Thematic Meeting 1：Wastes and sludge treatment in smart cities

Venue：Atlantic, 3F, InterContinental Yokohama Grand
Moderator：Mr. Gil-Hong Kim, Senior Director concurrently Chief Sector Officer for Sector Advisory Service Cluster of the Sustainable Development and Climate Change Department
Conference Secretariat/Rapporteur： Mr. Yasushi Hieda, Senior Researcher, OECC
Language：English/Japanese (simultaneous interpretation is provided)

	City/Organization	Title	Name
1	Mandaue	City Mayor	Mr. Gabriel Luis R. Quisumbing
2	Mumbai	Deputy Municipal Commissioner	Dr. Shri. Kishor N. Kshirsagar
3	Colombo	Chief Dispensary Medical Officer	Dr. Mahahewage ACM Wickramaratne
4	Baguio	City Environment & Parks Management Officer	Ms. Maria Adelaida C. Lacsamana
5	Cebu	City Mayor	Mr. Tomas R. Osmeña
6	JFE Engineering Corporation	Vice President	Dr. Kaoru Kikuyama
7	C40	Network Manager	Ms. Kathrin Zeller
8	GUUN CO., Ltd.	Senior Managing Director	Mr. Takeshi Konishi
9	JBIC	Deputy Director	Mr. Hiroshi Sagawa
10＊	Male	Councilor	Mr. Mohamed Fazeen
11＊	Embassy of the Republic of the Philippines	Second Secretary	Ms. Cassandra B. Sawadjaan
12#	Embassy of Bangladesh	Ambassador	Ms. Rabab Fatima

＊commentator
observer

MANDAUE CITY

Butuanon River
Challenges and Opportunities

ECONOMIC PROFILE

- Robust and diverse economic based with annual gross output of about PhP 142 Billion
- Estimated 18,200 registered establishments from about 4,000 industries
- Home of country's largest brewery and other manufacturing establishments like food processing, wood-based products, metal works, etc.
- Working age population is 63.56% of total population
- Literacy rate is 95.52%

*Source: 2013 data from City Planning and Development Office

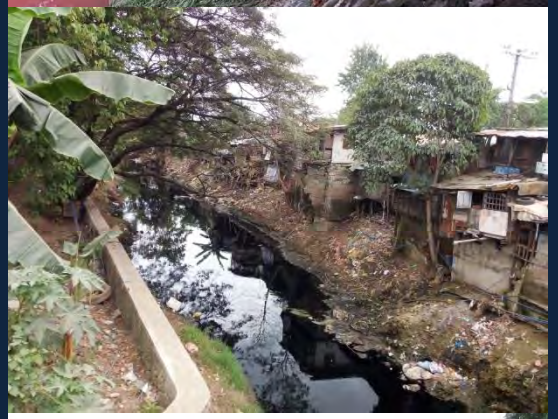
Butuanon River Watershed

Butuanon 'worst river in the Philippines'

Thursday, June 04, 2015

By JUJEMAY G. AWIT

BUTUANON RIVER. Through "Adopt-a-River" program wherein a private company cleans up a portion of it, the Butuanon River, once considered "dead," has been deemed by the Department of Environment and Natural Resources as 25 percent rehabilitated. (Sun.Star File)



MANDAUE CITY

Pilot project for Sewage waste water treatment.

Location – Lokmanya Tilak Municipal Hospital and Medical College, Sion Mumbai.

