資料８

資料８　インドネシア水インフラセミナー配付資料

WATER SUPPLY SITUATION AND EXPECTED TECHNOLOGIES IN WATER INFRASTRUCTURE IN INDONESIA

By Ir. Djoko Mursito, M.Eng, MM
Director of Sanitation Development

Fourth Meeting of " the PPP Council for Overseas Water Infrastructure"
February 1th 2013
Tokyo, Japan

MINISTRY OF PUBLIC WORKS
REPUBLIC OF INDONESIA

WATER SUPPLY CONDITION

WATER SUPPLY CONDITION 2009 & 2011

	2009	2011
Portion of people with protected drinking water (safe access)	National: 47.71%	National: 55.04%
	Urban Area: 49.82%	Urban Area: 52.16%
	Rural Area: 45.72%	Rural Area: 57.87%

Ket :
1) Water supply target in 2015 refers to MDGs target

2) Water supply target(safe access) in 2020:85% and 2025:100%

	2009	2011
Total coverage of piped water supply service	National: 25,56%	National: 27.05%
	Urban Area: 43,96%	Urban Area: 41.88%
	Rural Area: 11,54%	Rural Area: 13.94%

Directive President: Overcome the arid area so there will be no water crisis in 2025

WATER SUPPLY TARGET 2015-2025

	2015	2020	2025
Portion of people with protected drinking water (safe access)	National: 68.87 %	National: 85%	National: 100%
	Urban Area: 78,19%	Urban Area: 95%	Urban Area: 100%
	Rural Area: 61,60%	Rural Area: 75%	Rural Area: 100%

	2015	2020	2025
Total coverage of piped water supply service	National: 41,03%	National: 57,16%	National: 72.16%
	Urban Area: 68,32%	Urban Area: 85.13%	Urban Area: 90.13%
	Rural Area: 19,76%	Rural Area: 33.16%	Rural Area: 58.16%

WATER SUPPLY DEVELOPMENT PROGRAM

Urban Water Supply Development	
Program	**Target**
Expansion of Existing Water Supply System	459 location 3,916,512m3/d
New Area Secondary Cities/Small Cities	1136 location 1,114,560 m3/d

Rural Water Supply Development	
Program	**Target**
Water Supply and Sanitation for Low Income Communities (WSSLIC)	5000 villages
Water shortages/ remote	1750 villages

ISSUES AND EXPECTED TO TECHNOLOGIES IN WATER INFRASTRUCTURES

- **Water Treatment Plant**

  - Indonesia is an archipelago comprising approximately 17,508 islands and 70% of total areas of Indonesia are coastal areas. This condition has made the coastal areas has limited access to water supply.
  - Urbanization has created many activities which produce pollution. Thus increasing the demand of water supply and degrading the water resource. It impact for water in quality and quantity.
  - Therefore technology to cope with those issues are needed such as:
    - water treatment to produce drinking water from sea water or brackish water for coastal regions and small island
    - water supply system for remote area
    - improving water quality
    - reclaiming water

Reverse Osmosis Technology

Why reverse osmosis :

- **Rapid development in RO technology**
- **Desalination process has high efficiency**
- **High flow capacity**
- **The capability of chemical resistance is more stable**
- **Capital expense is 10% cheaper than 20 years ago**

WATER SUPPLY OPERATORS

Local Water Supply Enterprises / Water Operators (PDAM)

Capacity	Number of PDAM	Service Coverage (%)
> 3,600 m3/h (> 1,000 l/s)	23	> 60% : 13 < 60% : 10
3,600 m3/h – 1,800 m3/h (1,000 l/s – 500 l/s)	36	> 60% : 9 < 60% : 27
< 1,800 m3/h) (< 500 l/s)	286	> 60% : 35 < 60% : 247
Total capacity (m3/h) 529.210,8	Total PDAM: 341	

- **WOPs (Water Operator Partnerships)**

Collaboration between mentor (well run waterworks) with recipient (local waterworks) in particular agreed subject for certain period of time → twinning

Subject of interest:

- NRW reduction
- Energy efficiency
- Asset management
- Technical management
- Financial management, etc.

ISSUES AND EXPECTED TO TECHNOLOGIES IN WATER INFRASTRUCTURES

- **REDUCTION OF THE NON REVENUE WATER**

The term is related to the effort on reducing the Non Revenue Water (NRW) in water supply operator

The subjects is the level of NRW to be reduced

Pre-condition:

- Water Supply Operator with NRW > 40%;
- Supply coverage > 80% population
- Full cost recovery tariff

- **ENERGY EFFICIENCY**

The term is related to the effort on reducing the energy consumption in particular equipment as to the efficient one

The subjects are the apparatus of the water supply system which consume energy to operate. This includes the electrical and mechanical equipment.

Pre-condition:

- Water Supply Operator with energy consumption > 30% of the operational expenses;
- Full cost recovery tariff

Performance Base Contract

The implementation of NRW reduction and energy efficiency use **Performance Base Contract which means**

" The contract agreement between a water supply operator (waterworks) with a private partner based on the performance achievement of the partner to meet the goal of NRW reduction or energy efficiency which is set up, first in the beginning "

Thank You

Arigatou Gozaimasu

PROSPECTS OF PUBLIC PPP OF WATER INFRASTRUCTURES IN INDONESIA

4th Meeting of
"The PPP Council for Overseas Water Infrastructure"

By Ir. Djoko Mursito, M.Eng, MM
Director of Environmental Sanitation Development

February 1st , 2013
Tokyo, Japan

M I N I S T R Y O F P U B L I C W O R K S
R E P U B L I C O F I N D O N E S I A

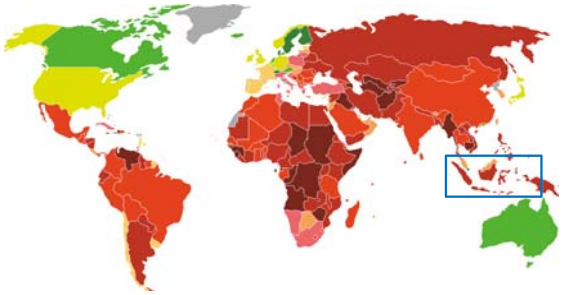
Introduction : Indonesia at a glance

COUNTRY SNAPSHOT: *THE BIGGEST ARCHIPELAGO*

I N D O N E S I A

GDP Size (2011)	US$ 840 Bi	Land Area	1,904,443 sq km
GDP percapita (2011)	US$ 3,500	Sea Area	3,116,163 sq km
		Total Area	5,020,606 sq km
		Coastal Line	81,000 km
Population (Statistic Indonesia 2010 census)	238 Million people (4th biggest population)		

Source: Various

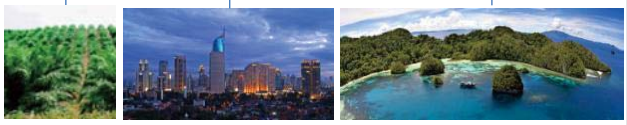


The rising population share of Indonesia's middle class (% of Population)

2003 37.7%

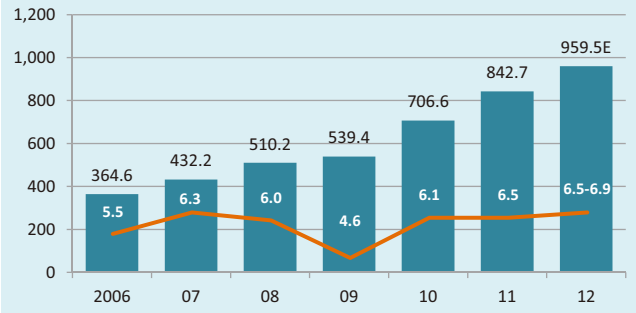
2010 56.5%

Source: World Bank



SOUND ECONOMY: *SUSTAINABLE GROWTH*

Nominal GDP (US$ bn), Real GDP Growth (%)

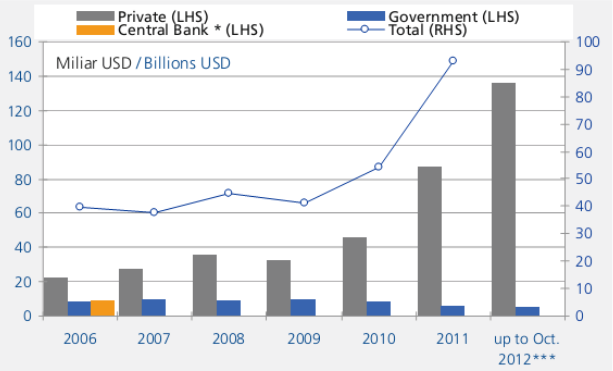


Source: EIU, Min. of Finance, and Central Bureau of Statistics

*Having a GDP size of more than US$ 840 billion in 2011 and economic growth of 6.5 – 6.9%, **Indonesia is the largest economy in Southeast Asia and the third fastest growing economy in Asia**.*

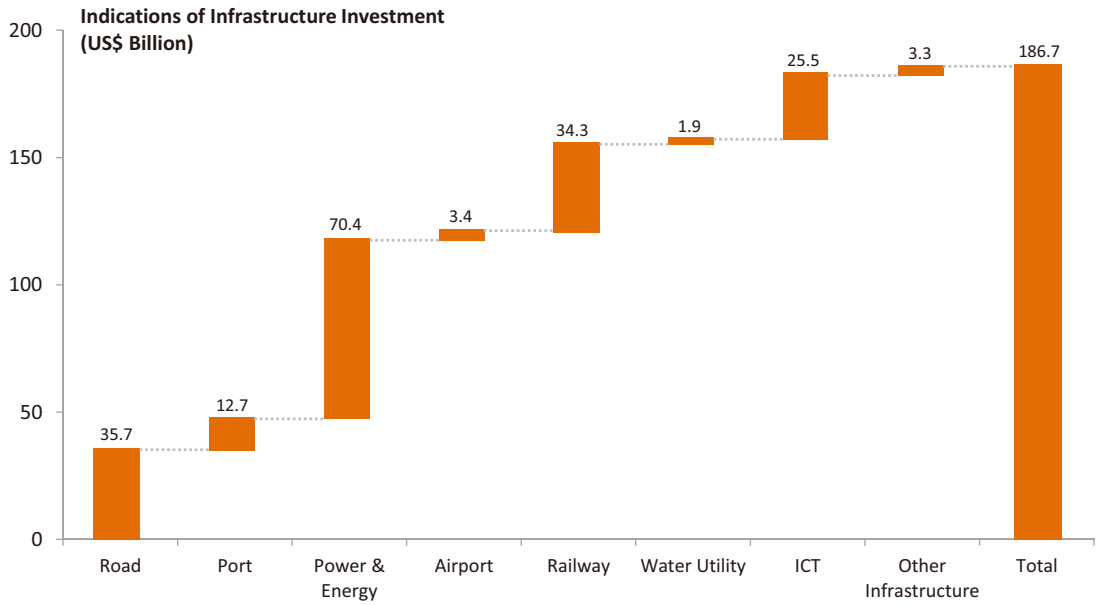
**) Since 2007, the debt's service payment of central bank very small*

Debt-Service Payment of Government, Central Bank and Private



Source: Bank of Indonesia

MASTER PLAN FOR ACCELERETATION AND EXPANSION OF INDONESIA ECONOMIC DEVELOPMENT (MP3EI) 2011-2025



Note: The investment will be funded by Goverment, State Owned Enterprises (SOE), and Privates.

