

## Terms of Reference

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is an international cooperation enterprise for sustainable development with worldwide operations on behalf of the German Government. Presently, GIZ Philippines offers a qualified student an internship for:

### **Internship for Circular Economy and Livestock Waste Analysis**

to support the project implementation of the EU-PH Green Economy Partnership Demonstration Project on a Pre-feasibility Study for Livestock Waste Treatment in the Farmer Cooperative Scale by conducting laboratory analysis of livestock waste in cooperation with experts from Mapua University and German Biomass Research Center (DBFZ)

#### **Project background:**

Funded by a P3.67 billion (€60 million) grant from the European Union (EU), the EU-PH Green Economy Partnership is part of EU's Global Gateway initiative – the European strategy engaging with partners globally and promoting investments around shared priorities such as the transition to a green economy. The Policy and Alliances component of the programme – co-funded with a €12 million grant from the European Union and a €1 million contribution from the International Climate Initiative of the German Federal Ministry for the Environment, Climate Action, Nature Conservation, and Nuclear Safety and implemented by GIZ and DENR-Environmental Management Bureau – supports policy development and fosters strong partnerships.

One of the outputs of the programme is the implementation of demonstration projects which shows Circular Economy initiatives on the ground. One of which is a pre-feasibility study on livestock waste treatment solutions in the farmer cooperative scale of Batangas Province. Swine waste will be tested for Biomethane Potential (BMP) along with co-substrates such as water hyacinth. This is in cooperation with the German Biomass Research Center (DBFZ) and Mapua University in which the BMP equipment is located.

#### **Main Role:**

The intern will directly support the livestock waste analysis in all experimental, analytical, and documentation activities related to the conduct of Biomethane Potential (BMP) analysis using both the Yieldmaster-BlueSens automated BMP system and manual batch test setup in Mapua university. The intern is expected to ensure smooth laboratory operations, accurate data recording, and adherence to safety and quality protocols. The intern is also expected to support the project by making graphic layouts of the knowledge products from the demonstration project which will be used on stakeholder presentations.

#### **Reporting Relationship:**

The intern directly reports to the EU-PH Green Economy Partnership Project Team Leader for the Policy and Alliances component, while his/her day-to-day tasks are overseen by the Advisor for

Organic Waste Demonstration Projects and Coordination with constant coordination with Biogas experts in Mapua University and colleagues from the German Biomass Research Center (DBFZ). S/He holds office in Mapua University with constant reporting in GIZ Manila and Quezon City Offices. S/He may be required to assist in field visits to support specific works and events, especially on photo documentation, and production of graphic layouts for the demonstration project outputs.

In carrying out his/her role, the intern performs the following major functions/duties:

### **A. Responsibilities**

- Supporting the EU-PH Green Economy Partnership in laboratory analysis of livestock waste along with Mapua University and DBFZ experts for the determination of Biomethane Potential of swine waste and water hyacinth.
- The intern will support pilot initiatives, workshops, and events that involve project partners and stakeholders, including technical and photo documentation, and will be involved in the production of communication and knowledge materials for the livestock waste demonstration project.
- Support desk research for biomass related information, if needed.

### **B. Tasks**

The intern is expected to perform the following tasks:

#### **Preparation and Characterization of Inoculum and Substrate**

1. **Inoculum Preparation**
  - Assist the main researcher in the incubation and degassing of inoculum for 5 – 7 days.
2. **Substrate Pre-treatment**
  - Aid in the preparation of substrate through size reduction, homogenization, and conditioning.
  - Support pre-treatment steps (mechanical, chemical, or thermal), as defined by the experimental plan.
  - Record weights, treatment conditions, and observations under the supervision of the main researcher.
3. **Total Solid (TS) Determination**
  - Assist in oven-drying samples at 105 °C to determine total solids content.
  - Perform weighing before and after drying.
4. **Volatile Solids (VS) Determination**
  - Help in conducting furnace ashing at 550 °C for VS determination.
  - Record data.

#### **B. Assist in the Chemical Analysis of Inoculum and Substrate:**

1. Ammonia ( $\text{NH}_4^+$ ) Analysis
2. pH Measurement
3. Kjeldahl Nitrogen (Total N) Analysis
4. Heavy Metal Analysis (Pb, Cd, Cu, Zn, Ni, Cr)

#### **C. Biochemical Methane Potential (BMP) Testing**

##### **1. Automated BMP Test (Yieldmaster – BlueSens System)**

- Assist the main researcher in setting up three (3) 1-L batch reactors (~800 mL working volume).

- Help prepare inoculum-substrate mixtures based on the prescribed inoculum-to-substrate ratio (ISR) following the VDI 4360 standard protocols.
- Conduct leak tests, ensure connections are secure, and verify system operation prior to startup.
- Monitor temperature, gas flow, and pressure during the 25–30 day continuous run.
- Record daily observations and assist in downloading and organizing data from the BlueSens software.
- Participate in cleaning, disinfection, and storage of reactors and accessories after completion.

## 2. Manual Batch Test (Water Displacement with CO<sub>2</sub> Absorption)

- Assist in preparing 1-L reactors (~800 mL working volume) and assembling the water displacement system.
- Support preparation of CO<sub>2</sub> absorption bottles (3 M NaOH in 500 mL media bottles).
- Measure and document gas volume displacement daily in coordination with the main researcher.
- Ensure consistent operating conditions and perform troubleshooting when required.
- Clean all glassware and equipment after use.

## D. Laboratory Maintenance, Documentation, and Inventory

- Assist in maintaining cleanliness and orderliness of the laboratory and all experimental workspaces.

## E. Safety, Quality Assurance, and Compliance

- Observe all laboratory safety guidelines and assist in ensuring safe handling of chemicals, biological materials, and pressurized systems.
- Wear proper personal protective equipment (lab coat, gloves, goggles) at all times.
- Immediately report any incidents, leaks, or equipment malfunctions to the main researcher or laboratory supervisor.
- Participate in proper segregation, labeling, and disposal of laboratory waste following institutional protocols.

## C. Required qualifications, competences and experience

### Qualifications

- Advanced studies (best to be performed during the last semester of study enrolment) that aim to complete requirements for BSc, MA /MSc or MBA degree in a certified institution in the fields of agricultural and biosystems, environmental or chemical engineering, communications, natural resource management, environmental management, economy or biogas resource management, or related fields.
- Desirable: Based at Mapua University, has a strong interest or some experience or exposure in working with EU, GIZ, or other international or regional development partners. Involvement and understanding of principles of biomass, biogas, circular economy, recycling, and waste management, as well as the Sustainable Development Agenda of the United Nations.
- Great to have: Basic knowledge in graphic layout tools, such as Canva, and can perform basic photo documentation with little to no supervision.

### Other knowledge, additional competences

- Ability to work in an intercultural environment,
- Excellent interpersonal skills, ability to work in a multicultural team, social competence,
- Readiness to travel within the Philippines,

---

- An asset: digital skills in graphic layout, basic knowledge on solid waste management program;
- Fluency in English and Filipino (written and spoken) is required; and/or German language is an asset.

**Duty Station:** Mapua University, Intramuros, Manila

**Target joining date:** 15 February 2026

**Length of internship program:** up to 5 months

**Direct Supervisor:** EU-PH Green Economy Partnership Team Leader for Policy and Alliances Component

Please send you application to **Engr. Adrian Daniel Pantano**, Advisor for Organic Waste Demonstration Projects and Coordination ( [adrian.pantano@giz.de](mailto:adrian.pantano@giz.de) )