

● Terms of Reference for Black Soldier Fly (BSF) Waste Treatment Technology Service Provider (DKI Jakarta, Indonesia)

IKI Ambitious City Promises project
As of 06 November 2020

1. About the Ambitious City Promises (ACP) Project

The Ambitious City Promises: Commitments for low-carbon urban development in Southeast Asian large cities is a 3.5-year international project being implemented by ICLEI – Local Governments for Sustainability with support from the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU).

The project aims to support selected large cities in Indonesia, the Philippines and Vietnam to establish strong greenhouse gas (GHG) reduction commitments, local climate action plans directed by concrete targets, enhanced multi-stakeholder engagement and integrated strategies. “City Promises” (city’s Local Climate Change Action Plan) shall be developed in three model cities and their implementation shall be outlined and initiated. Throughout the project period, each local government will design locally-appropriate targets and action plans on the basis of their development framework and priorities.

In Indonesia, the project works with DKI Jakarta, Tangerang, and Bekasi¹. DKI Jakarta government is committed to reducing its 30% GHG emission reduction target from business-as-usual (BAU) levels by 2030, as stated in Governor Regulation No. 131 Year 2012 on Local Action Plan for DKI Jakarta’s GHG Emission Reduction. Based on the regulation and result of a series of focus group discussions and public consultation with various stakeholders and community groups, waste is one of the priority sectors of DKI Jakarta to achieve its GHG emission reduction target.

DKI Jakarta faces challenges of increasing waste volume and waste management. In 2017, DKI Jakarta generated about 7,165 tons of waste per day; 6,872.18 tons per day is transported to the final disposal site in Bantar Gebang located in Bekasi City. However, the waste in this final disposal site is mostly unmanaged and it is foreseen that the capacity of the landfill will be exhausted in about three years. There are 292.25 tons of waste per day which are not transported to the landfill site. From these, only 9-10% are managed through composting and recycling processes (Central Bureau of Statistics, 2018). Based on this data, effective waste management at source is important in the overall strategy of DKI Jakarta in significantly reducing its waste generation and disposal including its associated costs. Furthermore, DKI Jakarta seeks to implement waste management strategies that also deliver economic, social, and environmental co-benefits driven by the active engagement of communities.

Therefore, through the ACP project, the Provincial Government of DKI Jakarta and ICLEI seeks to implement a pilot project on community-based waste management to demonstrate a solution to address the current waste management challenges and to contribute to the achievement of GHG reduction targets of DKI Jakarta. In particular, the pilot project aims to implement a local and environment-friendly technology in partnership with a local community. The pilot project also

¹For the purposes of this ToR, the expert will only work with Jakarta

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aims to demonstrate the circular economy model by deploying a decentralized community-based waste management system in DKI Jakarta. Hence, it can offer an alternative and additional source of income for the beneficiary community, while raising awareness among the community on community-based waste management. The communities will be the main actors in the implementation together with staff from Environment Agency of DKI Jakarta (DLH), so it is expected that the system design is adjusted accordingly.

2. Terms of Reference for the Service Provider of Black Soldier Fly (BSF) Waste Treatment Technology

The project requires the services of a BSF waste treatment technology service provider to undertake detailed engineering design, procurement of unit components and other materials, installation, testing, commissioning, and capacity building for Environment Agency of DKI Jakarta (DLH) staff and community members of Rawa Sari (Address: Jl Rawasari Selatan, Kelurahan Cempaka Putih Timur, Kecamatan Cempaka Putih, Central Jakarta) on the operationalization and maintenance of a BSF waste treatment system with a minimum treatment capacity of 1 ton/day of organic waste which dominated by food waste from household, restaurant and traditional market activity.