Source : MP3EI

*Exchange rate (Rp/US$) = 9,500

WATER SUPPLY PERFORMANCE

- **Existing condition (2011)**
  - Population with safe access to drinking water : 55.04%
    - Urban areas: 52.16%
    - Rural areas: 57.87%

- **MDGs Target (2015)**
  - Population with safe access to drinking water: 68.87%
    - Urban areas: 78.19%
    - Rural areas: 61.60%

WATER INFRASTRUCTURE PROJECTS

Urban Water Supply Development		Rural Water Supply Development	
Program	**Target**	**Program**	**Target**
Expansion of The Water Supply System	459 location 3,916,512 m3/d	Expansion of The Water Supply and Sanitation System for Low Income Communities (WSSLIC)	500 villages
Water Supply Development in New Area (Secondary Cities/Small Cities)	1136 location 1,114,560 m3/d	Water Supply and Sanitation Development in Remote and Water Shortage Area	1750 villages
Estimated Budget US$ 5.91 Billion		**Estimated Budget US$ 1.341 Billion**	

Financing Resources:
National budget = US$ 4.18 billion
Local Budget = US$ 1.48 billion
PPP / Bank = US$ 1.58 billion

WATER SUPPLY OPERATORS

Local Water Supply Enterprises/LWSE (PDAM)/Operators

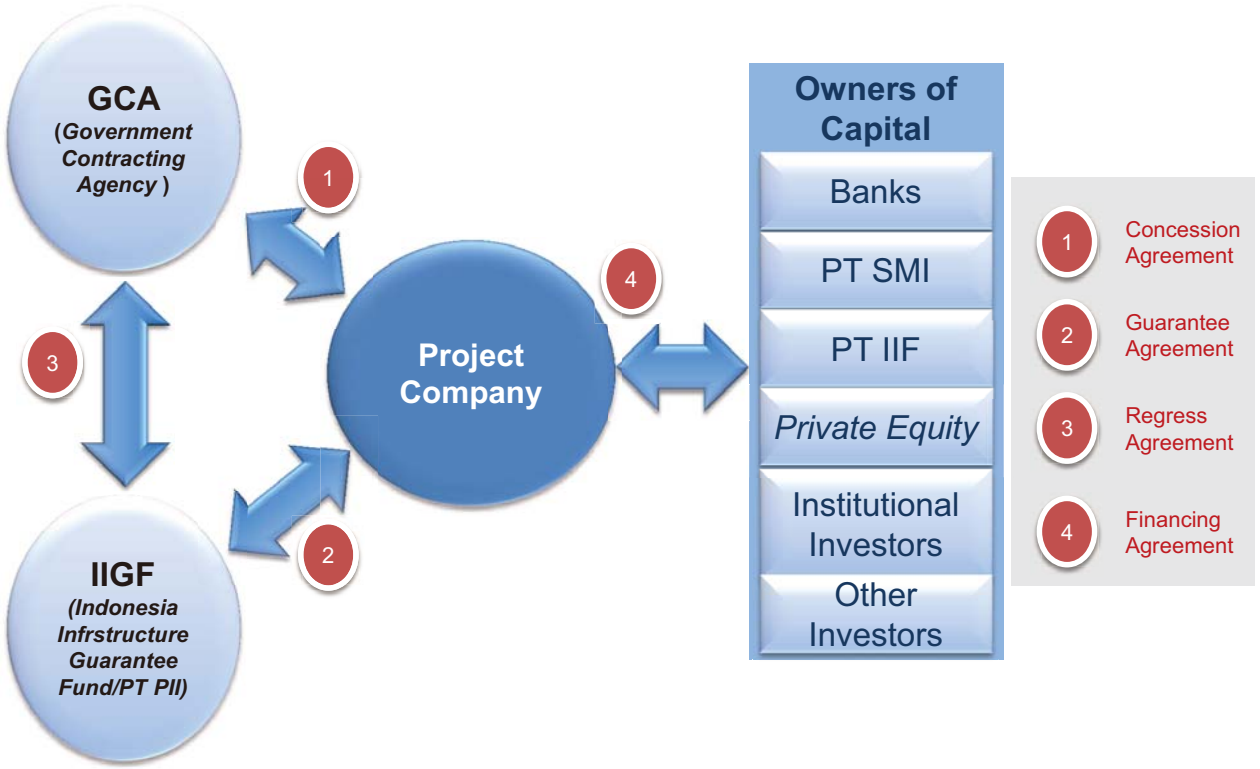
Capacity	Number of PDAM	Service Coverage (%)
> 3,600 m3/h (> 1,000 l/s)	23	> 60% : 13 < 60% : 10
3,600 m3/h – 1,800 m3/h (1,000 l/s – 500 l/s)	36	> 60% : 13 < 60% : 10
< 1,800 m3/h (< 500 l/s)	282	> 60% : 35 < 60% : 247
Total capacity : 530,000 m3/h (147,000 l/s)	Total PDAMs (LWSEs): 341	

BASIC SANITATION PERFORMANCE

- **Existing condition (2011)**
  - Population with safe access to basic sanitation facilities: 55.06%

- **MDGs Target (2015)**
  - Population with safe access to basic sanitation facilities: 62.41%

Synergys in PPP Project



Investement Policy

Conducive Investment Environment in Indonesia supported by Law & PPP Regulations

PPP Regulation

- Presidential Regulation No. 67/2005, and its amendment No. 13/2010 & No. 56/2011 (PPP in Infrastructure Development)
- Minister of National Development Planning Agency Regulation No. 4/2010 (Guidelines for PPP in Infrastructure Development)

Water Supply Sector

- Act No. 7/2004 (Water Resources)
- Government Regulation No. 16/2005 (Water Supply System Development)
- Minister of Public Works Regulation No. 12/2010 (Guidelines on Business Cooperation for Water Supply System Development)

PPP SCHEME OPPORTUNITIES

- Expansion of Water Supply System
- Non-Revenue Water Reduction under Performance Based Contract
- Energy Efficiency under Performance Based Contract
- Water Operation Management
- Water Treatment Supply

TENDER STATUS IN PPP PROJECTS

No	Project Title	Brief Descriptions	Status in late 2012
1	Umbulan Water Supply, East Java Province	• PPP modality : BOT • Capacity planning: 4,000 Lps • Estimated project cost: US$ 204.2 Million • Estimated IRR: 14.54% • Beneficiary: The utilization for 1.6 million inhabitants or 320,000 connection	The deal of capex values
2	Bandar Lampung Water Supply, Lampung Province	• PPP modality: BOT/concession • Estimated project cost: US$ 38 Million • Development of intake and WTP 2x250 L/sec • Development of distribution network and hose connections	Clarification process on Januari 2013
3	Maros Water Supply, South Sulawesi Province	• Construction of intake: 270 Lps • Installation raw water transmission: 8,5 km • WTP: 250 Lps • Reservoir: 4,500 m3 • Main distribution network: 37 km • Estimated cost project: US$ 11.50 Million	Pre-Qualification

The way to invest

OPPORTUNITIES IN PPP PROJECTS

No	Project Title	Brief Descriptions	Status in late 2012
1	DKI Jakarta-Bekasi- Karawang Water Supply (Jatiluhur), DKI Jakarta-West Java Province	• PPP modality : BOT • Capacity of WTP: 5,000 Lps • Estimated project cost: US$ 663 Million • Procurement of transmission pipe ND: 1,800 mm, length 58 Km	Financial and institutional review
2	Western Semarang Water Supply, West Semarang-Central Java Province	• PPP modality: BOT/concession • Estimated project cost: US$ 40-70 Million • Development of intake: 1,050 L/sec • WTP: 2x500 L/sec	Due dilligence to final business case
3	South Pekanbaru Water Supply, Pekanbaru Municipal & Kampar Regency	• Development of WTP: 500 L/sec • Development of distribution pipe • Estimated cost project: US$ 41 Million	Preparation of Pre FS
4	Karian-Serpong Water Conveyance, Banten Province	• PPP Modality: BOT • Estimated cost project: US$ 690 Million • Development of WTP: 10,000 Lps • Procurement of transmission pipe length 90 Km	Waiting for Dam construction
5	Jatigede Water Supply, West Java Province	• PPP Modality: BOT • Estimated cost project: US$ 357.6 Million • Development of WTP: 6,000 Lps • Procurement of transmission pipe ND 1,600mm, length 7.15 Km	Waiting for Completion of Dam Structure
6	Expansion of Padang Water Supply, West Sumatera Province	• Estimated cost project: US$ 20.50 Million • Development of WTP: 2000 L/sec • Rehabilitation of distribution network	Preparation of pre FS
7	Jakarta Sewerage DKI Jakarta Province	• Estimated cost project: US$ 457 Million • Development of Waste Water Treatment Plan: 20.000 m3/day • Procurement of trunk/main sewers length 14 Km	Pre FS has been completed

Thank You

Arigatou Gozaimasu

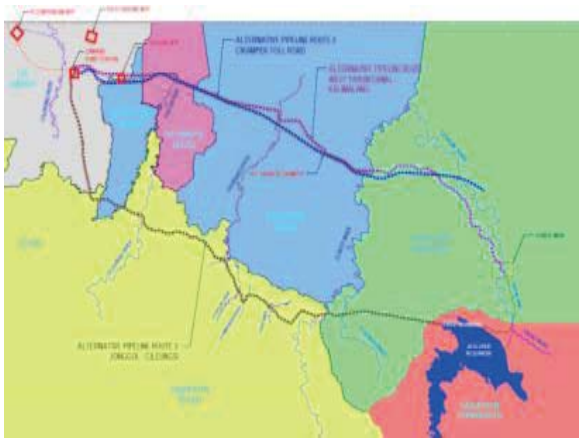
(website: www.pu.go.id)

PROJECT BRIEF OF PPP OPPORTUNITIES

(1) DKI JAKARTA, BEKASI, KARAWANG WATER SUPPLY (JATILUHUR)

PROJECT SCOPE :

- Development of intake 5,000 lps
- Development of Water Treatment Plant (WTP) 5,000 lps
- 6 reservoir offtakes



ESTIMATED COST:

- US $ 226 million

STATUS

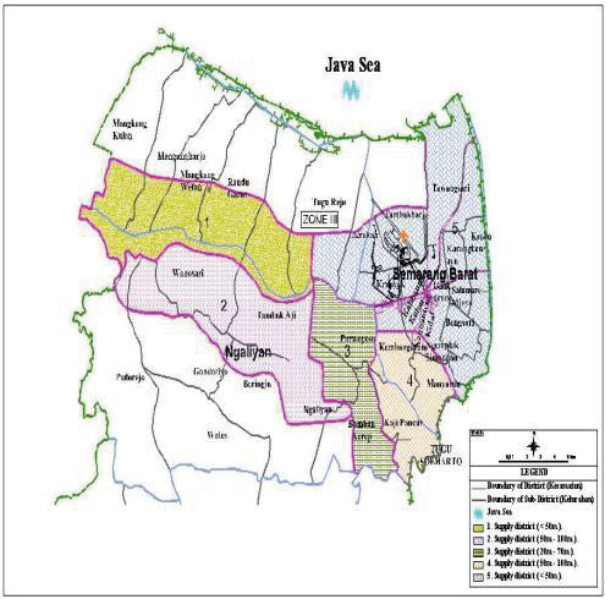
Review FS

(2) WESTERN SEMARANG CITY WATER SUPPLY

- PPP Modality : BOT plus
- Estimated Project Cost :
  US $ 50 – 90 Million
- Project Location: Western Semarang City

PROJECT SCOPE :

- Development of Intake 1.050 L/sec
- Transmission pipe of raw water
- WTP 2 x 500 L/sec
- Distribution pipe system
- Reservoir
- Primary & secondary distribution pipeline



STATUS : FBC (on going)

(4) SOUTHERN PEKANBARU WATER SUPPLY

Kampar River

- **SCOPE OF PROJECTS:**
  - Intake
  - Development of Water Treatment Plant 500L/s
  - Development of distribution pipe

•**PROJECT LOCATION**: Pekanbaru Municipal and Kampar Regency

•**COST ESTIMATION** : US$ 41 Million

- **STATUS :** Preparation of Pra FS

(5) KARIAN-SERPONG WATER CONVEYANCE

- PPP MODALITY : BOT
- CAPACITY PLANNING : 10,000 lps
- ESTIMATED PROJECT COST : US$ 690 Million
- ESTIMATED IRR : 16 %
- BENEFICIARY : The utilization for 4 million inhabitants or 800,000 connection
- PROJECT LOCATION : Banten Province

PROJECT SCOPE :

- Development of Water Treatment Plant (WTP) 10,000lps
- Procurement of transmission pipe length 90 km

STATUS: Pra FS of Karian Dam

(6) JATIGEDE WATER SUPPLY

- PPP MODALITY : BOT
- CAPACITY PLANNING : 6,000 lps
- ESTIMATED PROJECT COST : US$ 357.6 Million
- ESTIMATED IRR : 20.0 %
- BENEFICIARY : Utilization for 2,4 million inhabitants or 480,000 connection
- PROJECT LOCATION : West Java Province

PROJECT SCOPE :

- Development of WTP 2 x 3.000 lps
- Procurement of transmission pipe ND 1,600 mm , 7,150 m
- Development of Reservoir 2x 7,000 m3

