The Outline of the JCM-PS Description

22nd February, 2016

EMATEC

Project name：

Result of JCM-PS under MOEJ “Energy Saving in industrial wastewater treatment for rubber industry”

Project members：

・Environmental Management and Technology Center （EMATEC）

・Suzuki Sangyo (SUZUKI)

・Mitsubishi UFJ Research and Consulting（MURC）

1. 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.

◇Production activity in PT.ABP

Rubber latex coagula (row material)

Natural rubber (product of PT.ABP)

2. Objective of the project study

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

3. Project description

a. Project location

◇Palembang city, South Sumatra province, Indonesia

◇PT. Aneka Bumi Pratama

b. Indonesian partner(s)

Host company：PT.ABP

Advice：Local government BLH

Monitoring：BLH lab.

Consultant：MURC Indonesia

c. Description of the technology

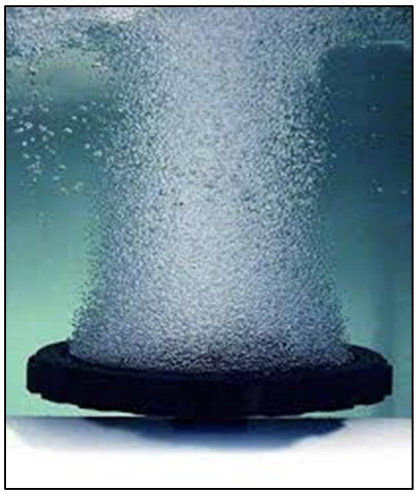
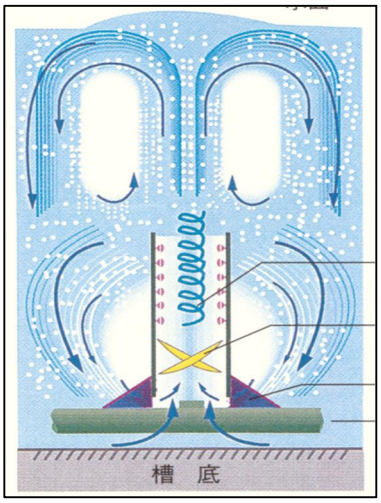
◇Technology to be adopted (aerator technology)

Aerator generates stronger air and wastewater circulation in WWTP with less air pressure loss (almost zero loss) compared with conventional diffuser.

This aerator strongly mixes air from blower and wastewater to treat wastewater aerobically.

This function contributes to reduce electricity consumption in blower and CO_2 emissions compared with existing diffuser.

Comparison of the diffuser and the aerator

	Diffuser (generic products)	Aerator
appearance		
principle	Performing the activated sludge process by generating fine bubbles from the diffuser connected to the air tube is plumbed to waste water treatment tank bottom.	Plumbed to waste water treatment tank bottom the wastewater and air are mixed in the aerator connected to the air tube, to generate a swirling flow to the upper from the bottom, it performs the activated sludge process.

Characteristic	・Since the rising water flow from the bottom to the top is limited to the peripheral diffuser, bottom becomes anaerobic, waste water treatment performance is deteriorated. ・Since the portion for generating a bubble (spraying component) is clogged, it is necessary to replace periodically (about 1 year), costly and labor. ・because there is a pressure loss at the diffuser unit (About 1,000mmAq), operating the blower at a high output, it is necessary for pumping air.	・This aerator strongly mix air from blower and wastewater to treat wastewater aerobically. ・There is no pressure loss in aerator and can reduce electricity consumption at blower. ・This aerator needs no maintenance more than 15 years. ・This aerator can use existing air pipe. ・Stench by anaerobic bacteria from the stabilization of the amount of dissolved oxygen is eliminated.

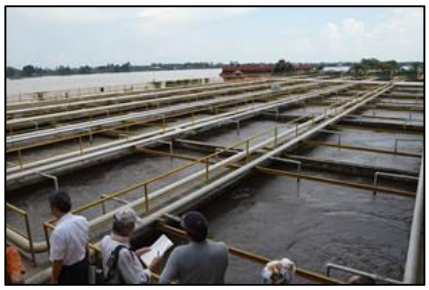
Aerator of Suzuki Sangyo has been delivered to a waste water treatment facility of 600 or more locations of the major domestic manufacturers, has a proven track record.

d. Project details

This project will substitute existing diffuser to Japanese aerator to improve wastewater treatment in PT. ABP as well as reduce electricity consumption and cost for changing diffuser.

It should be noted, are directed to two locations of waste water treatment facilities of PT. ABP Palembang factory in Indonesia South Sumatra Palembang City.