2.1. Scope of Work

The following activities will need to be undertaken to help meet the objectives of the project:

Detailed engineering design	<ul style="list-style-type: none"> ● Conduct on-site assessment to inform the design of the BSF waste treatment system to be implemented in the community. ● The detailed engineering design as well as the calculation of the system for the provision of a suitable BSF waste treatment system that reflect the results of the on-site assessment and the viability report prepared by the CBSWM technology expert of the project. The engineering documents shall be submitted to ICLEI and the Environment Agency for review and approval prior to actual implementation.
Procurement, construction and installation of the BSF waste treatment system	<ul style="list-style-type: none"> ● Upon receiving the approval of the submitted detailed design of the BSF system, the service provider shall proceed with the procurement of the individual unit components and installation of the entire BSF system. ● After successfully completing the installation, the service provider shall submit a progress report to ICLEI and the Environment Agency which will contain the following minimum information: <ul style="list-style-type: none"> ○ Layout of the installed BSF waste treatment system.

	<ul style="list-style-type: none"> ○ Diagram and description of each process and operations of the BSF waste treatment system (breeding unit, feedstock pre-processing unit, waste treatment unit, harvesting unit, and post-treatment unit). ○ Inventory and description of tools, equipment, and materials that were actually used in the installation.
Testing and commissioning	<ul style="list-style-type: none"> ● After the successful installation of the BSF waste treatment system, the service provider shall perform a three-month close monitoring period to ensure that all unit components and the overall BSF waste treatment system is functioning well and operating at optimum capacity. ● At the end of the monitoring period, the service provider shall submit a monitoring report to ICLEI and the Environment Agency which will contain the following minimum information: <ul style="list-style-type: none"> ○ Quantity and quality of feedstock used in the system. Quantity refers to the amount of feedstock while quality refers to the moisture content and pH level of the feedstock; ○ Description of operational systems and process parameters including input-output value, temperature, and humidity for each process and operation of the BSF waste treatment system (breeding unit, feedstock pre-processing unit, waste treatment unit, harvesting unit, and post-treatment unit); ○ Quantity of larvae pre-pupae and residue produced (end-product); ○ Quality of BSF waste treatment system end-products. In this case, the service provider shall provide results of a laboratory analysis of the system's end-product; ○ Ambient air quality including odor within the immediate surrounding of the BSF waste treatment system compound; and ○ Calculation of costs associated to the operation of the system. ● The service provider will assume liability for a 1-year performance guarantee. ● The service provider also assumes liability for the manufacturer warranties of the respective system components/parts which shall have no less than a minimum warranty period of 1 year for each component.
Capacity building training for the	<ul style="list-style-type: none"> ● Conduct capacity building training for personnel

<p>personnel in-charge (community member and DLH staff)</p>	<p>(community members and DLH staff) in charge of maintenance of the BSF waste treatment system on the proper use and maintenance of the technology to ensure optimum efficiency.</p> <ul style="list-style-type: none"> • Develop and handover standard operating procedures (SOP) manual for the personnel in-charge. • Establish coordination mechanisms (i.e. focal persons) to facilitate on-site and remote assistance in the operation and troubleshooting of the technology after installation and testing period.
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2.2. Deliverables and Time Frames

A maximum of **five (5) months** are estimated to complete the deliverables as stated below. The engagement and consultation with ICLEI and Jakarta Provincial Government will be made both in-person and online (e.g. via e-mail). The service provider will assume liability for a 1-year performance guarantee which shall cover removal, replacement, and/or repair of the BSF waste treatment system components. The system components will have their own representative manufacturer warranties which shall maintain a minimum warranty period of 1 year.

Deliverables	Indicative timeframe
Detailed engineering design	January 2021
Procurement, construction and installation of the BSF waste treatment system	February 2021
Testing and commissioning	March – May 2021
Capacity building training for the personnel in-charge (community member and DLH staff)	February 2021

3. Payment

Yayasan ICLEI Indonesia shall pay the web developer for the services herein stipulated. Payment will be made in cheque following the schedule of tranches.