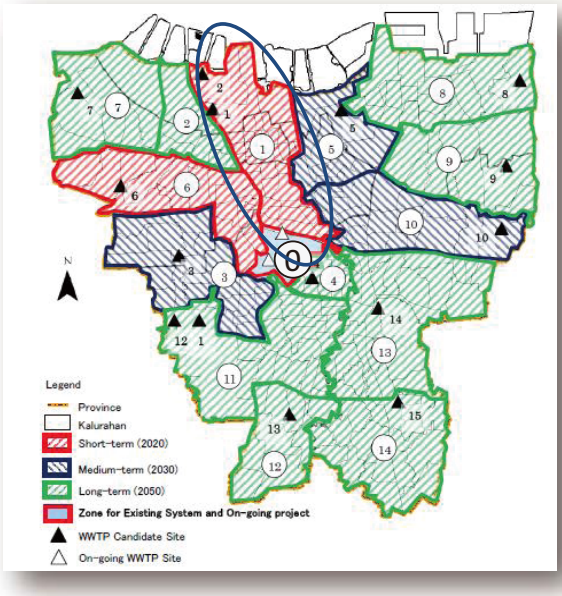
STATUS: Dam Construction

(3) SOUTHERN BALI WATER SUPPLY PROJECTS, BALI

- **SCOPE OF PROJECTS:**
  - Intake : Unda River (1500 L/s)
  - Development of Water Treatment Plant
  - Transmission and distribution pipe
  - Reservoir
  - Office and supporting facilities
  - Delivery points
- **PROJECT LOCATION**: Klungkung, Gianyar, Badung Regency, Denpasar City
- **PPP Modality : BOT 30 years**
- **COST ESTIMATION** : US$ 287 Million
- **STATUS** : The unsolicited proposal is being reviewed

(7) JAKARTA SEWERAGE

PRIORITY : ZONE 1



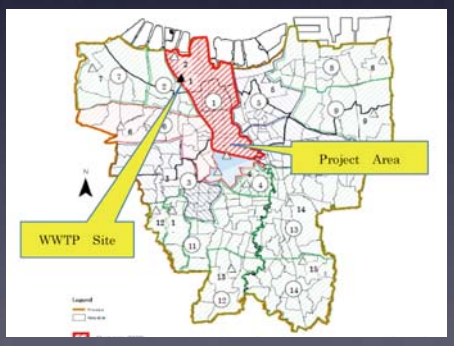
- **SCOPE OF PROJECTS:**
  - WWTP 200.000 m3/day
    Location : Pejagalan Park
  - Trunk/main sewers : 14 km
- **PROJECT LOCATION** : Gambir, Sawah Besar, Menteng, Tanah Abang, Matraman, Grogol Petamburan, Taman Sari, Tambora
- **BENEFICIARY :** The utilization for 989.000 inhabitants
- **COST ESTIMATION** : US$ 457 Million (60% public, 40% private)
- **STATUS** : Pra FS has been completed

Sewerage Treatment Plant Project: PPP Zone 1

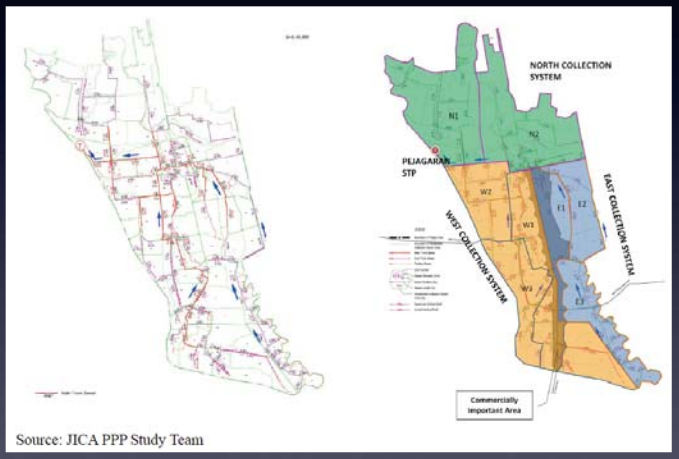
Jakarta Provincial Government

Project Profile

- Catchment Area 4,901 Ha
- Located in Penjaringan City Park, Sub-district Pejagalan, North of Jakarta
- Designated area is 3,3 Ha for treated 200,000 m3/d wastewater



Sewerage Pipe Plan and Sub-zone Divivision



Source: JICA PPP Study Team

Facility	Pipe	Manhoke	Interception Chamber
Trunk Sewer	883,095	4,122	9,113
Sub-trunk Sewer	998,978	24,230	42,762
Other			
Total	1,882,073	28,352	51,875

Financial Scheme

- STP: USD 167 Million
  - Schematic alternatives:
    - Design Built Operate (DBO): fully finance by GOI
    - Public Private Partnership (PPP): *Cost Sharing for Construction and Merit of PPP*
- Pipeline: USD 290 Million
  - Financial scheme
    - 70% GOI
    - 30% Jakarta Provincial Government

Cost Analysis & Merit of PPP:

Cost Sharing for Construction and Merit of PPP

Rate,9012.5 (IDR/USD) As of January,2012

	Pipe Network		Wastewater Treatment Plant		
Management	Public		Public		
Construction Cost	2.61 trillion IDR		1.78 trillion IDR		
	ODA + PU	DKI	PU		
Case 0	1.29 tri.	1.32 tri.	1.78 tri.		
	(30% of Total Public Portion)				
Management	Public		SPC		
Construction Cost	2.61 trillion IDR		1.51 trillion IDR		(15%)
Case 1 (DBO)	1.37 tri.	1.24 tri.	1.51 tri.		
	(30% of Total Public Portion)				
			(VGF)		SPC
Case 2 (BOT)	1.55 tri	1.06 tri.	0.76 tri. (50%)	0.15 (10%)	0.60 tri. (40%)
Case 3	1.60 tri.	1.01 tri.	0.755 tri. (50%)		0.755 tri. (50%)
Case 4	1.69 tri.	0.92 tri.	0.45 tri. (30%)		1.06 tri. (70%)

Progress

Current Progress: Study Stages

- Delivered report is Interim Report
- Next report, Draft Final Report, will be targeted end of January 2013, and
- Final report is scheduled by March 2013

Note: all reports should be discussed with Jakarta Provincial Government.

Progress

Next milestone

- Loan Agreement between GOI and JICA is scheduled on April 2013
- Ground Breaking is scheduled by the end of 2013 or in the beginning of 2014

Progress

Engineering

- JICA have sent Fact Finding Mission Team from December 2012 to January 2013, scope of discussion:
    1. Engineering Services,
    2. Detail Engineering Design,
    3. Constructions
- And will be sending Special Team for the project appraisal on the 3rd week of February
- JICA is preparing consultant team per request by Jakarta's government in 2013 for Ground Breaking works.

Progress

Further Discussion

- The pipeline will be mix system between separated and interceptor.
    1. Interceptor system will be used in area of densely populated residential areas and low income. Note, closed drainage.
    2. Besides those area above will be using separated system.
    3. Or will it be completely separated system?
- Membrane Bio-Reactor (MBR) technology or the others in regards to initial construction cost and future operation and maintenance costs?
- Land requirement. Further technical and legal adjustment!
- Possibility of other zones, that has more land availability?
- Traffic problems during construction have not been addressed!

Terima Kasih

Domo Arigato Gozaimasu

ECO Bottle Integrated Production Plant & Container Desalination System

Feb. 1, 2013

A M E C Inc.
President CEO

BLUE OCEANS Co., Ltd.
Chairman CEO & CFO

Masanori KAMAI
mkamai@amec.co.jp

Agenda

Ⅰ. AMEC Corporate Profile

Ⅱ. ECO Desalination Plant from Seawater and River water

Ⅲ. ECO Integrated Production Plant for Ultra-Light-Weight Bottle Water

Agenda

Ⅰ. AMEC Corporate Profile

Ⅱ. ECO Desalination Plant from Seawater and River water

Ⅲ. ECO Integrated Production Plant for Ultra-Light-Weight Bottle Water

Greeting

- I have the work experience for 16 years in Manufacturing Industry and for 16 years in Information Service Industry.
- I contribute to the enterprise and the society as all land player who made good use of all the business experience such as technology, marketing and management in the new industrial field where the 2nd industry and the 3rd industry are united.
- Work experience of big enterprises in Japan, Europe and America, Overseas life experience, Job change experience, and Management from big enterprises to small and medium-sized companies.
- I have Challenging Spirit and do consulting from Wide Viewpoints by making the best use of the business management experience of M&A, IPO, Business reproduction, Global management and Internal Audit etc.
- I promise to become Your Good Partner who make your business and company succeed as a professional.

Mission

AMEC advocate from Japan

- to make the best use of the nature of "Sun",
- "Water" and "Green",
- to have "Love" in all lives and touches it,
- to value the place of "One one term meeting",
- to contribute to the globalization world.

AMEC is the following abbreviation.

- **A** is **ALL** & **ASIA**.
- **M** is **Monozukuri** & **Management**.
- **E** is **Engineering** & **Education**.
- **C** is **Cooperation** & **Consulting**.

Agenda

Ⅰ. AMEC Corporate Profile

Ⅱ. ECO Desalination Plant from Seawater and River water

Ⅲ. ECO Integrated Production Plant for Ultra-Light-Weight Bottle Water

1. Desalination and Purification Systems from Seawater and River water

Using of natural yeast for water pre-treatment, which system is more environment friendly systems for desalination and purification from Seawater and River water etc.

Feature 1 Utilizing natural yeast for water purification

Feature 2 Saving energy type Plunger pump is being used

Feature 3 Production of original water, after mineral treatment

Feature 4 ECO System Generator is being used

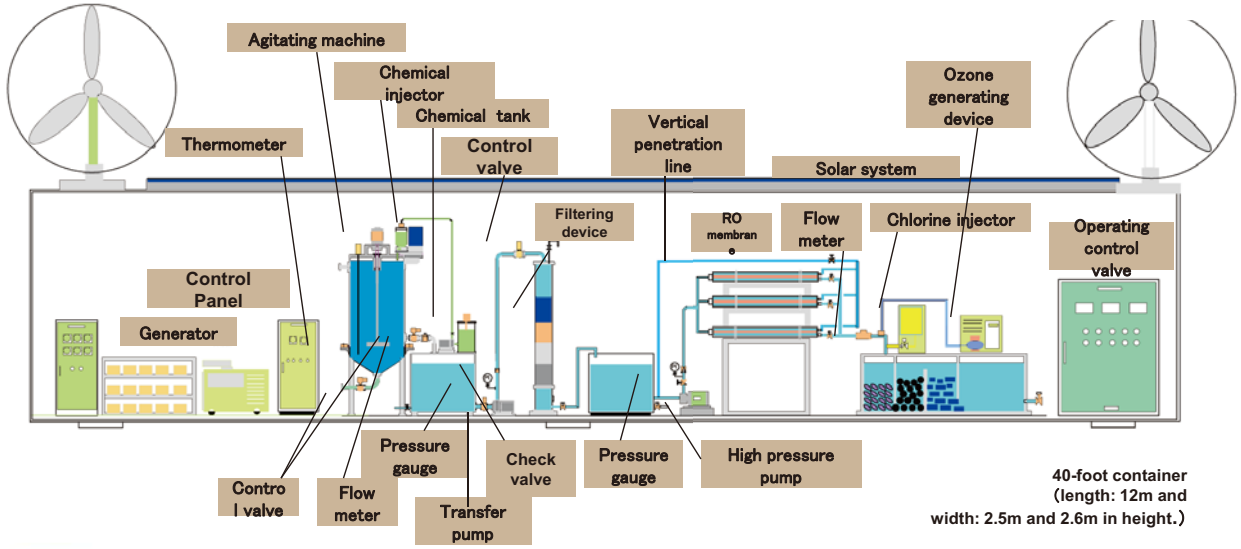
Feature 5 Smaller sized & mobile type various kind of appearances & equipment

Made with 5 features in One integrated system It can be moved to any place At any time.

Neither a big space or Installatin work is required so that it can be introduced In low cost.

Replacement of RO membrane is required only once in every year or two even if you use every day.

2. Diagram Of Desalination And Purification Unit Plant



40-foot container (length: 12m and width: 2.5m and 2.6m in height.)

Installed in 20 feet container type

Drinking water production quantity is 20 tons per day.
In case five (5) liters shares for one person per day is required, production water quantity can be available for 4,000 persons per day.

Installed in 40 feet container type

Drinking water production quantity is 40 tons per day.
In case five (5) liters shares for one person per day is required, production water quantity can be available for 8,000 persons per day.

3 ①. Value Point of Purification and Desalination Systems

Water pre－treatment Systems Using Natural yeast、and the impurity should be flocculated and precipitated before the raw water pass through RO membrane as water pre-treatment .

