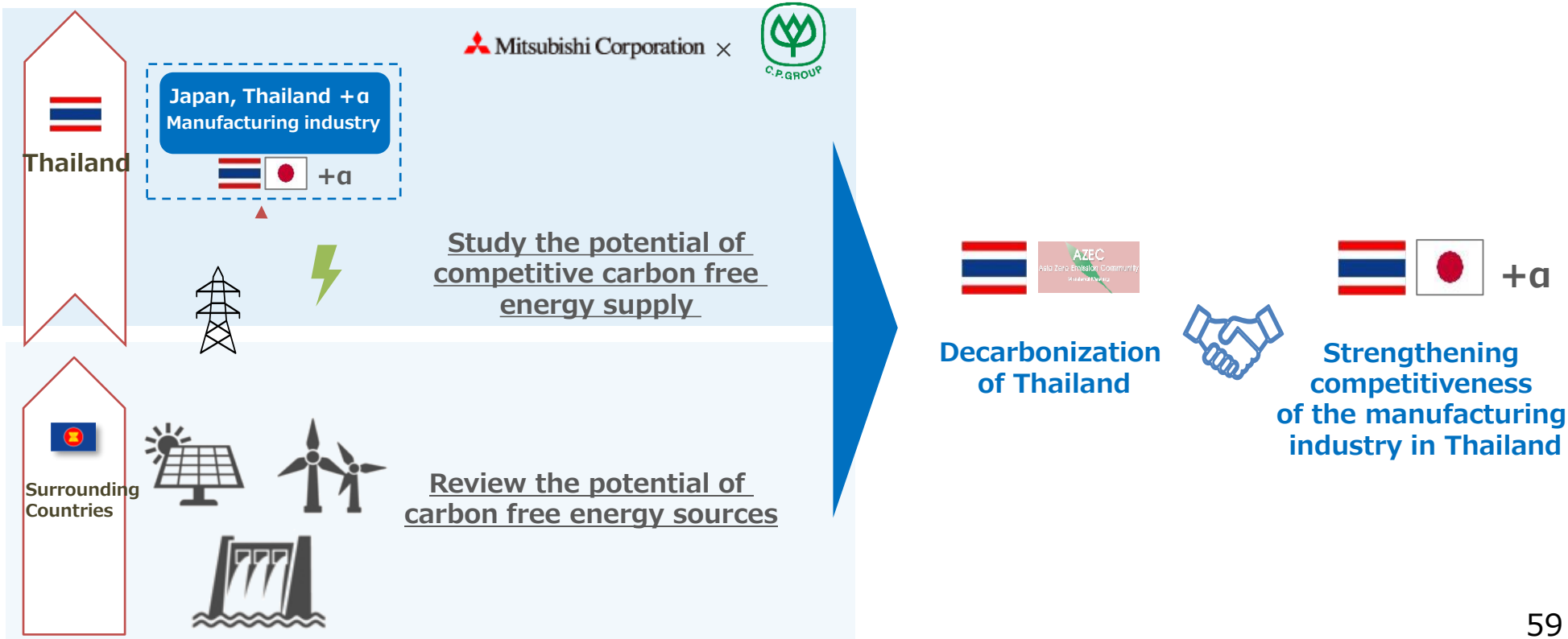
Comparative study to utilize H2, NH3, CCS



Signing Ceremony

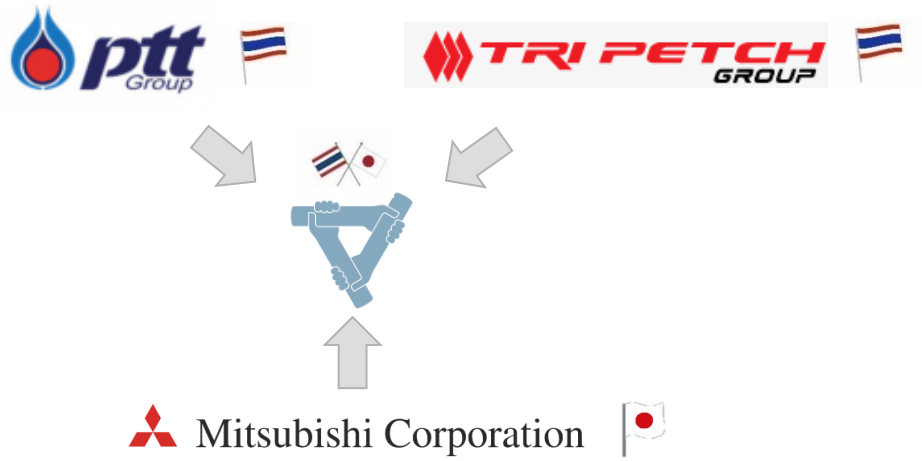
Mitsubishi Corporation and Thai CP Group Memorandum on joint FS for decarbonization of the manufacturing industry in Thailand