PERCENTAGE (%)	MILESTONE
25%	Detailed engineering design
25%	Procurement, construction and installation of the BSF waste treatment system
25%	Testing and commissioning
25%	Capacity building training for the personnel in-charge (community member and DLH staff)

4. Service provider eligibility

The service provider must provide evidence of:

- Prior experience in completed supply, installation, testing, commissioning, and handing over the BSF waste treatment system in a single order and operational for at least 1 year till the date of application for this project is preferred.
- Expertise in BSF waste treatment system including waste management, agriculture, insect rearing and nursery management (e.g. animal or insect nursery), among others is preferred.
- A company who has prior experience handling projects with a value above EUR 20.000 (approximately IDR 310.000.000). The company must have at least one Entomology expert (expert in insects) in the team who has a good experience in the Research and Development field.
- Use of environment-friendly, cost-effective, and genuine equipment and materials from reputable equipment/component supplies that conform with available and appropriate national and international standards.
- Safety construction solution and overall aesthetics consideration in the design and implementation.
- Excellent command in English language (written and spoken).
- Experts and staff are able and willing to travel domestically.

Additionally, advantageous criteria for prospective service providers include:

- Prior work experience with DKI Jakarta
- Flexibility and a shared vision for the project outcome are essential since the work will be undertaken in close cooperation with the project team members.

5. Proposal Requirements, and General Conditions

5.1. Proposal Requirement

The following information must be provided in the proposal:

- A detailed system design technical proposal taking into consideration the minimum requirements outlined in this Terms of Reference (ToR). The technical proposal must also provide descriptions of the system's design specifications, approaches to achieve optimal waste reduction and co-benefits of end-products while maintaining environmental safeguards (e.g. pollution prevention).
- A work plan with the corresponding timeline and financial proposal/bid duly signed by the bidder.

The following information must be provided together in the proposal:

- Letter of Interest
- Certified copy of valid business registration certificate (a company who has respective competency required for BSF waste treatment system is preferred).
- Certified copy of respective Value-added tax (VAT) registration certificate, and other relevant financial and registration documents required for the organization to operate in Indonesia.

- A portfolio of projects previously undertaken including information on the Beneficiary, Capacity of Installation, Contract Value, Date of Commencement, Date of Commissioning, Contact Details (portfolio of similar projects are preferred).
- Details of method, tools and equipment available to perform the work through considering the key indicators given in ToR.
- A detailed CV of technical personnel to be engaged for this project.
- The bidder shall produce original documents for cross verification as and when requested by ICLEI Southeast Asia.

5.2. General Conditions

The following conditions shall apply to this project contract:

- The service provider is not allowed to subcontract other firms(s) to carry out the project.
- The quotation shall be inclusive of all costs including taxes associated with the project. Furthermore, the service provider shall adhere to the following requirements:
 - The price quoted shall be fixed and firm and not subjected to any escalation or variation. The price should be inclusive of all transportation, communications, per diem, and installation charges including all required material to successfully complete tasks, duties & taxes, and insurance.
 - Bill of materials for the BSF waste treatment system as indicated should be provided along with the price bid.
 - ICLEI Southeast Asia reserves the right to add/delete to the final size and components of the BSF waste treatment system at the unit rate quoted by the bidder.
 - All or any accessories/consumables/items required for satisfactory commissioning of work shall be deemed to be included in the contract and shall be provided by the bidder without extra charges.
- It should be noted that the project is being implemented by ICLEI in partnership with DKI Jakarta. Hence instructions to bidders will be given by ICLEI Southeast Asia in consultation with DKI Jakarta. This also applies in the conduct of inspection before, during, and after construction.
- The decision on the capacity of the system to be installed will be taken in consultation with DKI Jakarta and ICLEI. The ICLEI Indonesia Office will assist in necessary permissions and access to the sites.
- Once the system is installed, commissioned, and operated successfully for 3 months, this will be handed over to Environmental Agency of DKI Jakarta as the beneficiary of the system.
- Bidders shall submit bids that satisfy every condition outlined in this Terms of Reference (ToR), failure to do so will make the tender liable to be rejected.

