日本の上下水道技術

Japanese water and sewerage technology



メタウォーターの水処理技術

メタウォーター株式会社 国際事業推進センター

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事業ターゲット



水環境分野の トータルソリューション

- O エンジニアリングからO&M
- 〇 官民連携事業

オンリーワンテクノロジー

○セラミック膜ろ過システム○オゾナイザ

独自技術・製品 による水資源の確保

- 〇再生水
- 〇海水淡水化

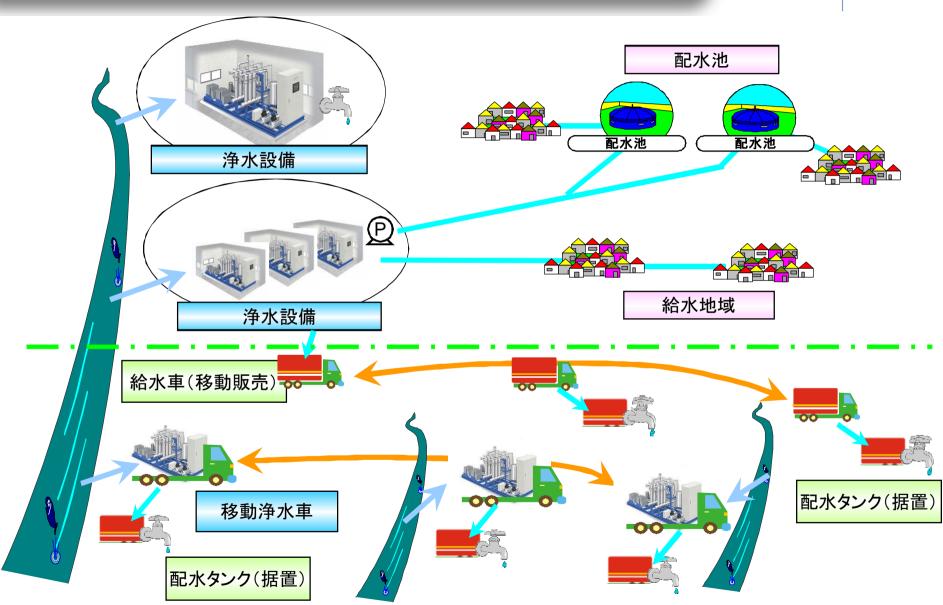
最近の実績



COUNTRY	PROJECT NAME	YEAR
カンボジア	カンボジア水道人材育成プロジェクト	2008-2010
カンボジア	プルサット浄水場電気設備改修工事	2009
ベトナム	Yen So ポンプ場向け電気設備	2009-2010
ベトナム	東南アジア地域での高濁度河川水利用型 浄水供給システムによる水循環事業	2009-2010
ベトナム	ハノイ都市圏水道PPPドン河事業FS 調査	2010-2011
インドネシア	南バリ再生水利用事業準備調査(PPPイン フラ事業)	2010-2011

セラミック膜ろ過設備の展開例

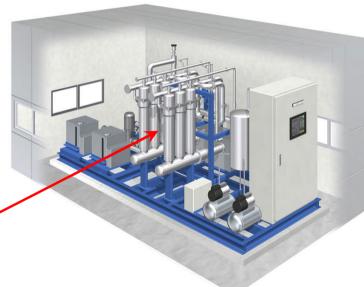




小規模セラミック膜システムのイメージ







セラミック膜

処理能力: ~ 650 m³/d

ベトナム/ドンタップ省における実証試験

METAWATER



パイロットプラント



取水点



処理後

処理前

ご清聴ありがとうございます。



Beyond engineering

問合せ先: www.metawater.co.jp/eng/index.html info-kaigai@metawater.co.jp



METAWATER Water Treatment Technologies

International Business Center

METAWATER Co., Ltd.

Business Target



Total Solution in Water Sector

- > From Engineering to O&M
- > Public Private Partnership

Differentiated Component

- > Ceramic MembraneFiltration System
- > Ozone Generation System

New Water Resource Creation

- > Reclaimed Water
- > Seawater Desalination

Recently Results



COUNTRY	PROJECT NAME	YEAR
Cambodia	Project on capacity building for water supply system in Cambodia	2008-2010
Cambodia	Purchasing equipment (power distribution panel for Pursat) for the project on capacity building for water supply system	2009
Vietnam	The second Hanoi drainage project for environmental improvement	2009-2010
Vietnam	NEDO Project 'Water-saving and environment- conscious Water recycle technology'- Drinking water supply from highly turbid surface water in Southeast Asia -	2009-2010
Vietnam The PPP project study for The Great Hanoi water supply system in The socialist Republic of Vietnam		2010-2011
Indonesia	The preparatory survey in application of wastewater reclaiming in southern Bali water supply system in The Republic of Indonesia	2010-2011

Example of Water Supply Network with Ceramic Membrane Systems



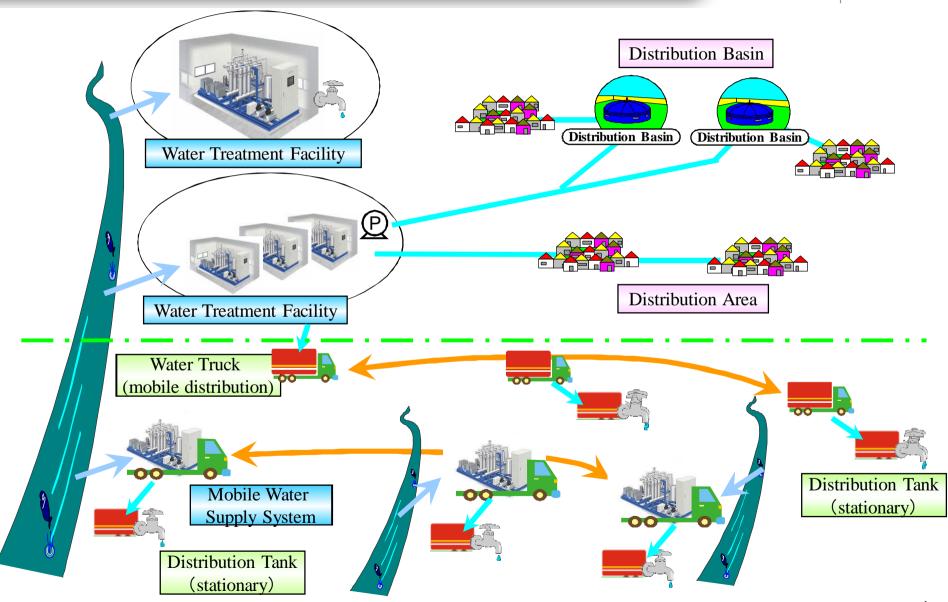


Image of Small-scale CMF system





Ceramic Membrane

Capacity: \sim 650 m³/d

Pilot Testing in Dong Thap

METAV/ATER



Ceramic Membrane Pilot Test Equipment



River (Water Source)



Filtrate

Raw Water

Thank you for your attention.



Beyond engineering

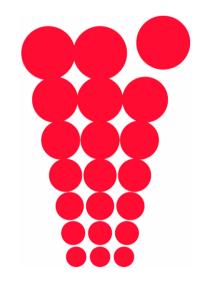
Contact: www.metawater.co.jp/eng/index.html

info-kaigai@metawater.co.jp



上下水道管路アセットの 包括的マネジメント事業のご提案

積水化学工業株式会社 2010.2.14

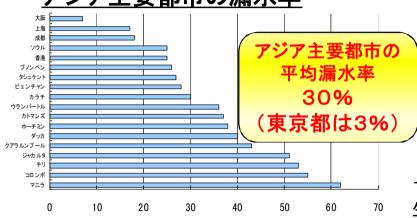


上水道管路に係る問題



◇漏水による貴重な水資源の損失

アジア主要都市の漏水率



出典: ADB"Water in Asia Cities, Utilities Performance and Civil Social View"から作成

損失金額の考え方

漏水に対してもその生産には一定のコストが 発生しており、漏水によって回収不能となっている ⇒漏水量に対する生産コスト分が損失金額と 考えられる

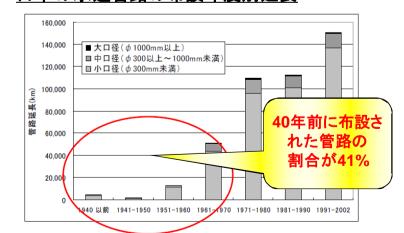
損失額=漏水量(総給水量×漏水率)×生産原価

1都市で年間の総給水量500,000,000㎡、漏水率20%、 生産原価を150円/㎡とすると...

◇管路の老朽化による破裂事故の発生

損失金額 約150億円!

日本の水道管路の布設年度別延長



管路破裂事故の発生事例

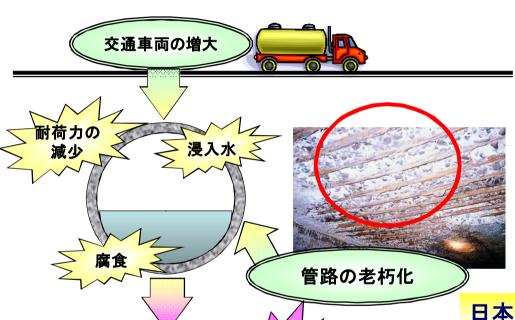


下水道管路に係る問題



◇老朽化による道路陥没

道路陥没のメカニズム



道路陥没事故の発生事例









日本全国で年間約6,000件の道路陥没が発生! 世界各都市でも同じく道路陥没が発生!



重大事故発生!

地盤沈下 道路陥没

さらに・・

下水溢水 臭気



下水道管路の老朽化、 下水の地下水への混入は 世界共通の問題

上下水道管路に係る課題



新興国の課題

新興国を中心にインフラ整備が活性化 (現地パイプメーカーの台頭による 製造、敷設)



主要都市の水道漏水率は軒並み20% を超えており、その改善が急務 (製品、配管設計、施工品質等の改善)

管路老朽化対策における課題

布設後30年以上を超える上下水道施設が老朽化

- ①漏水による費用損失(上水)
- ②漏水による地下水汚染 不明浸入水による処理場機能過負荷 (下水)
- ③陥没による機能停止(上下水)

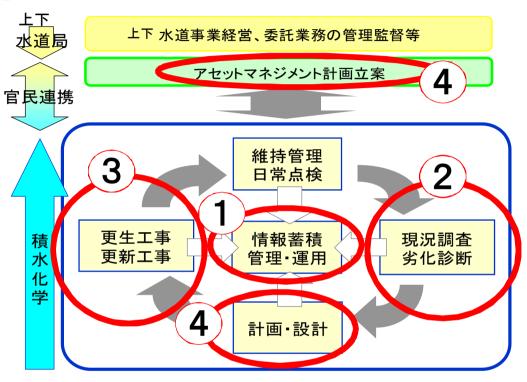
共通課題

- ① 現状は管路に比べ、浄水場、処理場の維持・管理に視点が集中
- ② 管路システムの品質管理、老朽化調査・診断、管路の更新・更生等、 管路の維持・管理に関しては膨大な費用がかかる (浄水場/処理場と管路にかかる維持・管理費用の割合は2:8(推定))

管路の包括的マネジメントの導入提案



【戦略的維持管理のためのアセットマネジメントの導入】



【期待効果】

- 1)最適手法の選定・提供
- ・保有する様々な技術・ノウハウから 最適なものを官民連携で選定
 - → 民間の創意工夫活用
- 2)包括化によるコストダウン
 - ・分割発注により発生していた業 務経費等の削減
 - 長期的計画に基づく予算平準化→ 歳出抑制と財政安定化
- 3)地域への安全・安心の提供
- ・予防保全型のマネジメントにより、 安全・安心な下水道サービスを実現

積水化学が提供する工法・システムの概要

- ①情報管理(マッピングシステム):施設情報(調査診断・工事・点検情報等)の一元管理
- 2調査診断:定期的な劣化、漏水調査・健全性診断の実施
- ③更生・更新工事:複数の更生工法から最適な手法を選定(20年超の更生実績)
- 4計画・設計:官民連携による中長期的アセットマネジメント計画の策定 管路情報、周辺環境、コストの側面から、最適な修繕手法を選定&設計

当社が提供する管路ソリューション技術

SEKISUI

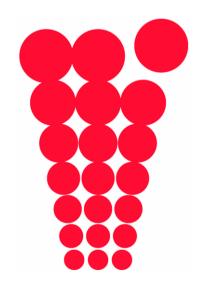




Proposal of comprehensive management business of water and sewer services conduit asset

SEKISUI CHEMICAL CO.,LTD.

2010.2.14

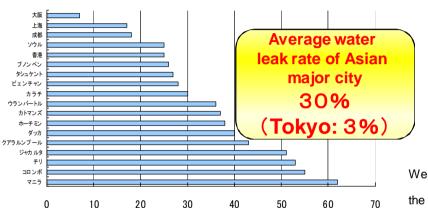


Problems about conduit of water services



Loss of valuable water resource by water leak Way of thinking about amount of lost money





A constant cost is also needed in the production for the water leak, and it is irrecoverable through the water leak. ⇒It is thought that the produce cost of the water leak is the amount of lost money.

Amount of a loss = amount of water leak (amount of total water supply × water leak rate) × production cost

amount of lost money: 15 billion ven!