- **Cooperation outline** : Mitsubishi Corporation and Thai CP Group will conduct a feasibility study on a concept to develop carbon free energy sources in countries surrounding Thailand and supply such carbon free energy to the manufacturing industry in Thailand.
- **Purpose of MOU** : Thailand is moving forward with various decarbonization measures with the goal of achieving carbon neutral by 2050. The concept of this cooperation is to comprehensively support the energy transition in Thailand and contribute to the decarbonization and the strengthening competitiveness of the manufacturing industry in Thailand.



Memorandum of Understanding between Mitsubishi Corporation and PTT Public Company Limited regarding joint study on the development of next-generation fuel for automobiles

- **Overview of MOU/Corporate Alliance:** Joint study by PTT Public Company Limited, Mitsubishi Corporation, and its subsidiary Tri Petch Isuzu Sales Co., Ltd. on the development of next-generation fuel for automobiles/HVO (Hydrotreated Vegetable Oil).
- **Significance and aim of this cooperation:** In order to achieve decarbonization goals in Thailand, PTT, which is leading energy major in Thailand, together with Mitsubishi Corporation and its subsidiary Tri Petch Isuzu Sales Co., Ltd, Isuzu vehicle distributor in Thailand, will cooperate and jointly study the development of next-generation fuel/HVO for automobiles in Thailand by providing related expertise.



HVO development by utilizing waste cooking oil

Study on next generation fuel

Practical use

Actual vehicle driving

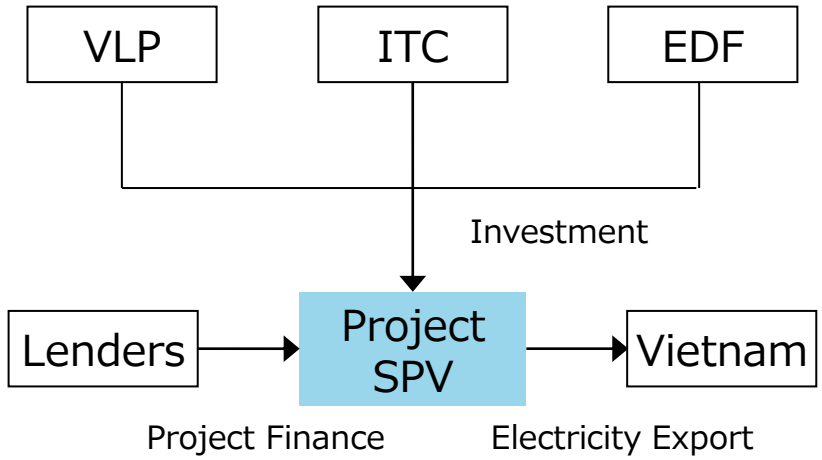
Three Parties' Joint Feasibility Study for FPV Project in Laos

- **MOU outline** : Viet Lao Power JSC (VLP), ITOCHU Corporation (ITC), and Electricite De France SA (EDF) to conduct a feasibility study for a floating solar PV (FPV) project on the reservoir of existing Xekaman 1 Hydro Power Plant that VLP owns and operates in Laos.
- **Objectives** : Vietnam to expand electricity import from Laos according to the national power development plan (PDP8). By installing the FPV, three parties to contribute to energy transition and electricity stability for Vietnam.

Project Site

Xekaman 1 HPP (290MW)

Expected Project Scheme

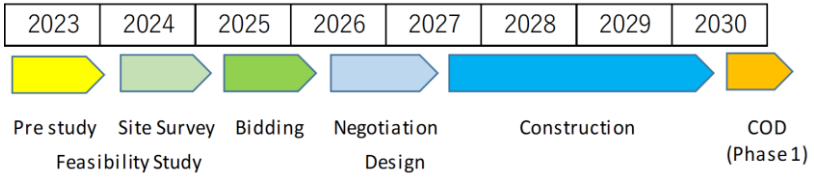


MEMORANDUM OF UNDERSTANDING
For the joint development of the Tra Vinh Offshore Wind Farm with a total expected capacity of 1.8 GW in Tra Vinh province, Vietnam

- **Outline of MOU** : TTVN, additional new Vietnamese company in this year, REE, 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 1,800MW 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 1,800 MW of power with a target COD by 2030. Through the promotion of this project, Vietnam's economic development and Japan's energy infrastructure exports are expected to be further promoted.
- **Others** : The project was selected as part of the "Feasibility Study for Overseas Development of High-Quality Energy Infrastructure in FY2022, 2023", "Asia Green Growth Promotion Project " surveys underway supported by METI and ANRE. *Kansai Electric Power and REE are not participating in the subsidy project in FY2023.

