

**PPP Center Support**

PPP Center can support the WTE initiatives of LGUs through the following:





Public-Private Partnership Center

## Output 2: Enhancement f LGUs' Capacity for Planning, Evaluation, Formulation, and Supervision of WtE Project

JICA Technical Cooperation Project Final Dissemination Seminar for SWM



**MA. CYNTHIA C. HERNANDEZ**  
Undersecretary and Executive Director  
PPP Center of the Philippines

Joy Nostalg Hotel| Manila, Pasig City | December 14, 2022

**PPP Center of the Philippines**

*The PPP Center facilitates the implementation of the country's PPP Program. It serves as a central coordinating and monitoring agency for all PPP projects in the country.*



## Project preparation support via PDMF

The **Project Development and Monitoring Facility (PDMF)** is a **PHP 4.4 billion revolving fund** managed by the PPP Center to enhance the investment environment for PPP and to develop a robust pipeline of viable and well-prepared PPP infrastructure projects.

For eligible projects, the PDMF can be tapped by implementing agencies for engagement of consultants who can assist in **preparation of feasibility studies** and **other pre-investment studies**, **transaction and probity advisory services** during the bidding process until financial close is achieved, and **independent consultancy services** for the monitoring of project construction or operation.

### Project preparation and transaction advisory consultants

- Solicited mode**
  - Conduct of feasibility study
  - Project structuring
  - Preparation of tender documents
  - Management of bid process
  - Assistance until financial close
- Unsolicited mode**
  - Evaluation and negotiation of unsolicited proposals
  - Assistance in management of Swiss Challenge until financial close

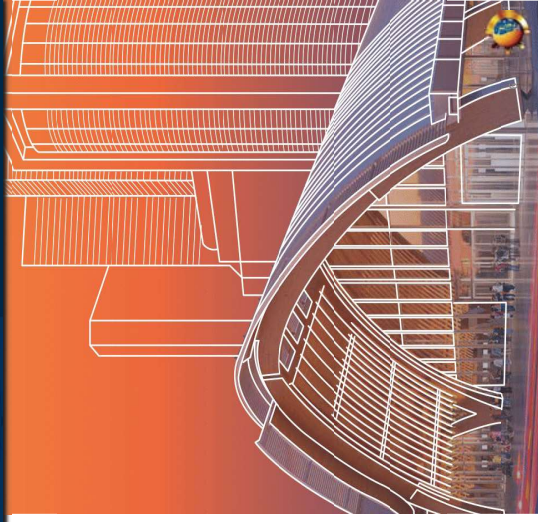
### Eligible Projects

Projects implemented through any of the following:

- Amended Build-Operate-and-Transfer (BOT) Law or R.A. 7718
- Government Joint Venture (JV) arrangements
- PPP Codes/Ordinances of Local Government Units

### Advantages of PDMF

- access to best practices and technology transfer through high-caliber international and national PPP experts;
- integrated package of support across a project's life cycle; consultant recruitment and management are handled by the PPP Center in coordination with the implementing agency;
- payment to consultants are initially paid through the PDMF and later reimbursed by the winning bidder for the project; and
- consultants are paid on a milestone basis and there are no pre-termination charges or success fee.



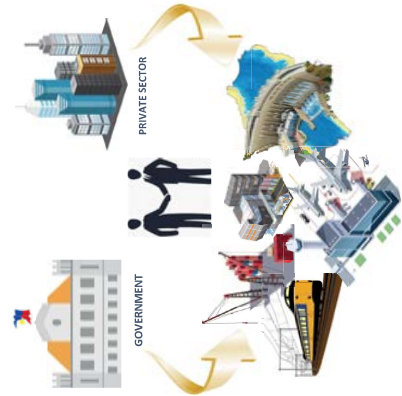
PPP Center Mandate

PPP Concepts

TCP Support to the PPP Center

SWM Projects assisted by the PPP Center

## PPP concept



- A contractual agreement between the government and a private firm targeted towards financing, designing, implementing and operating infrastructure facilities and services that were traditionally provided by the public sector
- It embodies **optimal risk allocation between the parties** – minimizing cost while realizing project developmental objectives

## PPP benefits

Integrated approach

Private sector capacity

Optimized risk allocation

Output specifications

Revenue potential

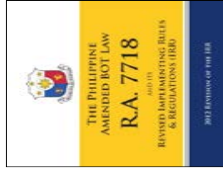
- Proper alignment of incentives (among contractor, operator and maintenance provider) in a whole-of-life approach
- Can address implementing agencies' limited absorptive capacity and government's limited fiscal space
- Allocation of risks to party who can best manage them (e.g. risk of cost and time overruns allocated to private partner)
- Government can tap private partner's expertise in a design that adheres to output specifications
- Revenue sharing with private partner
- Revenues from commercial activities

Incentive to improve service delivery and maximize value of government asset

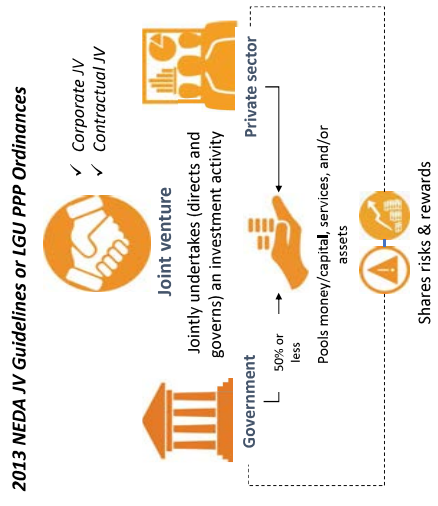
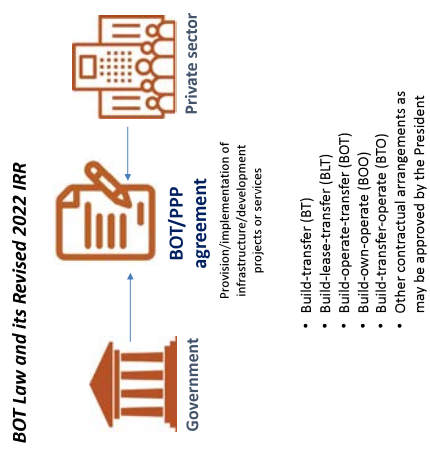


## PPP legal frameworks in the Philippines

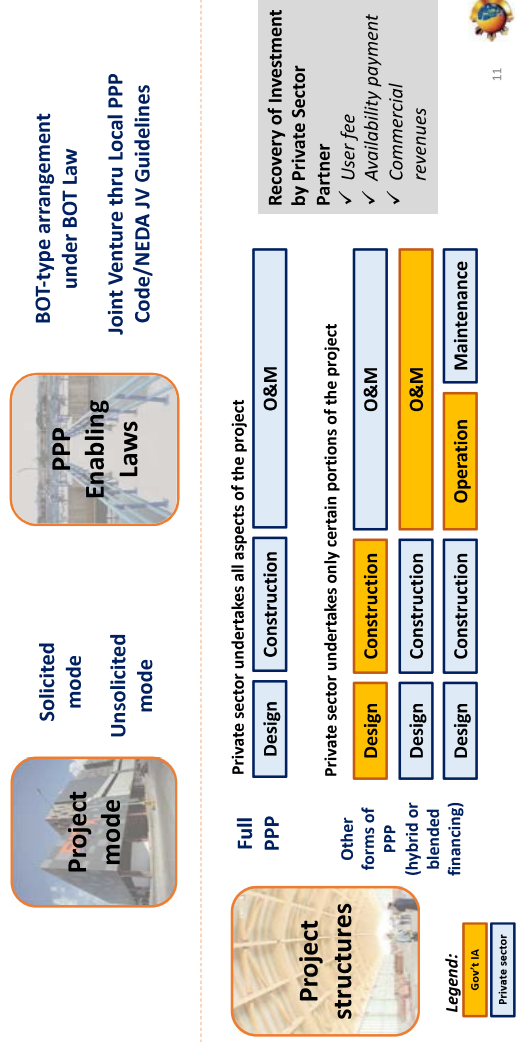
Implementing agency	RA 7718 (BOT Law)			NEDA Joint Venture (JV) Guidelines		Local PPP Code or JV Ordinances		Special Charters	
	✓	✓	✓	✗	✗	✗	✗	✗	✗
National government agencies	✓	✓	✓	✗	✗	✗	✗	✗	✗
SUCs, GOCCs, GCE, GICP, GFI, (including WDs)	✓	✓	✓	✗	✗	✗	✗	✗	✗
Local government units	✓	✓	✓	✗	✗	✗	✗	✗	✗



## Typical PPP contractual arrangements in the Philippines



## Common project modes and structures



## Project development of local SWM Projects



- LGUs may include its proposed SWM projects in its required plans such as the Comprehensive Land Use Plan (CLUP), Comprehensive Development Plan (CDP), and most especially its 10-year SWM Plan.
- A Multi-Criteria Assessment may be undertaken by the LGU to determine whether the SWM Project shall be prioritized for further preparation of its feasibility study.

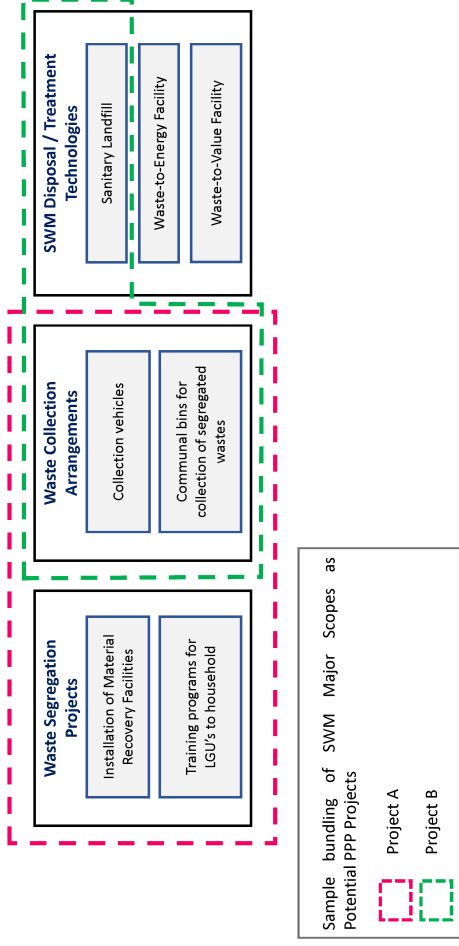


## Project development of local SWM Projects

LGUs may use the following set of guide questions to initially assess its readiness to undertake an SWM PPP Project

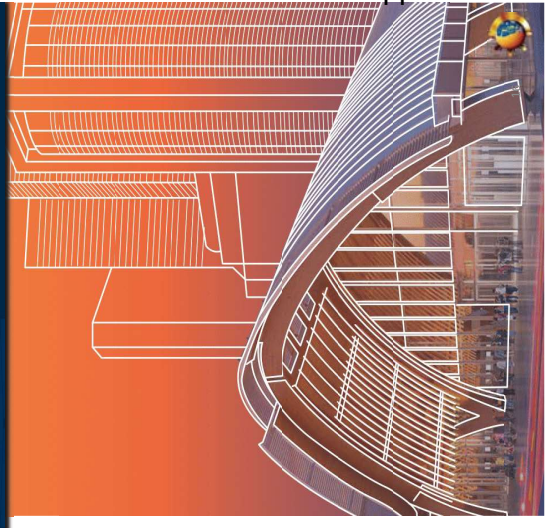
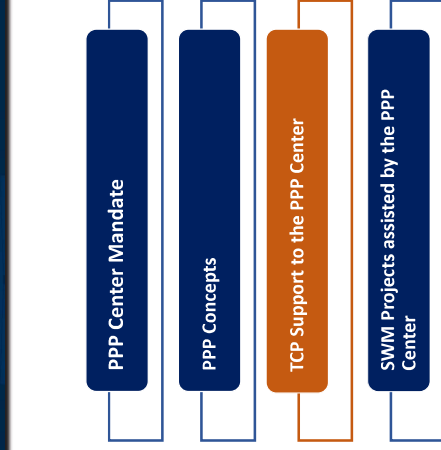
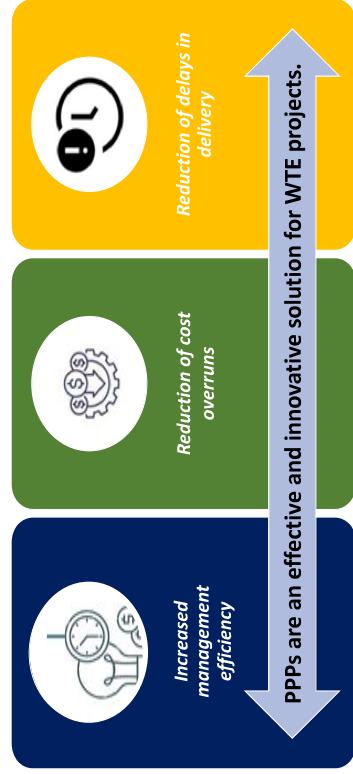
Area	Questions
Local ordinances and policies on SWM	<ul style="list-style-type: none"> <li>Does the LGU have its local PPP Code?</li> <li>Does the LGU have existing local ordinances prescribing guidelines and regulations regarding the SWM practices in the area?</li> <li>Does the LGU have an approved 10-year SWM plan? If yes, is there an update to the approved plan?</li> </ul>
Review of institutional readiness of the LGU	<ul style="list-style-type: none"> <li>Does the LGU have an existing PPP selection committee / implementing office committed to managing PPP projects?</li> <li>Has the LGU implemented successful PPP projects in the past? If none, does the LGU have the capability to do PPP or willingness to undergo PPP training?</li> <li>Does the LGU have an existing office dedicated to managing its SWM operations?</li> </ul>
Survey of existing SWM facilities	<ul style="list-style-type: none"> <li>What is the current situation for each component of the waste management chain?</li> <li>What are the existing SWM facilities owned by the LGU?</li> <li>What are the machineries and equipment dedicated to SWM operations owned by the LGU?</li> </ul>

## Potential PPP projects in the SWM sector



## Advantages of PPPs in solid waste management

In PPPs, there is a natural incentive for the private sector to ensure timely completion of the project since, **repayment commences during operations or availability of the facility.**







## TCP Support to the PPP Center

One of the activities under Output 2 is the **Support to SWM PPP Projects to Clarify Responsibility of LGUs under PPP Scheme** (Activity 2-6). The JICA Expert Team (JET) and the PPP Center commenced a partnership, through a Work Plan, from July 2021 to September 2022.