Project implementation site (PT. ABP. waste water treatment facilities)

	WWTP1	WWTP2
appearance		
Waste water treatment amount	4,725m^3/day	14,000m^3/day
Influent quality	790mgBOD/L	1,294mgBOD/L
installed aerator	186	246

4. The result of the study

a. Current condition in Indonesia

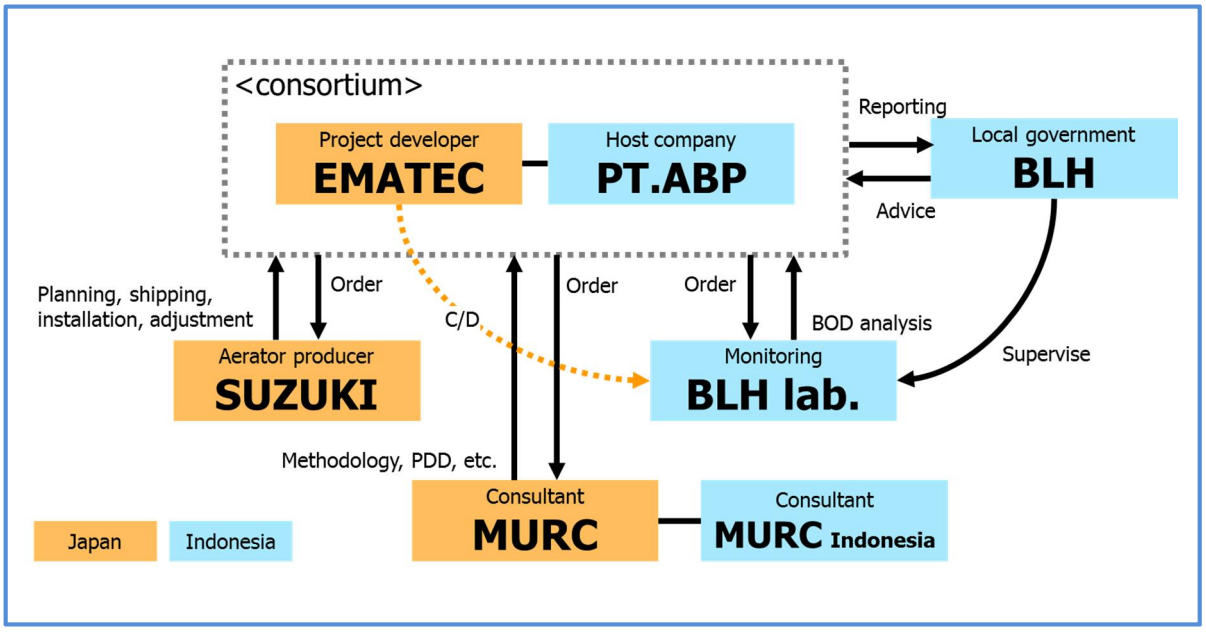
Waste water treatment system of the rubber plant is the main industry of Indonesia, the processing method according to the diffuser-type air diffuser in the concrete tank is being carried out in the mainstream.

b. Regulation(s) and policy(ies) related to the project

Is only carry out the improvement work of a running wastewater treatment facility in the ABP company, approval is not required in this project.

c. Role of each participant

The following are the project participants and the role.



Project participants and roles

d. Reference scenario setting

◇Outline

- By this project, electricity consumption in blower per BOD load (ECB) (kWh/kgBOD) will be reduced.
- Current ECB by diffuser is 1.07 (kWh/kgBOD) based on monitored data during JCM-PS in 2015FY. For conservativeness, lowest value of ECB (ECBref) will be used for estimation of electricity consumption in reference scenario (ECref).
- ECref will be estimated by ECBref (kWh/kgBOD) multiplied by monitored BOD load during project (kgBOD/year).

・BOD load during project is calculated by average BOD concentration (kgBOD/m^3) in inlet wastewater multiplied by monitored flow rate of inlet wastewater (m^3/day).

◇Amount of CO_2 reduction

・Electricity reduction (kWh/year) = Monitored electricity consumption during project (kWh/year) – ECBref (kwh/kgBOD) x BOD load (kgBOD/year).

・CO_2 reduction (t CO_2/year) = electricity reduction (kWh/year) x CO_2 emission factor (CO_2EF) in South Sumatra province (kg CO_2/kWh).

e. Monitoring methods

◇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.

・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.

f. Quantification of GHG emissions and their reductions

g. MRV methods

◇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).

◇CO_2 reduction

CO_2 emission factor for electricity consumption in South Sumatra province is XXX (kg CO_2/kWh). Therefore, yearly CO_2 reduction is estimated to approximately 377 t CO_2/year.

h. Scale of investment & financial viability

70,000,000 – 100,000,000 JPY is estimated.

i. Contribution to Indonesian Sustainable Development

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.

j. Proposed implementation schedule

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)						→

k. Capacity building to the host country

◇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 CO_2 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 and MURC.

l. 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.

◇CH_4 reduction

Aerator will improve aeration process in WWTP and may contribute to reduce CH_4 generation in WWTP. After JCM project will be started, monitoring of CH_4 will be conducted.

5. Conclusion and Next Steps

- By this project, electricity consumption in blower per BOD load (ECB) (kWh/kgBOD) will be reduced.
- Electricity reduction (kWh/year) = Monitored electricity consumption during project (kWh/year) – ECBref (kwh/kgBOD) x BOD load (kgBOD/year).
- CO_2 reduction (t CO_2/year) = electricity reduction (kWh/year) x CO_2 emission factor (CO_2EF) in South Sumatra province (kg CO_2/kWh).
- Average electricity reduction is 30 – 50% based on results of similar projects in Japan.
- Yearly CO_2 reduction is estimated to approximately 377 t CO_2/year.
- Discussion with relevant stakeholders will be conducted.