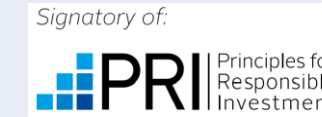

NEDO Demonstration Project in Moldova

Methane Fermentation System JCM Project for Utilization of Waste-to-Energy at Ethanol Brewery Plant in Moldova

(NEDO JCM Pre-demonstration survey, adopted in FY2024)

Nagayuki KURITA, Managing Partner
SDG Impact Japan

Overview of SDG Impact Japan Inc.



インパクト志向金融宣言
Japan Impact-driven Financing Initiative



Company Profile

Established: January 2021

Capital: 100 million yen

Shareholders: founding members, employees, strategic partners



Management Board



Mamoru Taniya
Chairperson
Angel investor (Lifenet Insurance, Campfire, Renova, etc.)
Asuka Asset Management/Mercuria Investments
Solomon Brothers Asia Pacific Debt Investment Managing Director



Mari Kogiso
Co-CEO
Fast Retailing, Head of Diversity Affairs
Multilateral Investment Guarantee Agency (MIGA), Tokyo Office
Representative
World Bank



Tadashi Maeda
External Board Member
Chairman of the Board of Directors of the Japan Bank
for International Cooperation.

Business overview

Sustainability fund

Formation and management promotion of high-growth sustainability fund strategies

- Achieving and pursuing both impact and financial returns
- Providing and designing frameworks for ESG and impact investments
- Discovering businesses that lead to incubation

Sustainability Business incubation

Hands-on business incubation and business development for promising sustainable businesses

- Support for business expansion through joint ventures with businesses, in-house business development, and collaboration with partner companies
- Collaboration with promising companies under venture capital

1

Venture Capital

AgFunder SIJ Impact Fund
(Agritech/Foodtech VC: Global)

Icehouse Ventures Sustainable Tech Fund
(Sustainable Tech/Circular Economy Tech: NZ)

Gender/Healthcare Tech Fund
(Japan/Global - Launching)

2

Listed Equity Impact Investing

NextGen ESG Japan
(Listed Equity ESG Fund: Japanese Stocks)

3

Decarbonization and carbon credit

Decarbonization Infrastructure development for Emerging Countries
(Renewable Energy/JCM)

Nature Commitment Fund
(Nature-based/Voluntary/JCM)

Project Development and Carbon Credit Creation

4

SaaS

Sustainability/ESG Scoring SaaS 'RIMM'

About New Energy and Industrial Technology Development Organization – NEDO



What is NEDO?

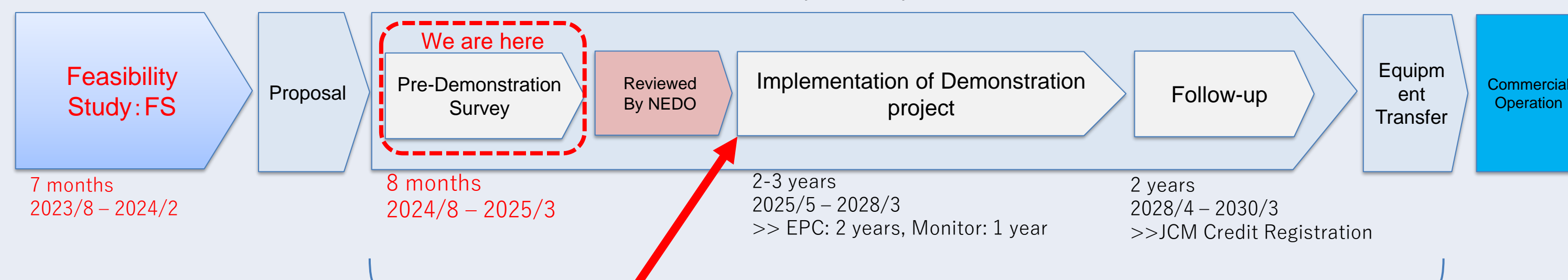
- NEDO is a national research and development agency that creates innovation by promoting technological development necessary for realization of a sustainable society.
- NEDO acts as **an innovation accelerator** to contribute to the resolution of social issues by developing and demonstrating high-risk innovative technologies having practical application
- NEDO actively contributes to **stable energy supply** and the **resolution of global environmental problems** by promoting both energy conservation and industrial technology development through international projects and research
- NEDO International demonstration projects aim to utilize Japan's technologies for decarbonization and energy transition overseas. Such demonstration projects are currently implemented or planned around the world **including Moldova**.