### Review of LGU PPP Projects

- JET, through the PPP Center, reviewed and provided inputs in the General Santos City Sanitary Landfill (SLF) Project and the Zamboanga City Waste to Value (WtV) Project.

### Preparation of PPP Center SWM Sectoral Strategy

- The PPP Center is currently preparing the Sectoral Strategy for SWM PPPs, and the JET provided valuable inputs.
  - Initial inter-agency consultation (QC, DOE, JICA) completed as of October 19, 2022.
  - Targeted for finalization within 1<sup>st</sup> Quarter 2023.

### Review of the Guide on Assessing Unsolicited JV Proposals for WtE Projects

- The PPP Center had previously drafted the Guide and the JET provided their review and comments.
- The draft Guide will serve as input to the PPP Center's new initiative to draft guidelines which will integrate PPP project identification in long-term SWM planning of LGUs.



### Forum on Renewable Energy and Waste-to-Energy PPPs

- The PPP Center, in partnership with the Asian Development Bank (ADB), held the forum on August 30, 2019 at the New World Hotel, Makati City. It was attended by national and local government units, private sector investors, technology providers, and financing institutions.
- Chief Advisor of the JET, Mr. Takahiro Kamishita, was one of the panelists for the PPP WtE discussion.



### Knowledge Sharing Session: WtE Best Available Technologies (BAT)/ Best Environmental Practices (BEP) Guidelines

- The PPP Center held an online KSS on November 22, 2021, attended by its employees and representatives from LGUs and other implementing agencies.
- The DENR-EMB discussed the highlights of DAO 2019-21, "Guidelines Governing WtE Facilities for the Integrated Management Of Municipal Solid Wastes", and the JET provided an overview of the BAT/BEP Guidelines.



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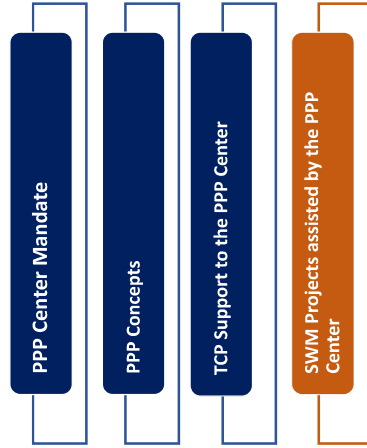
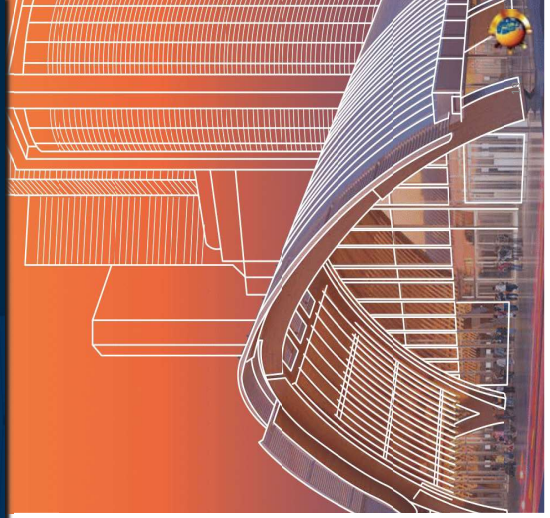
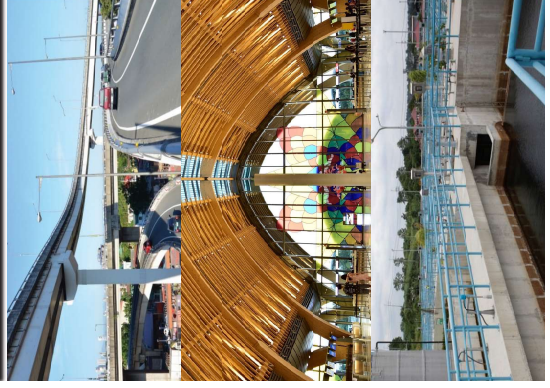
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## PPP projects



as of October 31, 2022

# 206

**PROJECTS  
IN THE PIPELINE  
PHP 3,022 Billion\***

No.	PHP (bn)
National	55
Local	22

# 77

**PROJECTS  
IN THE PIPELINE  
PHP 3,022 Billion\***

No.	PHP (bn)
National	55
Local	22

**AWARDED  
PROJECTS  
PHP 2,324 Billion**

No.	PHP (bn)
National	88
Local	118

\*Total cost does not include projects undergoing studies and with costs that are yet to be finalized

## Sectors for PPP development in the pipeline

as of October 31, 2022

### National PPPs (55)

- 38** Transportation (airport, road, rail, port, and terminal)
- 6** Health (hospital facilities and services)
- 6** Vertical infrastructure / government property development
- 3** IT system
- 1** Water supply and sanitation
- 1** Tourism

### Local PPPs (22)

- 7** Water supply and sanitation
  - 3** Vertical infrastructure / government property development
  - 2** Solid waste management
  - 2** Agriculture/Food Security
- Emerging sectors in local PPPs**
- 3** Transportation (e.g. port, road, bus rapid transport (BRT), and terminal)
  - 2** Tourism
  - 2** Renewable energy
  - 1** IT system

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For complete project information, you may visit [www.ppp.gov.ph](http://www.ppp.gov.ph)

## PPP Projects

### Under implementation

- LGU-GWMS Material Recovery Facility (MRF) Project
- Municipality of Malay Ecological Solid Waste Management Project
- Dagupan Waste-to-Energy Project
- Joint-Venture Agreement for the Puerto Princesa City Waste to Energy Project
- Tagum City Waste-to-Energy Plant Project
- Hermosa Sanitary Landfill
- Passi, Iloilo SWM Project

**General Santos Sanitary Landfill Project**  
O&M of General Santos City Sanitary Landfill (SLF) and the establishment and implementation of a waste conversion program.

**Quezon City Integrated SWM Facility (USD 460 million)**  
Construction and O&M of waste-to-energy facility (up to 3,000 MT of waste and up to 36 MWe of generated power)

- New Clark City Integrated Solid Waste Management System
- Iloilo City SWM Project
- Province of Catanduanes SWM Project

## Next steps

### Technical assistance to LGUs and other agencies for SWM PPP projects

- Provision of support and technical advice in the LGU's preparation and/or updating of SWM plans;
- Support in project exploration through the review of PPP Project Concept Notes and related documents;
- Project Preparation through development of project studies (through PDMF, in-house and other development partnerships such as the support from the Ministry of Environment, Japan (MOEJ) and Netherlands Enterprise Agency (RVO));
- Full technical support for undertaking of unsolicited proposals during evaluation, negotiation and competitive challenge; and,
- Provision of capacity building (for various PPP modules) at national and local level.

### Further enhancing legal and policy landscape for private sector participation such as PPPs in SWM

- Assistance in the formulation and review of LGU PPP Codes and related policy instruments;
- Updating of PPP Act;
- Implementation of Revised 2022 BOT Law IRR and updated ICC Checklists and Forms (for relevant national projects).

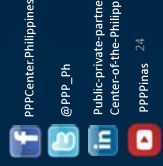


For further information, please visit:

[www.ppp.gov.ph](http://www.ppp.gov.ph)

For inquiries, kindly e-mail:

[info@ppp.gov.ph](mailto:info@ppp.gov.ph)



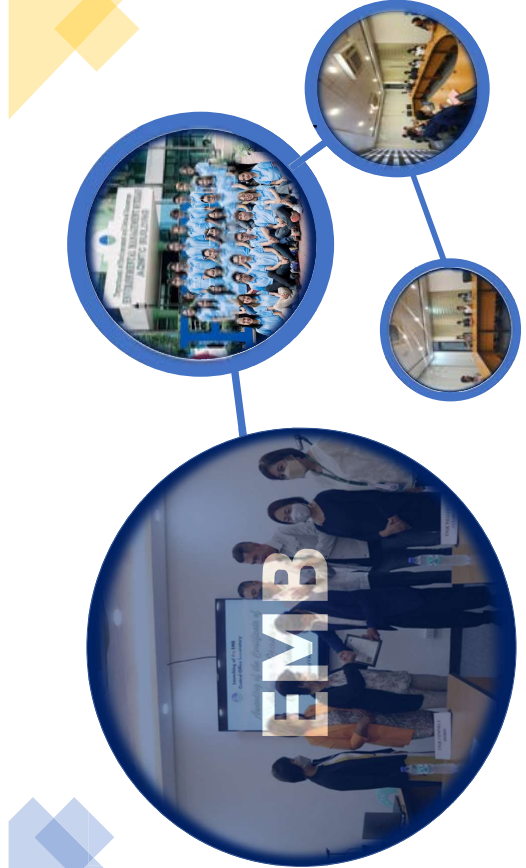
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Public-private partnership-  
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**The Project for Capacity Development  
on Improving SWM Through Advanced/  
Innovative Technologies:  
OUTPUT 3 ACTIVITIES  
AND ACCOMPLISHMENTS**

**ENVIRONMENTAL MANAGEMENT BUREAU**  
Environmental Research and Laboratory Services Division

# OUTPUT 3 ACTIVITIES



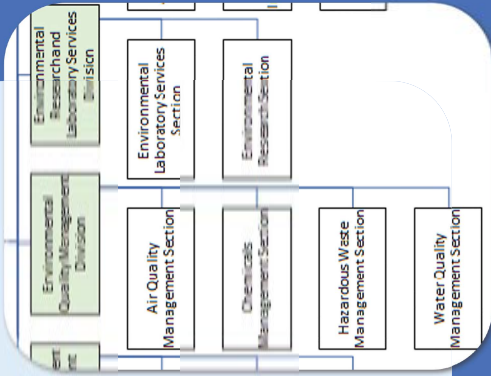




DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES  
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**ENVIRONMENTAL  
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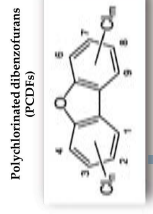
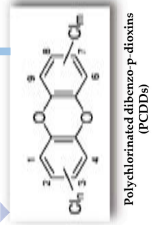
**OBJECTIVES**

- To determine the current capabilities and identify gaps for improvement
- Further capacitate the staff on dioxins and furans analysis
- Develop Standard Operating procedures for dioxins and furans analysis
- Enhance capability on sampling, analyzing, and QA/QC for Dioxins and Furans analysis

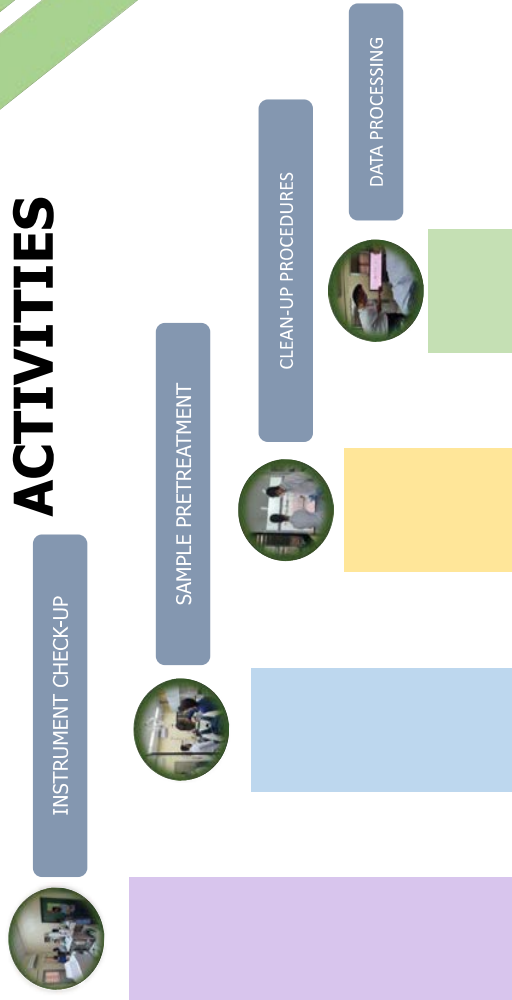


**17 priority congeners  
(7 PCDDs, 10 PCDFs)**

PCDDs	PCDFs
75 congeners	135 congeners
"Dioxins"	"Furans"
2,3,7,8-TCDD as the most toxic congener	Tend to co-occur with PCDDs



# MAJOR OUTPUT 3 ACTIVITIES



01

MAINTENANCE PROCEDURE ON THE GAS CHROMATOGRAPH WITH HIGH-RESOLUTION MS



## INSTRUMENT CHECK-UP

02

REPLACEMENT OF TRANSFER LINE AND GC COLUMN



03

MAINTENANCE PROCEDURES OF GC HRMS



## INSTRUMENT CHECK-UP

04

CLEANING OF ION SOURCE ASSEMBLY



SAMPLING MATERIALS

GLASSWARE AND APPARATUS

EQUIPMENT AND CONSUMABLES

EXTRACTION SET-UP

## SAMPLING MATERIAL PREPARATION AND SAMPLE ANALYSIS

# 01

MANUAL SOXHLET EXTRACTION



PRESSURIZED FLUID EXTRACTION



EMB Staff demonstrated the current practices of the laboratory for Dioxins and Furans analysis. JET were able to share their insights on how to improve the analytical process and control background contamination.

# 02

**EMB**  
**DEMONSTRATION**  
**EXTRACTION PROCEDURES**  
**CONCENTRATION PROCEDURES**  
**CLEAN-UP PROCEDURES**  
**INSTRUMENTATION**



JET shared tips on ways to further hasten concentration step of the analysis. EMB Staff plans to adopt these suggestions and will be included in the standard operating procedures as part of the analysis.