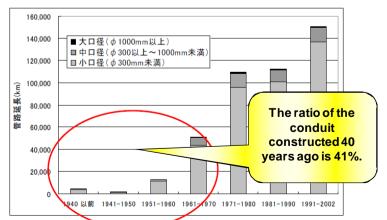
We assume: they are amount of 500 million mitotal water supply in one city during year.

the water leak rate 20% and the production cost 150 yen/m²; then:

Source: ADB"Water in Asia Cities. Utilities Performance and Civil Social View"

Occurrence of rupture accident because of superannuation of conduit

Extension of water service conduit in Japan according to construction fiscal year

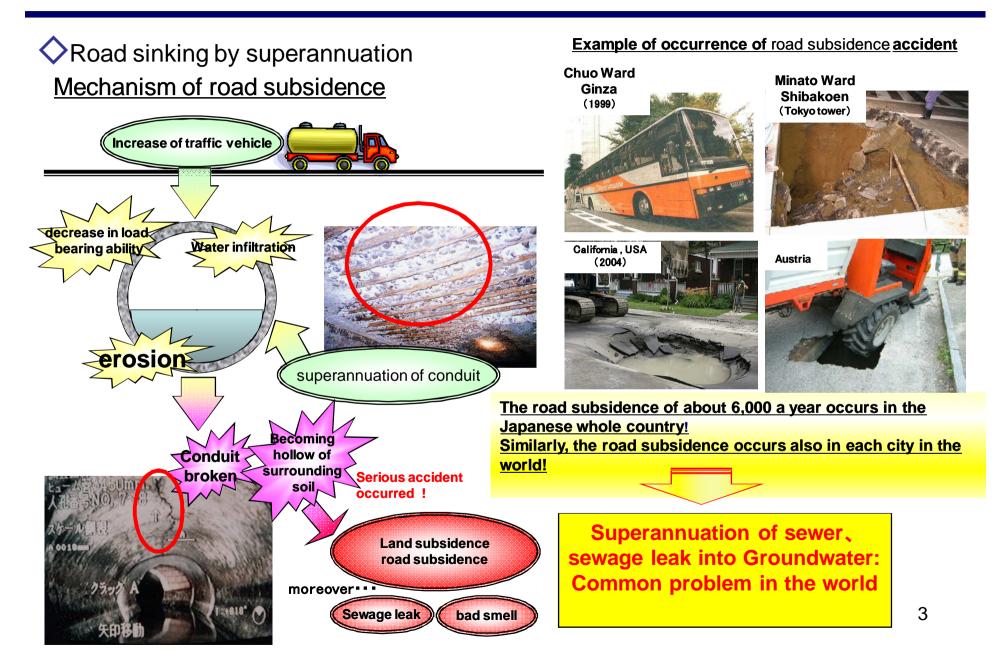


Example of occurrence of rupture accident



Problems about conduit of sewer services





Problems about conduit of water and sewer services



Problem of rising nation

The infrastructure construction and maintenance is activated mainly in the rising nation.

(Manufacturing and construction by gaining power of local pipe manufacturer)

Water leak rates of the major city exceed 20% everywhere, therefore, the improvement is a pressing need (improvements of the product, the piping design, and the construction quality, etc.).

Problem in conduit superannuation measures

water-and-sewer-service- facilities constructed 30 years ago or earlier become superannuated.

- 1 Loss of cost through water leak (water supply)
- **2**Contamination of Groundwater through sewage leak, Function of filtration plant is overloaded through uncertain infiltration water (sewage)
- 3 Function stop by subsidence (water and sewage)

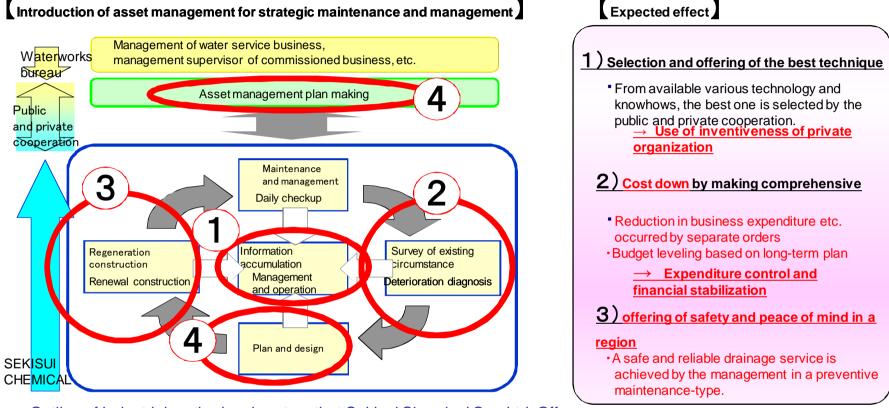
Common problems

- ① As for the current state, the aspect is concentrated on maintenance and the management of the filtration plant and the treatment plant, compared with the conduit.
- ② It requires huge cost for the maintenance and the management of conduits, like the quality control, the superannuation investigation, the diagnosis of the conduit system, and the renewal and the regeneration of the conduit, etc. (The ratio of the cost of maintenance and the management of the treatment plant and filtration plant and of conduit is 2:8(presumption)).



Proposal of introduction of comprehensive management of conduit



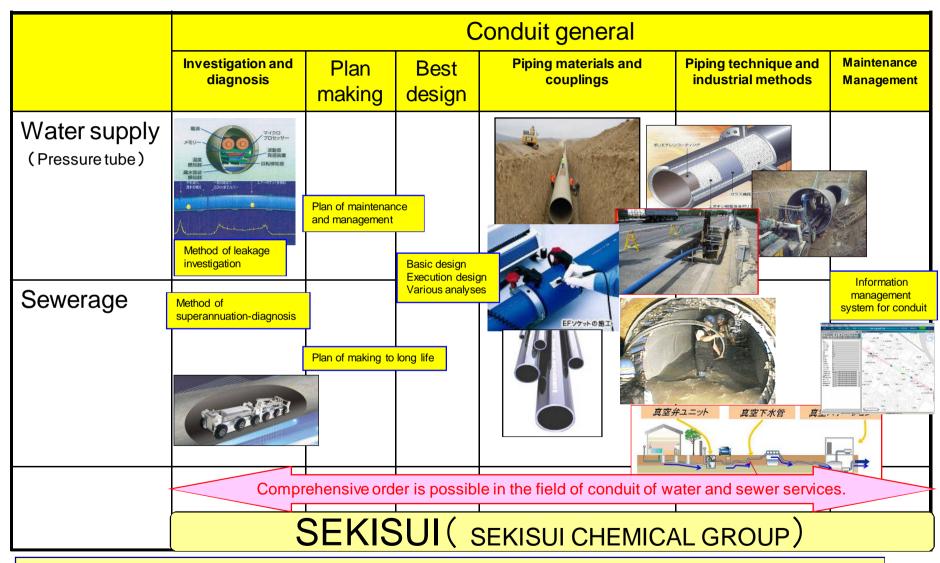


Outline of industrial method and system that Sekisui Chemical Co., Ltd. Offers

- Information management (mapping system): Centralized management of facilities information (investigation diagnosis, construction, and check information, etc.)
- 2Investigation and diagnosis: Regular execution of investigation of deterioration and leakage and soundness-diagnostics
- 3renewal and the regeneration construction: The best technique is selected from two or more regeneration industrial methods (achievements of regeneration for more than 20 years).
- Plan and design: Decision of mid/long-term asset management plan by public and private cooperation
 Selection & design of the best mending technique from the aspects of conduit information, ambient surrounding, and cost

Technology of conduit solution offered by our cooperation





Consistent value based on the plan can be offered, by the cycle of all business of the conduit asset management.

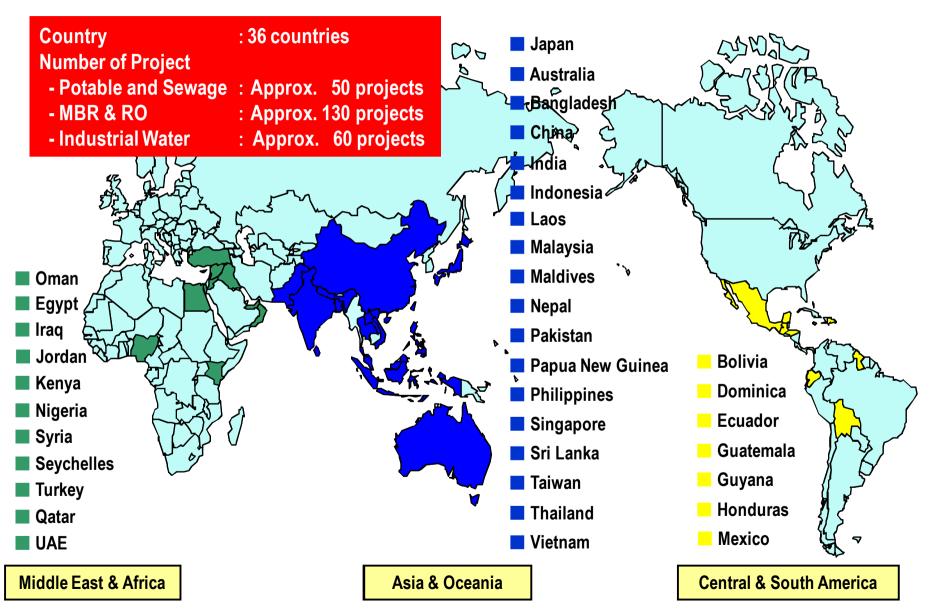


Hitachi Water Environment Solution Business

Feb. 14th, 2011 Water Environment Solutions Division Hitachi, Ltd.

World Wide Supply Records







Large-scale water supply pump for Water supply, Purification and Wastewater treatment and Electric power

China/manufacturing and sales base "Hitachi pump manufacturing (Wuxi Co.LTD " establishment (2006)



Hitachi Pump Manufacture(Wuxi)Co.,LTD

EGYPT Mubarak Pumping Station Project





Customer:

Ministry of Water Resources and Irrigation, Egypt

Year of Supply: 2002

No. of Sets: 21

Type: Vertical shaft, Single suction,

Turbine volute pump

Bore: 94 × 70in (2,400 × 1800mm)

Flow: 16.7m³/s Total Head: 57.1m

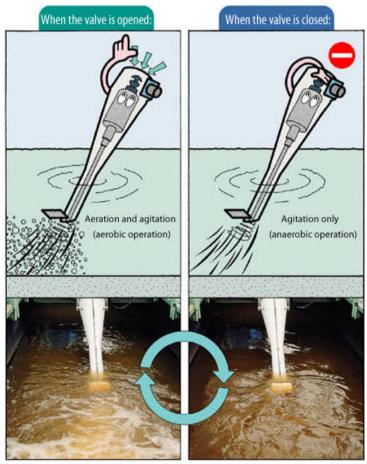
Prime Mover: 12,000kW



The SPAROTOR is an aerator that also works for anaerobic agitation







Overview

The SPAROTOR ACE is a highefficiency aerator and agitator that can perform aerobic and anaerobic operation with just one unit. The simple valve controls can perform appropriate aeration operations while maintaining agitation force.

Features

- 1.Easy operation when first put into service
- 2.Improved nitrogen removal rate
- 3.Can be applied to diverse applications



Water & Wastewater treatment

Water Purification System



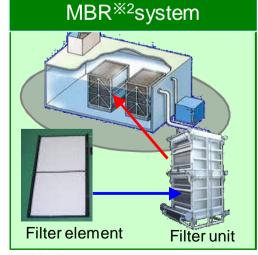


Proposal of treatment system that suits local environmental condition and needs



Wastewater Treatment System







EPC Supply Record



◆ Asia – Sri Lanka Potable Water Treatment (Total 10 projects)

Project Name	Greater Kandy Water Supply Augmentation Project	The Project for Improvement of Water Supply System in Matara District
Source of Fund	JBIC Loan	Japan's Grant Aid
Contract Period	From Nov/03 to Oct/06	From Jan/04 to Sep/05
Capacity	36,600m ³ /day	15,000m ³ /day



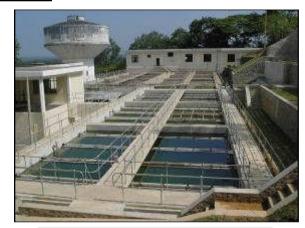
Completion ceremony (Matara)



Katsugastota WTP (Kandy)



Intake Pump Station (Kandy)



Marimbada WTP (Matara)

EPC Supply Record



◆ Asia – Malaysia Waste Water Treatment

Project Name	The Construction of Sewage Treatment Plant Project (Phase-I)		
Source of Fund	JBIC Loan		
Contract Period	From Dec/03 to Mar/08		
Capacity and Process method	5plants total capa Bunus Pantai Puchong Bandar Tun Razak Southern Klang Va		



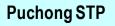
Bunus STP











37,000m³/day

Bandar STP

25,000m³/day



Pantai STP



EPC Supply Record



◆ Asia – Vietnam Waste Water Treatment

Project Name	Tan Son Nhat International Airport Terminal Construction
	Project
Source of Fund	JBIC Loan
Contract Period	From Nov/05 to Jul/07
Capacity	2,250m³/day



Aeration tank



Grit chamber



Pump Room



Panel Room



Water Management System

Managing various facilities from intake level to distribution

Water management center



Demand forecast

Water utilization plan

Forecast by the multiple regression analysis

Retrieval on similar days of the past weather et

The CO2 reduction is evaluated Optimization technique use



Intake water facility*1





Municipal water treatment plant



Water distribution Plant*2



Customer

^{*1} From Nishinomiya city HP

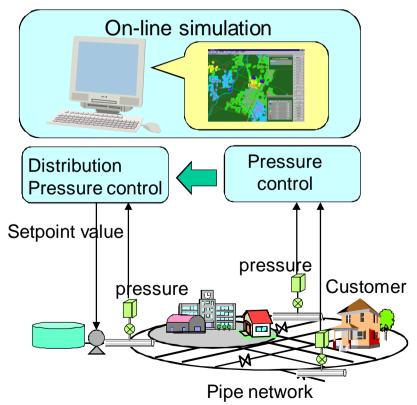
^{*2} From Kashiwa city HP

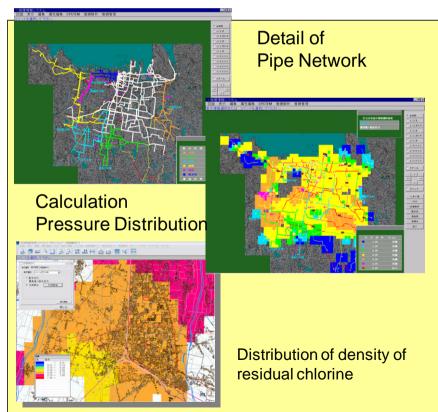
Technology Portfolio



Water Distribution Management System

- System Features
- Monitor & data management through geographical interface.
- Adaptability of demand fluctuation based on real-time analysis.
- Saving energy and leakage reduction.