DR. KISHOR KSHIRSAGAR

DY. MUNICIPAL COMMISSIONER

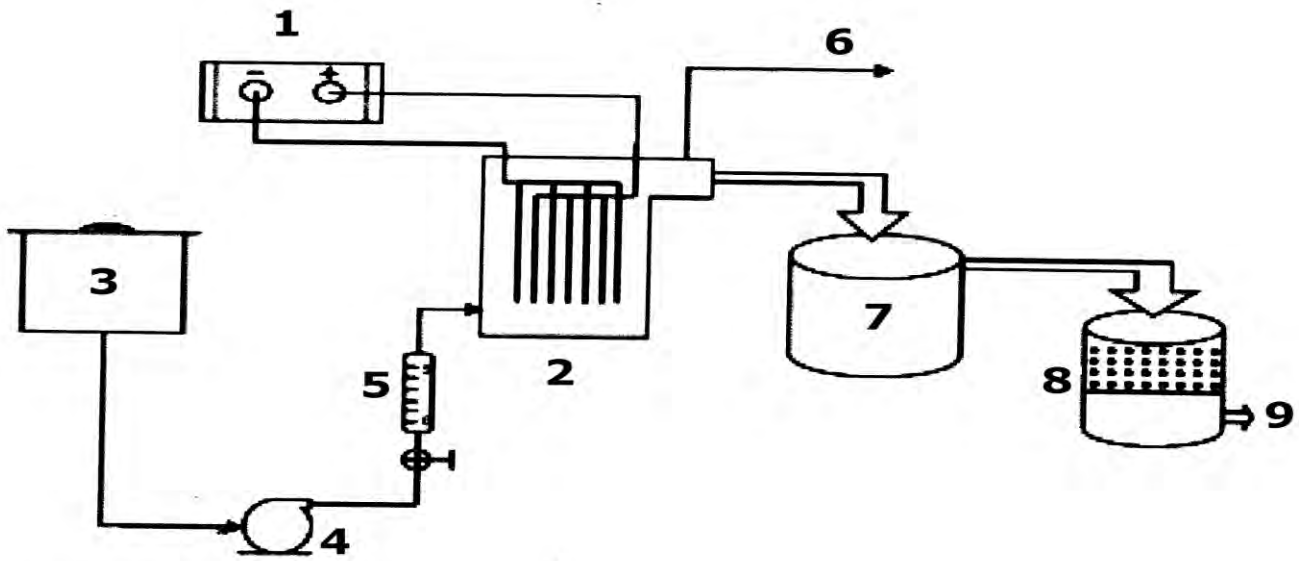
MUNICIPAL CORPORATION OF GREATER MUMBAI

MAHARASHTRA , INDIA

Purpose

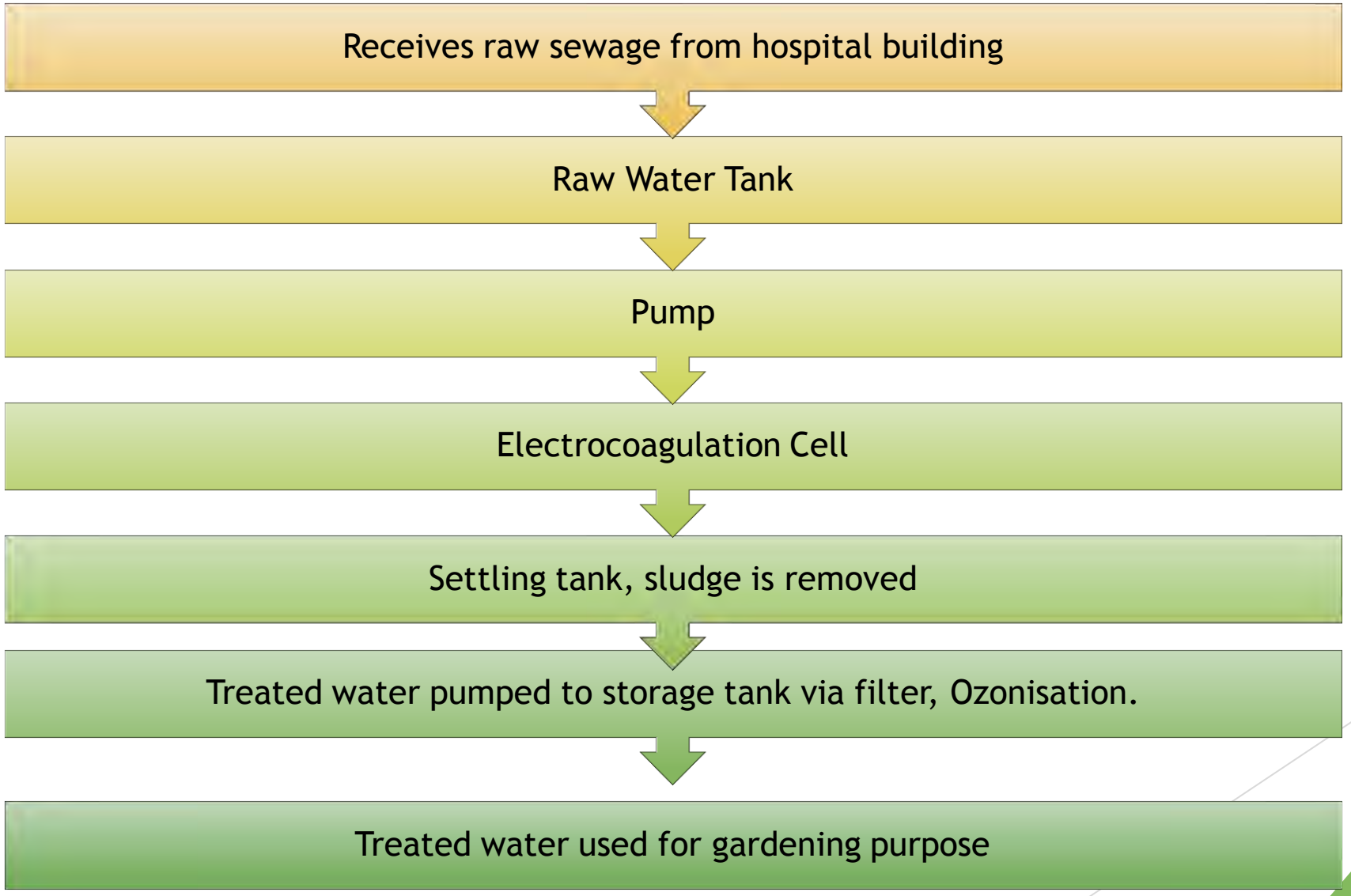
- To treat waste water generated through various hospital activities
- To remove physical, chemical and biological impurities from water.
- Use treated water for gardening instead of tap water.

Line diagram for Sewage treatment plant



1. Controlled Power Supply
2. Electrocoagulation cell
3. Raw water tank
4. Pump
5. Flow meter
6. Gas outlet
7. Settling tank/Filter press
8. Filter
9. Ozonation and Treated water out

Flow diagram for Sewage treatment plant



Test Reports

- Before

MUNICIPAL CORPORATION OF GREATER MUMBAI

DADAR LABORATORY

No. Supdt. Chem./Lab./Sew/ 254 **/Dadar** 21/7/15

Sub: Testing of sewage samples from Sion Hospital.

The sewage samples received from Sion Hospital Site was analysed for the following parameters.

Sample received on: 17/07/2015

Sr.No.	Parameters	Sample1 (7.00 am)	Sample2 (9.00 am)	Sample3 (11.00 am)	Sample4 (1.00 pm)	Sample5 (3.00 pm)	Sample6 (5.00 pm)
1	pH	6.7	7.1	6.8	7.2	7.1	7.2
2	BOD	227	223	216	212	213	227
3	COD	480	476	512	560	352	540
4	CHLORIDES	64	71	71	178	99	64
5	TSS	216	138	203	225	227	234
6	FREE NH_3	22.40	13.16	17.36	16.24	25.20	26.04

All parameters except pH are expressed in mg/L.

Chemist 21/7/15

M. Pant 21/7/2015
E. E. M.(Sew.) city –1

A. E. (Project)
A. E. (Civil) Sion Hospital

Sir shri Shinde @ 23/7/15 AE(P) SC 1

PASSED

- After

MUNICIPAL CORPORATION OF GREATER MUMBAI

DADAR LABORATORY

No. E.E.M./ Sew./ 6271 City-1 17 MAR 2017

Sub: Testing of treated sewage sample from LTMG Hospital.
Ref:- LTH/1878/OD/civil/23/2/17

Samples is analyzed for Waste water parameters and result is tabulated as follows.
Sample collected and submitted by party.
Sample received on: 23/02/2017
Sample No. : DL 112/17

Sr. No.	Parameters	Levels
1	Colour	Turbid
2	Odour	Offensive
3	pH	6.9
4	BOD	27
5	TSS	21
6	Free NH3	2.80
7	COD	159
8	Chlorides	824

Permissible Limits
BOD - < 30
COD - < 250
TSS - < 100
pH - 6.6 - 9.0

All parameters except pH are expressed in mg/L.

*The sample collected by party, hence the authenticity of the sample collection remains with the party.

Chemist 17/3/17

M. Pant 17/03/2017
E. E. M. (Sew.) city – 1.

AE(Civil) LTH

Sewage waste generated at hospital

Total sewage waste generated – 0.30 MLD

The capacity of pilot project – 33000 LD

Parameters of treated water

BOD	< 30 mg / lit
COD	< 250 mg / lit
pH	6.6 – 9

BOD- Biochemical Oxygen Demand
COD – Chemical Oxygen Demand

Size of the Plant – 10 mts X 2 mts
Total sewage generated- 0.30 MLD
Sewage Treated – 33000 LD
Saving of Tap Water per Months – 990000 L(Appx. 1 ML)