**EMB**  
**DEMONSTRATION**  
**EXTRACTION PROCEDURES**  
**CONCENTRATION PROCEDURES**  
**CLEAN-UP PROCEDURES**  
**INSTRUMENTATION**

# 03

HYDROCHLORIC ACID (HCl) TREATMENT FOR FLY-ASH SAMPLE



JICA EXPERT TEAM (JET) DISCUSSED HYDROCHLORIC ACID TREATMENT AS PART OF THE PRETREATMENT PROCEDURE FOR FLY ASH SAMPLES

# 01

MANUAL CLEAN-UP PROCEDURES



# 02

AUTOMATED CLEAN-UP PROCEDURES



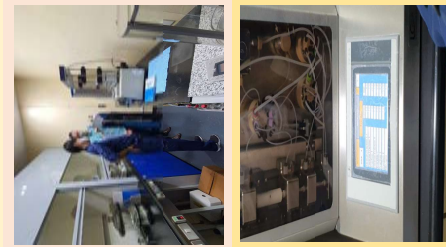
**EMB**  
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**CONCENTRATION PROCEDURES**  
**CLEAN-UP PROCEDURES**  
**INSTRUMENTATION**

**EMB**  
**DEMONSTRATION**  
**EXTRACTION PROCEDURES**  
**CONCENTRATION PROCEDURES**  
**CLEAN-UP PROCEDURES**  
**INSTRUMENTATION**



## 04 CONDUCT OF AUTOMATED CLEAN-UP PROCEDURES

EMB STAFF DEMONSTRATED THE AUTOMATED CLEAN-UP PROCESS USING THE LC TECH EQUIPMENT

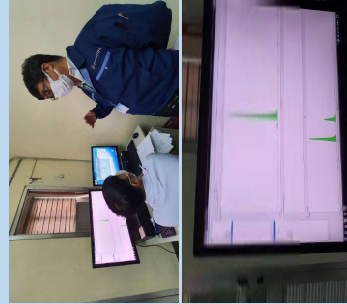


## 05 CONDUCT OF MANUAL CLEAN-UP PROCEDURES

JICA EXPERT TEAM (JET) FACILITATED THE TRAINING ON CONDUCT OF MANUAL CLEAN-UP PROCEDURES (SILICA AND CARBON CLEANUP)



## EMB DEMONSTRATION EXTRACTION PROCEDURES CONCENTRATION PROCEDURES CLEAN-UP PROCEDURES INSTRUMENTATION



JET shared important troubleshooting techniques in the operation of GC/HRMS. These techniques enhanced data processing and improved maintenance operations of the instrument.

## 01

### IMPROVEMENT OF STANDARD OPERATING PROCEDURES

	<b>TEST METHOD</b>	Document No. OLUJ TM-009
	Determination of Polychlorinated Biphenyls (PCBs), Polychlorinated Dibenzofurans (PCDFs) and Polychlorinated Biphenyls (PCBs) by High Resolution Gas Chromatography with Magnetic Sector Mass Spectrometer	Revision No. 0   Page 1 of 27 Effectivity Date: 25 November 2022

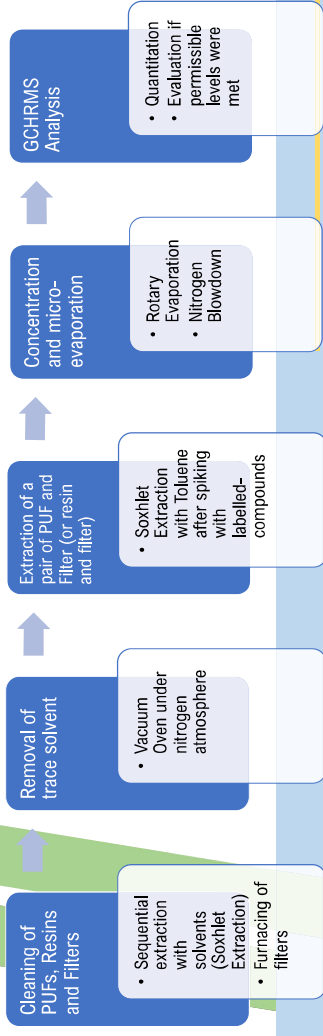
	<b>TEST METHOD</b>	Document No. OLUJ TM-013
	Determination of Polychlorinated Biphenyls (PCBs), Polychlorinated Dibenzofurans (PCDFs) by Gas-Liquid Chromatography with High Resolution Gas Chromatography with Magnetic Sector Mass Spectrometer	Revision No. 0   Page 1 of 26 Effectivity Date: 25 November 2022

## ACCOMPLISHMENTS

# ERLSD SOP Sections:

1. Principle
2. Interferences
3. Sample Storage and Preservation
4. Materials and Apparatuses
5. Equipment
6. Reagents and Standards
7. Procedure
8. Calculations
9. Reporting of Results
10. Quality Control
11. Health and Safety
12. Waste Handling and Disposal
13. Relevant Records
14. References
15. Distribution of Copies
16. Appendices

## Cleaning and Certification of Cleanliness of Sampling Materials Prior to Dispatch



Furnacings: at 400 degrees Celsius for at least five (5) hours

Extraction conditions: 16-24 hours with toluene @3-4 cycles/hour

Evaluate based on US EPA 10-09A and Method 23 requirements

- Sequential extraction with solvents (Soxhlet Extraction)
- Furnacing of filters

- Vacuum Oven under nitrogen atmosphere

- Soxhlet Extraction with Toluene after spiking with labelled-compounds

- Rotary Evaporation
- Nitrogen Blowdown

- Quantitation
- Evaluation if permissible levels were met

1. Cleaning through Soxhlet Extraction



2. Evaporation of residual solvent

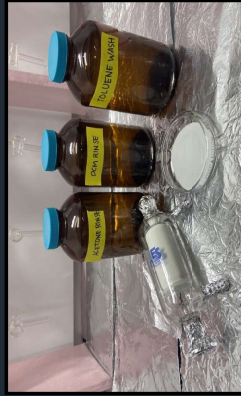


Treat representative filter/ PUF or filter/resin from the batch as sample to be analyzed for DFs

## Analysis Process for Ambient Air and Stationary Source Emissions

Notes on cleaning time: 22 hours extraction with toluene; 3 hours with acetone (for PUFs)  
8 hours with water, 22 hours with methanol, 22 hours with methylene chloride, 22 hours with toluene (for XAD-2 Resin)

## Stationary Source Emissions



XAD-2 resin, GFF, Solvent Rinses  
Reference: US EPA Method 23

## Ambient Air



PUF and cartridge

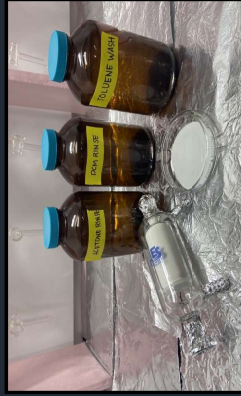
PUF and QFF  
Reference: US EPA Method TO-09A



QFF filter

PUF and QFF  
Reference: US EPA Method TO-09A

## Stationary Source Emissions



XAD-2 resin, GFF, Solvent Rinses  
Reference: US EPA Method 23

## Analysis Phase 1: Extraction of Samples

### Manual Soxhlet Extraction – for Ambient Air samples

Extraction conditions: 16-24 hours with toluene @3-4 cycles/hour

(followed by Rotary Evaporation and Solvent Exchange)



## Analysis Phase 1: Extraction of Samples

Pressurized Fluid Extraction – for stationary source emissions

Conditions: GFF and XAD-2 resin extracted with PFE using toluene (followed by Rotary Evaporation and Solvent Exchange)

Note: Solvent rinses are concentrated separately by rotary evaporation and combined with PFE extracts before solvent exchange





• Analysis Phase 2: Cleanup of Sample Extracts

Automated Cleanup (LC Tech)



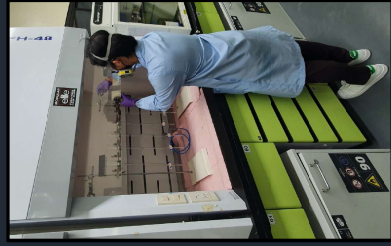
Columns used:  
Positions (1) and (2)  
are Silica gel  
columns

Positions (3) and (4)  
are Carbon Columns

Solvents:  
Toluene  
Dichloromethane  
Hexane

• Analysis Phase 2: Cleanup of Sample Extracts

Manual Cleanup (Silica and Carbon)

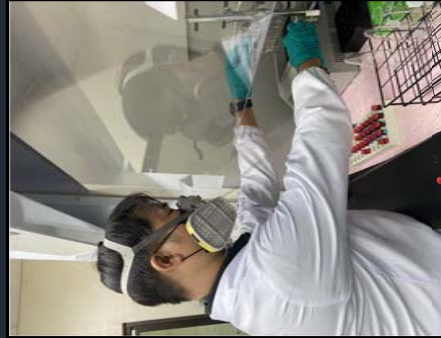


Columns used:  
Multi-layer acidic silica  
columns: 20% and 40%  
acidic silica

Carbon Column  
procured from Kanto  
Chemical Corp.

ERLSD also has Cape  
Columns and Cleanup  
techniques based on  
previous trainings

• Analysis Phase 3: Concentration and Micro-evaporation



Rotary evaporation of purified extracts

Nitrogen blowdown from conical tubes to GC vial. All transfers are facilitated with rinsing to ensure quantitative transfer.

• Analysis Phase 4: GC-HRMS Analysis



Columns used: DB-5 and ZB-Dioxins; Instrument Program was developed to meet the criteria for isomer specificity and window-defining tests as required by the reference methods. Additional qualification on peak identification (e.g., signal-to-noise ratios, relative retention time, relative response factors, etc.) are also based on the requirements of US EPA Method 23, Method 1631 and Method TO-09A.

# QA/QC REQUIREMENTS

QC TOOLS
Method Blank
Laboratory Surrogate Compound Recoveries
Field Surrogate Recoveries
Mass Resolution, Ion Abundance Ratios
Initial Calibration
Instrument Blanks
CRM analysis
Calibration Verification
Proficiency Testing

02

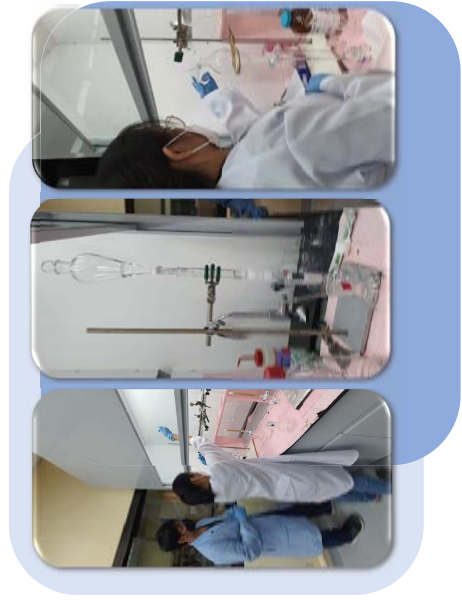
CAPABILITY IN CONDUCTING MAINTENANCE OF ION SOURCE



## ACCOMPLISHMENTS

04

TRAINED NEW STAFF IN CONDUCTING MANUAL AND AUTOMATED CLEAN-UP METHODS



## ACCOMPLISHMENTS

03

DEVELOPMENT OF GC/HRMS METHOD FOR NEW COLUMN



## ACCOMPLISHMENTS



05

DATA PROCESSING OF CHROMATOGRAM RESULTS USING DIOK 4





ACCOMPLISHMENTS

OTHER ACCOMPLISHMENTS



- 01 ESTABLISH DIRECT COMMUNICATION WITH JEOL Ltd.
- 02 PRIORITIZATION OF PARTS FOR GC/HRMS PREVENTIVE MAINTENANCE SERVICE
- 03 DEVELOPING CAPABILITY OF EMB STAFF ON METHOD CREATION FOR GC AND HRMS CONDITIONS
- 04 ENHANCE OPERATING PROCEDURES OF GC/HRMS i.e., TUNING PROCEDURES AND COLUMN REPLACEMENT
- 05 CREATED DATA PROCESSING METHOD ALIGNED WITH US EPA 1613 AND METHOD 23

WAYS FORWARD

- Monitor contamination levels in the Dioxins laboratory workrooms and enhance practices to prevent possible cross-contamination in the lab.
- Verify the viability for use of the cleanup method introduced by JET considering the acquisition of the required glassware and resources.
- Continually conduct Method Verification activities to include spiking of deaned PUFs and QFF for ambient air DF analysis.
- Complete the renovation of the three (3) additional workrooms for organic analyses in the EMB CO laboratory, one of which will be for a second GCHRMS unit.
- Include Dioxins and Furans analysis in the scope of the parameters to be applied for ISO/IEC 17025:2017 accreditation.
- Acquire a second GC-HRMS equipment to enhance efficiency of DF testing services.



THANK YOU!





## Output No. 4: Enhancement of National Government's and target LGUs' capacity to identify issues and provide suggestions/recommendations for SWM technologies other than WTE

Engr. Glory Rose Manatad  
Environmental Management Specialist  
Cebu City ENRO



## Deeper understanding of Cebu City's solid waste management

### Project commencement: March 2019

Since the commencement of the Project on March 2019, the JICA experts team provided technical assistance to Cebu City that paved the way for a better understanding of the City's solid waste management.

## Objective and Project Purpose



Improvement of Philippine's solid waste management system through the adoption of WTE and other SWM technologies

National government and target LGUs' capacity for improving solid waste management and other SWM technologies is enhanced.

## Project Outputs

Output No. 1: National government's capacity for supporting and coordinating of LGUs' WTE project is enhanced.

Output No. 2: Target LGUs' capacity for Planning, Evaluation, Formulation and Supervision of WTE project is enhanced.

Output No. 3: National government's capacity of environmental monitoring for WTE project is enhanced.

Output No. 4: National Government's and target LGUs' capacity to identify issues and provide suggestions/recommendations for other SWM technologies other than WTE is enhanced.