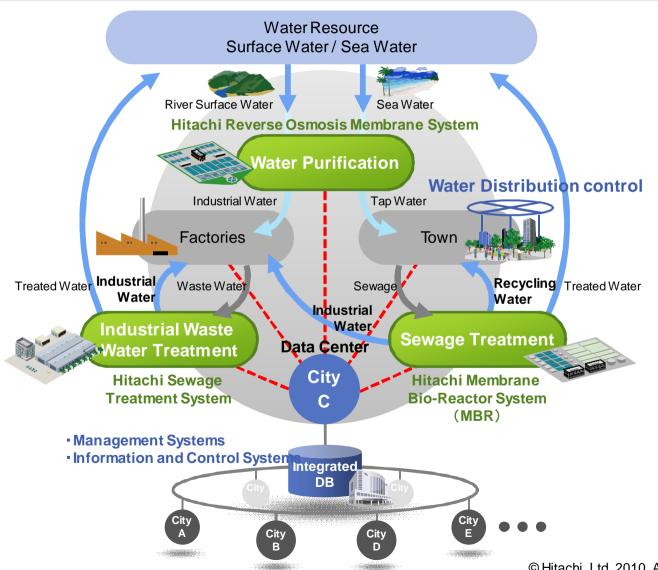




Intelligent Water System



Hitachi's Proposed Variety of Water Recirculation System



Solution Portfolio



Construction of water resource circulation cycle

MBR+RO unit (About 50 delivery around UAE Dubai)
Burj Dubai Waste water treatment plant(3,000m³/d)











Solution Portfolio



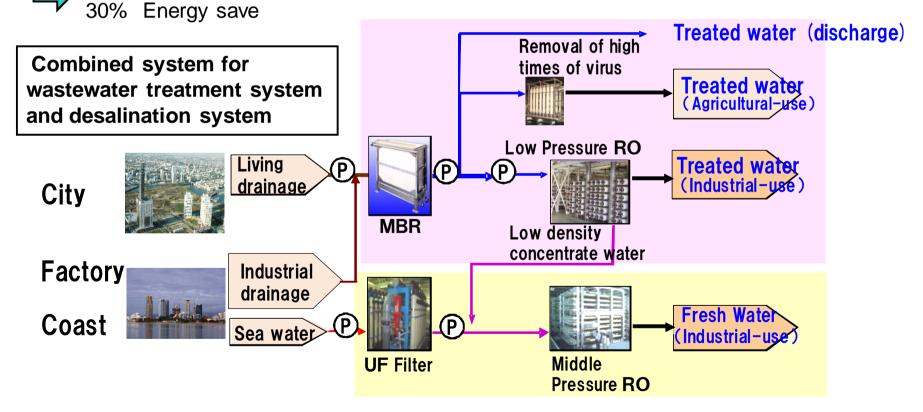
Construction of water resource circulation cycle



NEDO*Water Plaza (Kita-kyusyu city & Syunan city)

An advanced water circulation system by the integration of , industrial waste water treatment, and the seawater desalination to be proved.

Treated water to be supplied from high-quality level to the lower.



Solution Portfolio

Male



Management Business

Hitachi Plant Technologies, Ltd. acquired 20% share of Male' Water and Sewerage Company (Maldives).



Entered the management business



- Increase and update of existing equipment
- Accumulation of management knowhow
- Application of Intelligent water system



- Promotion of energy saving
- Improvement of managerial efficiency by total management of water





Ebara Engineering Service Co., Ltd.

February 2011





EES History

- ■1912 Inokuchi Type Machinery Office founded by Issei Hatakeyama
- ■1920 EBARA Corporation established
- ■1956 EBARA-INFILCO established with INFILCO Inc(USA)
- ■1994 EBARA-INFILCO became 100% subsidiary of 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 from April 1

Swing Corporation Takes Off!

A major player in the Japanese water industry offering comprehensive services and technologies has a new name from April 1, 2011.

We are proud of our leading-edge water and environmental technologies, developed in Japan over the years. Under our motto "Produce, Refine and Manage water", we aim to combine diverse technologies with one-of-a-kind service to provide complete water support.

2010 Combined expertise of three leading Japanese companies.



We bring the world wealth and future health by offering comprehensive solutions to match customer needs, from engineering to water business management. We aim at further expansion in the global water business market.

2011

Sustainable Water + ing



Swing Corporation

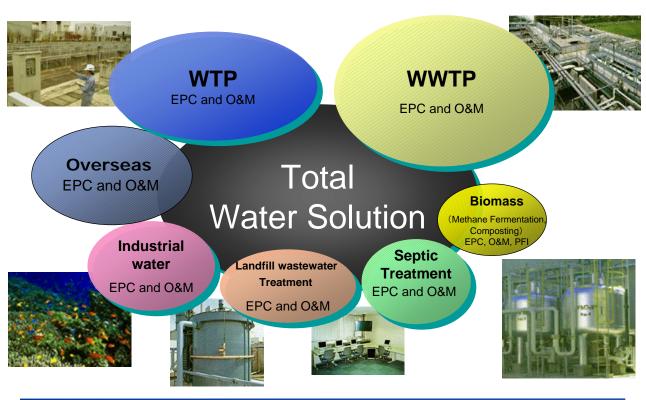
Our logo **% ing** in made up of the Japanese character for water **%** [pronounced sui in Japanesse] and ing from English (an indicator of the progressive tense).





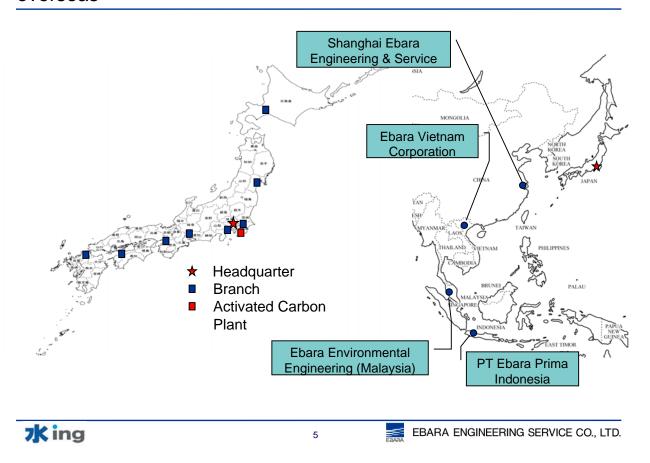
EBARA ENGINEERING SERVICE CO., LTD.

Abundant experience and accumulated technologies for total "Water" related solution

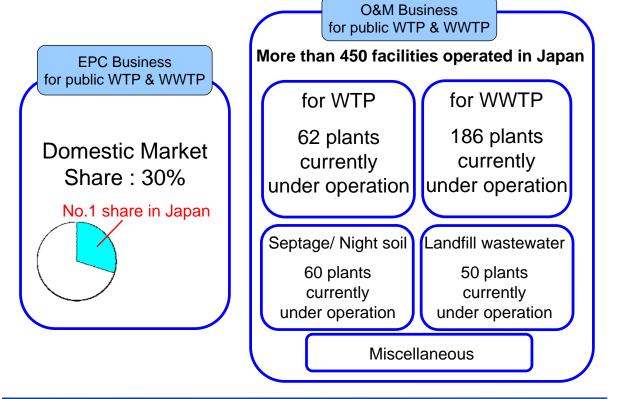




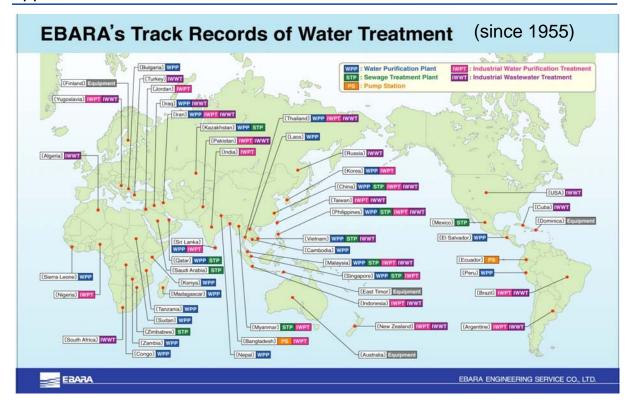
EES has 11 branches in Japan and 4 strategic subsidiaries in overseas



EES has abundant experience both in EPC and O&M works



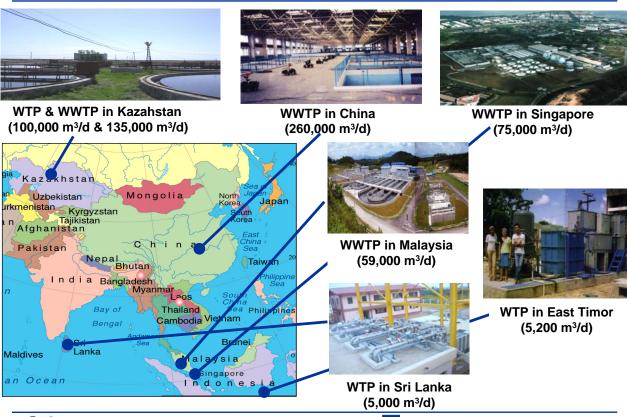
EES accomplished EPC works all over the world and enjoys appreciations from our clients



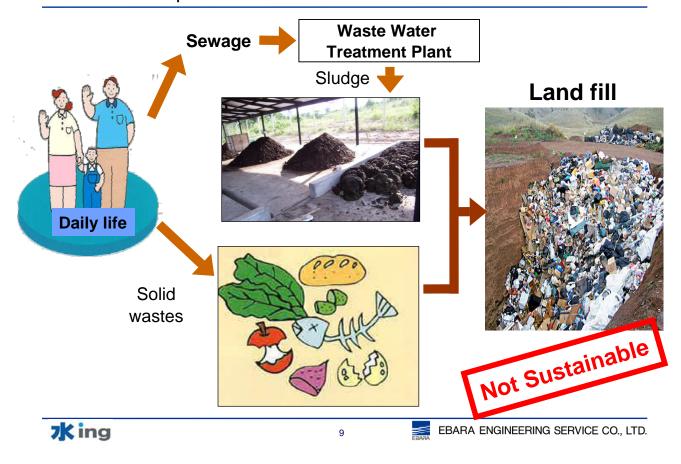




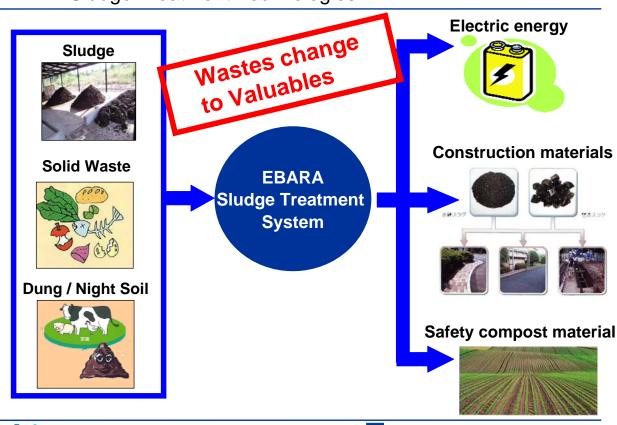
Experience in Asia



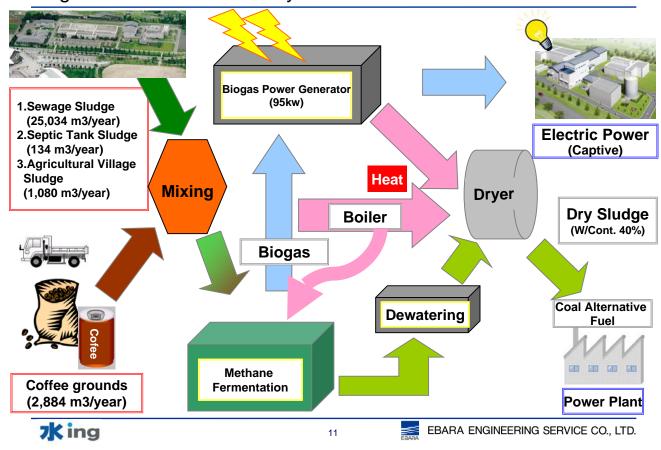
Now landfill disposal but • • •



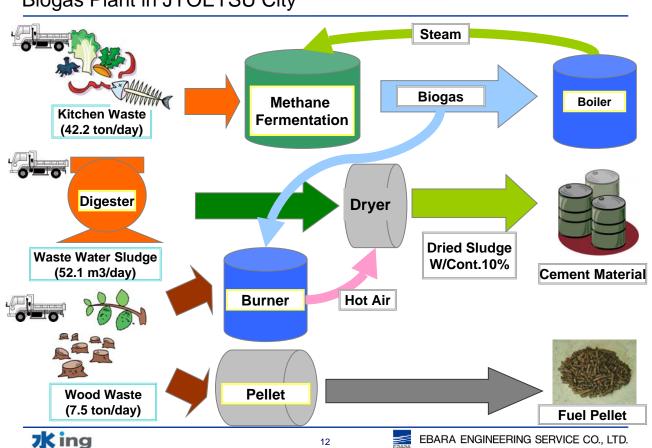
EBARA Sludge Treatment Technologies



Biogas Plant in KUROBE City



Biogas Plant in JYOETSU City



Project Experience: Viet Nam

Activated Sludge, Advanced Treatment (Denitrification), Sludge Dewatering





Advanced sewage treatment in Hanoi CP-12 (2,300 m3 /d & 3,700 m3 /d, 2005)



Sewage treatment in HCM (141,000 m³/day, completed in 2009)

Sewage treatment in in Thang Long North (42,000 m³/day, completed in 2008)



13





EBARA ENGINEERING SERVICE CO., LTD.