Water pretreatment using the natural yeast

High speed Filtrater

Advantage Point

Since the natural yeast is being used upon the water pretreatment, when the raw water should be passed through the RO membrane. The systems should be applied, the treatment results should be gained in remarkable efficiency in comparison with the conventional Ozone and other flocculent which was used in the past. It used be taken twelve hours by conventional method, however, it takes only one minute to be completed by this system.

A large open space of plant facility and the more construction cost used to be required , consequently, there are still many large scale of unit remained anywhere. However, since the method using the natural yeast, now it is possible for us to proceed the water treatment can be performed by smaller scale and the system has been minimized.

The water pre-treatment should be performed without the chemical agent, consequently, the water (drain) should be deposed of as high concentrated water and it can be used for some other purposes and it leads to the contribution of environmental protection issue.

The concentrated water (drain) to be discharged after having the water treatment, the water should be free of hazardous substances and the concentrated salt water can be used for the food additive on processing of making ham or also to be applied for (Seawater Therapy)

3 ②. Value Point of Purification and Desalination Systems

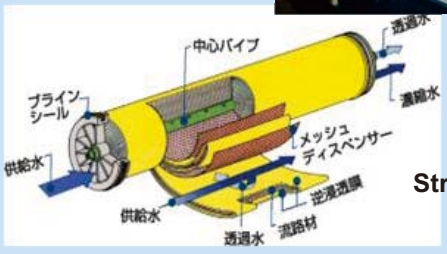
MODIFIED PLUNGER PUMP

Rotary Piston Pump **Proportional Injection Piston Pump**

Using the energy saving power, however, it can be gained High pressure power in efficiency

ROMEMBRANE (REVERSE OSMOSIS MENBRANE)

Water filtration performed by RO membrane using Plunger Pump



Structures

Advantage Point :

The pump which can be obtained the high pressure power with the high pressure power of energy saving in efficiency, which should be required for the seawater water passing through the RO membrane (Reverse Osmosis membrane) and tuned into the fresh water.

the lightweight smaller sized pump as called modified “Plunger Pump” which has been developed at the IKUTA Research Institute and It has become possible for us to obtain the high pressure power using by energy saving power in efficiency.

The specification of the pump should be selected for the kind of water (seawater, muddy water,) or the quality of water.

3 ③. Value Point of Purification and Desalination Systems

It can be produced the tasty mineral water from the purified fresh waterr

For your favorite water

Granite stone and Coral stone … Chlorine fixed quantity Pump

Example for water production

Purified water, Alkali ion water
Hydrogen water, mineral water
Carbonic Acid water, Hard water,
Soft water, Oxygen water,
Ozone water

Advantage Point :

When the raw water should be turned into the fresh water after having a water treatment, the water should become the mineral water, therefore, it is not so favorable for using as drinking water. It is possible for you to produce the characteristic water at various fields using with the optional equipment developed by IKUTA Formula catalyst.

The water can be produced such as Purified water, Alkali ion water, Hydrogen water, oxygen water ,Mineral water. Carbon oxide water, Hard water, Soft water, Ozone water.

The water can be used for agricultural specific purpose, it is due to current integrated technology as the specific magnetic activated vessel. .

4. Various Types in case of Purpose and Location

	Feature	Capacity
Container 	It is not necessary to do civil engineer work and it finishes to set up just one day. You can start to set up the plant from small funds in case of the water quantity and if necessary, can increase the container.	・20ft （seawater）20ton/day ・20ft （river water）40ton/day ・40ft （seawater） 40ton/day ・40ft （river water）80ton/day Can provide drinking water for 8000 people (5ℓ/day/person) by 40ft
Truck 	Can provide the drinking water from sea, river-water because it can move everywhere like a disaster area or chaotic infrastructure countries. It doesn't bother about the power because it has solar and wind-power, furthermore, decrease CO2 and harmful gas like a NOx and contribute to the prevention on global warming.	・4ton truck （sea）7～10ton/day ・4ton （river）10～20ton/day ・12ton （sea）40～50ton/day ・12ton （river）80ton/day Can provide drinking water for 3600 people (2ℓ/day/person)
Compact (ship/room inside) 	Seaside, ship (motor boat, fish boat, tourist boat) supermarket, office etc, can set up the small space（equipment size: 1370㎜ ×460㎜×500㎜）。	（sea）6ton/day （river）20ton/day ※can customize the equipment size and treatment quantity of water upon your request. (FYI following equipment size and pre-treatment unit is optional.)

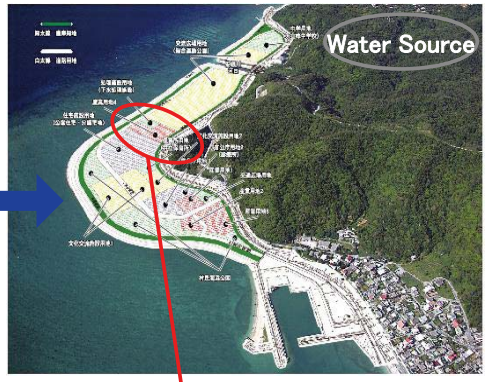
Agenda

Ⅰ. AMEC Corporate Profile

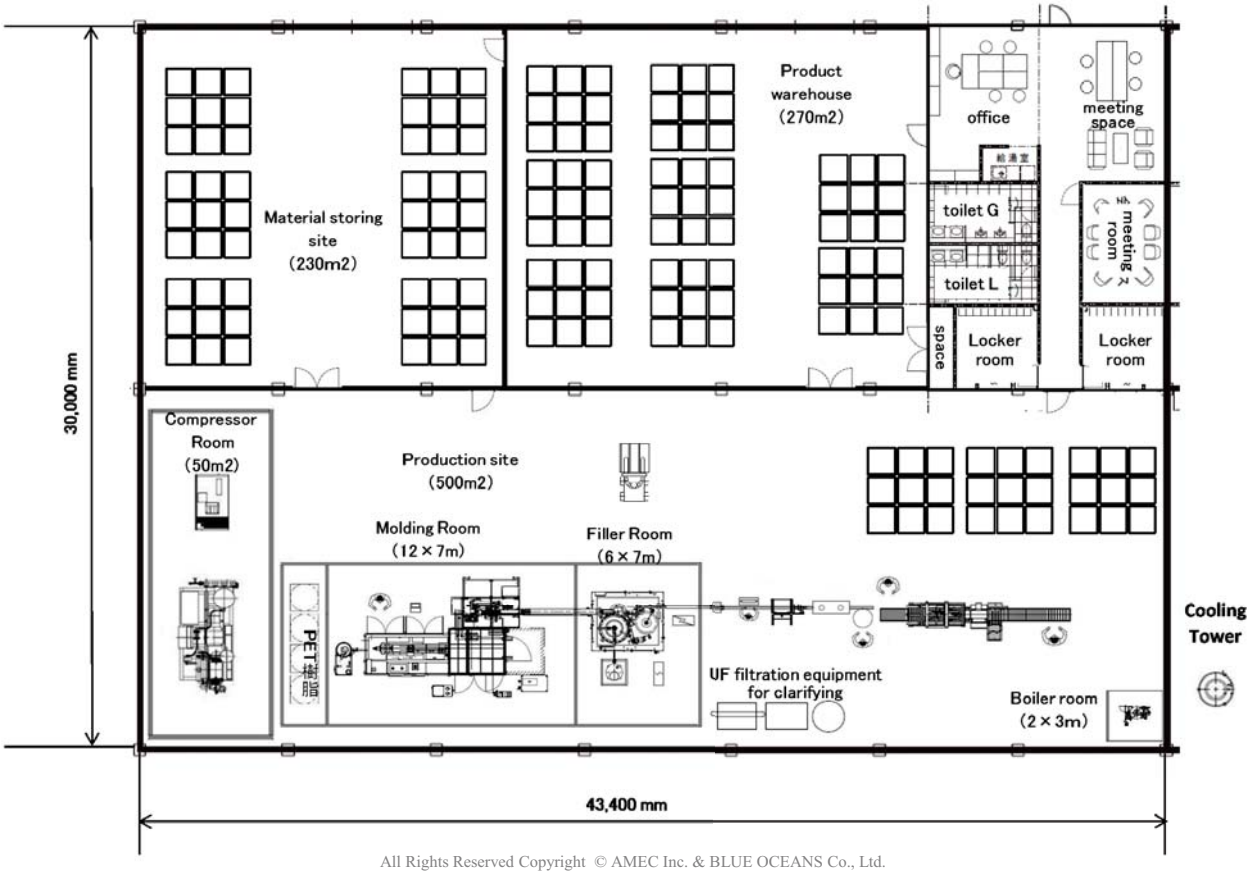
Ⅱ. ECO Desalination Plant from Seawater and River water

Ⅲ. ECO Integrated Production Plant for Ultra-Light-Weight Bottle Water

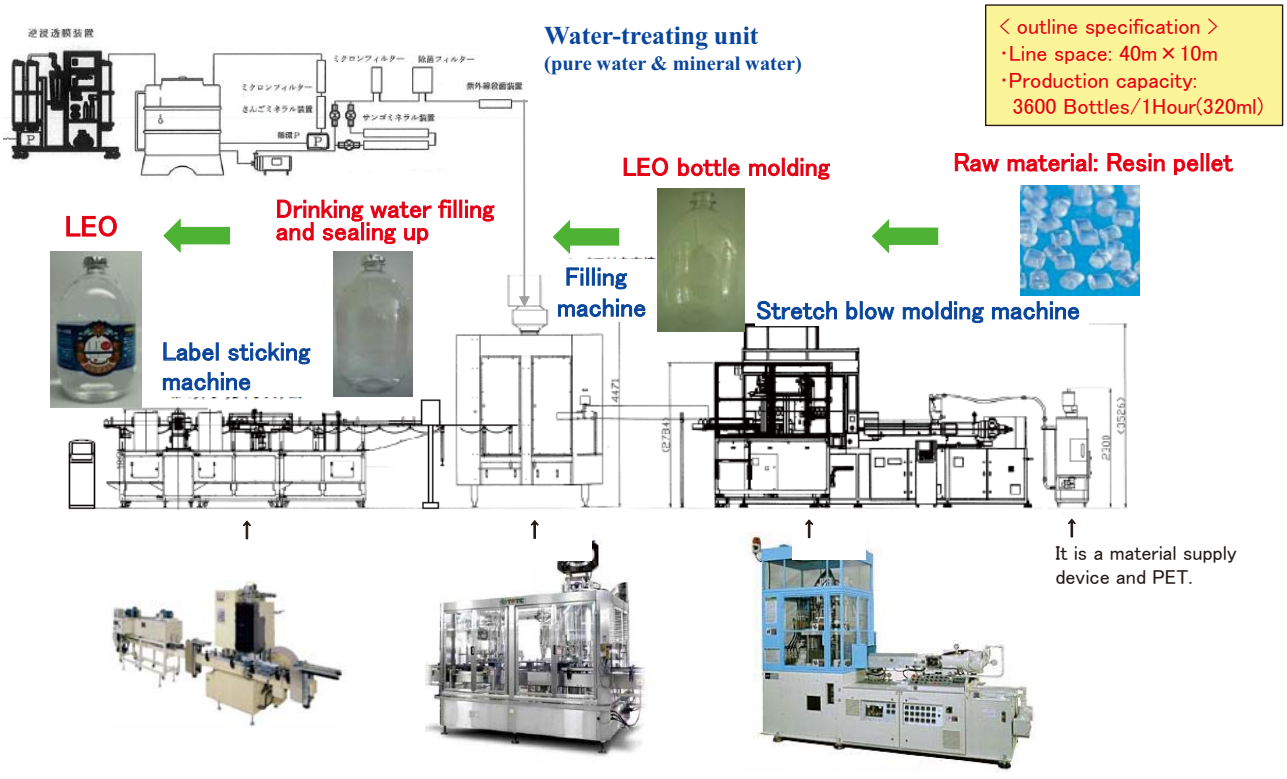
1. New Factory Plan at Ogimi village in Okinawa in Japan