1. Draft BAT/BEP guideline

2. Technical standard for WTE installation and operation

3. Manual for planning, evaluation, formulation and supervision

1. Updated 10-year SWM plan that reflects the waste volume reduction target.

2. Compilation of experiences of target LGUs' WTE project in PPP scheme reported to NSWMC.

Standard Operation Procedure (SOP) for monitoring, analyzing and QA/QC of Dioxins and Furans in ambient air and source emission gas endorsed to DENR-EVB for adoption

Identified issues and recommendations /suggestions

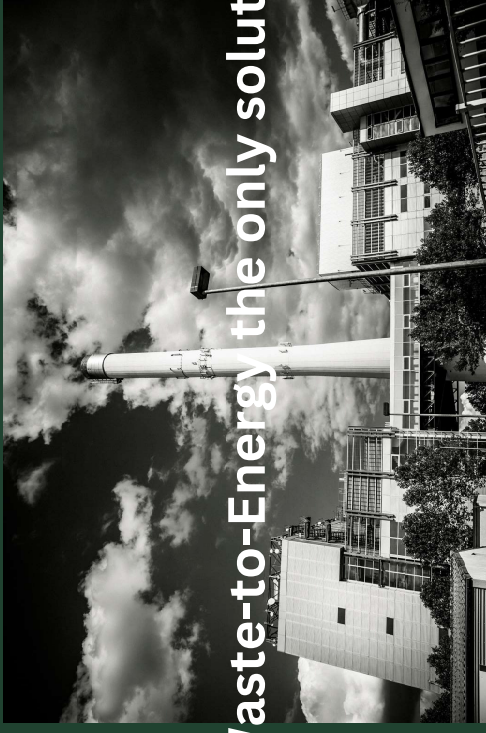
# Involvement of LGU Cebu City

Output No. 2: Target LGUs' capacity for Planning, Evaluation, Formulation and Supervision of WTE project is enhanced.

1. Updated 10 year SWM plan that reflects the waste volume reduction target.
2. Compilation of experiences of target LGUs' WTE project in PPP scheme reported to NSWMMC.

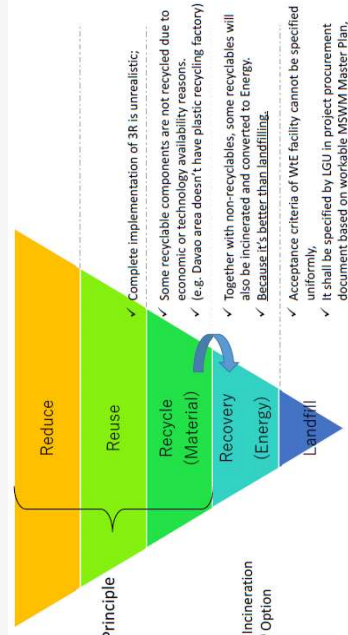
Output No. 4: National Government's and target LGUs' capacity to identify issues and provide suggestions/ recommendations for other SWM technologies other than WTE is enhanced.

Identified issues and recommendations /suggestions



## Is Waste-to-Energy the only solution?

# Waste Management Hierarchy



Source: JICA Expert Team

**SECTION 20.** Establishing Mandatory Solid Waste Diversion. — Each LGU plan shall include an implementation schedule which shows that within five (5) years after the effectivity of this Act, the LGU shall divert at least 25% of all solid waste from waste disposal facilities through re-use, recycling, and composting activities and other resource recovery activities: Provided, That the waste diversion goals shall be increased every three (3) years thereafter: Provided, further, That nothing in this Section prohibits a local government unit from implementing re-use, recycling, and composting activities designed to exceed the goal.

## Solid Waste Diversion and Segregation of Wastes should be a priority.

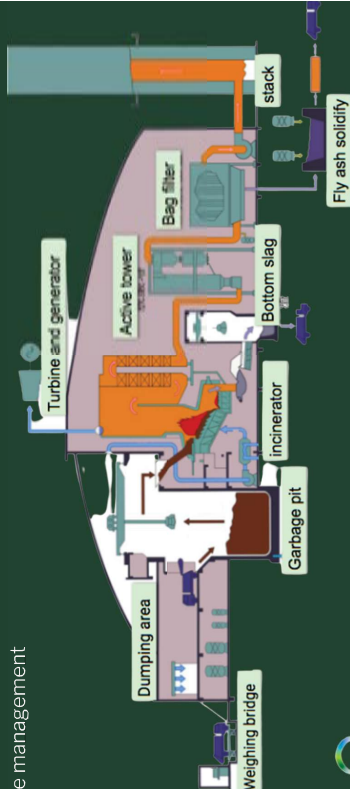
**SECTION 21.** Mandatory Segregation of Solid Wastes. — The LGUs shall evaluate alternative roles for the public and private sectors in providing collection services, type of collection system, or combination of systems, that best meet their needs: Provided, That segregation of wastes shall primarily be conducted at the source, to include household, institutional, industrial, commercial and agricultural sources: Provided, further, That wastes shall be segregated into the categories provided in Sec. 22 of this Act.



JICA Experts Team provided technical inputs which helped the JVSC in evaluating WTE proposal, placing emphasis on key considerations:

- ✓ Environmental concerns
- ✓ Leachate and sewage management
- ✓ Fly ash and dioxin
- ✓ Social acceptance

**NEW SKY  
CEBU CITY  
WASTE TO ENERGY  
PROJECT**



Mayor Mike Rama signed the Joint-Venture Agreement with New Sky for Waste-to-Energy (WTE) Facility



## The proposed WTE Project

After 43 years (1 year of permitting, 2 years of construction and 40 years of operation), the project site will be transferred to the City full of charge

Maintenance will be conducted by New Sky throughout the Contract Period. After the contract period, the WTE project will be given to the City in good working condition, free of charge (BOT)

Will promote economic activity in the area and provide possible sources of income to local residents and opportunities to MSMEs

Will be constructed at no cost to the City.



**Project benefits:**

Eliminate the need for more and more land to be used as landfills; reduce the volume of MSW by 90% of its original volume; treat and dispose of MSW more efficiently; reduce pathogen, water, soil and air pollution that comes with processing MSW; produce emissions that are harmless and meets EU standards; reduction of CO<sub>2</sub> emissions for power generation, in comparison to Coal.



## Good practices and Good technologies other than WTE

August 2022

The Project for Capacity Development on Improving Solid Waste Management through Advance/Innovative Technologies In The Republic of Philippines

As part of Output 4 of the Project, the booklet of Good Practices and Technologies Other than WTE is formulated.

The booklet is a collection of good practices in waste management in the Philippines, Japan, and other countries, and was prepared in order to provide guidance to the local government units (LGUs) in the Philippines to implement these strategies and practices for the better management of waste.



# Evaluation of Suitable Technology or Processes other than WTE



## Cost Recovery of SWM

Initiatives aligned to cost recovery, or the means by which LGUs can gather monetary gains that allow for the financial sustainability of the solid waste management activities of the LGUs.



## Collection and Transportation

Practices and technologies that ease the process of collecting different types of wastes and transporting them to the corresponding disposal sites.



## Intermediate Treatment

Waste diversion efforts that minimize wastes that would otherwise end up in landfill sites.

# Evaluation of Suitable Technology or Processes other than WTE



## Information, Education, and Communication

Initiatives aligned to cost recovery, or the means by which LGUs can gather monetary gains that allow for the financial sustainability of the solid waste management activities of the LGUs.



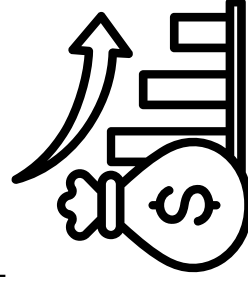
## Waste Analysis and Characterization Study

Practices and technologies that ease the process of collecting different types of wastes and transporting them to the corresponding disposal sites.



## Cost Recovery on SWM

- ✓ Charge on a waste bag designated by the LGU
- ✓ Volume-based fee system using designated garbage bags
- ✓ No Segregation-No Collection
- ✓ Sale of recyclables



## ✓ Charge on a waste bag designated by the LGU

Technical aspect	Economic aspect	Cultural aspect	Environmental aspect
Solid waste will be disposed and collected using a plastic bag regulated by the City.	It will provide income generation for the City for the charge on the waste bag, at the same time the City can regulate the collection of wastes. Non-segregated wastes may not be collected.	The residents will be encouraged to properly contain their wastes and be accountable of the waste they generate.	The initiative will prevent improper disposal of wastes. Only solid wastes contained in the designated bag will be collected.

## Cost Recovery on SWM

## ✓ Volume-based fee system using designated garbage bags

Technical aspect	Economic aspect	Cultural aspect	Environmental aspect
Volume-based fee system using designated garbage bags	Since generators are paying by volume, it provides more income to the City, compared to the current amount of garbage collection and disposal fee.	People will become more mindful of the volume of waste they generate, because they pay more if they generate more waste volume.	Waste disposal is expected to be minimized, since people will be more mindful of the volume they generate.

## Cost Recovery on SWM

- ✓ No Segregation-No Collection
- ✓ Sale of recyclables

	Technical aspect	Economic aspect	Cultural aspect	Environmental aspect
<b>Sale of recyclables</b>	Recyclable wastes is segregated from the waste stream. This initiative requires that an MRF be established and segregation must be strictly implemented.	Proceeds from the sale of recyclable wastes will provide additional income stream to the City, which can be used in solid waste management activities.	The residents will be more discipline in segregating recyclable wastes.	Disposal of recyclable wastes to the landfill can be minimized.

## Collection and Transportation



In waste management systems, the area collection-transfer-transportation plays a central role.

It cause for 60 to 80% of the total costs of waste disposal and therefore there are significant saving possibilities on improvements in its organization and implementation.



## Applicable Collection Methods

- ✓ Door-to-Door Collection
- ✓ Station collection for recyclable wastes
- ✓ Recycling Drop Off Centers
- ✓ Drop off sites for recyclable wastes and hazardous wastes
- ✓ Utilizing Transfer Station



- ✓ Door-to-Door Collection  
Most common in Cebu City.



## Collection and Transportation

### ✓ Station collection for recyclable wastes

Technical aspect	Economic aspect	Cultural aspect	Environmental aspect
<b>Station collection for recyclable wastes</b>	The collected recyclable wastes can provide income generation to the City or Barangay.	The residents will be mindful of their solid waste generation and practice segregation of wastes.	It promotes segregation, diversion of wastes, and minimizes landfilling.

## Collection and Transportation

### ✓ Recycling Drop Off Centers

#### ✓ Drop off sites for recyclable wastes and hazardous wastes

Technical aspect	Economic aspect	Cultural aspect	Environmental aspect
The City or Barangay may designate appropriate drop off stations for recyclable wastes or even household hazardous wastes.	This minimizes disposal costs since lesser amount of solid wastes are disposed of to the landfill. It will provide an income to the Barangay through sales of recyclable wastes.	The residents will be mindful of their solid waste generation and practice segregation of wastes.	Will ensure collection of recyclable wastes and households hazardous wastes, especially in Barangays where there is no Materials Recovery Facility.

(For this initiative, the City shall partner with an Accredited Waste Treatment Facility)



## Intermediate Treatment

### ✓ Food Waste Recycling

### ✓ Black Soldier Fly (BSF)

### ✓ Eco-brick Movement

### ✓ Plastic for Rice Program

### ✓ Biofences

### ✓ Eco-pavements

### ✓ Processing of biodegradable wastes

## Collection and Transportation

### ✓ Utilizing Transfer Station

Transfer station	Technical aspect	Economic aspect	Cultural aspect	Environmental aspect
	A temporary facility is used for temporary sorting or storage of solid wastes.	It will minimize disposal costs especially in cases where landfill is far.		Utilizing a transfer station will minimize the traffic and air pollution impacts of hauling wastes to landfill sites.

**SECTION 25.** Guidelines for Transfer Stations. — Transfer stations shall be designed and operated for efficient waste handling capacity and in compliance with environmental standards and guidelines set pursuant to this Act and other regulations: Provided, That no waste shall be stored in such station beyond twenty-four (24) hours.

The siting of the transfer station shall consider the land use plan, proximity to collection area, and accessibility of haul routes to disposal facility. The design shall give primary consideration to size and space sufficiency in order to accommodate the waste for storage and vehicles for loading and unloading of wastes.

**SECTION 32.** Establishment of LGU Materials Recovery Facility. — There shall be established a Materials Recovery Facility (MRF) in every barangay or cluster of barangays. The facility shall be established in a barangay-owned or -leased land or any suitable open space to be determined by the barangay through its Sanggunian. For this purpose, the barangay or cluster of barangays shall allocate a certain parcel of land for the MRF. The determination of site and actual establishment of the facility shall likewise be subject to the guidelines and criteria set pursuant to this Act. The MRF shall receive mixed waste for final sorting, segregation, composting, and recycling. The resulting residual wastes shall be transferred to a long-term storage or disposal facility or sanitary landfill.





## Information, Education, and Communication Campaigns

- ✓ Promotion of segregation; providing leaflet on waste segregation
- ✓ Promotion of SWM for private companies; requiring them to attend SWM course
- ✓ IEC Events and Conferences

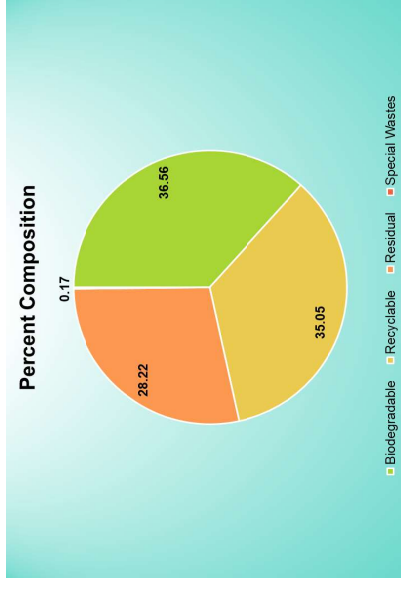


## Waste Analysis and Characterization Study

- ✓ WACS with a classification
- ✓ Regular Study and disclosure of WACS data to the public

Percent Composition by Classification	
Biodegradable	36.56%
Recyclable	35.05
Residual	28.22%
- For diversion	- 13.70%
- <b>For disposal</b>	- <b>14.52%</b>
Special wastes	0.17%
<b>TOTAL</b>	<b>100%</b>

WACS (Cebu City, 2016)



# Appendix 13: Newsletter



## Technical Cooperation Project

NEWSLETTER # 001  
JANUARY 2021

# The Project for Capacity Development on Improving Solid Waste Management through Advanced/Innovative Technologies



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KOGASAKI Incineration Facility in Kitakyushu City, Japan



## WHAT IS TCP?

### Technical Corporation Projects

Technical cooperation is an all-embracing term used to describe JICA's practical assistance to developing countries. Depending on the specific project, technical assistance can include the dispatch of JICA experts, the training of local officials for 'capacity development', the supply of equipment or financial assistance.