Objective of the NEDO JCM Demonstration Project

- Promote and expand the use of Japan's advanced low-carbon technologies and systems
- Demonstrate the effectiveness of Japanese technology in addressing technical challenges in partner countries
- Quantify greenhouse gas emission reductions and absorption through the JCM, and obtain JCM credits

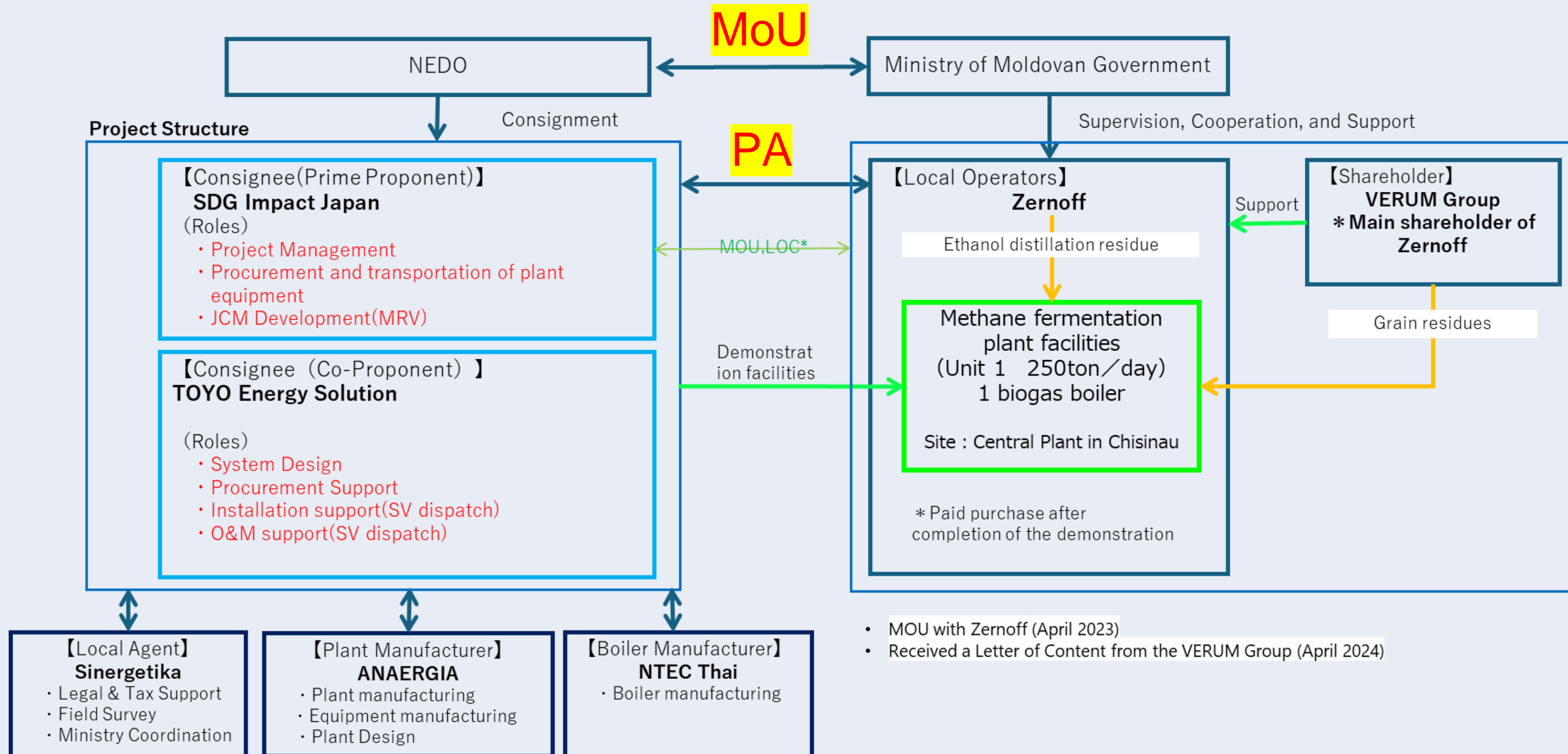


NEDO JCM Demonstration Project: Project Flow



Subject to further review and approval by NEDO after Pre-demonstration survey (Support from Partner countries are crucial to move JCM demonstration project)

Implementation Structure of JCM Demonstration Project



Biogas Project from Grain Residue