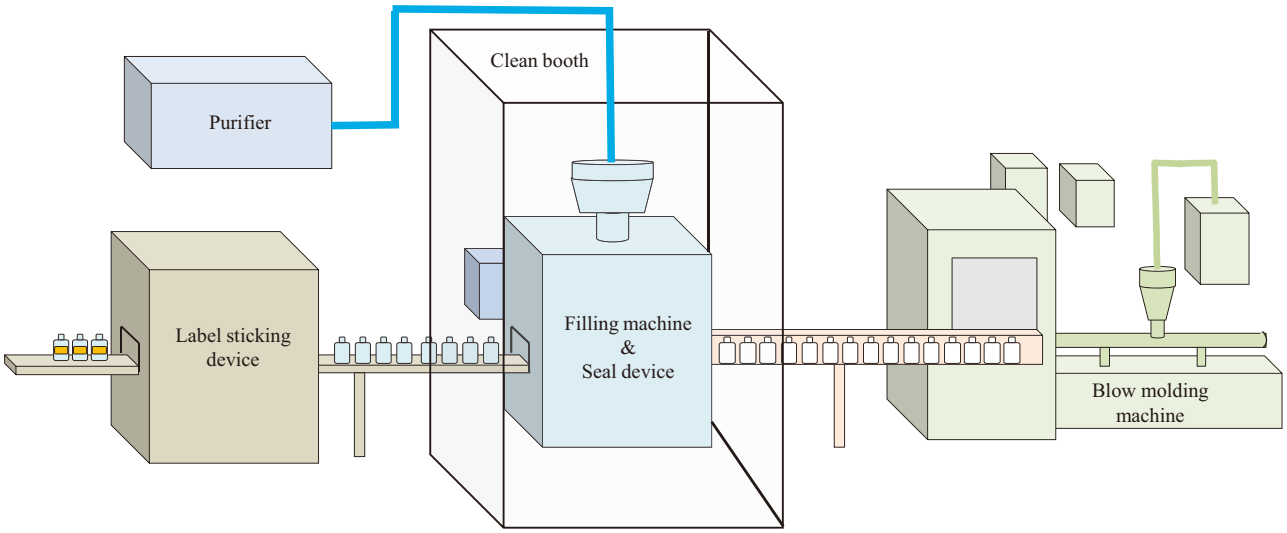
2. Factory Plan of LEO Bottle Water (3600 BPH)



3. Flow of ECO Integrated Production Plant for Ultra-Light-Weight Bottle Water



4. Plant Concept Chart

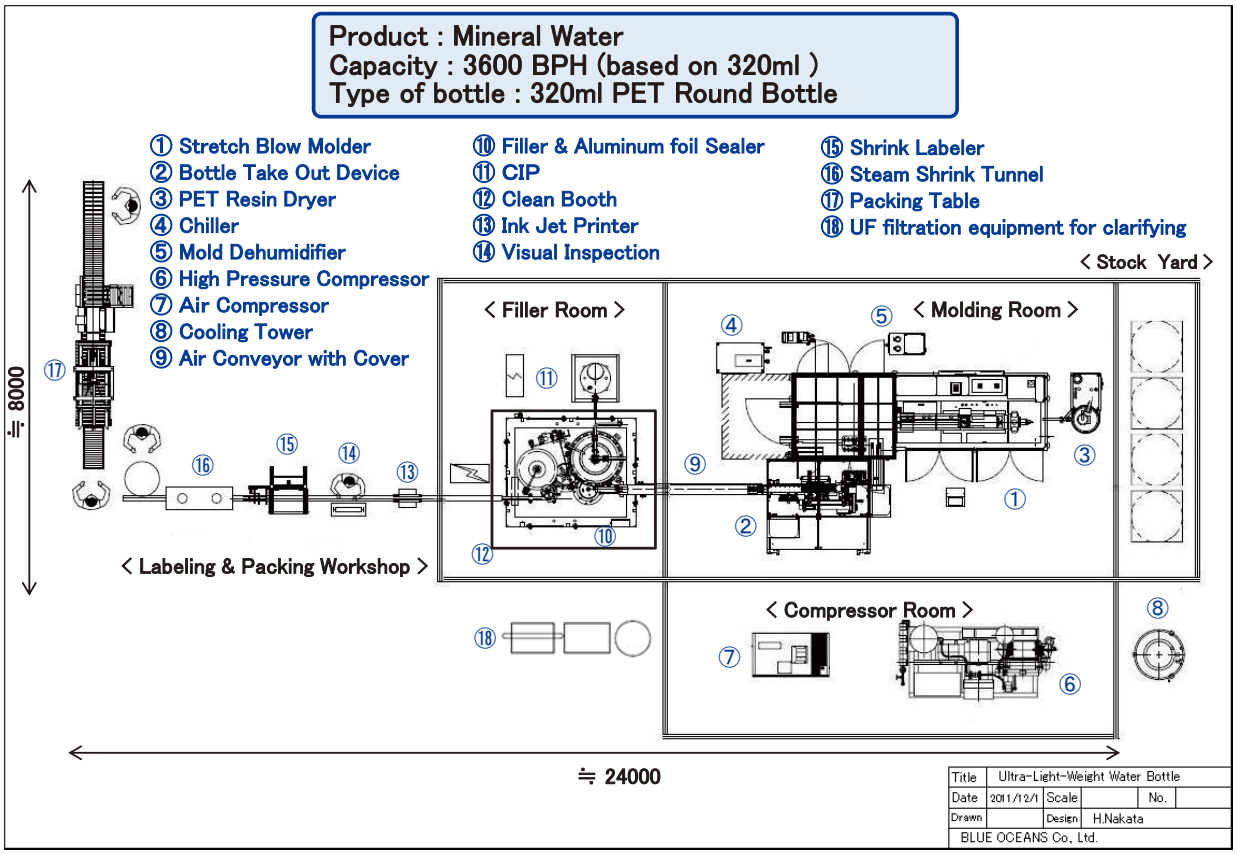


< feature of process production plant >

・The inventory location of the molding bottle is unnecessary.

・Mechanization and the miniaturization by process production are achieved.

5. Ultra-Light-Weight Water Bottle Production Line



6. UF filtration equipment for clarifying

(The Photos are only your reference)

Machine specification

1. Capacity: 2ton/H
2. Removal of foreign body filter
3. Feed water pump
4. UF Element
5. UF Vessel
6. Turbidity meters
7. Flowmeter, Manometer
8. Control panel

7. Schedule (Reference Only)

Month	1st	2nd	3rd	4th	5th	6th	7th
①Stretch Blow Molder	←	—	—	—	—	→	
⑩Bottle Filler & Sealer		←	—	—	—	→	
⑮Shrink Labeler		←	—	—	—	→	
Start up							↔
Training							↔

◆Remarks: Transportation is not included (Shipping)!

8. Value Point

- Plant by Uniting of High New Technologies
- Excellent Bottle Performance, In ½ Weight, Strength is more than others
- 1/2 Reduction of PET Material Cost
- Conservation of Energy
- Easy Distribution & Sanitary by Bottling
- Collected PET Bottle is Reusable

- Transportation Cost Down by easily crushing bottle by hand (Not bulky)
- Flexible Bottle Shape by CAD & CAM Design

- Labor Cost Reduction by Complete Automation
- High Safety by Safety System
- Environment Friendly (CO^2 is reduced by 50% or more)
- Possibility of Wide Application and Use
- PR of this place signature Consecrated Water LEO in Okinawa etc.
- Social Contribution (Support for Water Shortage and Disaster etc.)

9. Question

1. How many are necessary for the production of the bottle for 1month?
2. How much are operating time of 1 day and operating days for 1 month?
3. What do you put in the bottle? This time, the consecrated water is assumed.
4. Do you drink the content of the bottle? Is it necessary to purify to drink the water ? If so, do you include our Water Purifier Machine Unit in this plant? In that case, can you offer the data and the sample of the water to design?
5. Where is the installation location?
   Can the building where the plant is set up keep constant cleanness?
   According to circumstances, when there are some sand, dust and dirt etc., to suppress miscellaneous germs, a clean room is needed.

10. Scenery in Okinawa, Japan

Thank you very much!

A M E C Inc.
President CEO

BLUE OCEANS Co., Ltd.
Chairman CEO & CFO

Masanori KAMAI
mkamai@amec.co.jp

History of Swing Corporation

- ■1912 Inokuchi Type Machinery Office founded by Issei Hatakeyama
- ■1920 EBARA Corporation established
- ■1956 EBARA-INFILCO established with INFILCO Inc(USA)
- ■1994 EBARA-INFILCO was merged into EBARA Corporation
- ■2009 All EBARA's water related business unit integrated to Ebara Engineering Service (EES)
- ■2010 Mitsubishi and JGC joined EES
- ■2011 EES has a new name Swing Corporation as of April 1

Organization Restructuring for **21 Century**

Pump Manufacturing One century(100years)

Water Treatment Half century(55years)

Aiming at further expansion in the global water business market

Global Network, Finance, Business Management

Global procurement, Project Management

State-of-the art technologies for water/wastewater treatment and O&M works

Mitsubishi Corporation 33.3%

JGC 33.3%

EBARA 33.3%

EBARA ENGINEERING SERVICE CO., LTD.

As of April 1, 2011

水ing Swing Corporation

Abundant experience and accumulated technologies for Water treatment business

Drinking Water Treatment (WTP)

Waste Water Treatment (WWTP)

Water treatment Business

Industrial water treatment

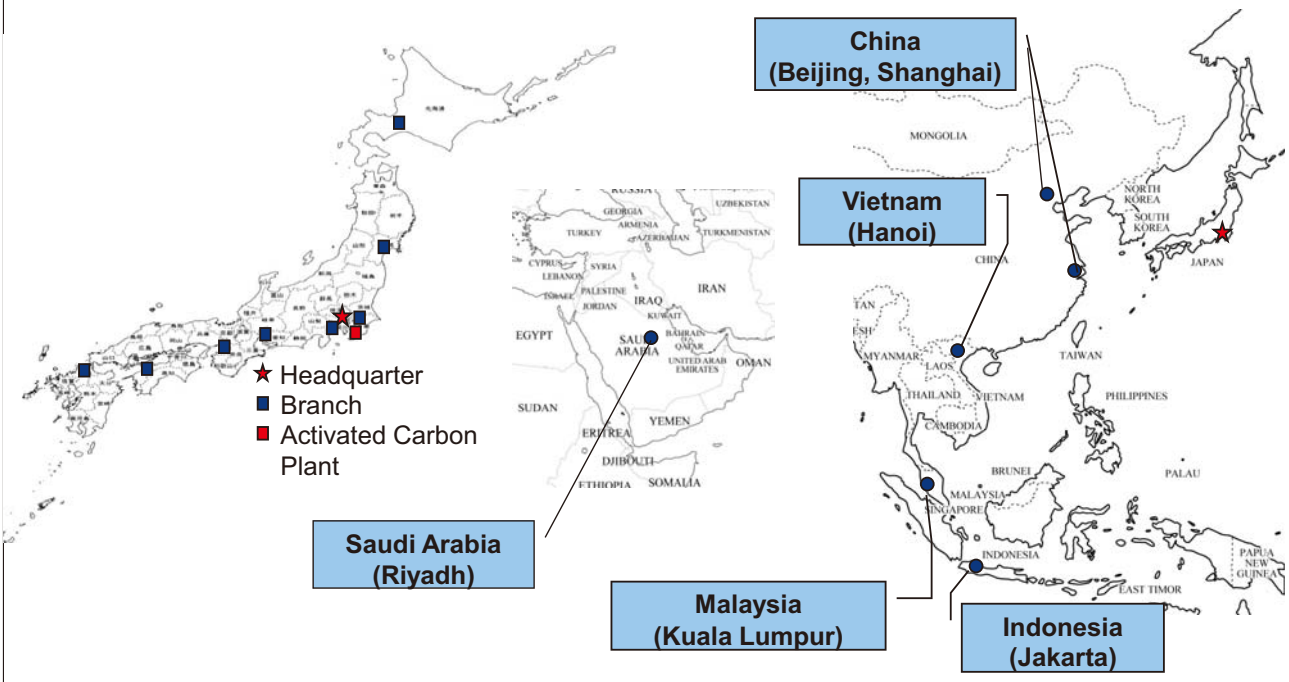
Biomass (Methane Fermentation, Composting)

Industrial wastewater Treatment

Leachate Treatment

Night soil Treatment

Swing has 9 branches in Japan and 6 strategic subsidiaries in Asia and Middle East



jk ing has abundant experience both in EPC and O&M works in Domestic

EPC Business for public DWTP & WWTP

Domestic Market Share : 30%

No.1 share in Japan

O&M Business for public DWTP & WWTP

More than 450 facilities operated in Japan

for WTP	for WWTP
67 plants currently under operation	186 plants currently under operation
Septic/ Night soil: 60 plants currently under operation	Landfill wastewater: 50 plants currently under operation

Miscellaneous

Domestic Experience

Sewage Treatment Plant

Ariake sewage treatment plant
(Tokyo, 300,000 m^3/day, 1994)

Advanced treatment :
Biofilm filtration (BIOPAC) and ozone

Morigasaki sewage treatment plant
(Tokyo, 1,5400,000 m^3/day, 1966)