Location

Offshore Wind Power Project(Image)



Estimated Project Schedule

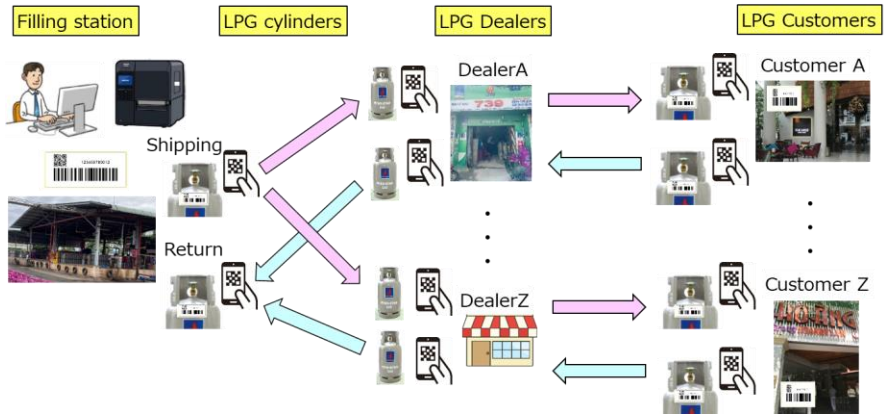
MOU Contracting Party

Photo session in
AZEC Public-Private Investment Forum
(March, 2023)

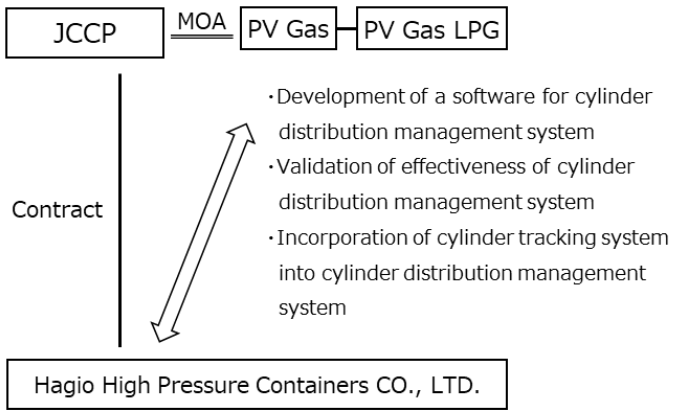
MEMORANDUM OF AGREEMENT ON JOINT PROJECT "Improving the Capacity of LPG Cylinder Distribution Management in Vietnam by using barcode seals"

- **Cooperation outline** : By transferring the LPG cylinder distribution management system technology used in Japan to Vietnam's LPG industry, the modernization of the industry will be contributed, and through this project the relationship with Socialist Republic of Vietnam will be strengthened.
- **Purpose or objectives of MOU** : Considering the applicability of Japan-style barcode-based LPG cylinder individual and transfer management system to Vietnam, and Verifying the effectiveness of measures against loss of LPG cylinders, safety and asset management.
- **Other points** : Holding local meetings twice a year and inviting Vietnamese engineers to Japan.
- **URL** : https://www.jccp.or.jp/country/docs/T-12%28VN%29PVGasMOA_20230830_en.pdf

Project Image



Scheme



Memorandum of Understanding with Vietnam Electricity("EVN") for collaboration on Decarbonizatio Roadmap development

- **MOU/ Cooperation outline** : Information sharing and discussions on the decarbonization of the power sector in Vietnam, establish of a roadmap for the decarbonization of EVN's entire business, including the thermal power sector and to explore the introduction ammonia and hydrogen to EVN's thermal power plants.
- **Purpose of MOU** : Vietnam's electricity demand is expected to continue to increase in line with its economic growth, which both securing a stable energy supply and decarbonization are nationwide challenges. EVN is the largest power producer and JERA expect that collaboration with EVN will contribute to the decarbonization of the country's power sector in Vietnam.