Project Scale	Estimated credit amount	Treatment capacity
24M m3	6,687 ton/y	250 ton/day

Project summary

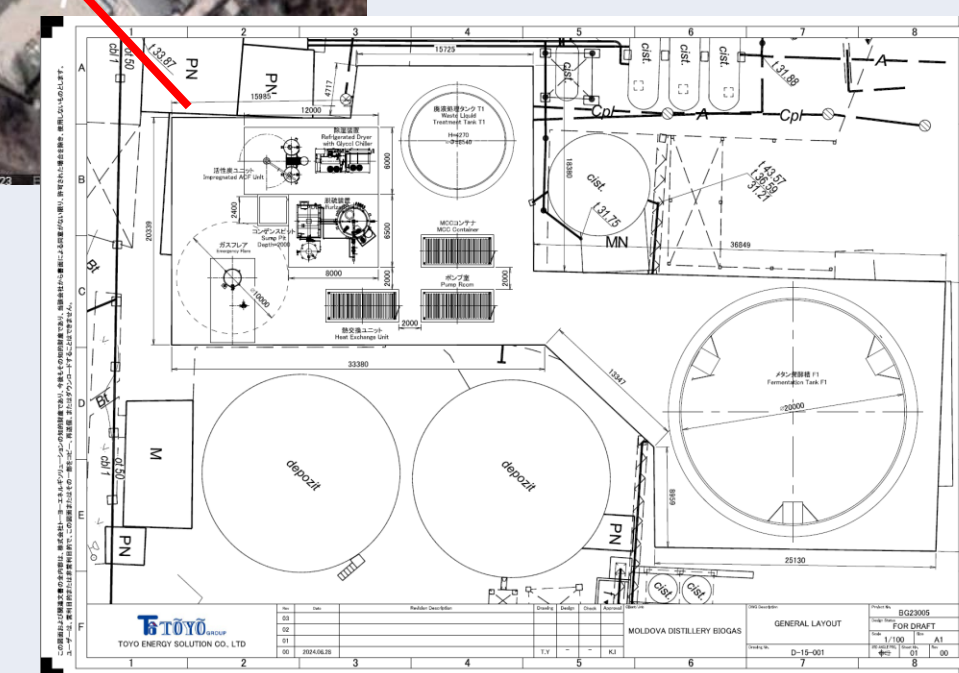
- Introduction of a biogas plant within Zernoff's ethanol distillery facilities to ferment the grain residue generated from the distillation process
- Use of the generated biogas as a heat source to replace the natural gas used in the ethanol distillation process

About Zernoff

- Operates throughout the value chain in Moldova's agricultural conglomerate, from grain production to storage, export, and processing
- Holds 70% of the country's ethanol market.
- Exports the produced ethanol to neighbouring countries for medical and beverage use.