Domestic Experience

Leachate Treatment Plant

Landfill Leachate treatment

(Tokyo, Total 20,500 m3/d, 1979, 1986, 2000)

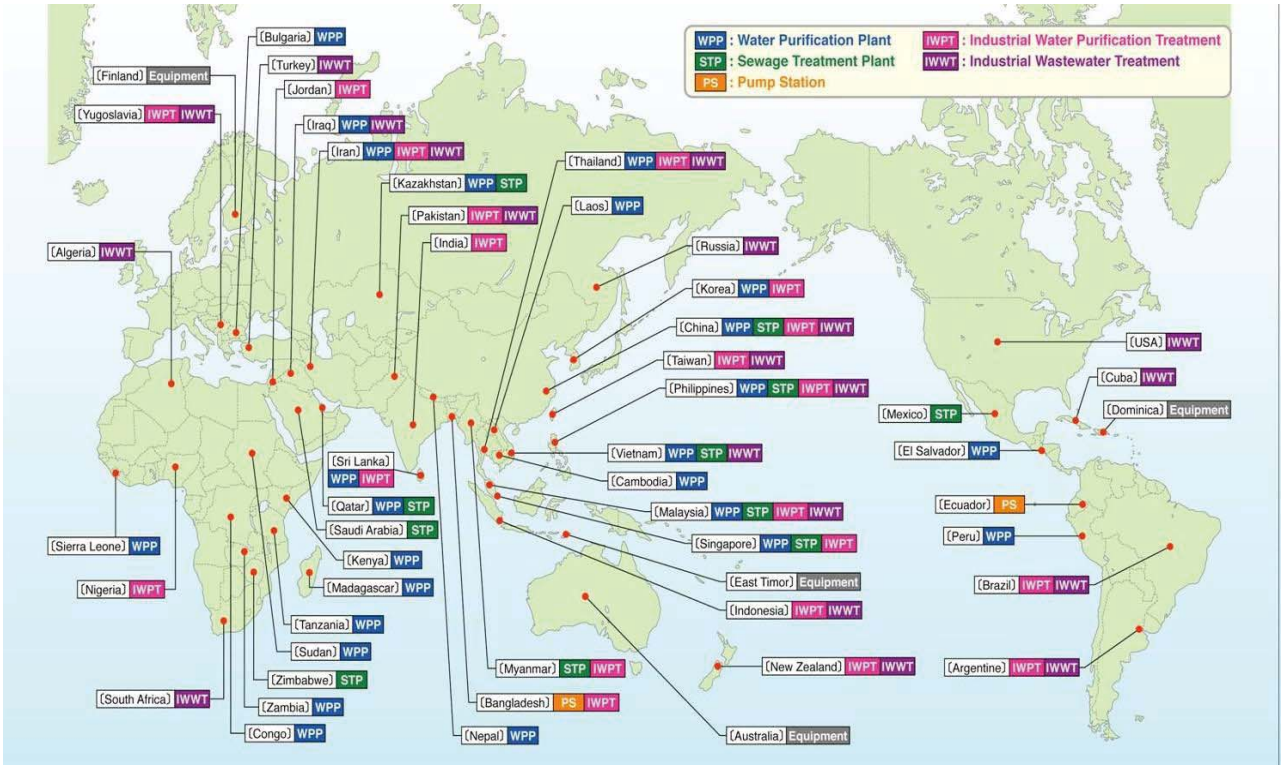
Process:

Nitrification/Denitrification (BIOERG)

Fenton Reaction

Adverse moving bed activated carbon tower

ing accomplished EPC works all over the world and enjoys appreciations from our clients



ing experience in Asia

WTP & WWTP in Kazahstan
(100,000 m³/d & 135,000 m³/d)

WWTP in China
(260,000 m³/d)

WWTP in Singapore
75 ,000 m³/d)

WWTP in Malaysia
(59,000 m³/d)

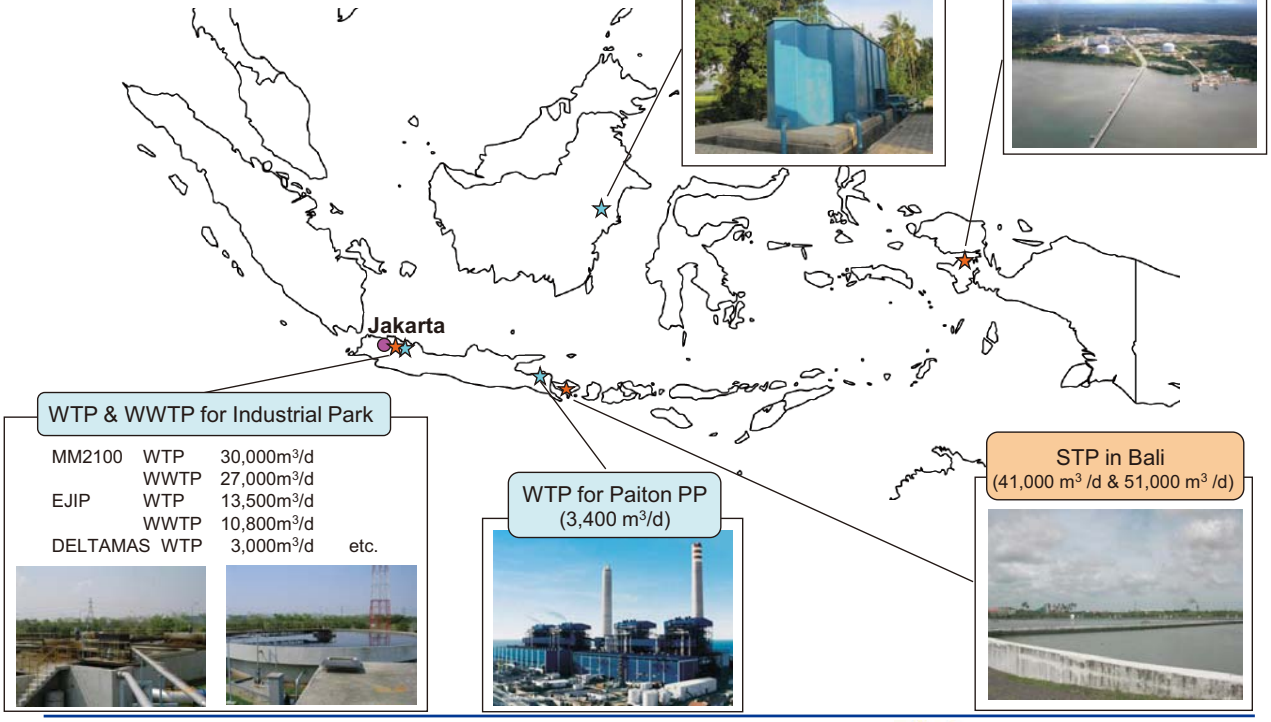
WTP in Vietnam
(50,000 m³/d)

WTP in Sri Lanka
(5,000 m³/d)

WWTP in Vietnam
(141,000 m³/d)

Experience in Indonesia

: Water Treatment Plant (WTP)
: Waste Water Treatment Plant (WWTP)



Sewage Treatment in Indonesia (1)

Bali/ Denpasar Sewerage Development Project

- Phase (I)
  Capacity : 41,000 m3/day
  Completion: March 2005

- Phase (II)
  Capacity : 51,000 m3/day
  Completion: March 2011

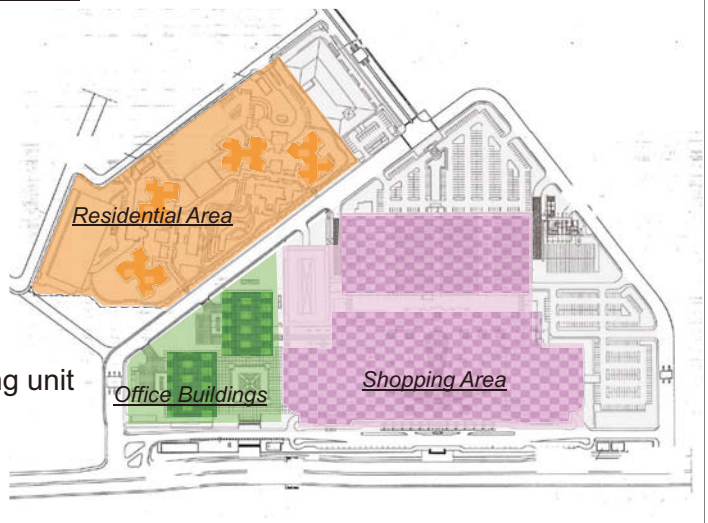
< Treatment Process >

Influent → Screen → Primary Sedimentation → Bio Reactor (Aeration) → Final Sedimentation → Discharge

Sewage Treatment in Indonesia (2)

A. EPC of Total 5 Sewage Treatment Plants for Senayan Square

-STP for Residential Area:
  -150 m3/day x 1
-STP for Shopping Area:
  -500 m3/day x 1 & 1040 m3/day x 1
-STP for Office Buildings:
  -600 m3/day x 1



Treatment Method:
(a) Activated sludge treatment with deodorizing unit
(b) Membrane Bioreactor Systems

B. Operation & Maintenance of all Sewage Treatment Plants in Senayan Square

-Daily operation for 24h x 7days/week
-12 Operators
-Total Capacity of 3,500 m3/day
-Regular maintenance

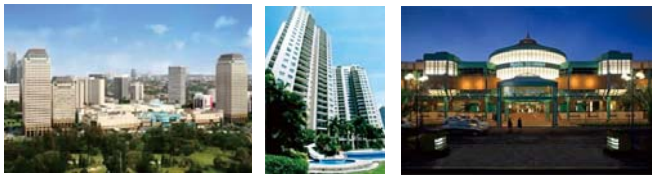


Photo: http://www.plaza-senayan.com/

Water Environment Improvement & Issue

1. **Protection of Raw Water Sources**
2. **Water Environment Improvement in Greater Area**

→Sewerage Treatment Plant Increase

Sludge Volume Increase

What is Issue ?

- **Wide Area for Landfill → Land Acquisition**
- **Provision for Environment**
  - **Landfill Leachate treatment Plant**
  - **Odor Protect & Control at Landfill Area**

Expensive for Environmental Protection

SWING Sludge Treatment Technologies

Sludge

Solid Waste

Dung / Night Soil

Wastes change to Valuables

SWING Sludge Treatment System

Electric energy

Construction materials

Safety compost material

Methane Fermentation System

Multiple Recycling System of Sewage Sludge and Industrial Organic Waste in KUROBE CITY

Delivered in 2011
〔80m³/day〕

1-1. Advantages

Local Government

- Sludge Discharge Reduced by 60%
  ⇒ Effective Utilization (Alternative Coal, Fertilizer)
- Fuel for Sludge Drying Unnecessary
- Supplements Electricity Supply for WWTP by 10%

Regional Contribution

- Foot Bath Facility (Several Hundreds of Visitors per Month)