Water reuse for commercial building

Roppongi Hills

Treated Water; 1,050m3/d

Yebisu Garden Place

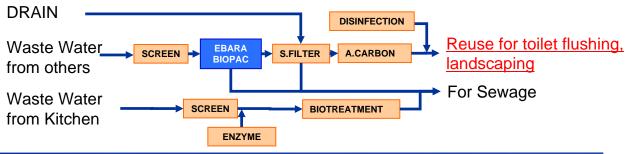
Treated Water; 1,051m3/d













Fenton, Bio-Denitrification, Activated Carbon





Ebara Engineering Service Co., Ltd.

SWing Corporation

To

provide best "Sustainable Water" solution based on advanced key technologies

KOBELCO Provides Integrated Solutions in Environmental related areas.

Kobelco Eco-Solutions Co., Ltd.(Kobelco), exerts strenuous efforts to be a corporation beneficial to customers and communities through the various services that greatly contribute to the creation of sustainable living environment.

Outline of the Company

Established: June 1954

Kobe Steel Group

Kobelco Eco- Solutions

We, Kobelco Eco-Solutions, are a member of Kobe Steel Group

Dec. 1957: Commenced sales of water treatment facility

Feb. 1983: Delivered first incineration plant of municipal solid waste

Oct. 2003: Merged as an integrated entity for environmental solutions

Our mission is to find the best way to live in harmony with the natural environment and contribute globally and locally.

Kobelco provides integrated solutions in environmental related areas such as water treatment, waste treatment and recycling, and satisfies a wide range of needs for communities aiming at a recycling-oriented society.

Domain of Business

To contribute to world's environment, restoration KOBELCO provides a









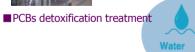




■Eco Analysis



■Water purification Unit (mobile)







- ■Water purification and ultra pure water facilities
- ■Sewage treatment facilities
- ■Industrial wastewater treatment plants



Water Treatment Systems

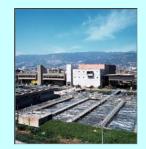
Water Purification Plant

Safe drinking water is available by our advanced treatment technology.



Sewage Treatment Plant

We support comfortable living with our advanced technology. Our wide range of technology offer various solutions in response to the requirements.



Sewage Sludge Incineration Facility

We contribute to reduce and recycle sewage sludge with our incineration and melting technology.



Waste Treatment Systems

Fluidized bed gasification & melting furnaces, Stoker type incinerator, Plasma melting furnaces.

Stable and continuous operational ability is the most important factor in alleviation the life cycle cost of facilities.



Miyagi Prefecture Ishinomaki Clean Center



Yamaguchi Prefecture City Environment

Polychlorinated biphenyl(PCB)has been deposited for more than 30 vears in an untreated condition. Effectible processing method has been developed and will established PCB detoxification system "SP Process" detoxify PCBs by chemical reaction of sodium and PCB.



Hokkaido PCB Waste Treatment Facility

Water Systems and Service

Industrial Water, Pure Water, Ultra pure Water, Waste Water Treatment.

We fulfill the industrial requirements for water treatment to protect global environment.

We manage various needs for water treatment, such as recovery, reuse, upgrade to ultra pure water, waste sludge reduction, through optimal proposals based on our products and wide range of engineering capabilities.







Process Equipment

Contributing by our high-quality products with our most advanced technology.

We manufacture glasslining equipment as the core of production various process equipment and facilities for chemical industry field. We contribute to wide range of industries, such as fine chemicals, pharmaceutical products, electrical materials and food industries, wherever high-quality production technology is required.



Harima Plant / Site area: 98,500m²

Cooling Tower

Cooling Towers

With a track record of 5,000 or more units in Japan and overseas.

> **Cooling Towers for District Heating and Cooling**



Technical Development

Research & Development friendly to human beings and the environment.

Business Development by our stateof-the art technology is also our task to meet various needs of customers.



R&D Center

■ Gasification and melting facilities

■Biomass technologies



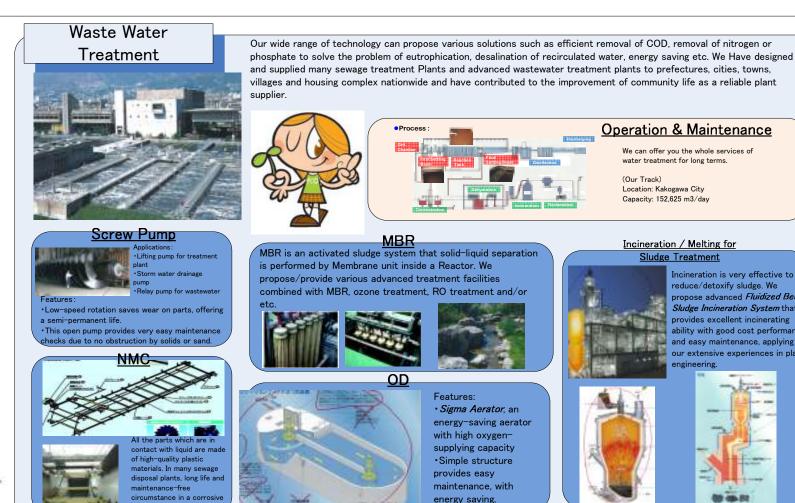
KOBELCO Approach for Water Infrastructure ~ Harmony with Human and Nature ~



Basic concept of Water treatment is to replace natural churning, precipitation and filtering process with Mechanical Processes. We can propose optimal System plans With proper design, taking into consideration original water quality, geography, environment and population of the water supply area. We can meet the requirements for advanced technology to produce safer and tastier water.







Operation & Maintenance

We can offer you the whole services of water treatment for long terms

Incineration / Melting for

Sludge Treatment

Incineration is very effective to

propose advanced Fluidized Bed

Sludge Incineration System that provides excellent incinerating

ability with good cost performance

and easy maintenance, applying al

reduce/detoxify sludge. We

Location: Kakogawa City Capacity: 152,625 m3/day





JFE 及びJFE グループとは?



"」"は日本

"F"は鉄鋼 (鉄の元素呼号のFe)

"E" はエンジニアリング

"JFE"は、日本を代表する未来志向の企業グループを表しています。

JFEスチール





売上高(百万円) 従業員数

3,355,365 43,000

JFEエンジニアリング





売上高(百万円) 従業員数

319,598 7.500

ユニバーサル造船



売上高(百万円) : 181,306

従業員数 : 2,800

JFE**都市開発**



売上高(百万円) : 24,161

従業員数 300

川**崎マイクロエレクト** ロニクス



売上高(百万円) : 27,849 **従業員数** : 500

JFEエンジニアリング(株)