Zernoff Central Plant Overview

- **Ethanol Production:** 100,000 litres/day.
- **Residue Generated:** 850 to 950 tons/day (average 900 tons/day) from the distillation process.
- **Residue Characteristics:** 96% liquid, requiring drying and solidification.
- **Biogas plant location:** integrated to the existing factory site



Demonstration project overview(under planning)

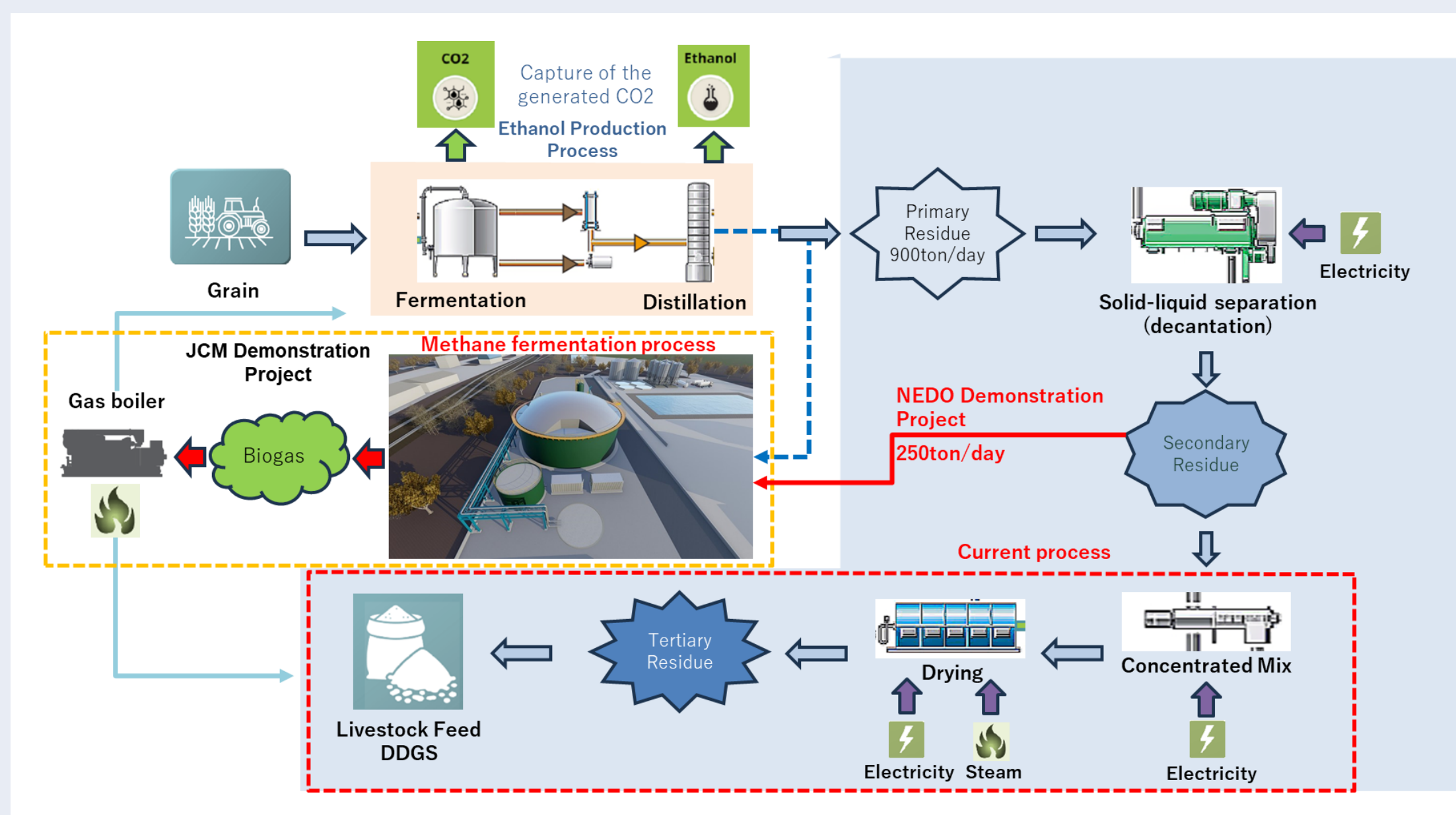
Current Waste Treatment & Energy Consumption(Red Dashed Line)

- **Heat Demand:** Large amount of heat required for drying residue.
- **Natural Gas Consumption:** High consumption, equivalent to ~1% of Moldova's total natural gas imports.
- **Management Issue:** High fossil fuel usage impacts both economic efficiency and social responsibility.