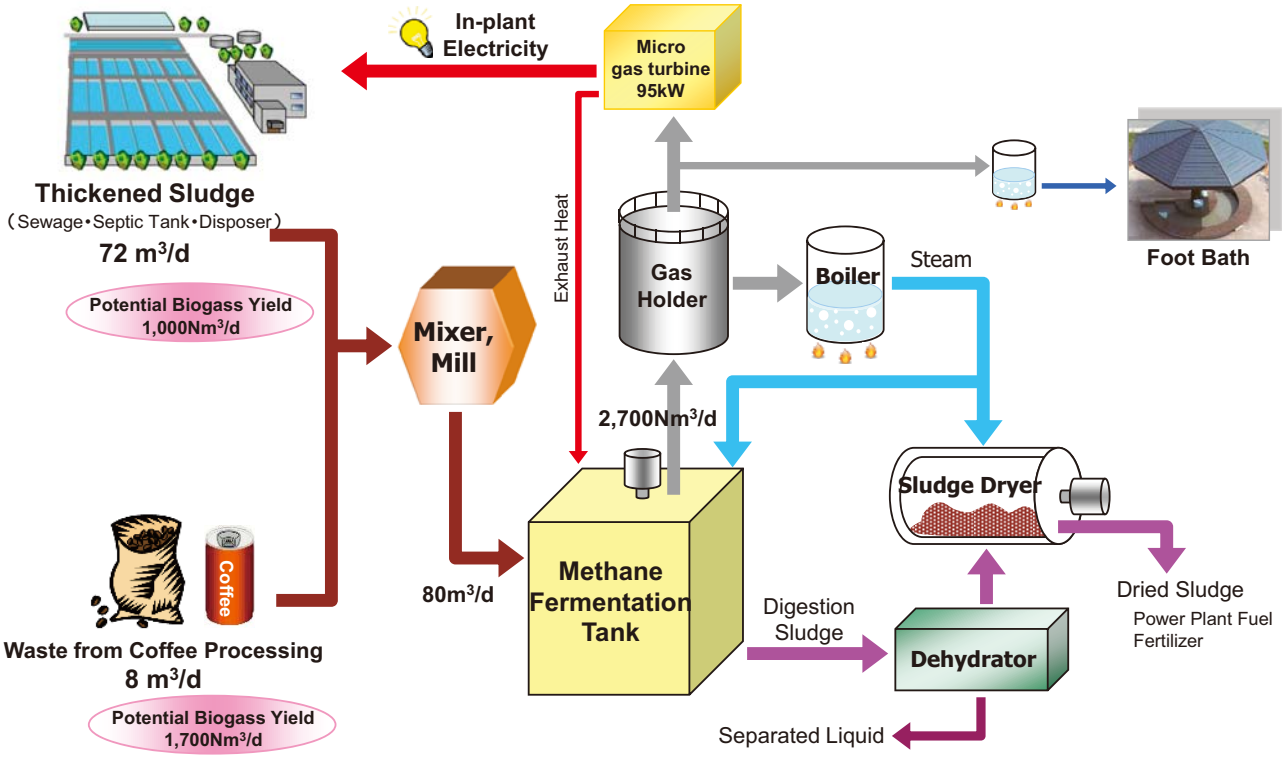
Private Factory

- Reduced Disposal Cost

Biomass Power Plant

- Available Alternative Fuel

1-2. System Configuration

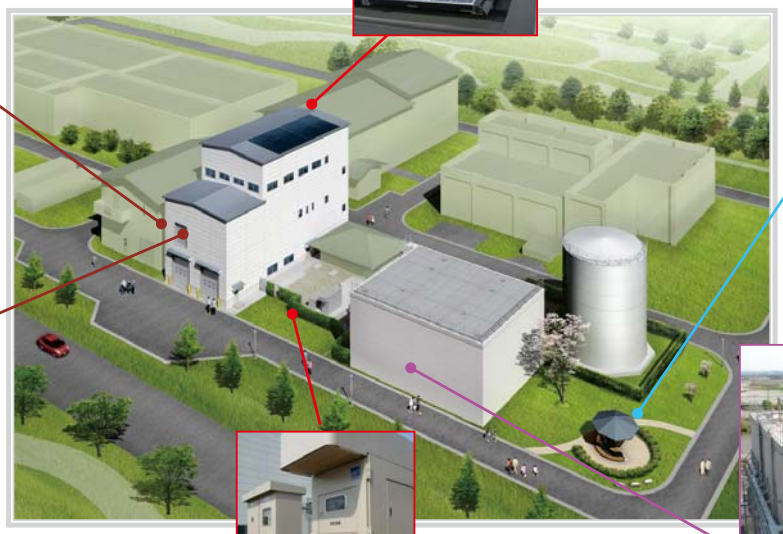


1-3. Plant Overview

Mixing and Milling Tank

Solar Panels

Foot Bath



Dehydrator

Sludge Dryer

Micro Gas Turbine

Methane Fermentation Tank

Swing Corporation

Track Record for Biomass recycling plant

Septic Tank Sludge
Sewage Sludge
Garbage

Garbage
Waste Wood

Septic Tank Sludge
Sewage Sludge
Garbage

Cow excreta

Kurobe
Waste water sewage
Coffee Residue

Coffee Residue

Septic Tank Sludge
Garbage

Cow Excreta
Food Processing
Waste

Distilled Spirit
Residue

Cow Excreta

Pig Excreta

Coffee
Residue

Food Processing
Waste

Swing Corporation

Swing Solution Technology for Reducing Sludge

Slide Shaft Screw Press Dehydrator

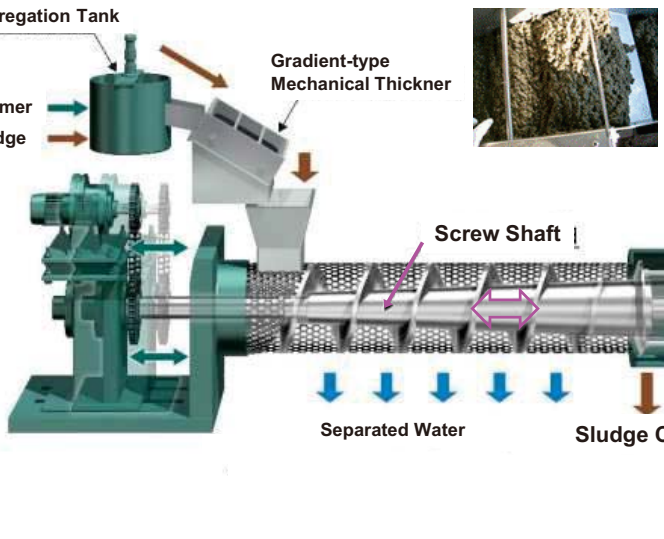
2008

- Chairman's Prize of the Japan Machinery Federation
- Chief's Prize of Industrial Science and Technology Policy and Environment Bureau of the METI

Advantages

Low Water Content of Sludge (Mixed Raw Sludge 71～75%、Digested 76～77%, OD 82～83%)
⇒ Cost Reduction for Disposal or Treatment for Drying and Incineration

- Stable Performance by Shaft Sliding Mechanism ⇒ Easy Operation
- Small Footprint, Low Maintenance Cost



Swing Odor Control System

- Prevent for odor pollution-

Features of Odor in Sewage Treatment Plant

Grit Chamber

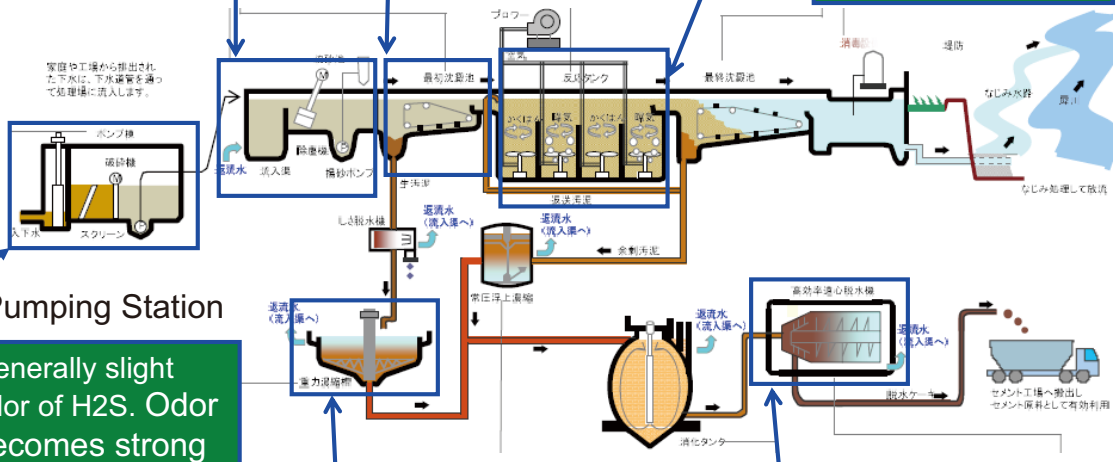
H_2S odor rises during grit & screening collection

Primary Sedimentation

Odor of H_2S. Rotten sludge and scum causes strong smell.

Bio Reactor

Slight odor composed of multiple compounds.



Pumping Station

Generally slight odor of H2S. Odor becomes strong by long period sewage retention.

Gravity Thickener

Strong odor of H_2S & methyl mercaptan.

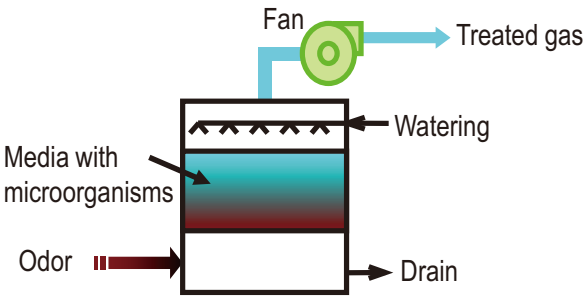
Sludge Dewaterer

Strong odor of H_2S & methyl mercaptan.

Bio-Deodorization Filter **Bio-sweeper**

Description

- Biological-deodorization filter
- Odor is decomposed by microorganisms that are fixed on filter media. Media is watered in order to maintain the microorganisms



Advantages

- Operational with only electricity and watering (chemicals and fuel is unnecessary)
- Simple structure, easy to operate
- Required maintenance for fan and watering device only

Bio-sweeper: Bio-deodorization Filter

Activated Carbon Filter

Description

- Activated Carbon Deodorization
- Odor is adsorbed by Specialized Activated Carbon

Activated Carbon Filter System

Advantages

1. Safety system due to no use of chemical
2. High stability for fluctuation of inflow odor level
3. Easy maintenance

Activated Carbon Module

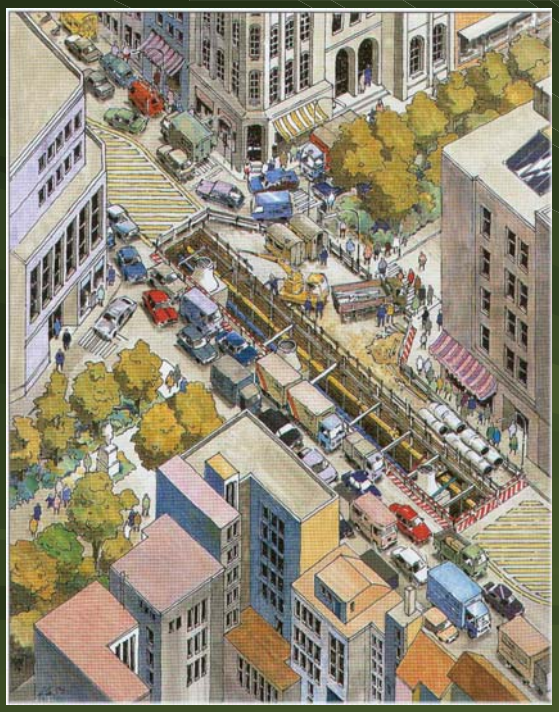
Terima kasih banyak !

Thank you very much for your attention!

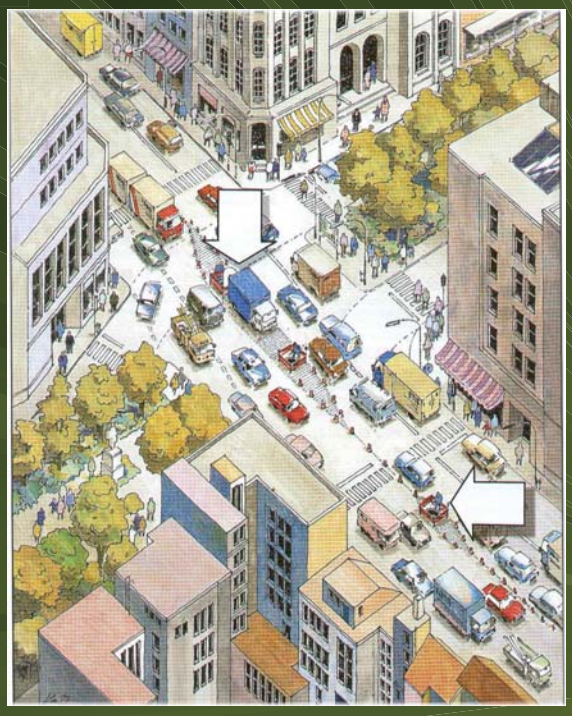
Swing, a total solutions provider for water and the environment.