Technical cooperation is one of JICA's three major areas of development assistance, the others being provision of grant and low-cost yen loans.



# PROJECT OUTLINE

## THE PROJECT FOR CAPACITY DEVELOPMENT ON IMPROVING SOLID WASTE MANAGEMENT THROUGH ADVANCED/ INNOVATIVE TECHNOLOGIES

### PROJECT BACKGROUND

The Project For Capacity Development On Improving Solid Waste Management Through Advanced/ Innovative Technologies.

The issue on Solid Waste Management (SWM) has become a serious social problem in major urban cities in the Republic of the Philippines (hereinafter "Philippines") and is recognized as one of the top priority issues to be solved. The Government enacted the Ecological Solid Waste Management Act (RA9003) in 2000 that stipulates that open and controlled dumpsites shall be closed, phased out and rehabilitated, and alternative sanitary landfill sites shall be developed and operated as final disposal sites. However, the number of landfills which has been converted into sanitary manner from open dumping is also limited.

On the other hand, waste incineration was recognized to be practically prohibited by the Clean Air Act (RA8749) enacted in 1999. However, in July 2002, the Department of Environment and Natural Resources (DENR) notified that only incineration emitting hazardous and toxic gas was prohibited after ruling of a decision by the Supreme Court in January 2002. With this, the NSWMC has developed and issued "Guidelines Governing the Establishment and Operation of Waste to Energy (WTE) Technologies for Municipal Solid Waste (MSW)" as NSWMC Resolution 669 in 2016 which eventually converted into a Department Administrative Order (DAO) by the DENR in 2019.

In order to develop the capacity to control and lead the WTE project development, DENR requested the Japanese Government a technical cooperation project for Capacity Development on Improving Solid Waste Management through Advanced/Innovative Technologies. Based on the Record of Discussion (R/D) signed by both parties on November 7, 2017, this project is being implemented for three years starting March 2019.

### What's "Project Design Matrix (PDM)" and "Plan of Operations (PO)"?

Project Design Matrix (PDM) is a table summarizing activities, inputs, outputs, objectives, and other components of a project, together with their logical interrelationships.

Plan of Operation (PO) is a planning chart showing implementation timing & duration for each activity on PDM.

The table on the right explains the structure of PDM.

Narrative Summary	Verifiable Indicator	Means of Verification	Important Assumption
<b>Overall Goal</b> What will be aimed at after the project purpose is achieved?	Standard for measuring project achievement	Data sources from which indicators are derived.	Conditions important for the project.
<b>Project Purpose</b> What should the project achieve within the project duration.			
<b>Outputs</b> How should the project achieve the Purpose.			
<b>Activities</b> What should be done concretely to achieve the Outputs?	<b>Inputs</b> Purpose, materials, equipment, facilities, and funds required by the project.		<b>Pre-conditions</b>

## PAGE 3

Output 1	National government's capacity for supporting and coordinating of LGUs' WTE project is enhanced.
Output 2	Target LGUs' capacity for Planning, Evaluation, Formulation and Supervision of WTE project is enhanced.
Output 3	National government's capacity of environmental monitoring for WTE project is enhanced.
Output 4	National Government's and target LGUs' capacity to identify issues and provide suggestion/recommendation for other SWM technologies than WTE enhanced.

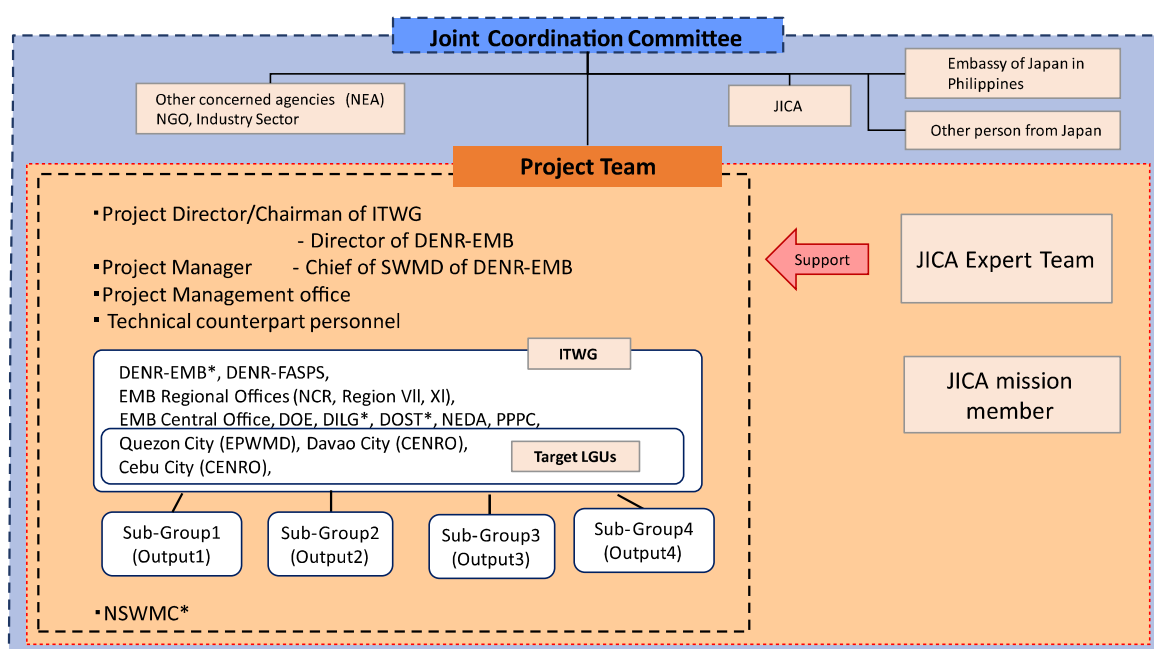


In this TCP, the project purpose is set as “national government and target LGUs' capacity for improving SWM utilizing WTE and other SWM technologies is enhanced”, and the series of Activities under the following four Outputs are being conducted by the counterparts (C/Ps) with technical assistance from JET.

## IMPLEMENTATION STRUCTURE

### Member of the Project Team

The Project implementation structures includes the Joint Coordination Committee (JCC), the Project Management Office (PMO) and the Interagency Technical Working Group (ITWG) composed of concerned government agencies, Subgroups (SG) for each project output, Embassy of Japan, JICA Philippines, and JICA Expert Team (JET) as shown in the figure below:



\*NSWMC: DENR, DOH, DA, MMDA, DOST, DILG, DPWH, DTI, TESDA, PIA, LCP, LMP, LPP, LNB, NGO, Recycling Industry, Manufacturing and Packaging Industry

Source: JET prepared by Special Order

JCC members are designated by Special Order.

- Chairperson : Undersecretary for Policy, Planning and International Affairs, DENR
- Co - chairperson : DOE
- Members: DILG, DOST, NEDA, NEA, PPPC, LGU Davao City, LGU Cebu City, LGU Quezon City, NGO, Industry Sector

## PAGE 4

Member of ITWG is shown below:

Inter-Agency Technical Working Group (ITWG)
<ul style="list-style-type: none"> <li>- DOE- Energy Policy and Planning Bureau (EFFB)</li> <li>- DILG- Bureau of Local Government Supervision (BLGS)</li> <li>- DOST- Industrial Technology Development Institute (ITDI)</li> <li>- NEDA- Investment Programming Group</li> <li>- Public- Private Partnership Center (PPPC)</li> <li>- DENR- Foreign Assisted and Special Projects Service (FASPS)</li> <li>- City ENRO LGU Davao City</li> <li>- City ENRO LGU Cebu City</li> <li>- City ENRO LGU Quezon City</li> </ul>
EMB Central Office
<ul style="list-style-type: none"> <li>- EMB-Environmental Quality Management Division (EQMD)</li> <li>- EMB-Air Quality Management Section (AQMS)</li> <li>- EMB- Planning, Policy and Program Development Division (PPPDD)</li> <li>- EMB- Environmental Research and Laboratory Services Division (ERLSD)</li> <li>- EMB- Solid Waste Management Division (SWMD)</li> <li>- EMB- Legal Division (LD)</li> </ul>
EMB Regional Office
<ul style="list-style-type: none"> <li>- EMB- NCR</li> <li>- EMB- Region VII</li> <li>- EMB Region XI</li> </ul>

Source: Special Order

(JICA Expert team)

## ROLE OF GOVERNMENT INSTITUTIONS

### Role of DENR-EMB on the Waste-to-Energy Project

Republic Act (RA) 9003 otherwise known as the Ecological Solid Waste Management Act of 2000 declares the policy of the state in adopting a systematic, comprehensive and ecological solid waste management program in the country. This Act ensures the protection of public health and the environment through the formulation and adoption of ecologically sustainable environmental practices such as, proper segregation, collection, transport, storage, treatment and disposal of solid waste. It also describes solid waste management as a discipline associated with the control of generation, transfer and processing of solid wastes.

The Environmental Management Bureau (EMB) of the Department of Environment and Natural Resources (DENR) is mandated to implement appropriate plans and programs on solid waste management (SWM) geared towards achieving the goals of the said Act. The DENR-EMB in coordination with the EMB Regional Offices nationwide ensures that the activities under the approved plans and programs are conducted in accordance with the best principles of public health, economics, engineering, conservation, other environmental considerations, and public attitudes through behavioral change.

November 26, 2019 marks the passage of DENR Administrative Order No. 2019-21 or the Guidelines Governing Waste-to-Energy (WtE) Facilities for the Integrated Management of Municipal Solid Waste. The DAO 2019-21 enables the Bureau to prescribe a solution to address the concern of applying WtE technologies in the country especially with regards to Republic Act 8749 or the Philippine Clear Air Act of 1999.



## PAGE 5

DAO 2019-21 provides guidelines specifically on environmentally-sound evaluation, establishment, operation and decommissioning or closure of WTE technologies for MSW management. It also sets the targets for solid waste avoidance and volume reduction through source reduction and waste minimization measures in accordance with ecologically sustainable development practices. The role of DENR-EMB in terms of construction, set-up and operation of the Waste-to-Energy Facility are processing of the necessary permits, clearances and other legal requirements, and documentation for compliance that includes an environmental health risk assessment. DAO 2019-21 also mandates the inclusion of planning and establishing and/or utilizing a WTE facility in the approved 10-year Solid Waste Management Plan of concerned Local Government Units and their submission of Environmental Technology Verification Statement and Report to the DENR-EMB. (DENR-EMB)

### Role of Local Government Units (LGUs) in the Introduction of WTE

Being at the forefront of the implementation of solid waste management, the local government units (LGUs) play a key role in the introduction of Waste-to-Energy facilities in the country. For LGUs to successfully take on the responsibility, they must be fully aware, and well-informed on waste-to-energy technologies, and facilities as mechanisms that may improve waste management.

Prior to the establishment of WTE facilities, specific key factors must first be met, this includes the following: the LGUs should have a well-planned, and effective solid waste management system in the locality; the communities, and households should be practicing proper segregation of wastes, and have an efficient waste recovery and/or recycling system. These basic prerequisites may be achieved if our LGUs are complying with the provisions of Republic Act No. 9003, or the Ecological Solid Waste Management Act of 2000.

The NSWMC Resolution No. 669 series of 2016 states that WTE facilities may only be established in LGUs that have an approved 10-year solid waste management plan. Moreover, the source of feedstock to sustain the operation of the facility shall only come from LGUs with an approved plan containing programs and activities relative to the prerequisites as enumerated above.

These conditions were imposed to ensure that the necessary environmental safeguards are in place, and that the establishment of the WTE facility will not negatively impact our environment, and the communities around it. In the introduction of all facilities and technologies, the protection of the rights of our people to a balanced, and healthful ecology must be the utmost priority. (DILG)

### Role of DOE in the Introduction of WTE

The Department of Energy (DOE) is the lead agency mandated to implement the provisions of the Republic Act (RA) 9513, otherwise known as the "Renewable Energy Act of 2008" and its Implementing Rules and Regulations (Section 22, RA 9513). Pursuant to Section 30 of RA 9513, the DOE encourages the adoption of waste-to-energy (WTE) facilities in coordination with the Department of Environment and Natural Resources to ensure compliance with this provision. The DOE through the Renewable Energy Management Bureau (REMB) formulates and implements policies, plans and programs related to the accelerated development, transformation, utilization and commercialization of renewable energy resources including emerging energy technologies such as WTE (Section 32). (DOE)

### Role of NEDA in the Introduction of WTE

NEDA serves as the Secretariat of the NEDA Board Investment Coordination Committee (ICC), which provides technical support to the ICC-Technical Board (TB) and Cabinet Committee (CC) in, among others, undertaking the appraisal/evaluation of projects (e.g., proposed WTE projects) submitted for ICC review and coming up with comments/recommendations for consideration by the Committee. (NEDA)



Pre-JCC on 26th June, 2019 at DENR

# ON GOING EFFORT IN THE TARGET LGUS

## QUEZON CITY INTEGRATED SOLID WASTE MANAGEMENT FACILITY PROJECT

**Source:** Quezon City Local Government Integrated  
Project Information Memorandum  
(October 23, 2018)

In this time, we focus on a project in Quezon City, one of the three target LGU's. The following is a part of the project information memorandum.

Full version is be accessible to the public on the internet. [https://ppp.gov.ph/wp-content/uploads/2018/10/PPPC\\_PROJ\\_QC-Intgrated-Proj-Info-Memo.pdf](https://ppp.gov.ph/wp-content/uploads/2018/10/PPPC_PROJ_QC-Intgrated-Proj-Info-Memo.pdf)

### 1 OVERVIEW

The design, financing, construction, operation, and maintenance of an Integrated Solid Waste Management Facility Project (the "**Project**") of the Quezon City Local Government (the "**LGU**") is a Public-Private Partnership Project to be undertaken in accordance with Ordinance No. SP 2336, series of 2014, entitled "Quezon City Code Pursuing a Public-Private Partnership (PPP) Approach Towards Development, Providing for the Procedure for Selecting the Private Sector Proponent, Adopting a Contract Management Framework, and Providing Appropriations and For Other Purposes", and its Implementing Rules and Regulations (the "**IRR**") (collectively, the "**PPP Code**").