Demonstration Project(Yellow Dashed Line)

- **Residue Treatment:** Convert 250 tons/day of ethanol distillation residue into biogas via methane fermentation.
- **Biogas Utilization:** Use biogas as fuel in a boiler to generate steam, which is then supplied back to the plant.
- The steam generated by the demonstration project will be estimated to cover **13%** of the above used in the ethanol production process in the plant.

Current Waste Treatment Process and future JCM Demonstration Project at Ethanol Brewery Plant



Technical Challenges	Solutions
Establishing a system compatible with Moldova's climate and significant temperature fluctuations	<ul style="list-style-type: none">• Introduce two heat exchangers to maintain the optimal temperature of the methane fermentation tank (40° C).• Use a custom design to efficiently stir the digester liquid in the fermentation tank.• Implement a control system to ensure continuous optimal control.
Developing a system capable of processing various organic wastes	<ul style="list-style-type: none">• Utilize Toyo Energy Solutions' expertise in handling multiple feedstocks to develop an optimal mixed fermentation recipe. *Plan to mix ethanol residue with one type of grain residue (assumed to be sorghum).
Creating a highly efficient system utilizing existing facilities	<ul style="list-style-type: none">• Secure adequate processing capacity within the limited space of the factory site.• Introduce a service system that allows inspection and replacement of mixers without interrupting the fermentation process.• Install high-efficiency, Japan-made biogas boilers optimized for biogas composition.

Greenhouse gas emission (GHG) reduction

GHG emission reductions are expected from the following:

- a) Reducing CNG consumption during steam generation by supplying biogas generated by methane fermentation to a steam boiler;
- b) Reducing energy consumption (electricity, CNG) by reducing the amount of ethanol distillation residue that needs to be dried by feeding the ethanol distillation residue to the methane fermentation system;
- c) Avoiding methane emissions that naturally occur when ethanol distillation residue is left unattended.

	Demonstration Project (250ton/day Treatment)	Next Project (650ton/day Treatment)
GHG emission reduction [t CO ₂ /year]	6,687	23,001
Reference emission [t CO ₂ /year]	6,965	23,724
Project emission [t CO ₂ /year]	278	723