Main Scope

1. **Support for a decarbonization roadmap**
   - PDP8 analysis
   - Information sharing on decarbonization roadmap in other countries
   - Establishment of the decarbonization roadmap
2. **Establishment of thermal power decarbonization roadmap**
   - Thermal power masterplan for energy transition
   - Information sharing about JERA initiatives in other countries
3. **Initial study for introducing ammonia/hydrogen co-firing**
   - Site selection
   - Preliminary Feasibility Study(FS)

MOU ceremony at EVN Office (5th Oct 2023)

MOU with VietinBank of Vietnam (December 2023)

- **Outline:** Building a cooperation framework for materializing projects, which promote decarbonization and Japanese SMEs' business expansion in Vietnam.
- **Purpose and objective:** Promoting implementation of concrete projects, which contribute to decarbonization and Japanese SMEs' business activities in Vietnam. Aiming for contribution towards the achievement of carbon neutrality and becoming high-income country by 2050.

MOU between PV Gas and Sumitomo Corporation for LNG to Power Project

- **Cooperation outline** : PV Gas and Sumitomo Corporation to jointly study towards materialization of LNG to Power Project in Khanh Hoa Province.
- **Purpose or objectives of MOU** : In order to develop new power projects that contribute towards the achievement of energy transition of Vietnam, PV Gas and Sumitomo Corporation will jointly study the feasibility of a potential LNG to Power Project in Khanh Hoa Province under the framework of the MOU.

Site Location

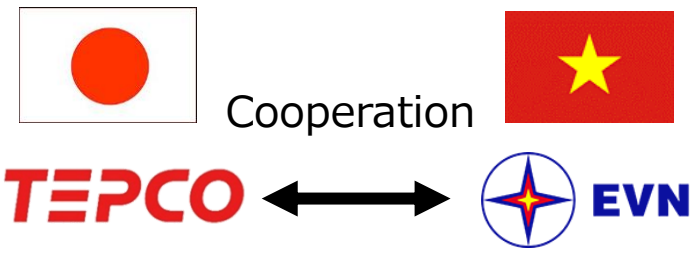
Project Site

MOU for business development to realize a Carbon Neutral Society

- **Outline** : TEPCO and Vietnam Electricity ("EVN") signed the MOU, which intends to foster better business operations, with a view to future joint business development. Specifically, both parties will cooperate in a wide range of areas, including carbon neutrality initiatives and power system optimization, such as improving the efficiency of power transmission and distribution networks.
- **Significance/Aim** : TEPCO and EVN have been sharing information through mutual exchanges for years, and now want to go beyond the conventional framework and consider joint business development. With this MOU, both parties will strengthen their cooperation, aim to cooperate with each other in anticipation of future system reforms such as electricity deregulation and contribute to the realization of a carbon neutral society in Vietnam.
- **Others** : Prior to this MOU, in April of this year, TEPCO Renewable Power, Inc. and EVNGENCO 1 entered into a basic agreement for the joint development of renewable energy.

<Examples of the cooperation area>

- Carbon neutrality initiatives
  - renewable energy, digital transformation, etc.
- Power system optimization
  - smart grid, distribution automation systems, etc.
- Customer experience
- Employee exchange program, corporate governance



Memorandum of Understanding with NATIF for cooperation in energy, environment-related technologies and industrial technologies

- **Outline of MOU** : NATIF, a technology development research and innovation technology promotion organization under the Ministry of Science and Technology (MOST) of Vietnam, and NEDO signed a comprehensive memorandum of understanding (MOU) on cooperation in the fields of energy and environment-related technologies and industrial technologies.
- **Purpose of MOU** :NATIF is an organization that supports private sector technology development projects and has a strong affinity with NEDO. By establishing a cooperative relationship between the two, NATIF and NEDO are expected to contribute to bilateral cooperation for decarbonization and accelerated energy transition in the country and to collaborative cooperation under the AZEC.

【Forms of cooperation】

1. exchanges of information and knowledge
2. organization of meetings, seminars, and workshops to explore cooperation
3. collaboration to identify potential opportunities for investment, technology collaboration, and/or technology deployments, and/or innovation projects between Vietnamese and Japanese companies
4. supporting projects and innovation programs to develop new, advanced and high-tech technologies in the areas of mutual interest between Vietnamese and Japanese companies
5. other areas of cooperation that may be agreed upon by the Participants

Scheme