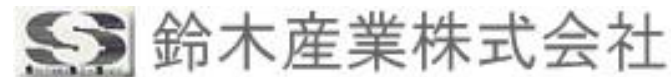

Result of JCM-PS under MOEJ

“Energy Saving in industrial wastewater treatment for rubber industry”

22nd February, 2016



Mitsubishi UFJ Research and Consulting

MUFG

1. Overview of the project

■ Background

- PT. Aneka Bumi Pratama (PT.ABP), natural rubber company in Kota Palembang in South Sumatra province, treats industrial wastewater from their rubber producing processes by aeration system using conventional diffuser to meet national wastewater quality standard in Indonesia.



PT.ABP

<Production activity in PT.ABP>



Rubber latex coagula (row material)



Natural rubber (product of PT.ABP)

1. Overview of the project

■ Project design

- This project plans to substitute existing diffuser in wastewater treatment plant (*WWTP*) in PT.ABP to aerator, developed by Suzuki Sangyo Co. Ltd., in order to upgrade wastewater treatment capacity in PT.ABP as well as to reduce electricity consumption and cost for renewal of diffuser.



WWTP in PT.ABP



Disposed diffuser

1. Overview of the project

■ Advantage of aerator

- Aerator generates stronger air and wastewater circulation in WWTP with less air pressure loss (almost zero loss) compared with conventional diffuser.
- This function contributes to reduce electricity consumption in blower and CO₂ emissions compared with existing diffuser.



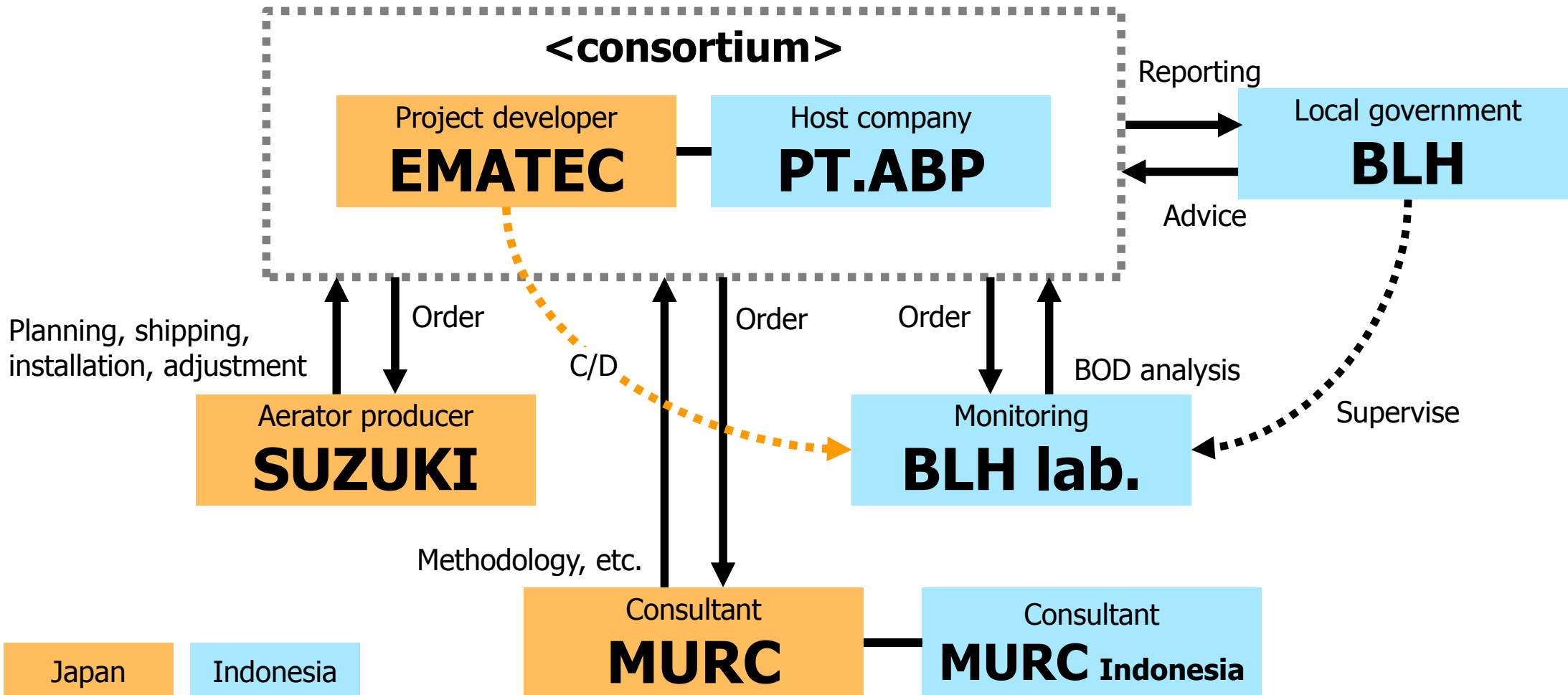
<Benefit of aerator>

- 30–50% Reduction of electricity consumption
- Maintenance free more than 10 years
- No sludge on the bottom of aeration tank
- Reduction of residual sludge
- No odor from aeration tank

Aerator (by Suzuki Sangyo Co. Ltd.)