Filtration, Ozonization, Storage of treated water

Sludge is used as manure

Thank You

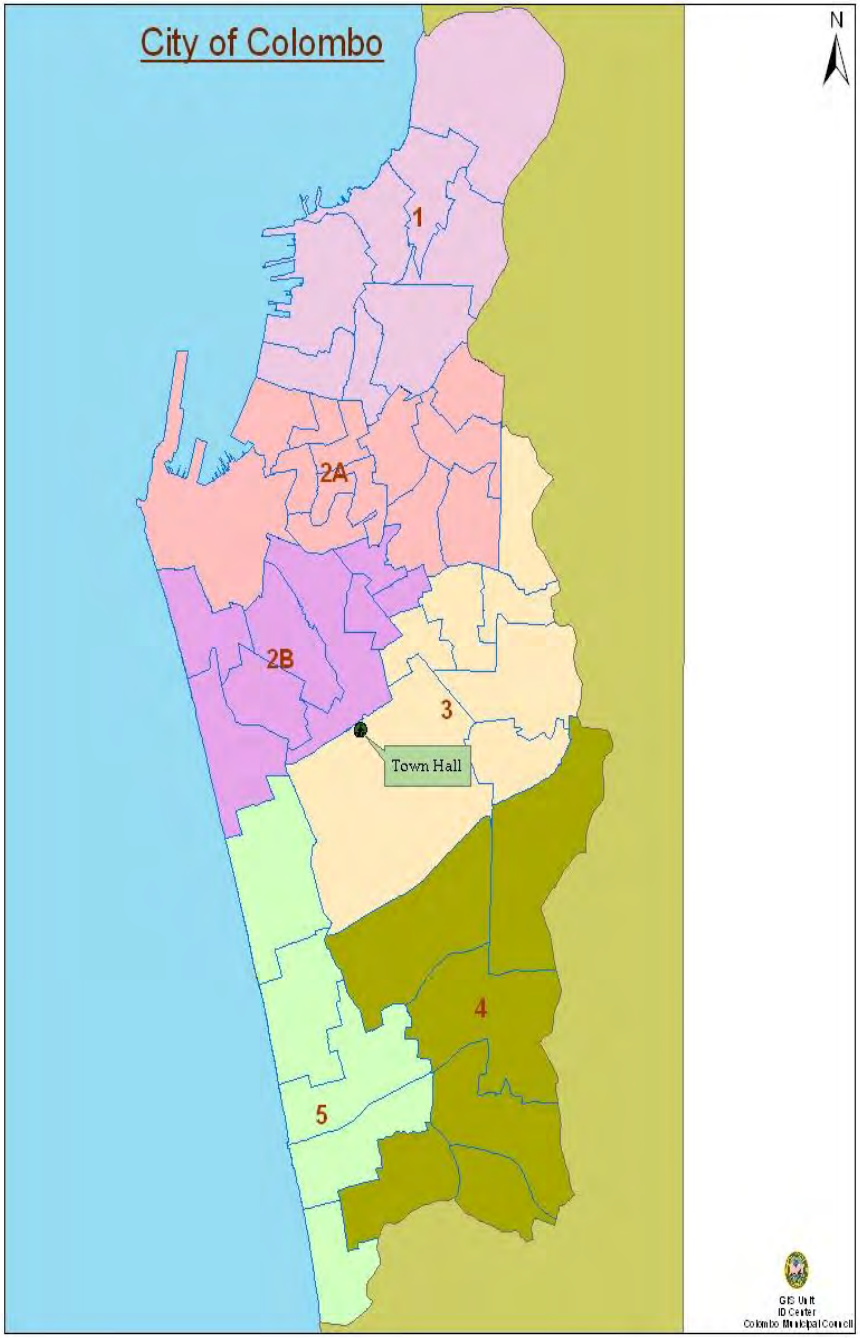
Thank You

6TH ASIA SMART CITY CONFERENCE COLOMBO MUNICIPAL COUNCIL

Presented by:
Dr. Ms. M. A. C. M Wickramaratne
Chief Dispensary Medical Offier,
Colombo, Sri Lanka


TAJIKISTAN
Kabul
AFGHANISTAN
Islamabad
PAKISTAN
New Delhi
NEPAL
Katmandu
Thimphu
BHUTAN
BANGLADESH
Dhaka
INDIA
MYANMA
Bay of
Bengal
Rangoon
ARABIAN
SEA
Gulf of
Martaban
SRI
LANKA
Gulf of
Mannar
Colombo
Male
MALDIVES


INDIA
Palk Strait
Palk
Bay
Bay
of
Bengal
Gulf
of
Mannar
NORTH
EASTERN
NORTH
CENTRAL
NORTH
WESTERN
CENTRAL
UVA
WESTERN
SABARAGAMUWA
SOUTHERN
Colombo
Trincomalee
Batticaloa
Sri Lanka



CITY OF COLOMBO

- **AREA – 37 km²**

  Divided into six districts for its administrative purposes.