The Project is expected to provide the LGU with a sustainable, environmentally friendly, and cheaper waste disposal solution for its current solid waste management challenges. Specifically, the benefits expected from the Project include:

- Increased health benefits to the local population resulting to a reduction in costs of illnesses (e.g. hospitalizations, physician and medical fees, hospital out and in-patient costs, time lost for treatments, time lost for hospitalization, etc.);
- Employment generation associated with the construction, operation, and maintenance of the Project;
- Increased market value of land associated with the significant improvements to the Project site brought about by the construction and operation of the Project;
- Reduced Greenhouse Gas (GHG) emission through the avoidance of landfilling municipal solid waste ("**MSW**"); and
- Additional savings equivalent to the amount of fossil fuels that would otherwise be required to produce the equivalent amount of electric power generated by the Project.

The Project involves Biodegradable Source Separated Waste Treatment and Residual Combustible Waste Treatment technologies capable of processing up to 3,000 metric tons of MSW per day and generating 36 MWe (Net). Based on the studies and due diligence conducted, the LGU has identified these technologies as the most appropriate technologies for processing its MSW.

The consortium composed of Metro Pacific Investments Corporation, Covanta Energy LLC, and Macquarie Capital Limited (the "**Original Proponent**") submitted the Project as an unsolicited proposal ("**USP**") to the LGU. The LGU has launched the Swiss/Competitive Challenge for the Project following the end of negotiation with the Original Proponent and the approval of the Project by the PPP Selection Committee (the "**PPP-SC**").

## PAGE 7

Key elements of the transaction are summarized in Table 1 below:

**Table 1 : Project Overview**

Feature	Terms
<b>Project Scope</b>	The Project involves the provision of the following infrastructure facilities: <ul style="list-style-type: none"> <li>• Biodegradable source separated organics (SSO) treatment facility;</li> <li>• Residual combustible waste (RCW) treatment facility;</li> <li>• Monofill for fly ash disposal</li> <li>• Other ancillary facilities, including continuous emission monitoring system, administration building, scale house, transmission lines, and utility systems and connections</li> </ul>
<b>Indicative Cost</b>	Up to PhP 22 billion
<b>PPP Structure</b>	Incorporated Joint Venture (JV) with Build-Own-Operate (BOO) mechanism, except in case of pre-termination whereby facility is transferred to the LGU upon paying a termination payment
<b>Concession Period</b>	35 years starting on MBT Component Operations Start Date (as defined under the Concession Agreement)
<b>Revenue Source</b>	<ul style="list-style-type: none"> <li>• Tipping fees</li> <li>• Power generation fees</li> <li>• Sale of by-products (e.g., recyclables, digestate, etc.)</li> </ul>
<b>Bid Parameter</b>	Lowest Tipping Fee (inclusive of VAT and other applicable taxes)
<b>Equity Share in the Incorporated JV</b>	<ul style="list-style-type: none"> <li>• Private Concessionaire – 95%</li> <li>• LGU – 5%</li> </ul>
<b>Project Site</b>	Any site within Quezon City which shall not: <ul style="list-style-type: none"> <li>• adversely affect the current flow of traffic within Quezon City;</li> <li>• result in an increase in haulage costs to the LGU; and</li> <li>• disrupt the residents of nearby communities considering the necessary ingress and egress of trucks hauling municipal solid waste to and from the proposed Project site location</li> </ul>
<b>LGU's Obligations</b>	<ul style="list-style-type: none"> <li>• Payment of Tipping Fees to Concessionaire</li> <li>• Delivery of 1,700 metric tons of MSW per day</li> <li>• LGU right-of-way acquisition (e.g. access roads, transmission line, etc.)</li> <li>• Project site acquisition in case of expropriation</li> </ul>

## 1.1 COMPETITIVE CHALLENGE TIMETABLE

The competitive challenge progress is expected to take approximately five (5) months from the date of issue of Tender Documents. Key dates are outlined in Table 2 below.

**Table 2: Competitive Challenge Timetable**

Milestone	Indicative Date
Availability and Issuance of Tender Documents for Purchase	October 30, 2018
Pre-Bid Conference	November 22, 2018
Comparative Proposal or Bid Submission Date	January 31, 2019
Determination of the Winning Proponent	February 28, 2019
Issuance of Notice of Award	March 5, 2019
Signing of the Project Documents	March 25, 2019

The actual schedule may be changed by the PPP-SC at any time as it may deem reasonable.



PAGE 8  
1.2 THE PROJECT AS AN UNSOLICITED PROPOSAL

The Project was evaluated by the LGU and accepted as an Unsolicited Proposal with the Original Proponent Status granted on March 22, 2017. Challengers now have the opportunity to develop and submit their Comparative Proposals to the PPP-SC. The Tipping Fee is the **single** bid parameter that will determine the winning qualified Challenger.

The Original Proponent will have the opportunity to match the financial proposal of the winning Challenger and, if it does, it will be awarded the contract. If the Original Proponent is unable to match, however, the Project will be awarded to the winning bid from amongst the comparative Challengers.

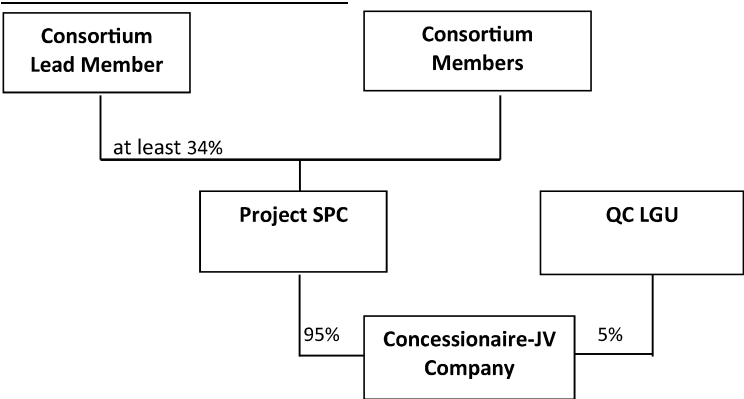
2 PROPOSED PPP-JV STRUCTURE

The Project will be developed under a 35-year design, build, finance, own, operate, and maintain contract to be signed between the Concessionaire and the LGU. The Project shall be undertaken by the Concessionaire, which shall be the Joint Venture (JV) Company to be established by the LGU and a special purpose corporation (SPC) to be created by the winning bidder. For this purpose, the LGU and the winning bidder, through the SPC, shall execute the JV Agreement which will govern their relations as shareholders of the Concessionaire-JV Company.

The Concessionaire shall be responsible for the design, financing, construction, operation, and maintenance of the Project and will receive compensation in the form of Tipping Fee from the LGU. Revenues are also expected from sale of power, recyclables, and digestate, among others.

A schematic of the PPP-JV structure is provided in Figure 1 below:

Figure 1: PPP-JV Structure



2 KEY PROJECT MILESTONES

The key project milestones and expected completion date for the Project are summarized in Table 3.

Table 3: Project Milestones

Milestone	Milestone Date
Possession by the Concessionaire of the Private ROW and the LGU ROW	[12 months] from Commencement Date
Construction Start Date	[18 months] from Commencement Date
Construction Completion Deadline for MBT Component	[15 months] from Construction Start Date
Construction Completion Deadline for Stoker Component	[30 Months] from Construction Start Date
MBT Component Operations Start Date	[18 months] from Construction Start Date
Stoker Component Operations Start Date	[36 months] from Construction Start Date

Source: Concession Agreement

# FEATURE :

## ENVIRONMENTAL MONITORING WITH OUTPUT 3

Output 3 will ensure that “National government’s capacity of environmental monitoring for WTE project is enhanced”. This article will show the topics related to Output 3.

### ENVIRONMENTAL MANAGEMENT BUREAU – ENVIRONMENTAL RESEARCH AND LABORATORY SERVICES DIVISION

The Environmental Research and Laboratory Services Division (ERLSD) is one of the nine (9) divisions of the Environmental Management Bureau Central Office (EMB CO). ERLSD provides support to the Bureau in the implementation of environmental laws through provision of laboratory services and conduct of research studies and programs.

The Division has two (2) sections, namely the Environmental Research Section (ERS) and the Environmental Laboratory Services Section (ELSS). The ELSS oversees the operation of the EMB CO Laboratory. The Dioxins and Furans Laboratory (D/F Lab) is with the Organics Laboratory Unit of the ELSS.

The EMB CO Lab was renovated to accommodate the requirements of a D/F Lab. These include separate work areas for storage/preparation, pre-treatment, extraction and cleanup of samples expected to contain high and low levels of dioxins and furans; and instrumentation rooms for the High Resolution Gas Chromatograph – High Resolution Mass Spectrometer (HRGC-HRMS) and High Resolution Gas Chromatograph Tandem Mass Spectrometer (HRGC/MS/MS).

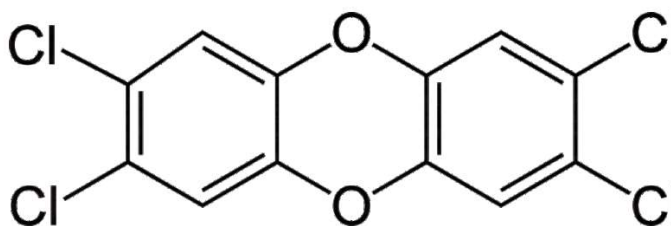
To ensure cross-contamination between samples is prevented, if not, kept at a minimum, the High Level and Low Level D/F rooms have separate sets of extraction, concentration and cleanup apparatuses, equipment, and consumable materials.

With the latest instrumentation, professional and trained staff, and following internationally-accepted methodologies, the EMB CO Laboratory can provide the required analytical laboratory services for Dioxins and Furans in different matrices, especially for the Waste-to-Energy Projects.

(ERLSD)

### WHAT IS DIOXIN?

Dioxin is a toxic chemical that can cause cancer. It is a by-product of combustion from such activities as burning of garbage and biomass, accidental fire, production of cement, tobacco smoking among others. Thus, it is imperative that refraining from smoking and indiscriminate burning, proper operation of production facilities, and employment of appropriate air pollution control devices are undertaken to avoid their releases.



## PAGE 10

Aside from cancer, dioxin can cause other health effects such as chloracne (disfiguring and painful form of acne), heart and circulation problems, liver damage, reduced reproductive capacity, and suppressed immune systems.

Dioxin, and its relative compound called furan, may take the form of 210 congeners or chemical compound closely related to another in composition and maybe exerting similar or antagonistic effects. Seventeen (17) of these congeners pose significant risks to human health, with 2,3,7,8- tetrachlorodibenzo-p-dioxin as the most toxic compound.

The Stockholm Convention on Persistent Organic Pollutants (POPs), includes dioxins and furans as part of these POPs that require signatories to this treaty to minimize or eliminate their releases. It is important, eventually, to monitor and measure the levels of dioxin in air, water and land as these may eventually enter the food chain.

The standard methods for sampling and analysis of for dioxin and furan are Method 0023A (Sampling Method for Polychlorinated Dibenzop-Dioxins [PCDD] and Polychlorinated Dibenzofurans [PCDF] Emission from Stationary Sources) and Method 8290 (PCDD and PCDF by High Resolution Gas Chromatography/High Resolution Mass Spectrometry [HRGC/HRMS]), respectively, or any method approved by the Department of Environment and Natural Resources.

(DOST)

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## SOURCE EMISSION TESTING IN THE PHILIPPINES

Source emission testing in the Philippines is conducted by the Department of Environment and Natural Resources- Environmental Management Bureau (DENR-EMB), the accredited Third Party Source Emission Testing firms (TPSETF) and, occasionally, the industrial facilities themselves to measure and monitor the air quality from the source. Thus, checking the compliance of the source with the National Emission Standards for Source Specific Air Pollutants (NESSAP) listed in the DENR Administrative Order (DAO) 2000-81 (Implementing Rules and Regulations (IRR) of RA 8749 (Philippine Clean Air Act of 1999)).

Associated with these emission standards are the methods of sampling and analysis approved by the EMB. These methods of sampling and analysis are based on the Reference Methods for Stationary Source Sampling of the United States' Environmental Protection Agency (USEPA).

Most of these stack tests require the measurement of the following parameters: (1) gas velocity, (2) pressure and temperature, (3) gas composition and density, (4) moisture, and, (5) volumetric flow rate. This measurement is designed to enable the calculation of waste gas mass emission rates. Tests are conducted when there is constant flow through the stack / duct to minimize the number of variables. This flow is maintained throughout the test.

According to the Stack Testing Manual developed by the EMB, "sample conditioning is generally required to successfully transfer the analyte to the collection media." This often involves additional processes such as filtration, heating, cooling, or condensation, to maintain the integrity of the sample.

Moreover, in the collection of isokinetic samples, construction of the sampling train may differ depending on the nature of the flue gas, the layout of the duct or stack, access to the platform, platform size, shape, and facilities. Nonetheless, the basic elements of the isokinetic train are a nozzle, filter, impinger train, flow meters, dry gas meter and pump.

Furthermore, isokinetic testing requires a thorough understanding of the first five test methods presented in the CFR 40 Part 60 Appendix A, such as the following:

- Method 1: Determination of sampling location and traverse points
- Method 2: Determination of stack gas velocity and volumetric flow rate
- Method 3: Determination of CO<sub>2</sub> and O<sub>2</sub> concentrations and dry molecular weight
- Method 4: Determination of moisture in stack gases
- Method 5: Determination of particulate emissions from stationary sources



## PAGE 11

The USEPA Method 5 provides the general protocol for operating the sampling train to collect representative sample, while Methods 1 to 4 prescribe techniques underpinning the sampling activities associated with Method 5.