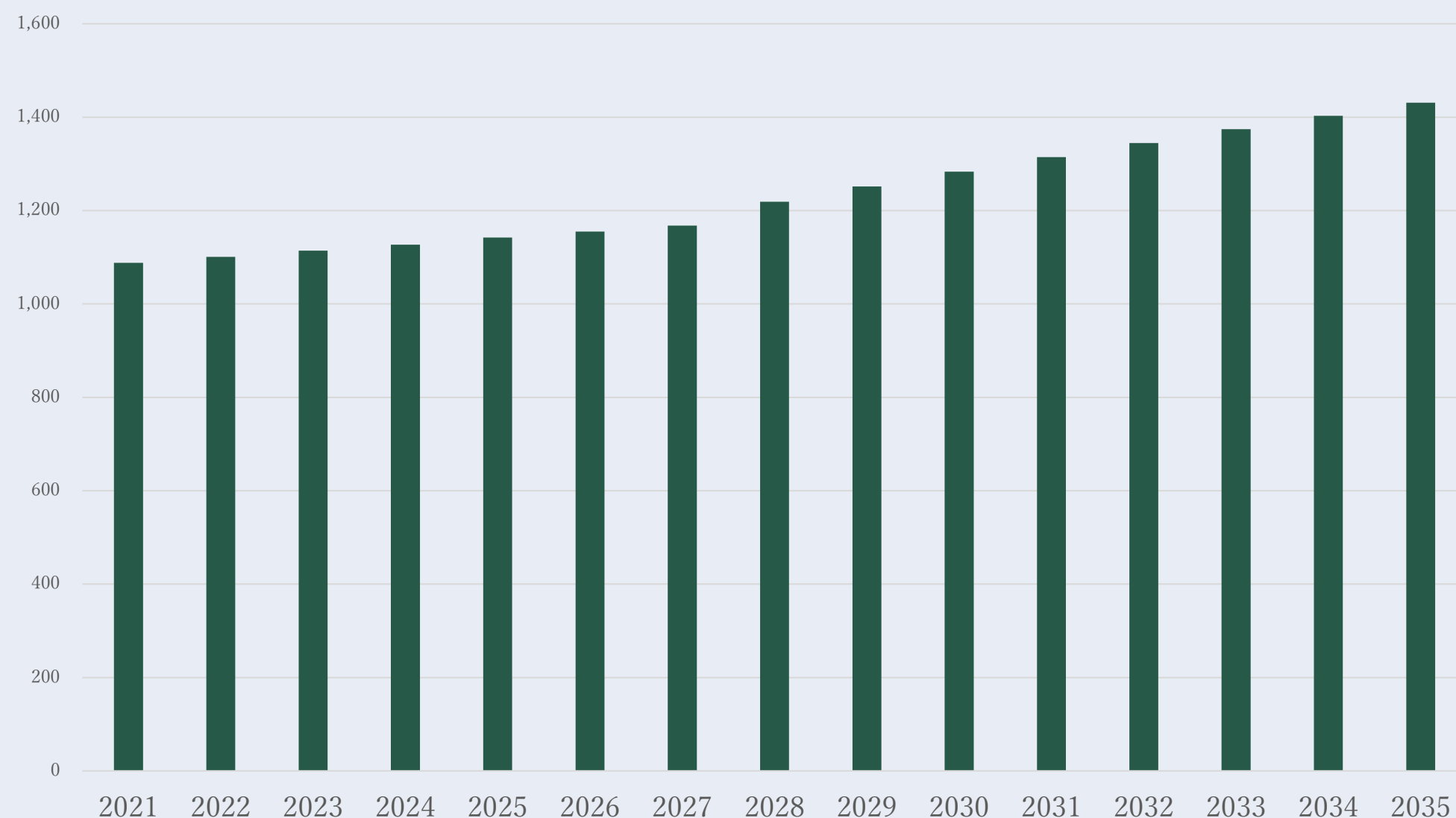
GHG emission reduction by Full Scale Project: 29,688 tCO₂/year

Moldova potential and project expansion (animal waste, human waste)

Diffusion Stage – Zernoff Central Plant

- Objective: Treat the remaining 650 tons/day of ethanol distillation residue not processed in the demonstration project.
- Plan to use the JCM methodology from the demonstration project to JCM credits.