JFEエンジニアリング





売上高(百万円) 従業員数

319,598 7,500

エネルギー本部

都市環境本部

產業機械本部

鋼構造本部

|総合研究所



ハイパーストーカーシステム

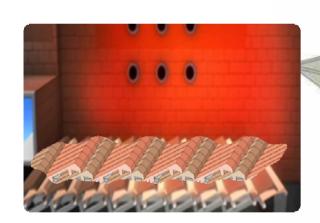






ハイブリッド ACC

高温空気吹込み技術を応用した低空気比燃焼



ハイパー火格子

- ・理想的な設計
- ·安定高温焼却



二回流ガス流れ

- 幅広いごみ質への対応
- ・窒素酸化物及び ダイオキシン除去

高温ガス化直接溶融炉



多様なゴミをコンパクトなひとつの炉で一気にガス化・溶融



都市工



RDF



焼却灰



医療系廃棄物



消化ガス発電システム



濃縮汚泥

家畜糞尿

The same

食品残渣

Ψ¶

空調用温水

電力

廃熱

分別 及び 混練

消化ガス

消化タンク加温用温水



消化ガスエンジン発電機

消化タンク

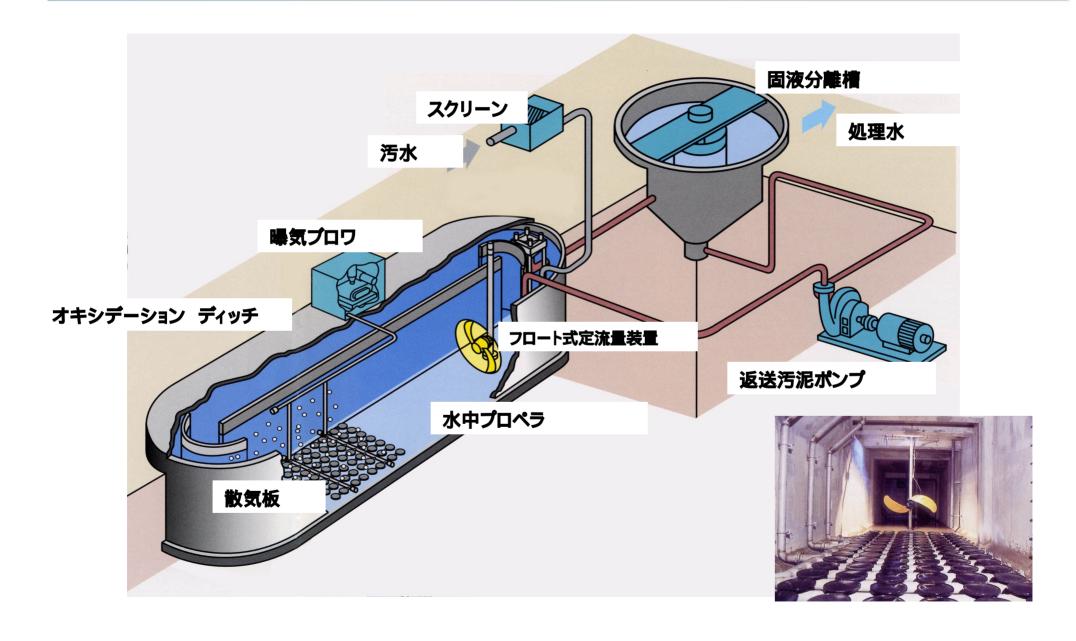
消化汚泥

汚泥減容化

汚泥処理設備

JFE OD システム

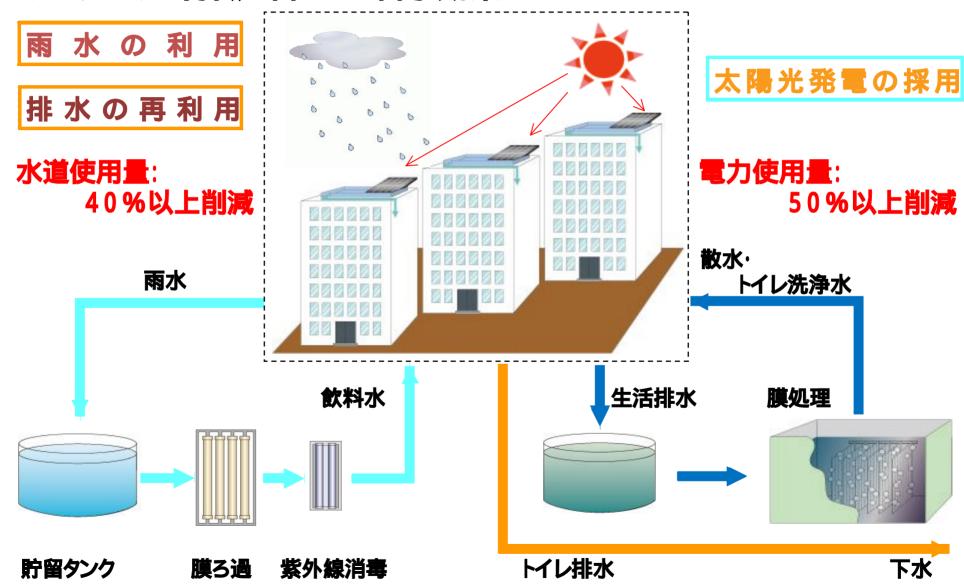




分散型水供給システム

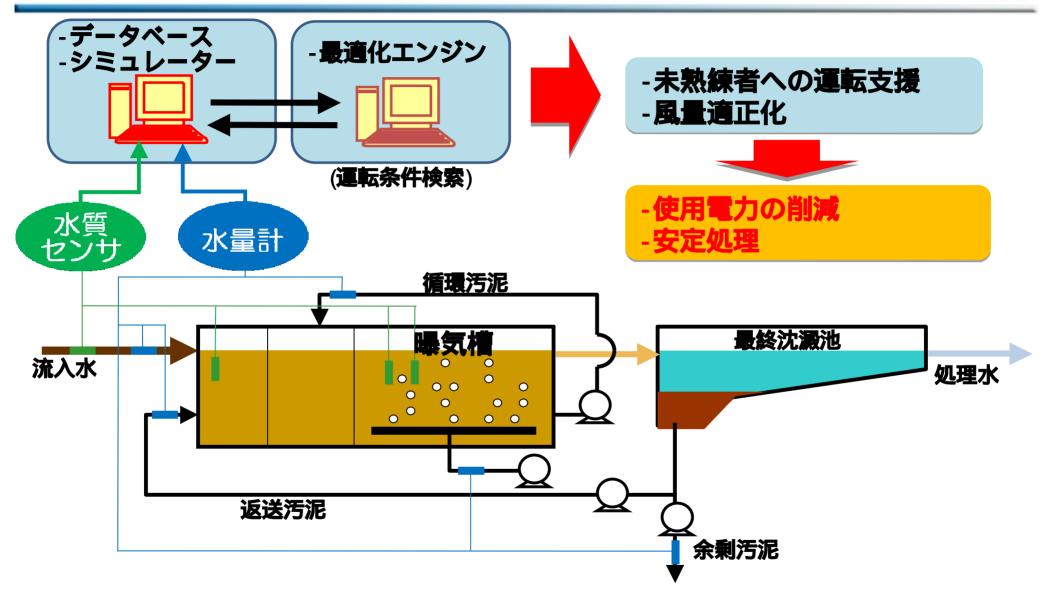


システムの特徴と省エネ・省水効果



活性汚泥処理施設運転支援システム









JFE エンジニアリング(株)



What JFE Stands for? and JFE Group



"J" for Japan

"F"for Steel (Fe, atomic symbol of iron)

"E" for Engineering

It also means "Japan Future Enterprise"







Net Sales (million \$): 25,300 Employees: 43,000

JFE Engineering





Net Sales (million \$) : 3,300 Employees : 7,500

Universal Shipbuilding



Net Sales (million \$) : 3,200 Employees : 2,800

JFE Urban Development



Net Sales (million \$) : 300 Employees : 300

Kawasaki Microelectronics



Net Sales (million \$) : 270 Employees : 500

JFE Engineering Organization



JFE Engineering





Net Sales (million \$) : Employees : 3,300 7,500 Energy Industries Engineering Sector

Environmental Solutions Sector

Recycling Business Sector

Steel Structure Engineering Sector

Industrial Machinery Sector



Hyper Stoker System

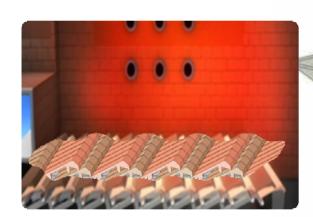






Hybrid ACC

Complete combustion under low air ratio



Hyper Grate

- ·Compact Design
- ·Stable Combustion



Two way flue gas system

- Applicable for wide range of wastes
- Suppression of NOx and Dioxins

High Temperature Gasifying and Direct Melting System

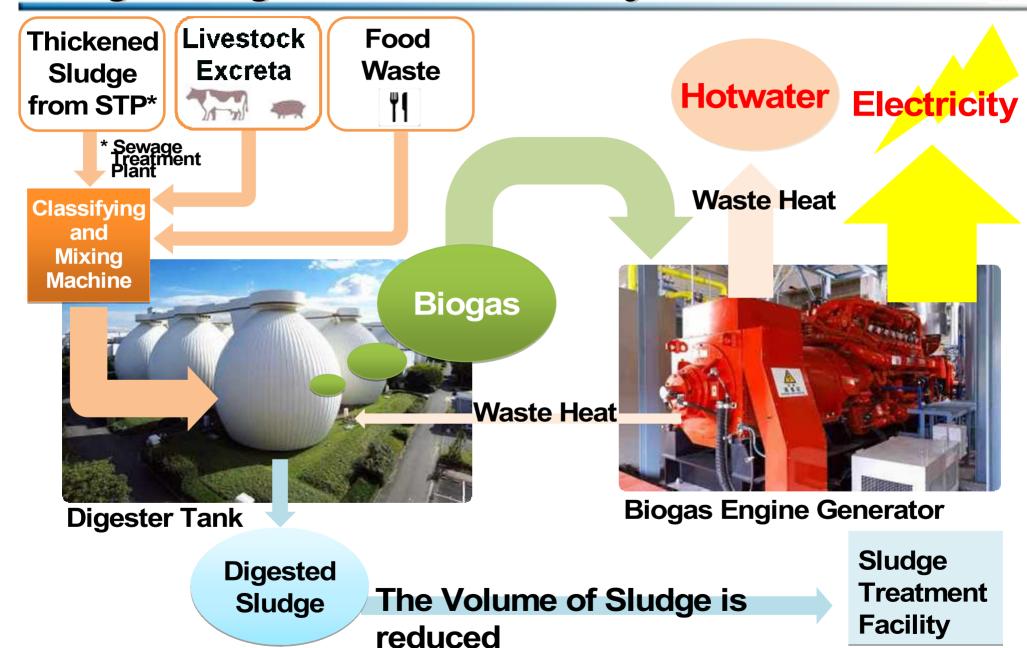


Melting wide range of wastes under high temperature



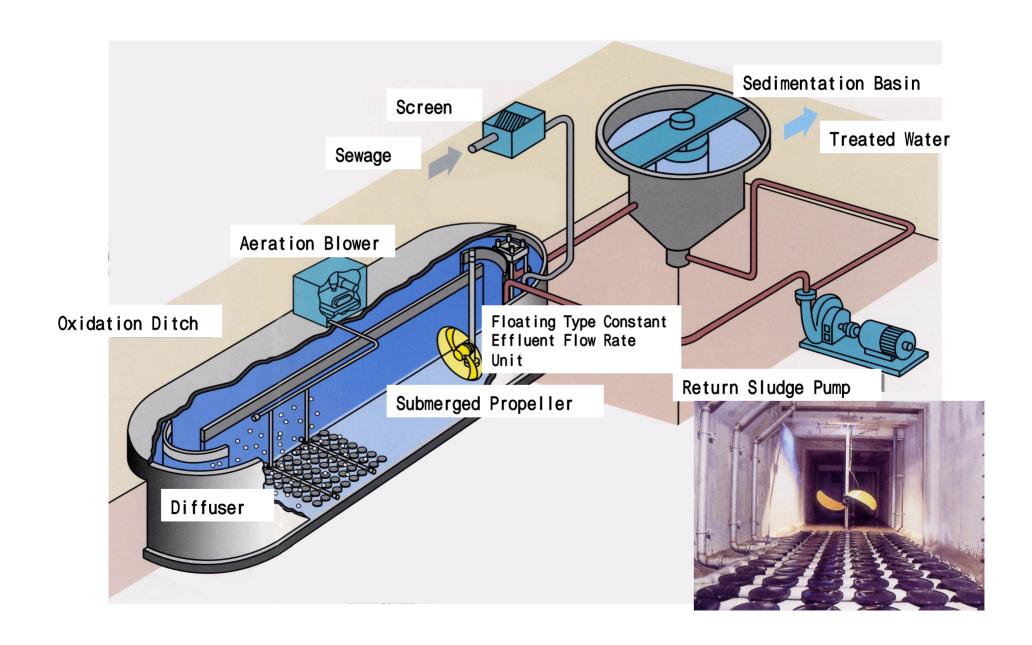
Biogas Engine Generation System





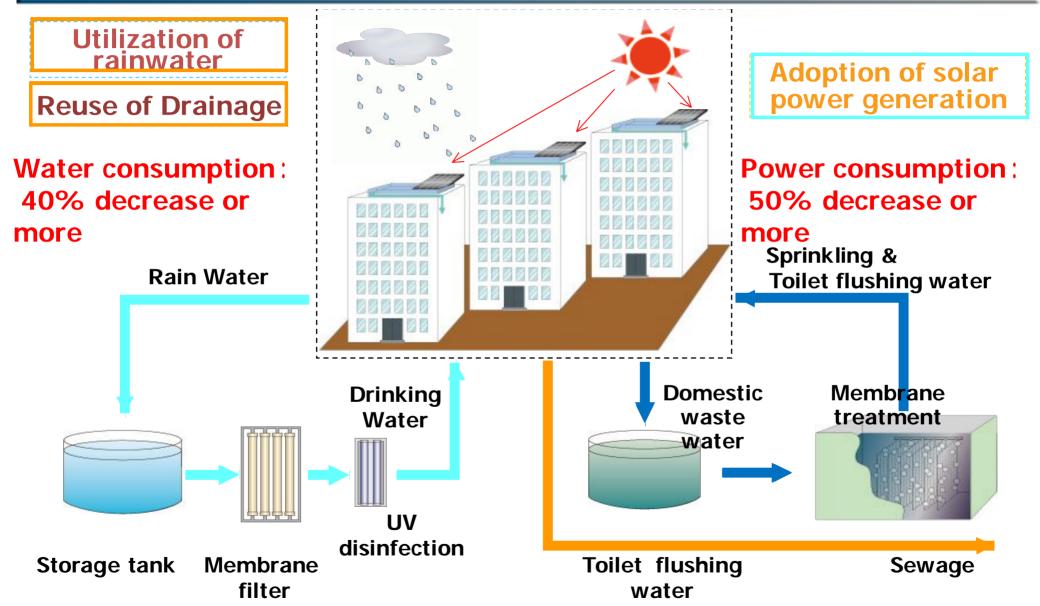
JFE OD System Outline





Feature and Effect of the system





Operational Support System for Sewage Treatment Plant with Activated Sludge Process



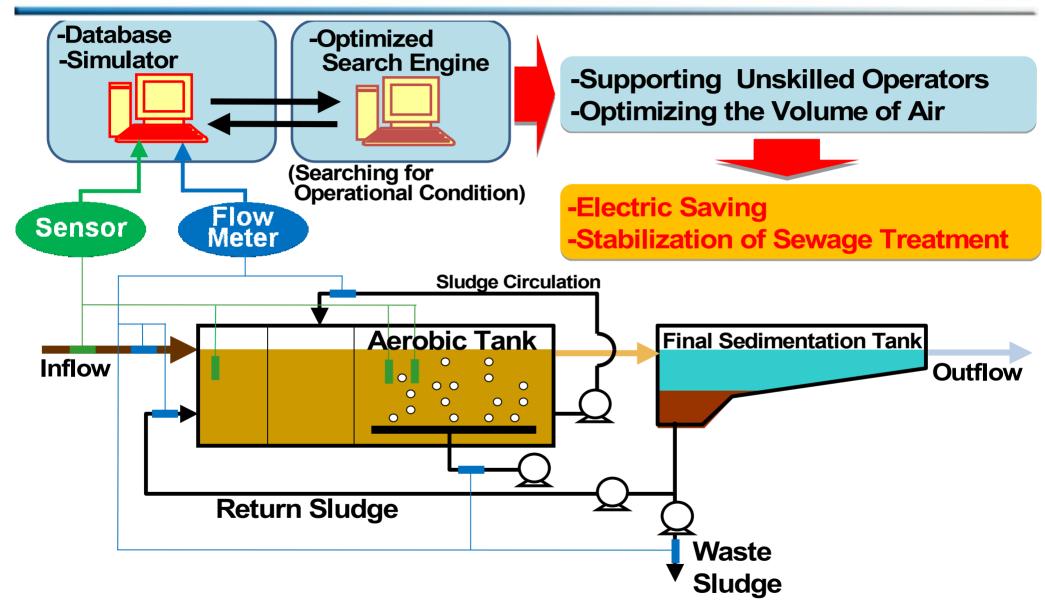


Figure 1: General Outline of the System





JFE Engineering Corporation



Water Infrastructure Business of Sumitomo Corporation

Feb. 14th, 2011









Sumitomo Corporation Water Utilities Investment Team

Business Organization (2011.1)

Sumitomo
Corporation

Wind Power & Water
Infrastructure Business
Dept.

2010.4~: Establishment

■ Tokyo HQ: 25 staffs~

Overseas : NY, Beijing, etc.