The USEPA Method 5 is the foremost development of isokinetic sampling methods. The basic Method 5 sampling train is adapted to test for many other gaseous and particulate parameters of interest from stationary sources, including dioxins and furans. While other methods are designated by other USEPA or agency method numbers, they are variations of Method 5 procedures.

In view of the volume of solid waste produced in the Philippines, the limited capacity of sanitary landfills and the thrust of the EMB to adopt a systematic, comprehensive, and ecological solid waste management program, the issuance of DAO 2019 -21 (*“Guidelines Governing Waste-to-Energy (WtE) Facilities for the Integrated Management of Municipal Solid Wastes”*) was formulated.

In conformance with RA 8749, and as prescribed in said DAO, the emission of Dioxins and Furans shall be reduced by the most progressive techniques and that all average values of Dioxins and Furans shall not exceed the limit value of 0.1 nanogram / NM<sup>3</sup>TEQ over a sample period of a minimum of six (6) hours and a maximum of eight (8) hours.

The EMB, in conjunction with the USEPA Method 5, employs the USEPA Method 23 (*“Determination of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans from Stationary Sources”*) in the sampling, recovery, and analysis of Dioxins and Furans from stationary sources.

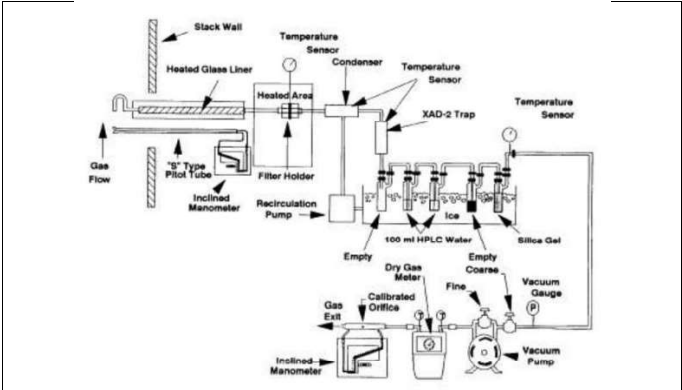
Shown below are photos taken from source emission testing for Dioxins and Furans:



Method 23 employs an identical sampling train to Method 5, but with some additions to the nozzle, sample transfer lines, filter support, condenser, water bath, and adsorbent module.

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Shown below is a schematic sampling train for Method 23:



Source: <https://www.epa.gov/eme/method-23-dioxins-and-furans>

(AQMS)

### ACHIEVED EVENTS AND MEETING IN THE PROJECT

Each meeting was held on the below schedule.

The pre-JCC, ITWG and the first kick-off seminar were held in that order, followed by each subgroup meeting. In the subgroup meetings, the progress of each activity was confirmed.

year-month	2019	2020			
		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>
JCC	Pre ●				
ITWG		●			●
Kick off Seminar		●			
SG for OP1		● ●	●	● ●	●
SG for OP2		●		●	
SG for OP3		●			
SG for OP4		●	●	●	



ITWG in January 2020



ITWG in January 2020



Kick off Seminar in February 2020



Kick off Seminar in February 2020

# Technical Cooperation Project



NEWSLETTER # 002  
**OCTOBER 2021**



## THE PROJECT FOR CAPACITY DEVELOPMENT ON IMPROVING SOLID WASTE MANAGEMENT THROUGH ADVANCED/INNOVATIVE TECHNOLOGIES



Front Page Photos: ©HigashiYodo Incineration Facility All Rights Reserved



# TECHNICAL STANDARDS FOR WASTE-TO- ENERGY (WTE) FACILITY ON APPROPRIATELY CONTROLLED COMBUSTION

The preparation of this Guidelines for the Technical Standards of Waste-to-Energy (WtE) Facility on Appropriately Controlled Combustion is part of the project activities under the Technical Cooperation Project on Capacity Development on Improving SWM Through Advanced/Innovative Technologies, which is being implemented by JICA and the Philippines through the Environmental Management Bureau (EMB) under the Activity 1-4 of the Project Output 1 that aims to Enhance the National Government's Capacity for Supporting and Coordinating the LGU's WtE Project. The Technical Standards (T/S) focused on waste incineration with power generation, that is in line with the provision of the approved DAO 2019-21 on the "Guidelines Governing Waste-to-Energy (WtE) Facilities for Integrated Management of Municipal Solid Wastes which was approved by the DENR Secretary last November 26, 2019.

The T/S' major objective is to provide a document that contains a set of T/S as a guidance document, particularly on the evaluation, establishment, and control of Waste-to-Energy on Appropriate Controlled Combustion (WtE-ACC) Facilities, for proper management of municipal solid wastes in the country. This is essential to meet the requirements about the technical criteria, key methods, procedures, processes, formats and practices reflecting proper establishment and control of WtE facilities. The T/S is a formal document that applies to all WtE-ACC Facilities to be operated nationwide; and shall provide a comprehensive set of standards in the form of technical checklist for the structure, operation

and maintenance of WtE-ACC Facilities and the guidelines for the management of bottom ash and fly ash.

Prior to the drafting of the T/S, the various technical, structural, operation and maintenance standards of WtE facility in Japan including management of bottom ash and fly ash were introduced. The pollution control standards that will be applied to the target LGUs and the good practices in other countries were also compared as basis for the preparation. It was confirmed by the project team the necessity for the establishment of a T/S as a tool in setting up the waste-to-energy facilities, and the need for the national government to proactively gather expertise in the preparation of minimum T/S for permitting and managing of these WtE facilities.

The Technical Standard was drafted by the JICA Expert Team (JET) with substantial inputs and comments from the Project Team composed of representatives from the concerned government agencies (i.e. DOST ITDI, DENR-EMB, DENR-FASPS, DOE-REMB, DILG-BLGS, NEDA), Public-Private Partnership Center, and partner LGUs of Quezon City, Cebu City, and Davao City. This was approved during the 1st Joint Coordination Committee (JCC) Meeting and 3rd Inter-agency Technical Working Group Meeting dated 09 February 2021 and 20 January 2021, respectively and formally endorsed by Undersecretary Jonas R. Leones as the JCC Chair and Assistant Secretary Roberto Uy of DOE as the JCC Co-Chair to the EMB Director for further deliberation by the EMB Policy Technical Working Group (EPTWG) prior to approval by the DENR Secretary.

# SWM in 3LGUs

## Special Topic

The TCP has identified 3 target LGUs, namely Quezon City, Cebu City, and Davao City for the scope and implementation of the project. While the TCP is helping to capacitate the local counterparts in the LGUs through the review of their LGU' s SWM regulations, assessment of their SLF facilities and waste management practices, and other technical support that the LGUs require, the TCP is also interested in knowing about local efforts and good practices that are already in place in their respective LGUs.



## Quezon City

In the following section, Quezon City, Cebu City, and Davao City share their LGU–initiated efforts through the implementation of programs and policies that support better solid waste management in their LGUs.

### Efforts to improve waste management

Quezon City (QC), presently, has an estimated population of more than three million. Based on the City's 2013 Waste Analysis and Characterization Study (WACS), each QC resident generates 0.88 kilograms of waste per day, which means that more than 2,700 tons of waste is generated per day. To ensure that city waste is properly managed, QC has adopted measures to reduce both waste generation and waste disposal through the promotion of reusable products, recycling activities and other related waste reduction and diversion practices.



While these measures are shown to be viable and effective, Quezon City is also open to exploring the use of technology-based options in solid waste management. It recognizes that waste generation is likely to increase as a result of the steady increase in population. Quezon City, however, remains committed to exhausting all possible measures on waste reduction, avoidance and diversion as provided for under Republic Act 9003, otherwise known as the Ecological Solid Waste Management Act of 2000. QC's perspective is that the introduction of advanced systems and technologies may not be the absolute solution, rather, it is a complement to proper existing SWM practices.

Quezon City, in fact, is continuously building its capacity to understand and evaluate emerging technologies for urban waste management. The city is fortunate that it has been selected by Japan International Cooperation Agency (JICA) in partnership with the Department of Environment and Natural Resources (DENR) as one of the LGU-beneficiaries of the Technical Cooperation Project (TCP) for Capacity Development on Improving Solid Waste Management through Advanced/Innovative Technologies in the Philippines.



The city, at the moment, is entertaining an unsolicited proposal from the consortium composed of Metro Pacific Investments Corporation, Covanta Energy LLC, and Macquarie Capital Limited to design, construct, finance, and operate an Integrated Solid Waste Management facility. The Project involves Biodegradable Source Separated Waste Treatment and Residual Combustible Waste Treatment technologies capable of processing up to 3,000 metric tons of MSW per day and with a 36 MW power generating capacity. The proposal is currently under review, taking into consideration recent developments in the solid waste management program of the City and other considerations as well.

The City Government remains committed in pursuing environmental sustainability through inclusive, viable and efficient measures beneficial for all Quezon City residents. Thus, it welcomes the conduct of in-depth studies, currently undertaken with the assistance of Local and International Partners such as the Japan International Cooperation Agency (JICA), Department of Environment and Natural Resources (DENR).

### Expectation for JICA Technical Cooperation

With this capacity development, the City Government will be able to gain relevant knowledge on the various Advanced SWM technologies that may be utilized to complement the City's various efforts on proper solid waste management to deliver an effective and efficient service to the people. The City Government will also be capacitated on important technology aspects and details to aid in determining the appropriate technology and monitoring performance proficiency of Waste-to-Energy (WTE) facilities.





### **Policies to improve waste management Practices in SWM in Davao City.**

Waste Reduction and Resource Maximization activities implemented per City Ordinance 0361-10 or the "Ecological Solid Waste Mgt. Ordinance":

Waste reduction and resource maximization activities form a crucial part in the Solid Waste Management Program of Davao City. City Ordinance 0361-10 also known as the "Davao City Ecological Solid Waste Management Ordinance" recognizes the importance of waste reduction and increased resource recovery as strategies towards ensuring a safe and healthy environment for its constituents. Among the provisions provided in the ordinance that the city is implementing and striving to accomplish are the following:

#### **ARTICLE VII SEGREGATION OF SOLID WASTE**

**Section 10.** Mandatory Segregation of Solid Waste. The segregation of waste at source by generators such as institutional, industrial, commercial and agri-industrial establishments and households, shall be mandatory.

#### **ARTICLE IX: MATERIALS RECOVERY AND PROCESSING**

**Section 23.** Roles and Responsibilities of Barangays. Consistent with the provisions of RA 9003, Barangays shall assume primary responsibility in managing the biodegradable and recyclable waste within their respective barangays.

**Section 24.** Composting by Barangays. Barangays shall undertake composting of biodegradable waste

from sources within the Barangay. Barangays without adequate space for composting may enter into arrangements with other Barangays or private entities for the composting of their biodegradable waste. Such arrangements may include the payment of fees for the services provided.

**Section 25.** Composting by Households. As part of the implementation of the City Solid Waste Management Plan, households shall be encouraged to undertake backyard composting.

**Section 26.** Composting by Establishments. Establishments shall undertake composting of biodegradable waste generated at source

**Section 28.** Materials Recovery Facility (MRF) and Buy-back Center. Individual Barangays or clusters of Barangays shall establish a materials recovery facility (MRF). The City shall assist the Barangays in recycling or processing biodegradable and recyclable wastes into fuel, construction materials or into other uses.

**Section 21.** Transport of Large Quantities of Residual and Special Wastes. The City ENRO shall not collect large quantities of residual and special wastes with a volume of three (3) cubic meters or more from any source except public markets. The generators of such quantity shall be responsible for the transport of the same to the sanitary landfill of the City.

Per Ordinance No. 0291-17 or "The 2017 Tax Revenue Code of Davao City Special Collection:

P5,000 per truckload Tipping Fee:  
P3.00 per kilo





# Cebu City

## Moving Forward on Cebu City's Solid Waste Management

Solid waste management is among the most serious environmental problems confronting highly urbanized cities, and the City of Cebu is not an exception. With the development of the City, waste management situations also evolve. The increasing solid waste generation, about 0.934 kilograms of waste per capita generation per day, presents several problems such as uncollected solid wastes leading to the accumulation of wastes in rivers and open spaces, lack of landfill space, increase in transportation and disposal costs, etc. Considering the present circumstances, integrated solid waste management must be set in place. With this, Cebu City welcomes unsolicited proposals for Waste-to-Energy Projects. The assistance of DENR and JICA through the Project for Capacity Development on Improving Solid Waste Management through Advanced/Innovative Technologies is very significant as we endeavor to establish an effective and integrated solid waste management scheme for the City of Cebu.

Many countries have embraced waste-to-energy as a solution to managing their solid waste and producing energy. Among these countries are Singapore, Japan, USA, and Europe. Internationally, Waste-to-Energy continues to be a viable alternative before simple disposal to landfilling. Cebu City likewise embraces the Waste-to-Energy technologies. Several questions stimulated from environmental groups, zero waste advocates, and concerned citizens whether Waste-to-Energy is the right solution to the current solid waste phenomenon. Many individuals assert that burning

waste produces toxic emissions, contributes to climate change, contradicts with the circular economy goals, and can lead to financial burden. Such significant concerns are being considered, ensuring that environmental standards are complied with. The City highlights its goals in promoting waste reduction at source, segregation, recycling, and composting. The implementation of City Ordinances shall likewise be strengthened such as the No Segregation, No Collection Policy, prohibition of plastic bags, proper waste disposal, etc. In no way that the City promotes more solid waste generation to sustain more feedstock for the Waste-to-Energy facility. While the project is expected to reduce landfill space, it shall not compete with the waste reduction strategies of the City.

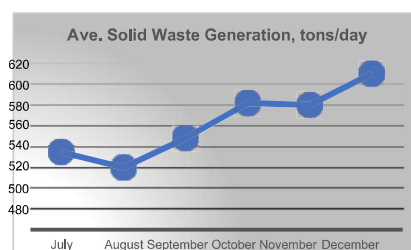


### Importance of Waste Reduction

The promotion of waste reduction through waste minimization, adoption of a wide practice of reuse, material recycling of waste, barangay-based and household level composting activities and resource recovery systems is a priority of the City. Continued implementation of such elements will reduce both the utilization of raw materials and quantities of wastes disposed into the environment. Increased recovery would mean less landfilling. Such initiative is geared towards compliance with the mandate of RA 9003 which is to divert at least 25% of all solid waste from waste disposal facilities through reuse, recycling, and composting activities and other resource recovery activities. The Waste-to-Energy project is a complementary technology for the reduction of solid waste volume and recovery of energy and should not compete with the waste reduction, reuse, and material recycling measures of the City.