Diffusion Stage – Moldova

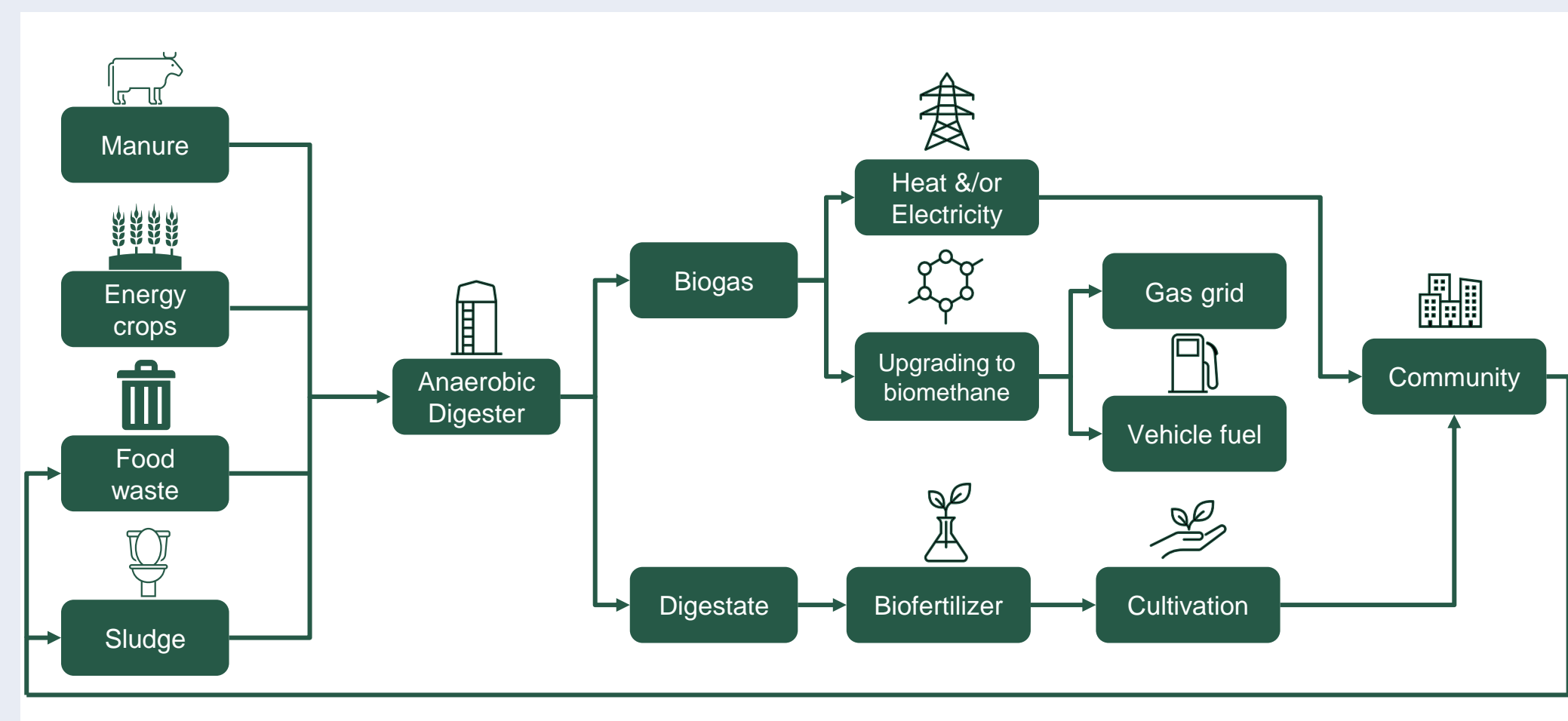


Republic of Moldova General waste generation forecast (2021-2035, thousand tons/year)
OECD "Waste - Municipal waste: generation and treatment"

Renewable Energy Potential in Moldova

Technology	Technical Potential 2030
Wind	20.9GW
Solar PV	4.6GW
Biomass	0.9GW (Current: 6.3MW)
Hydropower	0.8GW

German Energy Agency



3 times onsite visits planned in FY 2024

Visit	Content
1st field survey – 2024/9/23~9/28	Site inspection with Zernoff and the engineering/manufacturing company, determination of the project plan, project presentation to the Moldovan government and the JCM seminar, progress report to the Japanese embassy.
2nd field survey – The beginning of December 2024	Status confirmation for the permits and licenses, basic design discussions with Zernoff, MoU discussions with the Moldovan government, PA discussions with Zernoff
3rd field survey – Second half of January 2025	Survey content presentation to Zernoff and the Moldovan government, basic design discussions, confirmation of the upcoming business schedule, status confirmation for the permits and licenses, finalization of the MoU proposal

Main Tasks of the Pre-Demonstration Survey

- Basic design and project implementation cost calculation
- Identification of required licenses and permissions for project implementation
- Preparation of draft Project Agreement and MoU
- Research on customs duties, taxes, etc.
- Confirmation of roles and responsibilities between the Japanese and Moldovan sides for project implementation