MICROTUNNELLING
(Pipe Jacking Method)
COMPENDIUM

Open-cut vs Microtunnelling
(Pipe Jacking Method)



Open Cut



Microtunneling

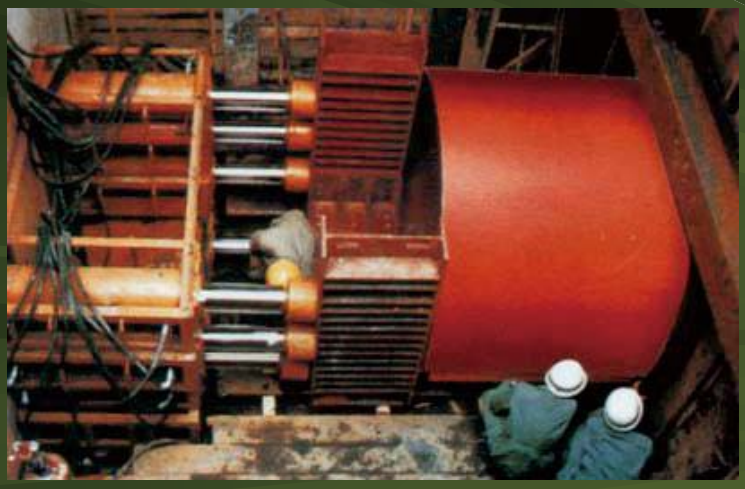
Courtesy: GSTT

Problems with Cut-and-Cover

- Underground space in public right-of-way is heavily used
- Traffic congestion growing
- Street pavement damage
- Cost of surface restoration
- Direct and indirect business loss
- Great deal of spoil

MICROTUNNELLING
(Pipe Jacking Method)

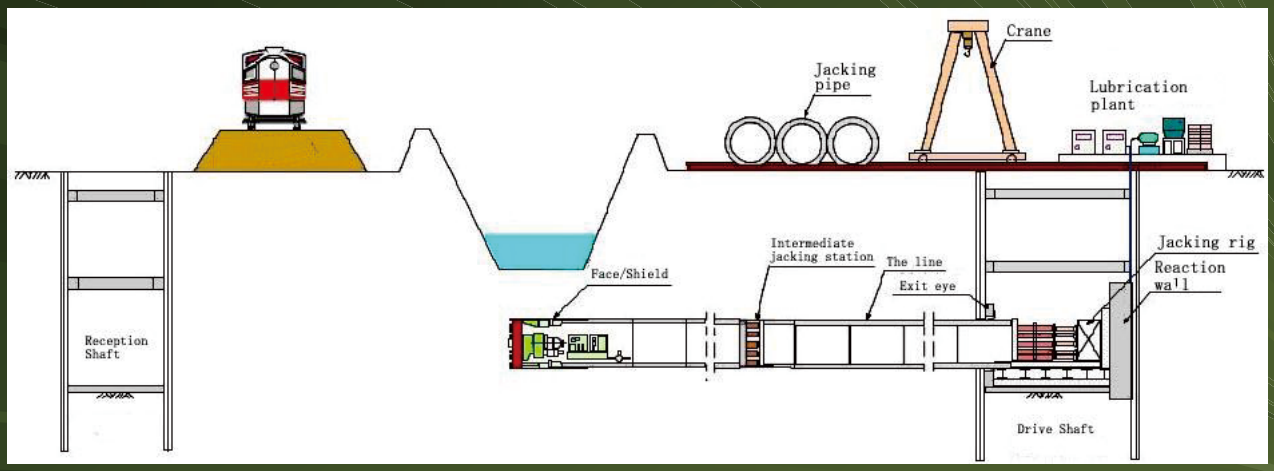
A system of directly installing pipes behind a Shield Machine by hydraulic jacking from a Drive Shaft such that the pipes form a continuous string in the ground



Used for places where;

1. Heavy traffic roads.
2. Utility pipes buried underground are congested and difficult to dig from the surface of the ground.
3. Crossing road and rivers, which means impossible to dig from above ground.
4. The level of the installation is deep and microtunnelling would be cost-effective.

Basic elements for microtunnelling



Shaft for Microtunnelling (Pipe Jacking Method)

Sheet pile

Liner plate sheeting

Steel casing

MICROTUNNELLING
(Pipe Jacking Method)
Procedure

Earth-Pressure-Balance (EPB) type
for 3.0m Concrete pipe

Microtunnelling (Pipe Jacking Method)
Facilities installation (Drive shaft)

Exit eye

Reaction wall

Microtunnelling (Pipe Jacking Method) Facilities installation (Drive shaft)

support rails

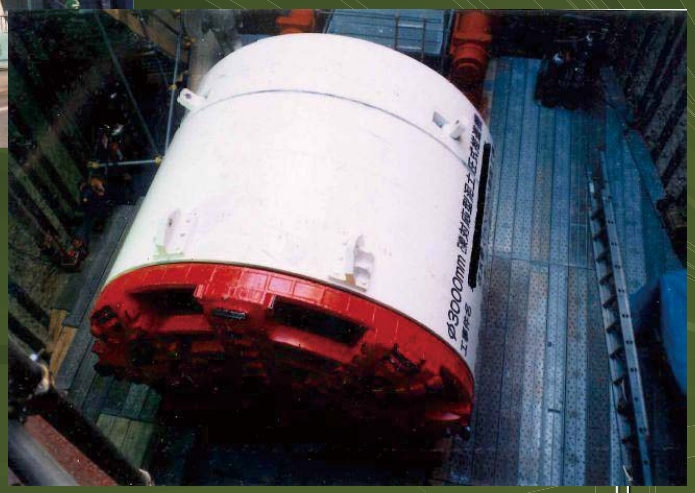
Jacking rig

Microtunnelling (Pipe Jacking Method) Facilities installation (Drive shaft surface)

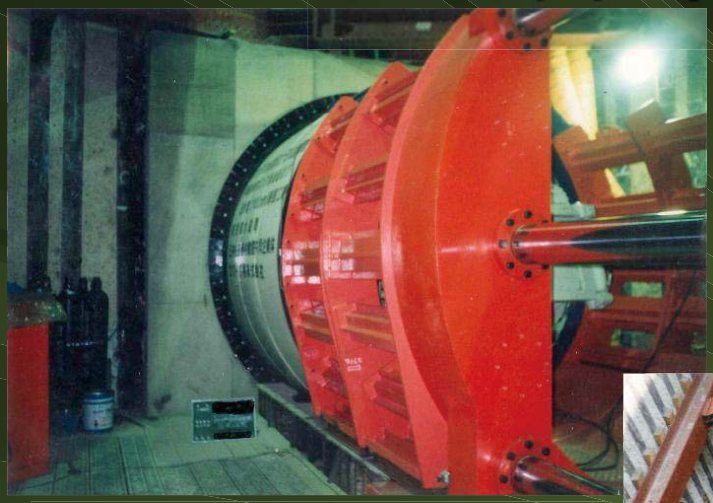
Lubrication & Backfill grouting Plant

Muck pit

Installation of Shield machine



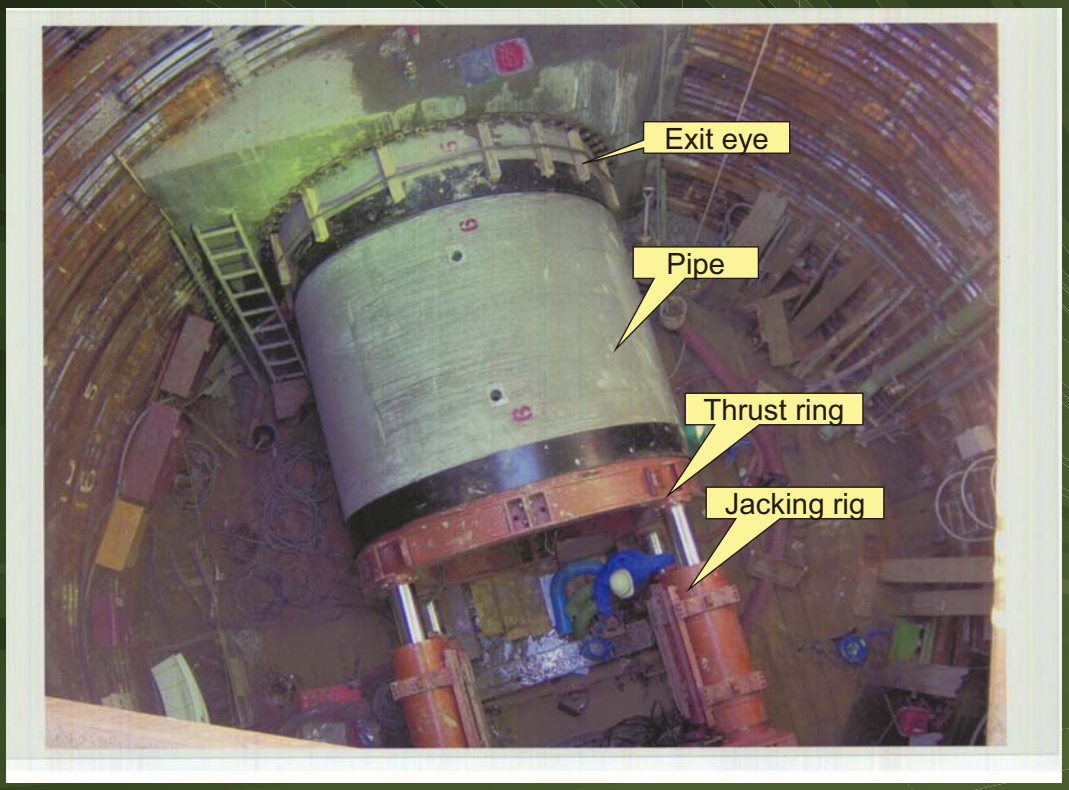
Start pipe jacking



Launch of microtunnelling

Jacking pipe is dropped into the shaft and placed on the support rails.

Pipe Jacking



Measurement

Confirm the line and level by measurement. Make sure the installation is within close limits of the target.

Muck transportation and discharge

Muck discharge
(behind the shield)

Muck transportation
(by muck wagon)

Muck transportation and discharge

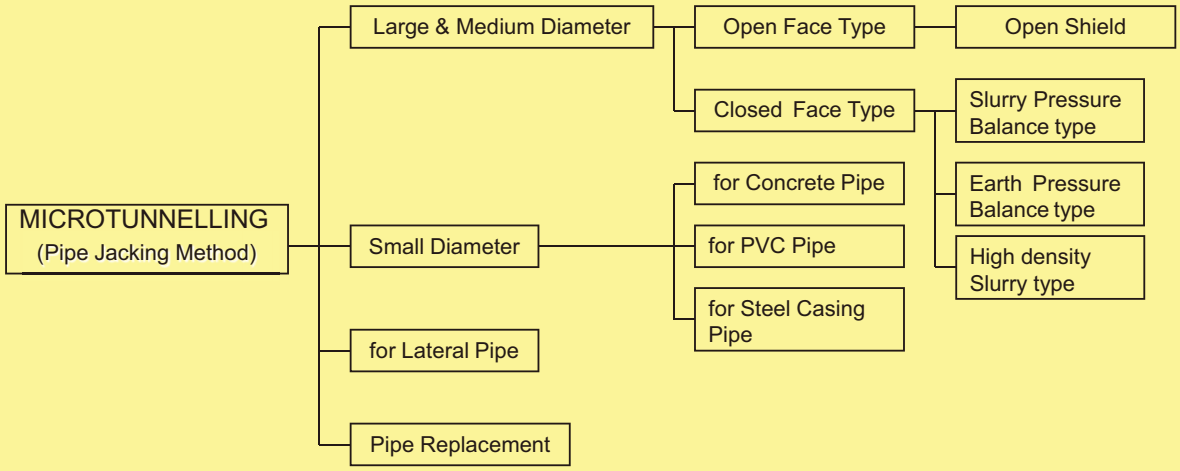
Muck wagon being lifted and discharged into the muck pit

Reception of microtunnelling

After reception, backfill grouting is carried out

CLASSIFICATION OF MICROTUNNELLING

(Pipe Jacking Method)



Super large diameter Pipe Jacking

（3500mm～5000mm）

Shield Machine

Segmented type Jacking Pipe

Microtunnelling (Pipe Jacking Method)
for Large & Medium Diameter
(Slurry Pressure Balance type)

Microtunnelling (Pipe Jacking Method) for Large & Medium Diameter

(Earth Pressure Balance type)

Microtunnelling (Pipe Jacking Method) for Large & Medium Diameter

(High density slurry type)

Small diameter Microtunnelling

（150mm～700mm）

for Concrete Pipe

for PVC Pipe

for Steel Casing Pipe

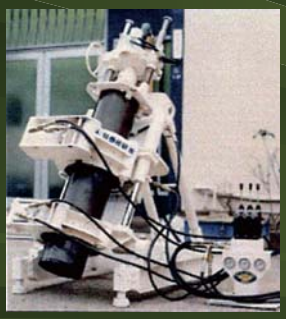
Microtunnelling (Pipe Jacking Method) for Small Diameter

(Slurry Pressure Balance type)

Microtunnelling for Lateral Pipe

（100mm～300mm）

Shield Machine



Steel casing pipe

Pipe Replacement

Shield Machine

Jacking rig

Thank you

Japan Microtunnelling Association

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