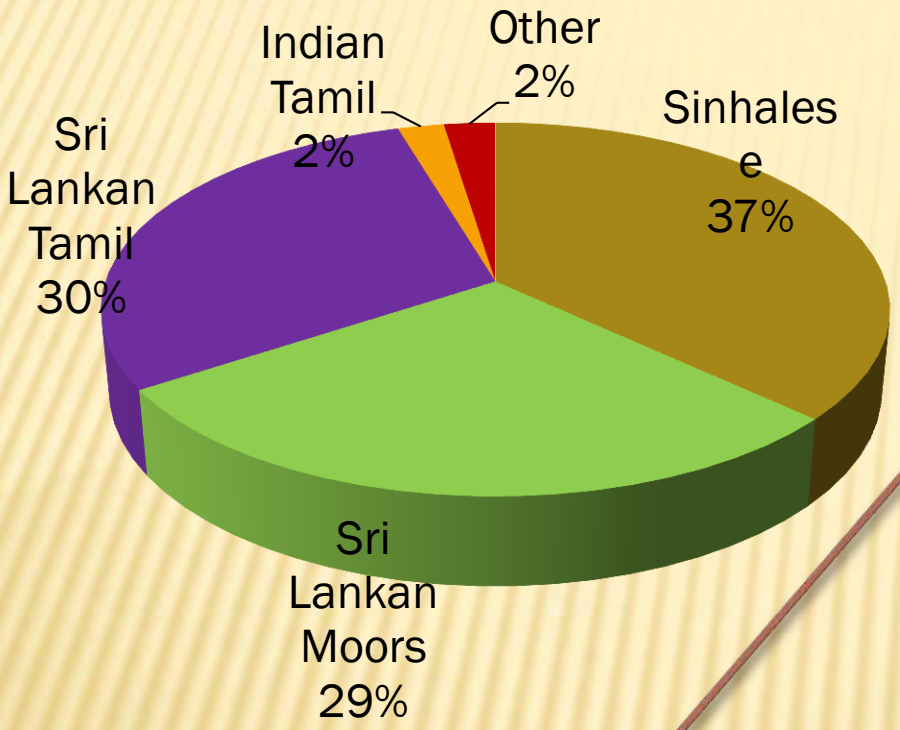
- **POPULATION**

  Residential - 647,100 *

  Floating - 500,000

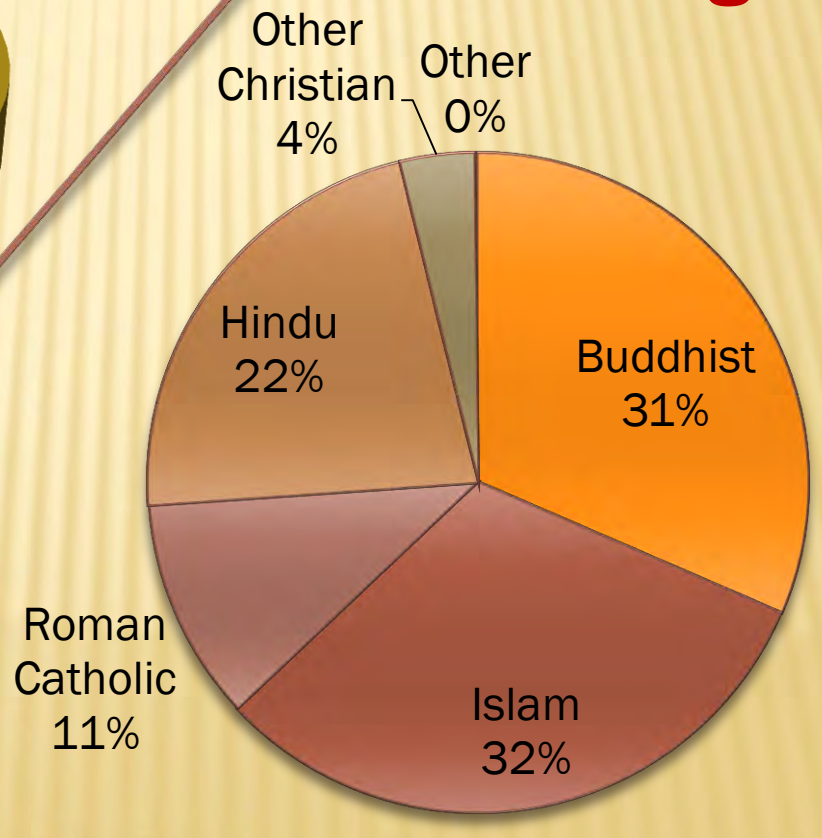
- **CMC BUDGET - Rs. 9 Billion**

CITY COMPOSITION



Ethnicity

Religon



HISTORY

- The name "Colombo", first introduced by the Portuguese in 1505, is believed to be derived from the classical Sinhalese name *Kolon thota*, meaning "port on the river Kelani". It has also been suggested that the name "Harbor with leafy mango trees".

- Due to its large harbour and its strategic position along the East-West sea trade routes, Colombo was known to ancient traders 2,000 years ago. However it was only made the capital of the island when Sri Lanka was ceded to the British Empire in 1815, and its status as capital was retained when the nation became independent in 1948. In 1978, Colombo was designated as the commercial capital of Sri Lanka.

ECONOMY

- Major Harbour and most of the Head Offices of private & Public Institutes are in Colombo City.
- Most of the Star Hotels & new City Hotels are coming up in the City for tourist Industry.

INITIATIVES TOWARDS SMART CITY

- 1. Bus shelter Project WiFi facilities – On going PPP Project

- 2. Trash Bins with WiFi – On going PPP Project

- 3. Smart Street Lighting Project – Tenders called and under evaluation PPP Project

- Introduction of Light Rail Transport LRT – Feasibility report done

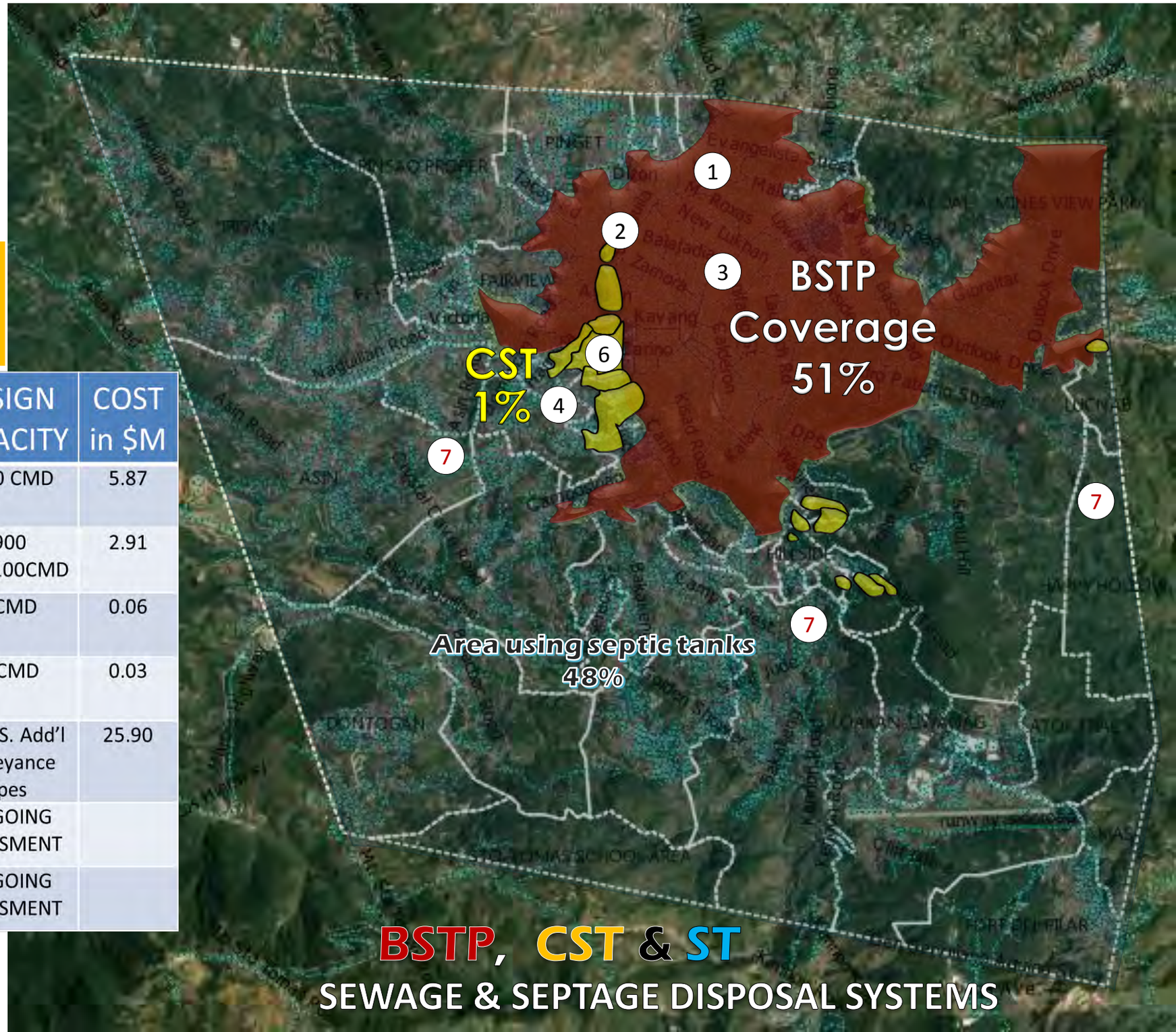
- Thank You

GREEN & INTEGRATED WASTEWATER MANAGEMENT IN BAGUIO CITY

MS. MARIA ADELAIDA C. LACSAMANA
CITY GOVERNMENT DEPARTMENT HEAD II
City Environment & Parks Management Office
OCTOBER,2017
Baguio City