Under increasing staffs

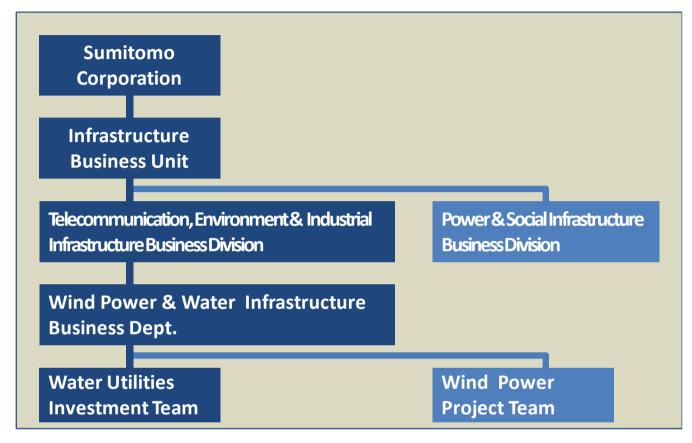
Business Model

- Investment in overseas water infrastructure business
- Target : 20 million water supplied population
- To become an integrated Water business company
- M&A and Greenfield
- Sponsorship + O&M

Target Region

3 major markets

- -East Asia, incl. China & India
- the Middle East
- Latin America
- + Emerging market
 - Confidential -





Global Network

Sumitomo
Corporation

Sumitomo Corporation Global Network

Overseas: 65 countries, 115 locations

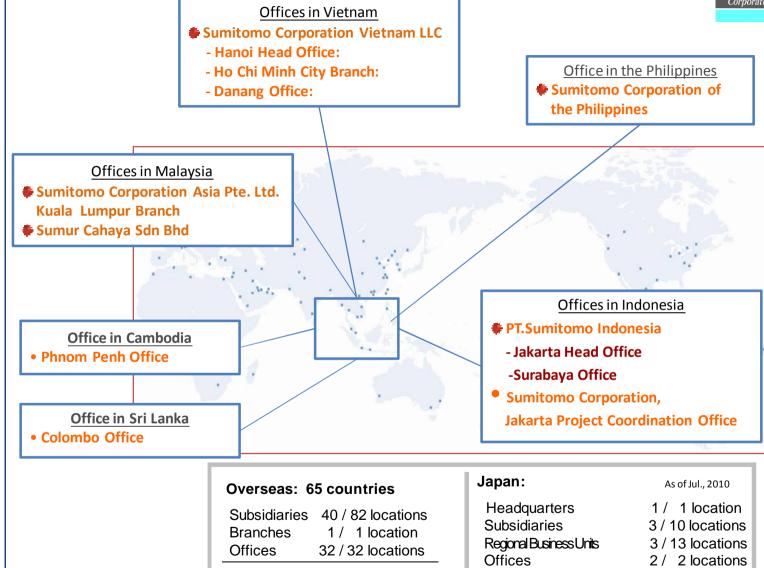
Engaged in infrastructure business such as power, telecommunications, or other industrial facilities for Asian countries; Malaysia, Indonesia, Vietnam, Philippines, etc.



Utilizing the experience through investments in infrastructure business.

Pursuing synergy with existing infrastructure business.

Developing new infrastructure business through public-private partnership.



115 locations

Total

Total

26 locations

Portfolio in Water Infrastructure Business



Business Strategy

Entry & expansion into water infrastructure business by the optimal partner & scheme in consideration of each country or region characteristic.

- -Expanding business base
- -Upgrading management function for business
- Differentiated by innovation

Entry to growing market & Obtaining the business base

CHINA: 2010 -

Alliance with <u>Beijing Capital Co., Ltd.</u>, the largest provider of water infrastructure in China.

- To expand TOT/BOT business through JV.
- To collaborate on other businesses such as waste & sludge treatment and other environment technologies.

Developing Public-Private Partnership

MALAYSIA: 2010 -

Organizing PPP scheme with <u>Tokyo</u> Metropolitan Government.



BAHRAIN / UAE (Middle East): 2005 -

IWPP business with <u>Suez</u>. (Desalination)

Expanding businesses deriving from IPP

INDIA: 2000 -

Alliance with <u>VA Tech Wabag Ltd.</u>, a leading multi national company in water treatment industry.

Foothold for growing market

Our Strategic Activities

Water

Resource



Malaysia

Tokyo Metropolitan Proven Technology







Master Plan

Key Challenges



Advanced Treatment

Expertise In Malaysia Pollution





Upgrading **Technologies**

Experience In Water **Businesses** Aging Water & **Sewerage Assets**



Treatment Plant

NRW Reduction Experience

Capabilities

Of Finance **Arrangement** High % of NRW

Inefficient Operation



Rationalization Knowhow

China

Sumitomo Corporation

• Extensive Partnership with Japanese Manufacturers/Technology Providers

Beijing Capital Co., Ltd.

 Accumulated Knowhow & Business Network in Water Infrastructure Related Businesses in China

Technical Platform

Japanese Advanced Technologies Related to Water & Environment *Infrastructure*

- Demonstration
- Model Project
- Localization
- Sales Promotion
- Local Production

Municipalities Commercial Entities In China



Successful Example of PPP (Manila Water Company)

PPP in Metro Manila, Philippines

Provision for water and wastewater services in Metro Manila is divided into the East and the West Zones, following the 1997 PPP bids for 25-year concession contracts. Mitsubishi Corporation participated in the bid for the East Zone through Manila Water Company, Inc., which provides water and wastewater services to more than 6.1 million people.

Today, it has become one of the world's most successful examples of PPP. In fact, its Concession Agreement has been extended for an additional 15 years on top of the 25 years that have been previously granted.

Manila Water's achievements

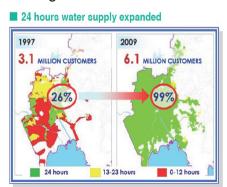
Before Manila Water's entry in the industry in 1997, eastern Metro Manila suffered from various challenges such as insufficient infrastructure and environmental deterioration, accelerated by rapid population increase. Twenty-four-hour water supply was only available to 26% of the East Zone population due to leakages mainly caused by old water lines, meter tampering and illegal connections. In fact, non-revenue water (NRW) was at a record high of 63% at that time.

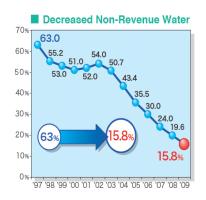
Under these circumstances, Manila Water prioritized improving water network efficiency to deliver recovered water to more customers. This was supplemented by organizational improvements, employee development and facility rehabilitation.

The remarkable results are as follows:

- 1) Increased billed volume (from 440,000 m³/day in 1997 to 1.10 million m³/day by the end of 2009)
- 2) Improved 24-hour potable water supply (from 1997's 26% to 2009's 99%)
- 3) Reduced NRW (from 1997's 63% to 2009's 15.8%)

In addition, Manila Water now supplies clean and potable water to more than 1.6 million residents in marginalized communities. Manila Water was also the first water and wastewater service provider to be listed in the Philippine Stock Exchange after a successful Initial Public Offering in 2005.







Name: MANILA WATER COMPANY, INC.

Establishment: January 6, 1997

Capital: 6.2 billion Pesos (USD135 million as of December 2009)

Total 2009 Sales: 9.5 billion Pesos

(USD205 million as of December 2009)

Employee: 1,583 (as of December 2009)



東京都の水インフラに関する取組 ー上水道ー



東京水道の概要

東京水道は、東京都水道局と東京水道サービス㈱(TSS)が一体となり、1,260万の人々に安全な水の安定した給水を実現しています。

東京水道 基本指標		
事業開始	1898.12.1	
供給区域面積	1,223km ²	
給水人口	12.6 million	
無収水率	4.4 %	
配水管延長	25,969 km (half way of the globe)	
稼働能力	6.9 million m3/day	
一日平均供給量	4.3 million m3/day	
供給時間	24時間365日	

優れた技術と国際貢献ビジネスの取組

世界で最も進んだ浄水技術などの先進的・複合的な技術を有し、新たな国際貢献の取組を進めています。

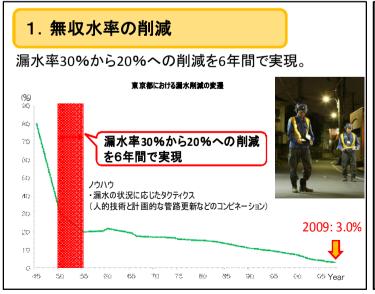
1 優れた技術など

- (1) どのような水質にも対応できる浄水処理技術と高度な水質管理技術 高度浄水処理やTOKYO高度品質プログラムなど
- (2)漏水防止技術 水資源の有効利用、経営効率の向上。漏水率 21年度3.0%
- (3) 危機管理・安定給水 水運用センターによる一元管理など
- (4)料金徴収 徴収率 21年度99.9%
- 2 東京水道国際展開ミッション団の派遣

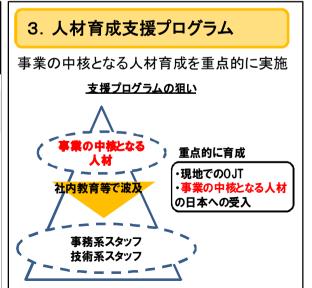
平成22年度に、マレーシア、ベトナム、インドネシア、インド、モルディブ に調査団を派遣

(平成22年度から24年度の3年間で10カ国程度派遣予定)

東京水道の主な実績







東京都の水インフラに関する取組 一下水道一



東京下水道の概要

大規模な下水道システムを効率的に運営し、安定的な下水道サービスを提供しています。

東京下水道 基本指標		
事業開始	1884年	
下水処理区域面積	963km2	
下水道普及人口 (下水道普及率)	12.1 百万人 (99.7 %)	
管渠管理延長	16,062 km	
処理能力 (水再生センター数)	7.7 百万 m3/日 (20か所)	
一日平均処理量	5.6百万m3/日	
一日平均脱水汚泥発生量	3,291 t/日	

優れた技術と国際展開の基本的考え方

東京下水道の優れた技術やノウハウなどの強みを活かし、国際展開を進めています。

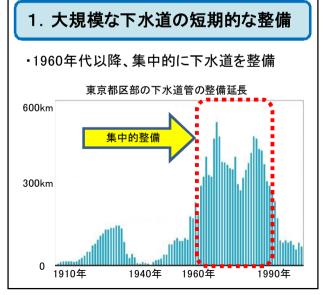
1 優れた技術

- (1) 過密な大都市の中で短期間・集中的に下水道管から処理場まで整備した技術
- (2) 大規模で高度な下水道システムを総合的に運営・管理する技術
- (3) 再生水造水や高度処理技術
- (4) 炭化炉、ガス化炉など先進的・実用的な技術 ※特許等の件数 約250件

2 国際展開の基本的考え方

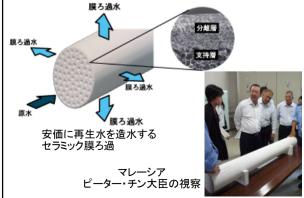
- ○水・衛生問題に直面する国や地域の発展に寄与
- ○下水道関連企業の海外展開を後押しすることで、産業力の強化に貢献
 - ・監理団体(東京都下水道サービス㈱)と一体的に対応
 - ・下水道グローバルセンター(GCUS)等とも連携
- ※具体的な事例 ①SPR工法を海外展開中
 - ②水面制御装置のライセンス契約をドイツや韓国の企業と締結済

東京下水道の主な実績



2. 再生水の有効活用

・貴重な水資源として、高度処理した再生水を オフィスビルのトイレ用水等に活用



3. 老朽化した下水道管の更生(SPR工法)

- ・老朽化施設を効率的に再構築
- ・SPR工法は、国内で600km以上、アジア、北米、欧州など国外で30km以上の施工実績





施工中

施工後

Measures on Water Infrastructure by Tokyo Metropolitan Government -Water Supply-



Tokyo Waterworks Summary

Tokyo Waterworks has integrated the Tokyo Metropolitan Government (TMG) Bureau of Waterworks and Tokyo Suido Services Co., Ltd. (TSS), and steadily supplies safe water to 12.6 million people.

Tokyo Waterworks Fundamental Indicators		
Start of Service	December 1, 1898	
Service Area	1,223 km ²	
Population Served	12.6 million	
Non Revenue Water	4.4%	
Total Length of Pipes	25,969 km (half way round the Earth)	
Capacity of Water Supply Facilities	6.9 million m ³ /day	
Average Daily Water Supply	4.3 million m ³ /day	
Water Availability	24 hours 365days	

Tokyo Waterworks Major Achievements

Advanced Technologies and Tokyo's Water Business –International Projects and Cooperation -

Using the most advanced comprehensive water-related technologies, Tokyo Waterworks actively carries out international contribution projects.

- 1 Tokyo Waterworks' advanced technologies, etc.
 - (1) Advanced water quality control and water treatment technologies suitable for any water quality

Tokyo Waterworks' advanced water treatment technologies, Tokyo High Quality Management Program, etc, contributes to stable water quality.

(2) Leakage prevention technology

Tokyo Waterworks' technology contributes to efficient use of water resources and improves management efficiency. In 2009, Tokyo Waterworks' Leakage Rate was 3.0%.

(3) Crisis prevention/stable water supply

Vertical management by Water Supply Operation Center ensures stable water supply in addition to prevention of emergencies.

(4)Tariff collection

The collection rate in 2009 was 99.9%

2 Tokyo delegation for overseas waterworks development

In 2010, Tokyo Waterworks sent its delegation team to Malaysia, Vietnam, Indonesia, India and the Maldives. Tokyo Waterworks plans to send its delegation to approximately 10 countries from 2010 to 2012.

1.Reduction of NRW Rate A reduction in the leakage rate from 30% to 20% was achieved in 6 years History of Leakage Rates in Tokyo (%) !!!!: A reduction in the leakage rate from 30% to 20% was achieved in 6 years 880 TO 60 100 40 · Tactics according to status of leakage (Combination of human technology and planned pipe renewals) 30 20 2009: 3.0% 10





Measures on Water Infrastructure by Tokyo Metropolitan Government -Sewerage-



Tokyo Sewerage Systems Summary

Tokyo Sewerage operates large-scale sewerage systems efficiently, and offers stable sewerage service.