1. Overview of the project

■ Project participants and roles



- EMATEC: Environmental Management and Technology Center (一般財団法人 関西環境管理技術センター)
- SUZUKI: Suzuki Sangyo (鈴木産業株式会社)
- MURC: Mitsubishi UFJ Research and Consulting (三菱UFJリサーチ&コンサルティング株式会社)

2. Reference scenario

■ Outline

- By this project, electricity consumption in blower per BOD load (ECB) (kWh/kgBOD) will be reduced.
- Current average ECB by diffuser is 1.07 (kWh/kgBOD) based on monitored data during JCM-PS in 2015FY. For conservativeness, lowest value of monthly ECB (ECB_{ref}) will be developed for estimation of electricity consumption in reference scenario (EC_{ref}).
- EC_{ref} will be estimated by ECB_{ref} (kWh/kgBOD) multiplied by monitored BOD load during project (kgBOD/year).
- BOD load during project is calculated by average reduced BOD concentration (kgBOD/m³) in wastewater multiplied by monitored flow rate of inlet wastewater (m³/day).

2. Reference scenario

■ Amount of CO₂ reduction

- Electricity reduction (kWh/year) = Monitored electricity consumption during project (kWh/year) – ECB_{ref} (kwh/kgBOD) x BOD load (kgBOD/year).
- CO₂ reduction (tCO₂/year) = electricity reduction (kWh/year) x CO₂ emission factor (CO_2EF) in South Sumatra province (kg CO₂/kWh).

3. Monitoring methodology

■ BOD load

- BOD concentration in inlet wastewater will be monitored every day. Inlet wastewater will be sampled by PT.ABP and BOD concentration will be measured by provincial environmental laboratory (BLH-lab.).
- Flow rate of inlet wastewater (m^3/day) will be measured by PT.ABP everyday by flow rate meter.

■ Electricity consumption

- Electricity consumption at blower will be monitored by PT.ABP every day by electricity meter.



■ CO_2EF

- Information for CO_2EF will be collected by PT.ABP and MURC.

4. Expected CO₂ reduction

■ Average electricity reduction

- Average electricity reduction is 30 – 50% based on results of similar projects in Japan.
- Expected yearly electricity consumption in blower of PT.ABP is 1.9 (GWh/year)*. Therefore, reduction of electricity consumption in blower is estimated as 618 (MWh/year).

** For this estimation, conservative 30% is used for average electricity reduction.*

■ CO₂ reduction

- CO₂ emission factor for electricity consumption in South Sumatra province is 0.61 (kgCO₂/kWh)**. Therefore, yearly CO₂ reduction is estimated to approximately 377 tCO₂/year.

*** This value will be updated.*

5. Planned capacity development (*C/D*)

■ *C/D* for provincial environmental laboratory

- BOD monitoring will be conducted by laboratory in the environmental agency in South Sumatra (BLH Sumsel). Accuracy of monitored BOD concentration is one of the most important data for estimation of CO₂ reduction. Therefore, EMATEC, an incorporated foundation for environmental monitoring, already started C/D for laboratory in 2015FY.

■ *C/D* for South Sumatra province

- This project will be the first JCM project in South Sumatra province. For sharing experience and developing further potential JCM projects, JCM training for provincial government (BLH, BAPPEDA, other related agency in province) and Kabupaten/Kota will be conducted in 2016FY by EMATEC with MURC.

6. Co-benefit

■ Reduction of cost

- Aerator needs no maintenance more than 10 years, on the other hand, diffuser needs replacement every half year to 1 year. Therefore, cost for replacing diffuser will become almost zero by this project.
- Also, reduction of electricity consumption contributes to reduce cost for purchase of electricity.
- Necessary time for initial cost recovery will be 5 to 7 years with JCM financial support.

■ CH₄ reduction

- Aerator will improve aeration process in WWTP and may contribute to reduce CH₄ generation in WWTP. After JCM project will be started, monitoring of CH₄ will be conducted.

7. Contribution to Sustainable Development

■ Green wastewater treatment

- Aerator is applicable to all industries in Indonesia (especially with high BOD load). This project may contribute to improve wastewater treatment capacity as well as GHG reduction in Indonesia.

8. Plan in 2016FY

Work	Apr-May	June-July	Aug-Sep	Oct-Nov	Dec-Jan	Feb-Mar
Submission of proposal, contract	→					
Detailed planning based on JCM-PS		→				
Shipping of aerator and installation		→				
Trial operation, adjustment				→		
Monitoring, PDD, crediting				→		
Study in Japan (1 week)		↔				
C/D for lab in BLH Sumsel		↔				
C/D for South Sumatra					↔	
Reporting, etc. (until the end of the project)						→