6. Reporting requirements and management

- The vendor will report to Mr. Selamat Daroyni, Project Officer for Ambitious City Promises (ACP) Project of Yayasan ICLEI Indonesia and the activities in Jakarta will be implemented in close collaboration with Ms. Happy Tiara Asvita, Project Assistant for Ambitious City Promises (ACP) Project of Yayasan ICLEI Indonesia, and Ms. Pamela Cabacungan, Senior Project Officer of ICLEI Southeast Asia Secretariat.
- Field Work for Installing, commissioning, testing, and operation monitoring.

- Regular meetings/calls to report on progress on specific tasks and deliverables will be required.
- Payment of the service provider will be contingent on the timely submissions of deliverables listed in this term of references.

7. Closing date for submission

Please send all materials (proposal and supporting documents) in one PDF document via email with subject “Installation of BSF Maggot System for Community-Based Waste Management (CBWM) Technology ACP” to iclei-indonesia@iclei.org no later than Monday, 7 December 2020.

For any queries related to submission, please contact Yayasan ICLEI Indonesia via the e-mail address above.

Please use English for all communications. Only successful candidates will be contacted. Due to the volume of applications being received, our office would not be able to entertain phone calls. For more information about ICLEI Southeast Asia Secretariat and ICLEI Indonesia Office, visit <http://icleiseas.org/>.

ANNEX I.

Minimum technical specifications to guide prospective bidders in developing their proposals

No	Parameters	Value or Indicators
A. General Information		
1	Location	Rawa Sari (Central Jakarta) / Coordinate -6.184825,106.873729 Address: Jl Rawasari Selatan Kelurahan Cempaka Putih Timur Kecamatan Cempaka Putih, Central Jakarta
2	Space Areal and Personnel Availability	<ul style="list-style-type: none"> 160-200 m² for Nursery (Layout location is attached in appendix A) <ul style="list-style-type: none"> Open space areal (outdoor): 6 x 7 m² Semi-outdoor areal: 9 x 18 m² (already has rooftop) There are 12 personil/staff of DLH ready to support the operation.
3	Waste input type	<ul style="list-style-type: none"> Food waste and/or wet waste (Inc.: Vegetable, fruit, fish, and meat waste) Household and Restaurant Activity Sources.
4	Waste-processing capacity	1 ton per day
5	Initial moisture content of waste	Inconsistent (0-100%)
6	Initial pH of waste	Various Value
7	Waste Size	Chunk and/or Irregular Size

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8	End Products Expectation	Co-Benefit End Product
9	Production capacity	Minimal 20% of feedstock
10	BSF Main Facility Unit	Rearing/Breeding Process Unit, Feedstock preprocessing unit, Waste Treatment Unit, End Product Harvesting Unit, and Post treatment Unit.

B. Breeding/Rearing Unit

1	Egg production	<p>Mating & Oviposition</p> <ul style="list-style-type: none"> · Temperature: 27.5 – 37.5°C. · Humidity: >60% · Light: 450-700 nm (source of light: sunshine or artificial light) · Duration: ± 1 week (2 days mating; 4 days oviposition) <p>Egg Harvesting and Hatching</p> <ul style="list-style-type: none"> · Temperature: 27.5 – 37.5°C. · Humidity: >60% · Light: Photophobic or Photophilic · Duration: 3-4 days (Eggs hatching)
2	Young larvae production	<ul style="list-style-type: none"> · Light: Photophobic or Photophilic · Temperature: 24-33°C · Duration: 4-6 days
3	Colony perpetuation	<ul style="list-style-type: none"> · Light: Photophobic or Photophilic · Temperature: 24-33°C · Humidity: > 60% · Duration: 2-3 weeks

C. Preprocessing Unit

1	Preprocessing techniques	Dewatering, Mixing different waste type, and Shredding.
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| 2 | Feedstock characteristics after preprocessing | <ul style="list-style-type: none"> · Moisture content of the waste: 60-90% (Wet Weight) · Value of pH: 5-8 · Particle size: 1-2 cm |
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D. Waste treatment Unit