GREEN and INTEGRATED WASTEWATER MANAGEMENT 2017-2035

PRIORITY PROJECTS	DESIGN CAPACITY	COST in $M
1. Expansion of Baguio Sewage Treatment Plant	6,500 CMD	5.87
2. Construction of DEWATS and SpTP at Lower Rock Quarry	3900 CMD/100CMD	2.91
3. Rehabilitation of WWTP at City Abattoir	20CMD	0.06
4. Construction of Septic Tank at the Public Market	20 CMD	0.03
5. Rehabilitation and Construction of Sewer Lines	27 KMS. Add'l conveyance pipes	25.90
6. Rehabilitation of Communal Septic Tanks	ON-GOING ASSESSMENT	
7. Construction of Satellite WWTP along 3 Main River Basins	ON-GOING ASSESSMENT	

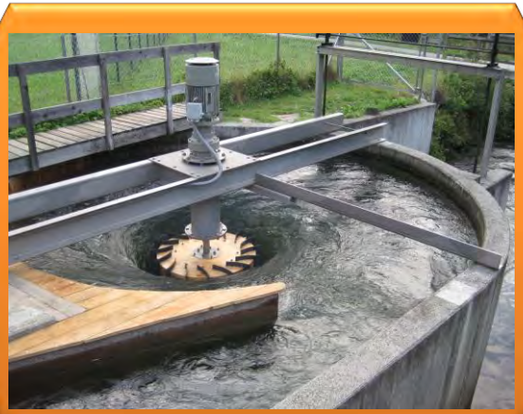


- Treated water is discharged into the adjoining river system.
- Sometimes used for street scrubbing & flushing
- Supplement for watering in Parks during summer

GIWWM ROADMAP

VISION: BY 2035 … 100% collection & treatment of wastewater generated in the City.

URBAN NEXUS



- Treated Water and Sludge as inputs Parks & Forest management in the City
- Supply for adjoining areas who are into Cut flower industry

CHALLENGES

- INADEQUATE LOCAL EXPERTISE AND TECHNOLOGY TO EMBARK ON THE COMMERCIAL PROCESSING & DISPOSAL OF TREATED SLUDGE AS FERTILIZER
- SOCIAL STIGMA ON THE USE OF SLUDGE FOR AGRICULTURAL FOOD PRODUCTION
-
- STRINGENT REQUIREMENTS FOR THE USE OF SEWAGE SLUDGE ON A COMMERCIAL SCALE


Thank
you and
good
day!
I
Baguio
CITY OF BAGUIO
1909

Smart City Development

- JFE Advanced Environmental Infrastructure and Solutions -

October, 2017

JFE Engineering Corporation

JFE Engineering Co. Global Network

CEO Mr. Oshita

Tokyo / Yokohama
(Headquarters)

America

Long Beach (USA)

Europe

Duisburg (Germany)
Rome (Italy)

Middle East

Al Khobar (Saudi Arabia)

Asia & Oceania

Singapore
Kuala Lumpur (Malaysia)
Jakarta (Indonesia)
Hanoi, Ho Chi Minh (Vietnam)
Bangkok (Thailand)
Yangon (Myanmar)
Manila (Philippines)
Delhi, Pune, Mumbai (India)
Shanghai, Beijing (China)