Tokyo Sewerage Fundamental Indicators		
Start of Service	1884	
Service Area	963km2	
Sewered Population (%)	12.1 million (99.7 %)	
Total Length of Pipes	16,062 km	
Treatment Capacity (Number of Water Reclamation Centers)	7.7 million m3/day (20)	
Average Daily Treated Effluent	5.6million m3/day	
Average Daily Amount of Dewatered Sludge	3,291 t/day	

Tokyo Sewerage's Major Achievements

Advanced Technologies and Basic Policy for International Activities

We are positively working on international activities making use of various technologies and know-how Tokyo Sewerage posses.

- 1 Advanced Technologies
 - (1) Technologies of building-up sewer pipes and Water Reclamation Centers intensively under overcrowded city in a short period of time.
 - (2) Technologies of operating and managing large and highly advanced sewerage systems comprehensively.
 - (3) Technologies of utilizing reclaimed water and advanced treatment.
 - (4) Advanced and practical Technologies such as sludge Carbonization and Gasification. %number of patents: approx. 250
- 2 Basic Policy for International Activities
 - O Contribute to the development of countries and regions facing water and hygiene problems
 - O Advance the overseas development of sewerage related companies, and thereby contribute to stimulation of sewerage business and strengthening industrial abilities in Tokyo and Japan
 - Closely cooperate with Tokyo Metropolitan Sewerage Service Corporation(TGS).
 - · Cooperate with the Global Center for Urban Sanitation (GCUS) etc.
 - *For Example 1) Disseminating Sewerage Pipe Renewal (SPR) Method overseas
 - ②Concluded a license contract of "water surface control device" with a German company and a South Korean one

1.Construction of large scale of Sewerage System in a short period Construction of sewer pipes intensively after the 1960s. Intensive construction O 1910 1940 1960 1990

Utilize reclaimed water for non-potable use such as toilet flushing in office buildings. filtered water filtered water filtered water A ceramic membrane filtration that produces reclaimed water at low cost Demonstration to the minister of Malaysia, Datuk Peter Chin

2.Utilization of reclaimed water

3. Reconstruction of deteriorated pipes

Reconstruct deteriorated facilities efficiently. Construction results of SPR-Method exceed 600km domestically, and 30km in overseas including Asia, North America, and Europe.





under construction

after construction

北九州市の海外水インフラの取り組み



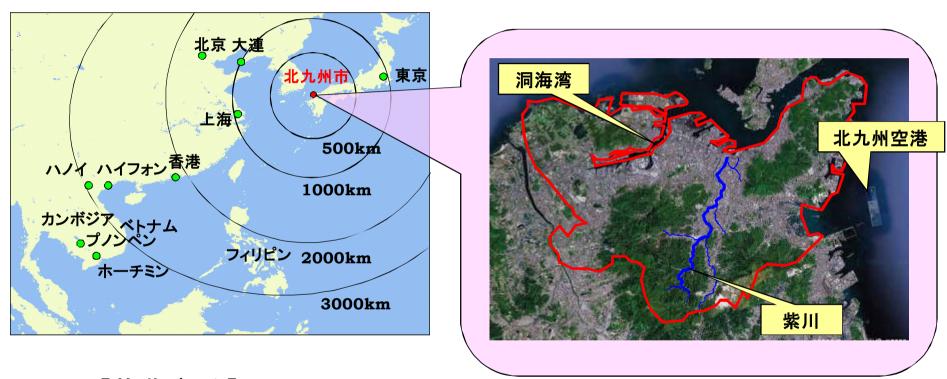
FEB. 14, 2011

Kunio OHARA
Chief Executive, Construction Bureau



北九州市の概要

- ●日本列島の西端、九州の最北端に位置 ⇒ アジアのゲートウェイ
- ●産業集積と技術力を誇るモノづくりのまち ⇒ 鉄鋼、化学、機械、窯業、IC等
- ●豊かな自然にも恵まれたまち ⇒ 210kmの海岸線、市域約40%が森林



【基礎データ】

•面積:約488km²、人口:約98万人

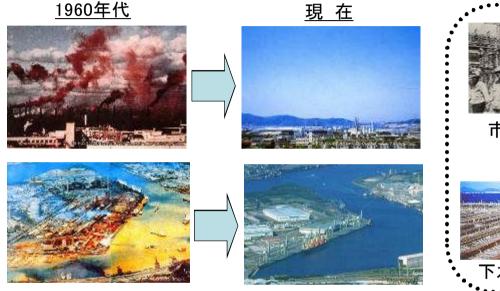
•平均気温 :約16℃

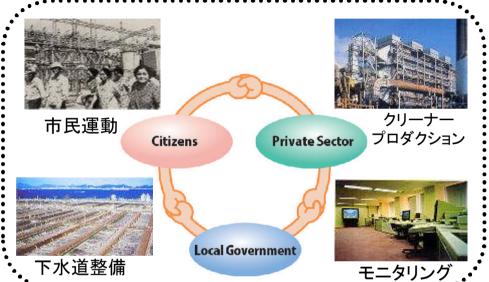
•年間降水量:約1,600mm

環境再生の成果、国際技術協力の実績

■ 環境再生(公害克服)の成果、成功体験がある

市民の力を行政が支え、「ばい煙」の空、「死の海」から復活





■ 国際技術協力の豊富な経験、実績がある

環境再生の技術やノウハウを海外へ移転

○技術者育成 (上下水道分野 1990~2009年度)

·専門家派遣:12ヵ国、126人

·研修員受入:100ヵ国以上、約2,500人

〇市民力向上:環境教育

中国、インドネシアなど

技術協力の成果(水道分野)

1993年	プノンペンの飛躍的改善	2006年
25%	行政区域内水道普及率	90%
10h	給水時間	24h
72%	無収水量率	8%

2005年5月飲用可能宣言

水インフラの海外輸出のために

<北九州市の取り組み>

■ 官民による支援体制が整っている

民間企業85社、国の機関(JICA、JBIC、GCUS他)などとともに、「北九州市海外水ビジネス推進協議会」を設立

・民間:コンサルティング、素材供給、プラント建設、金融支援など

・官側:政策立案の支援、自治体ノウハウの提供など

■ 施設の計画、建設、維持管理から事業経営まで、 上下水道事業の全般にわたる支援ができる













北九州市は、自治体のノウハウと民間の技術で、 水に関する多様なニーズにお応えします

- ◆最適施設計画を提案
- ◆健全な事業経営を支援(料金設定、市民対応等)
- ◆人材を育成(研修、技術指導)

具体的な取組内容

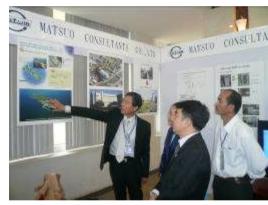
<下水道分野>

- ◆ベトナム・ハイフォン市との技術交流
- ◆中国・大連市の調査、事業提案
- ◆サウジアラビア向け案件形成への参画(GCUS)
- ◆バラスト水への下水処理水活用の具体化
- ◆最新技術拠点の開設(ウォータープラザ)
- ◆カンボジアでの水環境改善の啓発

<水道分野>

- ◆技術協力と人材育成 カンボジア(1999~)、中国・大連市(2000~)、 ベトナム・ハイフォン市(2010~)
- ◆現地ニーズの調査 カンボジア、ベトナム・ハイフォン市
- ◆カンボジア国の水の安全供給を促進
- ◆ベトナム・ハイフォン市へミッション団派遣、 水道展へ出展、技術提案





ベトナム水道展へ出展(ハイフォン市)





技術の普及・展開

代表的な取組事例

- ベトナム国ハイフォン市との技術交流(下水道分野)
 - ・ハイフォン下水道排水公社と「覚書」締結(2010年11月26日)
 - ・今後、現地調査のうえ施設計画、事業経営や人材育成の方策などを提案



両市副市長の交流



調印式



技術協議

- カンボジア国の水道安定供給を支援(水道分野)
 - ・カンボジア鉱工業エネルギー省と厚生労働省が「覚書」締結(2011年1月6日)
 - 日本の経験、カンボジアの先進的取組みを全域に活用する方策検討
 - 両国産業界の有する技術力の活用方策検討
 - 官民による現地調査の実施
 - 両国の事業者と産業界との連携、協力の促進
 - ・今後、両者及び北九州市が具体的な活動内容を調整し、策定



調印式

ご清聴ありがとうございました

是非一度、北九州市にお越しください!









Contact

Water Environmental Division, Construction Bureau E-mail: ken-mizukankyou@city.kitakyushu.lg.jp





参考資料

環境再生の国際的評価

■1990年:国連環境計画(UNEP)から「グローバル500」受賞(日本の自治体初)

-1992年:リオ・サミットで「国連地方自治体表彰」受賞(日本の自治体で唯一)

■2000年:北九州市で国連ESCAP環境大臣会議を開催 (ESCAP:アジア太平洋経済社会委員会)

■2006年:米国NPOウォーターフロントセンターより「クリアーウォーター賞」受賞

•2007年:同じく「エクセレンス·オン·ザ·ウォーターフロント賞」受賞









ウォーターフロントセンター表彰

<u>国連表彰</u>

※2008年、国内では、「環境モデル都市」 に選定(全国で6箇所)



環境モデル都市選定



習近平中国副主席来訪

北九州市の下水道概要

【経緯】

·1963年 2月 北九州市誕生 ⇒ 本格的に整備着手

•1963年 7月 皇后崎浄化センター運転開始

•1977年 3月 下水道普及率 50%達成

•1982年 1月 管渠布設延長 2,000km達成

•2005年 3月 管渠布設延長 4,000km達成

-2006年 3月 下水道普及率 99.8%達成(汚水整備概成)

【主な下水道施設】

・<u>浄化センター 5箇所</u>(処理能力 621,000m³/日)

・ポンプ場 36箇所

·管渠 4, 324km

 汚水
 3, 172km

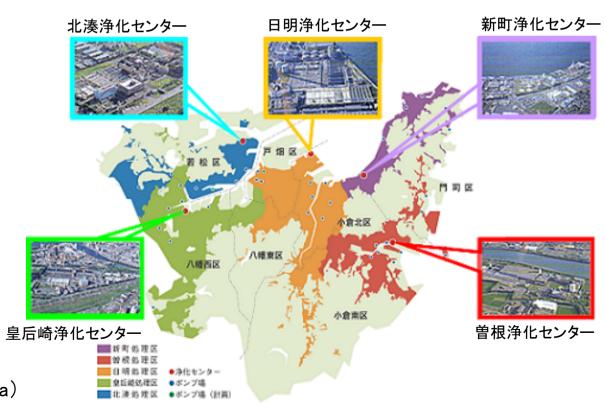
 雨水
 312km

 合流
 840km

【処理区域面積】

•16, 164ha

(うち合流区域面積:3,422ha)



約40年間で、6.000億円を超える

建設事業費を投資

下水道整備の効果

◆約40年をかけて、行政と市民が一体となって下水道整備を推進

行政:下水処理場や管渠の整備

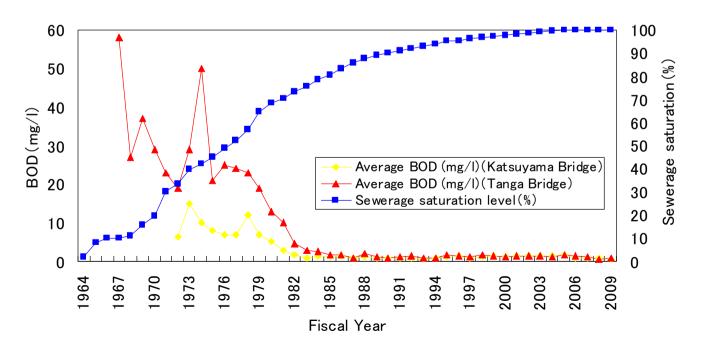
•市民:水洗化(下水道への接続)の徹底





戻ってきた清流に棲む魚:アユ

※下水道の普及とともに、紫川の水質が飛躍的に改善







北九州市で様々な技術をご覧いただけます

【計画から建設、維持管理まで】

下水処理場:5箇所 ポンプ場:36箇所 管渠:4,324km



下水処理場





パイプライニング

【汚泥の有効利用】



セメント原料化



ごみ焼却工場で発電

【最新技術】

〇下水の持つエネルギーと自然エネルギーの活用





消化ガス発電

太陽光発電





北九州市の水道概要

【主要施設】

(平成22年3月31日)

●水 源 10ヶ所●浄水場 5ヵ所

●配水池 47ヶ所

●管路延長 4,275km うち配水管 3,917km

●供給能力 769,000㎡



【給水状況】

(平成21年度)

項目	内 容	
行政人口(北九州市のみ)	979,476 人	
給水区域内人口 (うち芦屋町)	993,360 人(14,904 人)	
給水人口(うち芦屋町)	988,848 人(14,822 人)	
普 及 率	99.5 %	
供給能力	769,000 m3/日	
有収水量	106,187,569 m3/年	
一日最大給水量	361,300 m3/日	
一日平均給水量 333,138 m3/日		

北九州市の水道技術

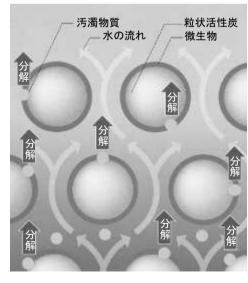
【省エネ対策】

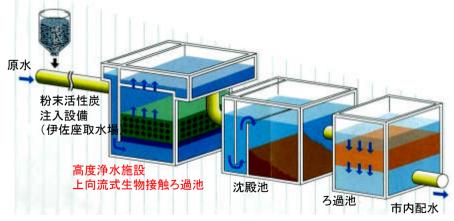
種類		省エネ効果 千kwh/年
自然エネルギーの活用	太陽光発電(6施設)	7, 157
	水力発電 (4施設)	220
省エネルギー対策	ポンプ改良	277
	ポンプのインバータ化	1、381
	管路更新	1, 650
	沈でん池改造	308
	配水ブロックの改善	7 7