Projection of Solid Waste Generation

Year	PCG*	Population**	Projected Waste
			Generation (kg/day)
2015	0.934	922,611.00	861,718.67
2016	0.934	934,328.16	872,662.50
2017	0.934	946,194.13	883,745.31
2018	0.934	958,210.79	894,968.88
2019	0.934	970,380.07	906,334.99
2020	0.934	982,703.90	917,845.44
2021	0.934	995,184.24	929,502.08
2022	0.934	1,007,823.08	941,306.75
2023	0.934	1,020,622.43	953,261.35
2024	0.934	1,033,584.33	965,367.77
2025	0.934	1,046,710.85	977,627.94
2026	0.934	1,060,004.08	990,043.81
2027	0.934	1,073,466.13	1,002,617.37
2028	0.934	1,087,099.15	1,015,350.61



Source: Department of Public Services (DPS), Cebu City Government

\*per capita generation per day

Month (2019)	Average Solid Waste Generation (tons/day)
July	534.68
August	519.90
September	548.02
October	581.66
November	579.92
December	610.12



Other Strategies of the City include:

1. Strict enforcement of segregation at source and the "No Segregation, No Collection" policy of the City as outlined in City Ordinance No. 2031.
2. Establishment of composting centers in each barangay or cluster of barangays to process biodegradable waste.
3. Processing of plastic wastes with the use of Plastic Shredding Facility.
4. To provide recovery bins or containment for special waste in all barangays.
5. Strict implementation on the submission of the Environmental Sustainability Action Plan by business establishments pursuant to City Ordinance No. 2243 and monitoring thereafter by CCENRO.
6. Allocate sufficient resources to effectively implement and sustain solid waste management programs and projects in partnership with the private sectors and stakeholders.
7. Encourage different sectors of the community to take part and support solid waste management initiatives and practices as part of their Corporate Social Responsibility (CSR).
8. Promotion of Eco-Bricks Making for plastic waste diversion.
9. Separate collection for glass bottles from glass waste generators.

The growing interest of Cebu City in utilizing Waste-to-Energy facility is impelled by the need to conserve landfill space, minimize environmental liabilities, reduce greenhouse gas emissions, and obtain energy from solid waste. Waste-to-Energy technology's

proven capacity to treat waste, reduce waste volume, diminish landfill demands, and recover energy while not requiring major pre-treatment is a major advantage that makes it suitable for Cebu City. Energy recovered from solid waste is a valuable source for the national power grid and is much more beneficial from the environmental point of view than energy produced from fossil fuels.

However, to strengthen the integration of solid waste management of the City and to gain social acceptance, proper coordination with the LGU, stakeholders, and the project proponent is vital. Most importantly, public participation shall be institutionalized as the negotiation of the project progress.

While Waste-to-Energy is aimed to reduce the final waste volume, waste reduction strategies and waste segregation incorporated at the barangay or household level remain the most preferred practice. To actuate this goal, the City is set to fully implement the No Segregation, No Collection Policy, in accordance with RA 9003 which states that segregation of waste shall primarily be conducted at source and is mandatory for LGU's. Special wastes or hazardous wastes are unacceptable to a waste-to-energy facility such as busted fluorescent bulbs, household batteries, lead-acid batteries, spray canisters, paints, thinners, and the like. The City shall make sure that no special waste is delivered into the facility. This can be made possible through the implementation of the City Ordinance 2450 or the Ordinance Providing for the Management of Special Wastes in the City of Cebu which provides guidelines for the handling of special waste in the City.

Besides an efficient solid waste collection and implementation of waste reduction initiatives, compliance to environmental standards and conformity with the City's land-use plan and ten-year solid waste management plan is of paramount importance to achieve an integrated solid waste management for Cebu City. The facility should be capable of achieving all applicable regulatory standards to proceed with the project.



# Achieved Events and Meeting in the Project

The meetings shown in the table below were held during 1st to 3rd quarters of year 2021. One time of the Joint Coordination Committee (JCC) meeting, two times of Interagency Technical Working Group (ITWG) meeting, and five times of ITWG subgroup (SG) meetings were organized and the project members participated in. All meetings were held online due to the pandemic of COVID-19.

year-quarters	2021		
	1st Q	2nd Q	3rd Q
JCC	●		
ITWG		● ●	●
SG for OP1		● ●	
SG for OP2		●	
SG for OP3		●	
SG for OP4	●		
PMO*FASPS	● ● ● ●	● ● ● ●	● ● ● ●

PMO: Project Management Office (PMO)



## JCC meeting

**FRONT PAGE**

- Higashi Yodo Incineration Facility is in Osaka City, Japan. Disposal capacity is 400t/day, and power generation capacity of 10,000kW.
- A flea market and other events are held at the facility, which is popular with citizens.



# Appendix 14: Capacity Assessment Sheet

### Capacity Evaluation Sheet for Output1

Please evaluate your capacity according to questions shown in the following table.

Please fill the column of “Assessment of current capacity” with “x” corresponding to score of your self-evaluation.

Assessment Score      5: Excellent, 4: Good, 3: Fair, 2: Weak, 1: Poor

Name of Agency: \_\_\_\_\_ Name of respondent: \_\_\_\_\_ Date: \_\_\_\_\_ / \_\_\_\_\_ /2020

No.	Capacity to be Developed	Related Activity	Assessment of Current Capacity					Reasons of Assessment	Key Points for Further Improvement
			1	2	3	4	5		
Example	Member of ITWG subgroup x can segregate solid waste appropriately according the rule decided by his/her barangay.					x		I evaluate my capacity as “good” because I segregate my waste every day into 3 types as instructed by our barangay.	Careful attention to avoid contamination to each waste classification
Q1-1	Member of ITWG subgroup for output1 understands good practices and technologies of WTE in neighboring countries and can disseminate it to LGUs by preparing BAT/BEP guideline.	Activity 1-1							
Q1-2	Member of ITWG subgroup for output1 understands policies and mechanism to control WTE projects in neighboring countries including cost sharing scheme.	Activity 1-2							
Q1-3	Member of ITWG subgroup for output1 can disseminate WTE technology and make recommendation on	Activity 1-3							

	utilization of the technology & practices to LGUs.										
Q1-4	Member of ITWG subgroup for output1 understands technical standards for WTE facility in neighboring countries, and can prepare technical standards on installation, operation and maintenance for WTE facility in the Philippines.	Activity 1-4									
Q1-5	Member of ITWG subgroup for output1 understands waste incineration ash management in neighboring countries and can prepare manual on waste incineration ash in the Philippines.	Activity 1-5									
Q1-6	Member of ITWG subgroup for output1 can prepare the manual on planning, evaluation, formulation and supervision for WTE projects referring to practices in neighboring countries.	Activity 1-6									
Q1-7	Member of ITWG subgroup for output1 can update evaluation criteria for 10-year SWM plan by reflecting option utilizing WTE technology.	Activity 1-6									
Q1-8	Member of ITWG subgroup for output1 can illustrate model procedure to introduce WTE facility in accordance with WTE guidelines and requirements on environmental and social considerations.	Activity 1-7									

Assessment score: 5: Excellent, 4: Good, 3: Fair, 2: Weak, 1: Poor

## Capacity Evaluation Sheet for Output2

Please evaluate your capacity according to questions shown in the following table.

Please fill the column of “Assessment of current capacity” with “x” corresponding to score of your self-evaluation.

Assessment Score      5: Excellent, 4: Good, 3: Fair, 2: Weak, 1: Poor

No.	Capacity to be Developed	Name of respondent:	Assessment of Current Capacity					Reasons of Assessment	Key Points for Further Improvement
			1	2	3	4	5		
Example	Member of ITWG subgroup x can segregate solid waste appropriately according the rule decided by his/her barangay.					x		I evaluate my capacity as “good” because I segregate my waste every day into 3 types as instructed by our barangay.	Careful attention to avoid contamination to each waste classification
Q2-1	Member of ITWG subgroup for output2 can explain current situation of introduction of WTE projects based on the target LGU’s 10-year SWM plan and other information & data.	Activity 2-1							
Q2-2	Member of ITWG subgroup for output2 can clarify current waste flow/amount, set waste reduction target for final disposal, and estimate amount of waste treatment through WTE facility and other method in the target LGU’s 10-year SWM plan.	Activity 2-2							
Q2-3	Member of ITWG subgroup for output2 understands	Activity 2-3							



	necessary procedures to locate WTE projects in LGU's land use plan, and the candidate WTE projects is placed in LGU's land use plan.									
Q2-4	Member of ITWG subgroup for output2 can analyze and verify if the candidate WTE projects and understand points and issues to be addressed for formulating WTE projects.	Activity 2-4 Activity 2-5								
Q2-5	Member of ITWG subgroup for output2 understand how to check, supervise and monitor the components proposed in the candidates WTE projects to ensure compliance with its proposal/specification.	Activity 2-4 Activity 2-8								
Q2-6	Member of ITWG subgroup for output2 understands its responsibility in formulation and implementation of WTE projects for LGU's SWM under PPP scheme.	Activity 2-6								
Q2-7	Member of ITWG subgroup for output2 can formulate technical specification of WTE facility in accordance with LGU's 10 years SWM plan.	Activity 2-7								

Assessment category: 5: Excellent, 4: Good, 3: Fair, 2: Weak, 1: Poor

### Capacity Evaluation Sheet for Output3

Please evaluate your capacity according to questions shown in the following table.

Please fill the column of “Assessment of current capacity” with “x” corresponding to score of your self-evaluation.

Assessment Score      5: Excellent, 4: Good, 3: Fair, 2: Weak, 1: Poor

No.	Capacity to be Developed	Name of respondent:	Assessment of Current Capacity					Reasons of Assessment	Key Points for Further Improvement
			1	2	3	4	5		
Example	Member of ITWG subgroup x can segregate solid waste appropriately according the rule decided by his/her barangay.					x		I evaluate my capacity as “good” because I segregate my waste every day into 3 types as instructed by our barangay.	Careful attention to avoid contamination to each waste classification
Q3-1	Member of ITWG subgroup for output3 understands its current capacity on dioxins & furans analysis in the central and regional EMB.	Activity 3-1							
Q3-2	Member of ITWG subgroup for output3 can identify gaps between current and required capacity on dioxins & furans analysis in the central EMB.	Activity 3-2							
Q3-3	Member of ITWG subgroup for output3 can formulate training program on dioxins & furans analysis in ambient air and emission gas for staff in the central laboratory of EMB based on the capacity gap analysis.	Activity 3-2							

Q3-4	Member of ITWG subgroup for output3 can prepare SOP for sampling, analysis and QA/QC of dioxins & furans in ambient air and emission gas.	Activity 3-3							
Q3-5	Staffs in the DENR-EMB (AQMS and ERLSD) receive training on dioxins & furans sampling & analysis in ambient air and emission gas.	Activity 3-4							
Q3-6	DENR-EMB can formulate sampling plan (design) on dioxins & furans in ambient air.	Activity 3-5							
Q3-7	DENR-EMB implements sampling, analysis and QA/AC of dioxins & furans in ambient air and emission gas in compliance with the SOPs.	Activity 3-6							
Q3-8	DENR-EMB has a capacity to conduct analysis and QA/AC of dioxins & furans (including matrices other than ambient air and emission gas) 300 samples per year.	Activity 3-6							

Assessment category: 5: Excellent, 4: Good, 3: Fair, 2: Weak, 1: Poor



### Capacity Evaluation Sheet for Output4

Please evaluate your capacity according to questions shown in the following table.  
Please fill the column of “Assessment of current capacity” with “x” corresponding to score of your self-evaluation.

Assessment Score      5: Excellent, 4: Good, 3: Fair, 2: Weak, 1: Poor

Name of Agency:	Capacity to be Developed	Name of respondent:	Date: / /2020	Related Activity	Assessment of Current Capacity					Reasons of Assessment	Key Points for Further Improvement
					1	2	3	4	5		
Example	Member of ITWG subgroup x can segregate solid waste appropriately according to the rule decided by his/her barangay.							x		I evaluate my capacity as “good” because I segregate my waste every day into 3 types as instructed by our barangay.	Careful attention to avoid contamination to each waste classification
Q4-1-1 (National Government member)	Member of ITWG subgroup for output4 can explain current situation of SWM in the Philippines based on National SWM strategy and other information & data.			Activity 4-1							
Q4-1-2 (for LGUs)	Member of ITWG subgroup for output4 can explain current situation of the target LGU’s SWM based on the target LGU’s 10-year SWM plan and other information & data.			Activity 4-1							
Q4-2-1 (National Government)	(Q for National Government) Member of ITWG subgroup for output4 can identify current issues on			Activity 4-2							

member)	SWM technologies other than WTE utilized in the Philippines.									
Q4-2-2 (for LGUs)	Member of ITWG subgroup for output4 can identify current issues on SWM technologies other than WTE utilized in the LGU.	Activity 4-2								
Q4-3	Member of ITWG subgroup for output4 understands and shares Appropriate Technology on SWM other than WTE in the Philippines and other countries.	Activity 4-3								
Q4-4	Member of ITWG subgroup for output4 understands and shares Good Practice on SWM other than WTE in the Philippines and other countries.	Activity 4-4								
Q4-5-1 (National Government member)	Member of ITWG subgroup for output4 can make recommendation to improve utilization SWM technology other than WTE to LGUs	Activity 4-4								
Q4-5-2 (for LGUs)	Member of ITWG subgroup for output4 can propose its plan to improve utilization SWM technology other than WTE.	Activity 4-4								
Q4-6	Member of ITWG subgroup for output4 can disseminate Appropriate Technologies & Good Practices on SWM other than WTE and make recommendation on utilization of those technologies & practices to other LGUs.	Activity 4-5								

Assessment category: 5: Excellent, 4: Good, 3: Fair, 2: Weak, 1: Poor