Yokohama Head Office

JFE Smart Infrastructure

Water Purification

Sewage Treatment

Biogas / Biomass

Gas Engine

Waste to Energy

Water & Gas Pipeline

City Landmark

Ballast Water Treatment

JFE can offer
the world leading technology

Gantry Crane

Oilfield Water Recycle

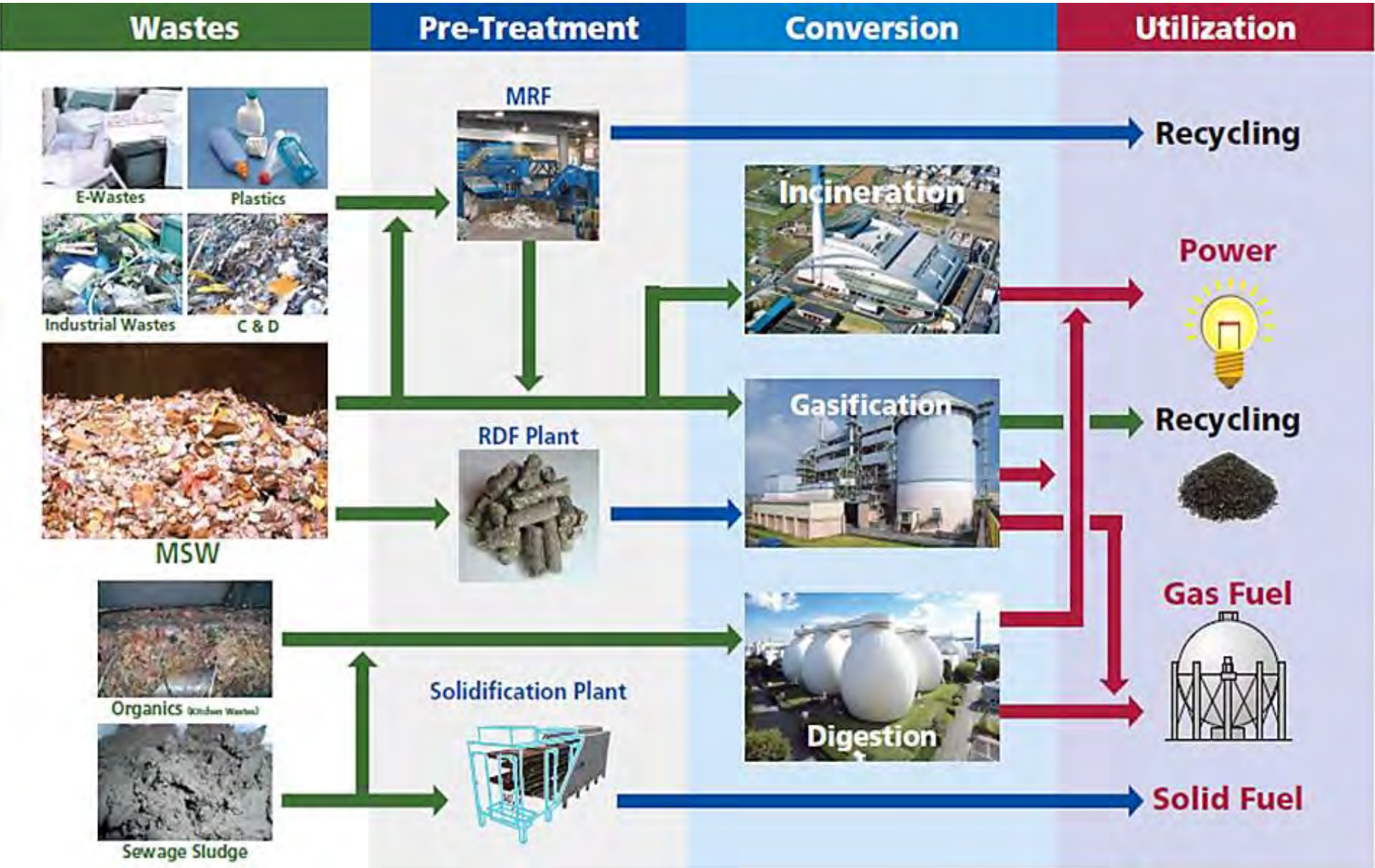
Smart Agriculture

Solar Power

LNG Tank

Bridge

Integrated Approach for Waste



JFE Stoker Furnace (Nerima, TOKYO)

Completion	Nov 2015
Capacity	500 tpd (250tpd×2 lines)
Power Gen.	18.7 MW
Site Area	Approx. 15,000m2
Flue gas treat.	dry-type flue gas treatment system, bag filter, wet scrubber, deNOx reactor
Ignition Loss of Bottom Ash	≦5%

Design Calorific Value of Waste		
Min. LHV 7,100 kJ/kg 1,700 kcal/kg	Ave. LHV 10,200 kJ/kg 2,400kcal/kg	Max. LHV 14,300 kJ/kg 3,400 kcal/kg

	Emission Performance	Regulatory Standards
Dust & Fly Ash	**0.01 g/Nm3**	**0.04 g/Nm3**
SOx	**10 ppm**	**91 ppm**
NOx	**50 ppm**	**85 ppm**
HCl	**10 ppm**	**430 ppm**
DXN	**0.1 ng-TEQ/Nm3**	**0.1 ng-TEQ/Nm3**
Hg	**0.05 g/Nm3**	**Unregulated**

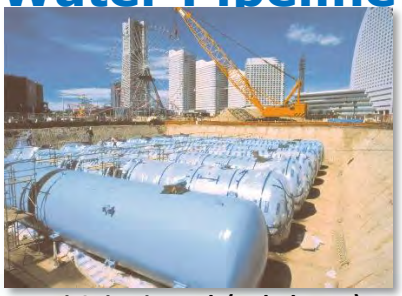
Seamless Capability for Water Supply and Treatment

Water Purification

Murano Water Treatment Plant

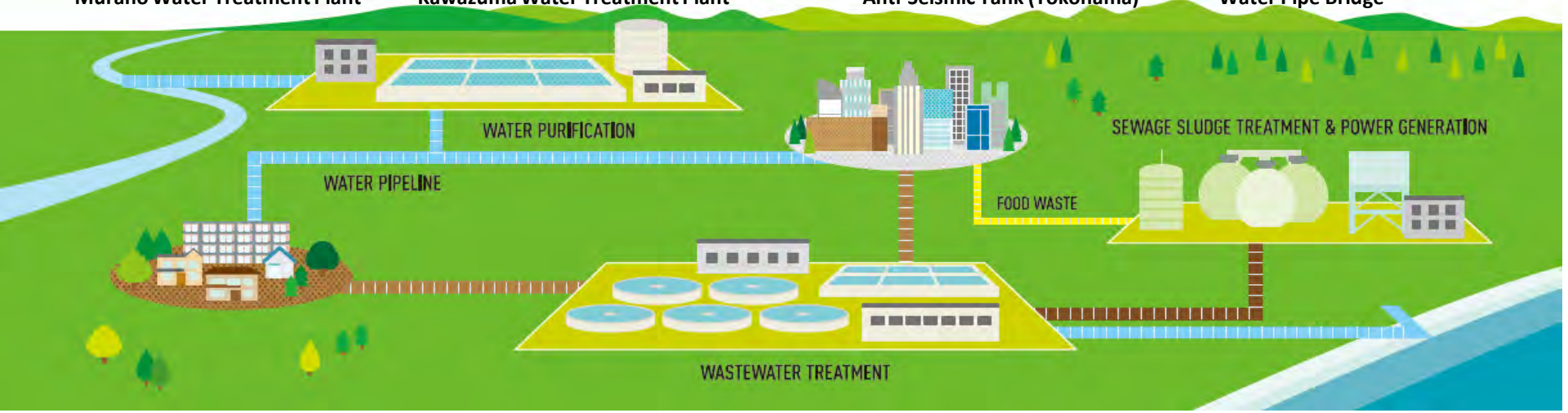
Kawazuma Water Treatment Plant

Water Pipeline



Anti-Seismic Tank (Yokohama)

Water Pipe Bridge



Sewage Treatment

Iriezaki Sewage Treatment Plant

Sewage Treatment Plant (Philippines)