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| 1 | Configuration | <ul style="list-style-type: none"> • Individual Containers or Larger Basin. • Vertical or Horizontal Stacking. |
| 2 | Larval density | 1.2 - 5 larvae per cm ² |
| 3 | Feeding rate | 20-130 per mg per larvae, day (Wet Weight) |
| 4 | Feeding regime | <ul style="list-style-type: none"> • Batch or Continuous System. • Incremental Feeding or Lump Amount Feeding |
| 5 | Waste Layer Thickness | 1 - 15 cm |
| 6 | Waste Structure | Providing sufficient structure to allow the larvae breathing inside the waste. |
| 7 | Waste load | Waste weight is loaded per m ² |
| 8 | Larval feeding period | 12-20 days |
| 9 | Inhibitor | Handling the Inhibitor (Wasps, lizards, insects, and others predator) |
| 10 | Challenges | Preventing the Anaerobic condition / liquid leakage Potential |

E. Harvesting and post treatment Unit

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| 1 | Harvesting | Manual or Automatic Machine |
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2 Sanitization Heating or other treatment

3 Post processing Larvae and waste residue handling

F. Support Facility Need

1 Water Supply Spring water sources for clean water supply (Existing depth 15 m, need old pump and its accessories replacement)

2 Electricity Supply PLN sources for power supply systems will be connected with existing power supply systems.

ANNEX II.

Layout of available space

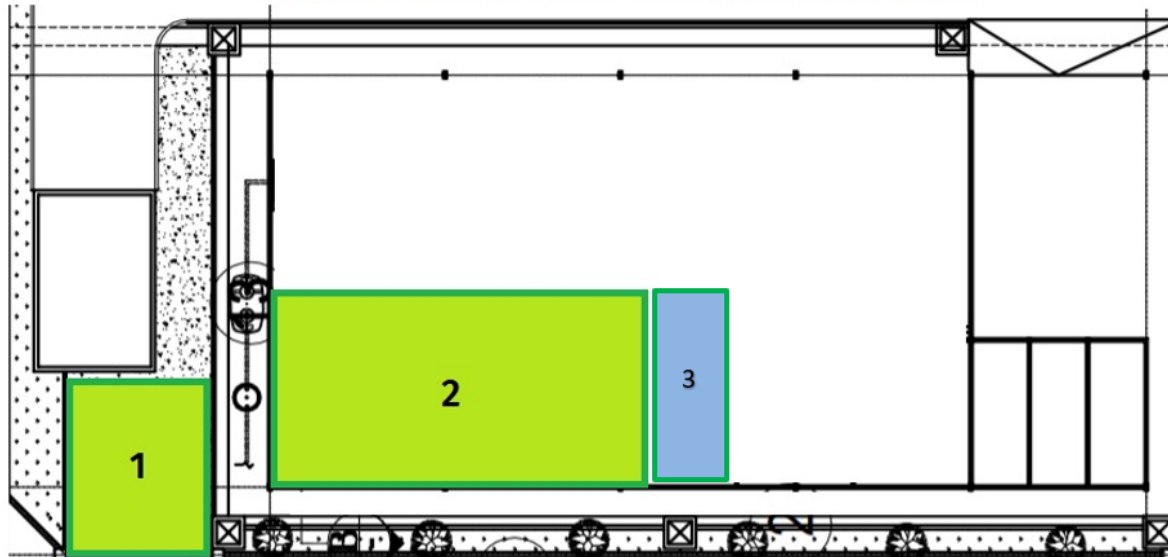


Figure 1 Layout of available space; (1) open space areal (outdoor); (2) semi outdoor; (3) Existing washing areal

1. Open Space Areal (Outdoor): 6 m x 7 m (42 m²)
2. Semi Outdoor Areal: 9m x 18m (162m²)
3. Existing Washing Areal



Figure 2 Field Documentation of the project location; open space areal/ outdoor (left), Semi outdoor space (right)