【BCF(上向流式生物接触ろ過)】

【BCFについて】

自然の微生物が汚濁物質を取り 込み分解する作用を人工の装置 内でより効果的に実現するもの で、他の高度浄水に比べ、コスト が大幅に低いのが特徴です。





高度浄水処理(穴生浄水場)の配置図

Overseas Water Infrastructure Measures in Kitakyushu City



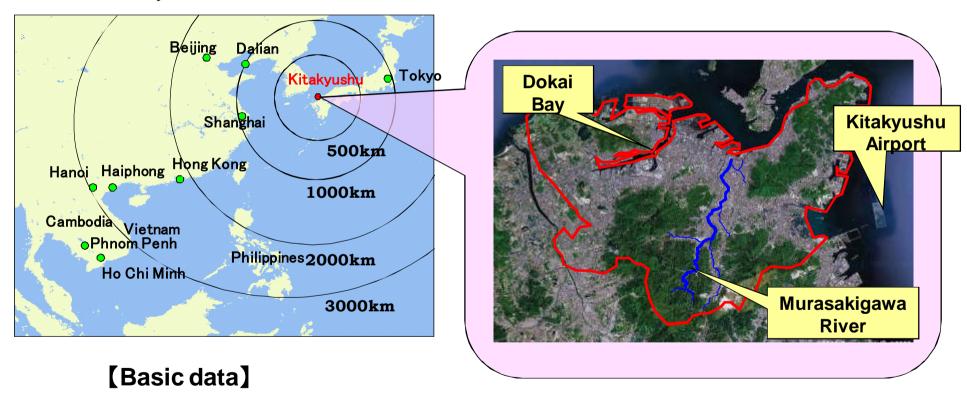
FEB. 14, 2011

Kunio OHARA
Chief Executive, Construction Bureau



Overview of Kitakyushu

- ■Located at the western end of the Japanese archipelago and northern end of Kyushu ⇒ Gateway to Asia
- ■Manufacturing city known for industrial accumulation and technical strength ⇒ iron and steel, chemicals, machinery, pottery, IC, etc.
- Oity with abundant nature ⇒ 210-km-long coastline, forests accounting for approx. 40% of the city area

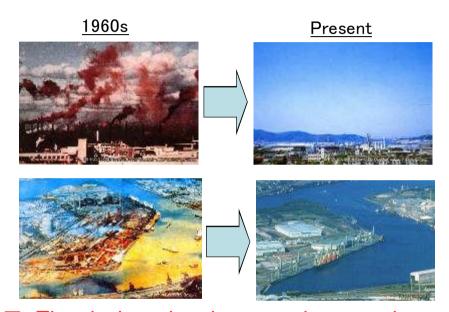


- Area: approx. 488 km2, population: approx. 980,000
- •Mean temperature: approx. 16°C
- Annual precipitation: approx. 1,600 mm

Results achieved by environmental restoration and accomplishments in international technical cooperation

■ The city has a successful experience in environmental restoration (overcoming pollution)

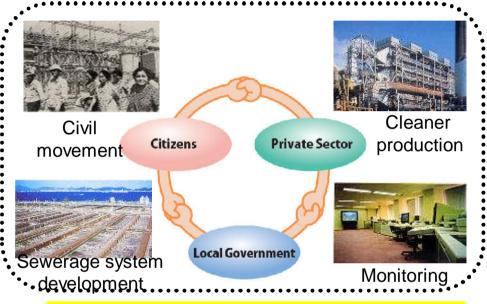
The government supported the efforts of residents to revive the smoke-filled sky and dying sea.



■ The city has abundant experience and accomplishments in international cooperation

Transfer of environmental restoration technologies and expertise to overseas

- Training of engineers (water supply/sewerage FY 1990 – 2009)
 - Dispatch of specialists: 126 to 12 countries
 - Acceptance of trainees: approx. 2,500 from over 100 countries
- O Improvement in civil power/environmental education
 - ·China, Indonesia, etc.



Achievements in technical cooperation (water supply)

1993	Significant improvements in Phnom Penh	2006
25%	Water supply coverage in the administrative district	90%
10h	Water supply hours	24h
72%	Non-revenue water ratio	8%

Declaration of water being safe to drink in May 2005

For export of water infrastructure to overseas

< Measures taken in Kitakyushu>

There is a support system involving both the public and private sectors.

The Kitakyushu Oversea Water Business Association was established together by 85 private companies and government organizations (JICA, JBIC, GCUS, etc.).

- Private: consulting, material supply, plant construction, financial support, etc.
- •Government: support for policy planning, provision of government expertise, etc.
- Support can be provided in water supply and sewerage projects in general, from planning, construction and maintenance of facilities to project management.











Kitakyushu satisfies diverse needs related to water with expertise of the government sector and technologies of the private sector.

- Proposal of optimum facility planning
- **♦** Support for sound project management (e.g., price setting, dealing with residents)
- Personnel training (training, technical guidance)

Specific measures

<Sewerage>

- ◆Technical exchange with Haiphong, Vietnam
- Survey/project proposal in Dalian, China
- ◆Involvement in project formation for Saudi Arabia (GCUS)
- ◆ Realization of the utilization of treated wastewater for ballast water
- ◆ Opening of a state-of-the-art technical base (Water Plaza)
- ◆ Education on water environment improvement in Cambodia

<Water supply>

- ◆ Technical cooperation and personnel training

 Cambodia (1999), Dalian, China (2000), Haiphong,

 Vietnam (2010)
- Survey of local needs
 Cambodia; Haiphong, Vietnam
- Promotion of safe water supply in Cambodia
- ◆ Dispatch of a mission to Haiphong, Vietnam, participation in a water exhibition and technical proposal





Participation in a water exhibition in Vietnam (Haiphong)





Dissemination/development of technologies

Representative cases of measures

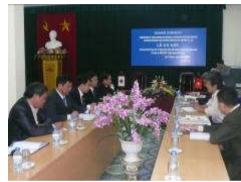
- Technical exchange with Haiphong, Vietnam (sewerage)
 - •Conclusion of a memorandum with the Haiphong Sewerage and Drainage Company (November 26, 2010)
- In the future, facility planning, project management, personnel training and other measures will be proposed based on field surveys.



Exchange between the deputy mayors



Signing ceremony



Technical discussion

- Support for stable water supply in Cambodia (water supply)
 - Cambodia's Ministry of Industry, Mines and Energy and Japan's Ministry of Health Labor and Welfare concluded a memorandum (January 6, 2011).
 - Consideration of measures to apply Japan's experience and advanced measures in Cambodia to the entire nation
 - Consideration of measures to utilize technologies owned by industries of the two countries
 - Implementation of field surveys by the government and private sectors
 - Promotion of partnership/cooperation among entrepreneurs and industries of the two countries

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Signing ceremony

Adjustment and development of specific activities by Kitakyushu and with Cambodia in the future

Thank you for your attention.

Do come to Kitakyushu if you have an opportunity!









Contact

Water Environmental Division, Construction Bureau E-mail: ken-mizukankyou@city.kitakyushu.lg.jp





Reference material

International reputation of environmental restoration

- 1990: Won the Global 500 award from the United Nations Environment Programme (UNEP) (first municipality in Japan)
- 1992: Won the UN Local Government Honours Award at the Rio Summit (only municipality in Japan)
- 2000: UN/ESCAP Environment Ministers Meeting held in Kitakyushu (ESCAP: Economic and Social Commission for Asia and the Pacific)
- •2006: Won the Clear Water Award from the NPO Water Front Center in USA
- •2007: Won the Excellence on the Waterfront Award from the Water Front Center









Water Front Center award ceremony

UN award ceremony

★Selected as one of the six Eco Model

Cities in Japan in 2008



Selected as an Eco Model City



Visit by Vice President Xi Jinping of China

Overview of Kitakyushu's sewerage system

[History]

•Feb. 1963 Incorporation of Kitakyushu as a city ⇒ Commencement of development in full scale

July 1963 Operation of the Kogasaki Sewage Treatment Plant starts

• Mar. 1977 Sanitation coverage reaches 50%

Jan. 1982 Pipe installation length reaches 2,000 km

•Mar. 2005 Pipe installation length reaches 4,000 km

Mar. 2006 Sanitation coverage reaches 99.8% (almost complete sewage treatment)

[Main sewerage facilities]

5 sewage treatment plants
 (treatment capacity: 621,000 m3/dav)

36 pump stations

•Pipe length 4,324 km

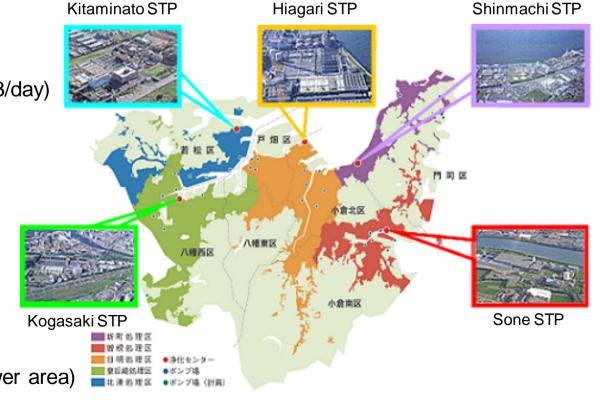
Sewage 3,172 km

Stormwater 312 km

Combined 840 km

[Treatment area]

•16,164 ha (incl. 3,422 ha combined sewer area)



More than ¥600 billion

construction project cost has been invested in approx. 40 years.

Effects of sewerage system development

◆The government and residents have joined forces to promote sewerage system development for approximately 40 years.

Government: establishment of treatment plants and sewers

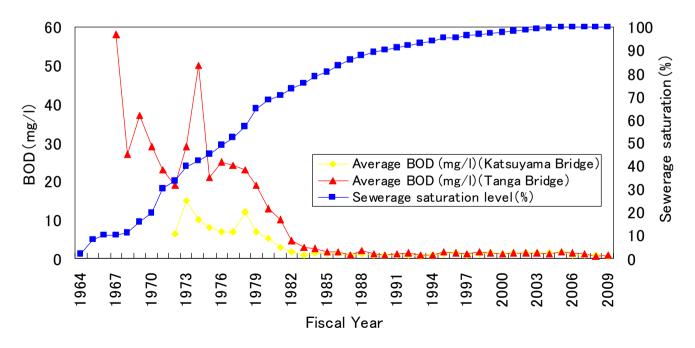
Residents: thorough promotion of flush toilets

(connection to the sewer system)



Ayu living in the restored clear stream

*Water quality of the Murasakigawa River has improved significantly with an increase in sanitation coverage.







A variety of technologies can be observed in Kitakyushu.

[From planning to construction, maintenance

and management]

Sewage treatment plants: 5

Pump stations: 36 Pipes: 4,324 km

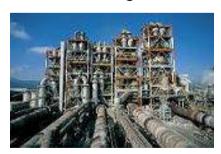


Sewage treatment plant



Pipe lining

[Effective sludge utilization]



Use as cement raw material



Power generation at a waste incineration plant

[Latest technologies]

O Utilization of sewerage and natural energy



<u>Digestion gas</u> power generation



Solar power generation





Overview of Kitakyushu's water service

[Main facilities] (March 31, 2010)

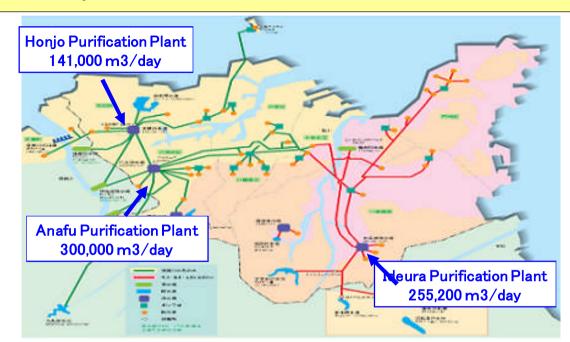
Water sources:

Purification plants5

Distribution reservoirs47

Pipe length 4,275 kmService pipe length 3,917 km

■ Supply capacity 769,000 m³



[Water supply status] (FY2009)

Item	Content	
Total population (Kitakyushu City only)	979,476	
Population in the supply area (no. in Ashiya-machi)	993,360 (14,904)	
Supply population (no. in Ashiya-machi)	988,848 (14,822)	
Coverage	99.5%	
Supply capacity	769,000 m3/day	
Revenue-earning water	106,187,569 m3/year	
Daily maximum supply	361,300 m3/day	
Daily average supply	333,138 m3/day	

Water technologies in Kitakyushu

[Energy-saving measures]

Туре		Energy-saving effect 1,000 kwh/year
Utilization of	Solar power generation (6 facilities)	7, 157
natural energy	Hydropower generation (4 facilities)	220
Energy-saving measures	Pump improvements	277
	Application of inverter pumps	1,381
	Pipeline rehabilitation	1, 650
	Reconstruction of sedimentation basins	308
	Improvement in the block distribution system	7 7

[BCF (up-flow biological contact filter)]

[About BCF]

The system performs the action of natural microbes to take in and decompose pollutants more Decomposition effectively in an artificial device. It is characterized by the significantly lower cost compared to other advanced purification systems.