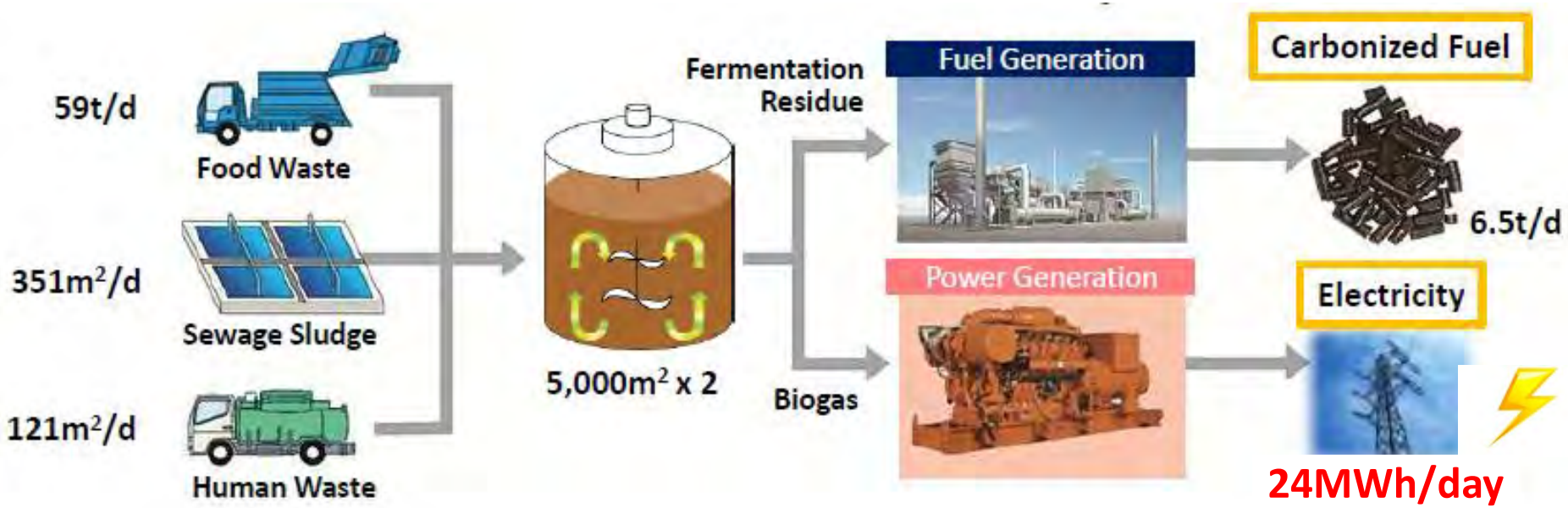
Sludge Treatment

Sludge Biogas Plant

Biogas Power Generation

World's First Multi-Bio Waste Treatment

Client	Toyohashi City, Aichi Pref.
Capacity	472 m3/d (sewage sludge) 59 t/d (kitchen waste)
Output	1,000 kw
Scheme	BTO
O&M	20 years
GHG Reduction	3,900 CO2-t /year



Thank you

Smart City Conference Asia
October 27th, 2017
Yokohama

THIS IS C40

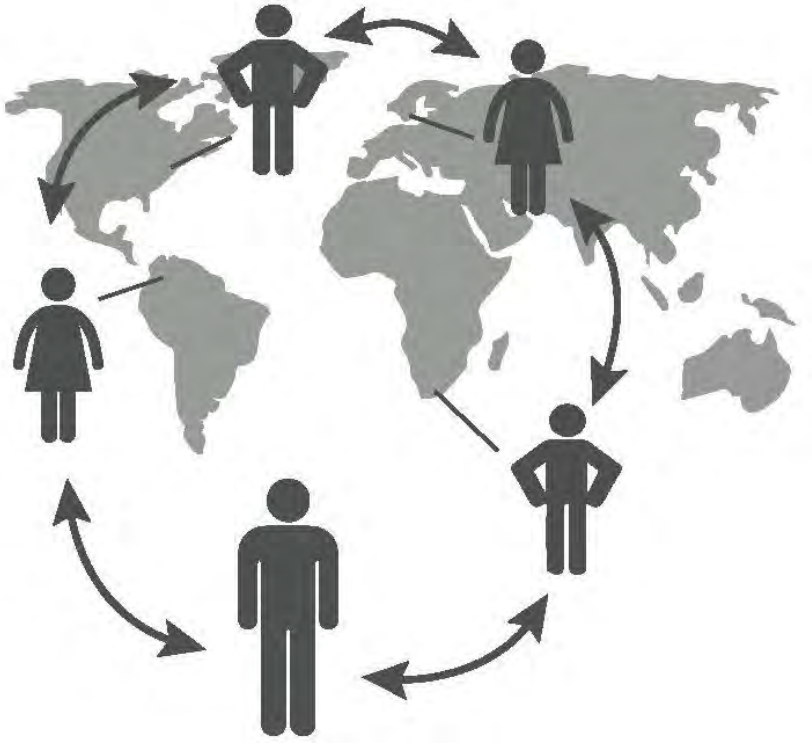
The world's leading megacities working together to tackle climate change

91
cities

11%
of population

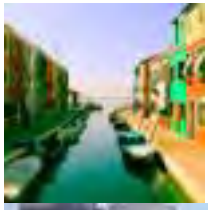
25%
of global GDP

The best inspiration for one city leader is another city leader who has already solved the problem

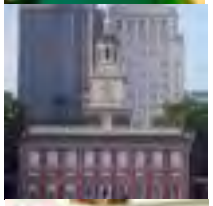


- Innovate new solutions
- Leverage technical assistance
- Catalyze market transformation
- Provide trusted advice amongst peers
- Replicate good ideas

Adaptation & water

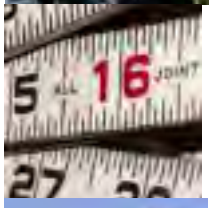


Energy



Finance & economic Development

Measurement and Planning



Waste

Sustainable communities

Transportation

C40 Global Initiatives and Networks

C40 Networks catalyse new, better or faster climate action by helping cities learn from one another

ENERGY AND BUILDINGS	TRANSPORTATION	URBAN PLANNING AND DEVELOPMENT	WASTE AND WATER
• Private Building Efficiency • Municipal Building Efficiency • *New Building Efficiency* • Clean Energy	• Mobility Management • Low Emission Vehicles • Bus Rapid Transit	• Land Use Planning • Transit Oriented Development • Low-Carbon Districts • Food Systems	• Sustainable Solid Waste Systems • Waste to Resources

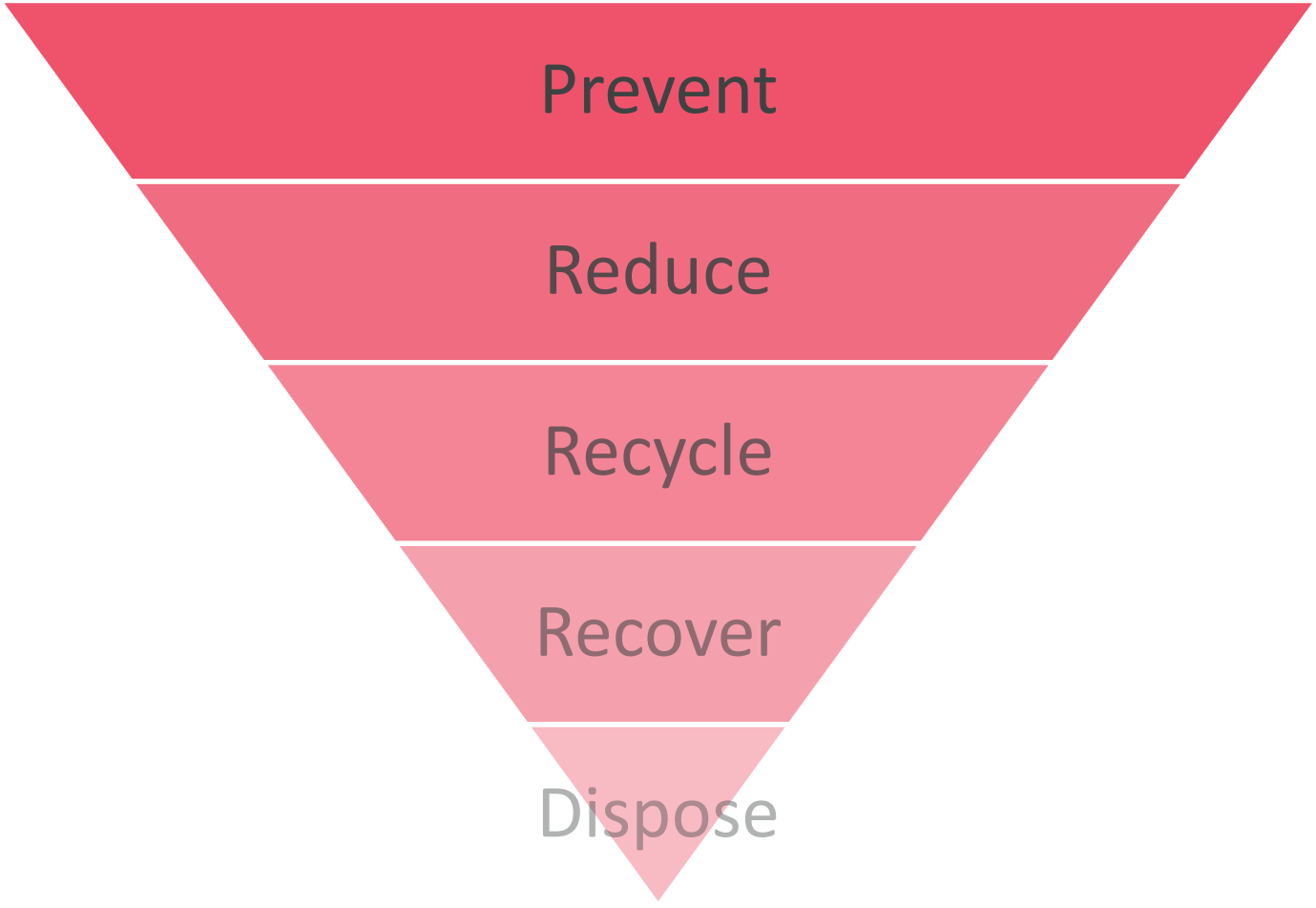
ADAPTATION	BUSINESS, DATA AND INNOVATION
• Connecting Delta Cities • Climate Change Risk Assessment • Cool Cities	• Green Growth

C40 WASTE TO RESOURCES NETWORK

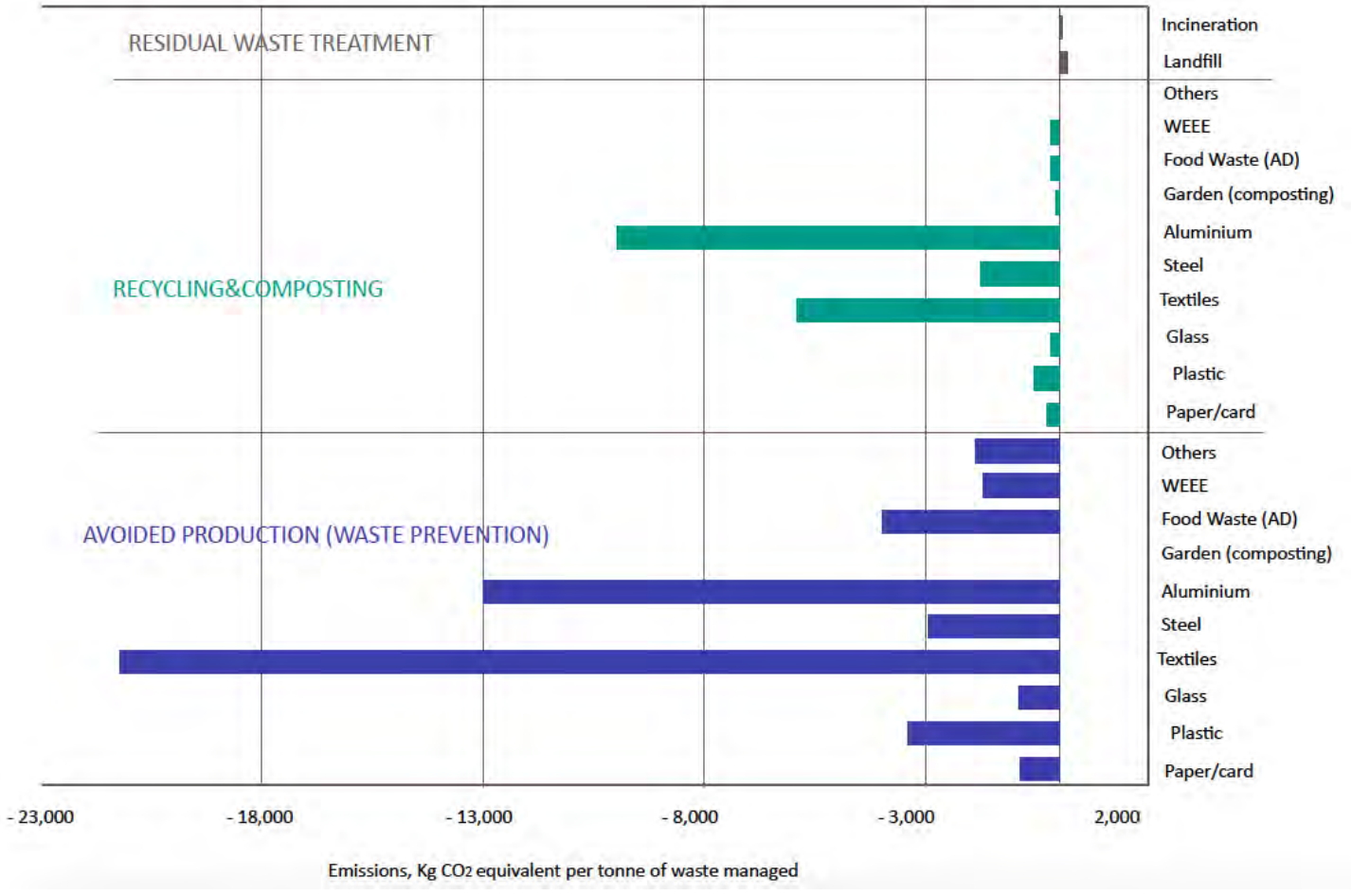
Cities Participating in the Network

Amsterdam
Athens
Auckland
Berlin
Copenhagen
Dubai
Hong Kong
London
Milan
New York
Oslo
Rotterdam
San Francisco
Seoul
Shenzhen
Stockholm
Sydney
Tokyo
Washington DC
Yokohama

Focus on top of the waste hierarchy



Waste to Resources Network



Source: Eunomia (2015), The potential contribution of waste management to a low carbon economy.

DEADLINE 2020

The first significant roadmap for turning the aspirations of the Paris Agreement into action

DEADLINE 2020

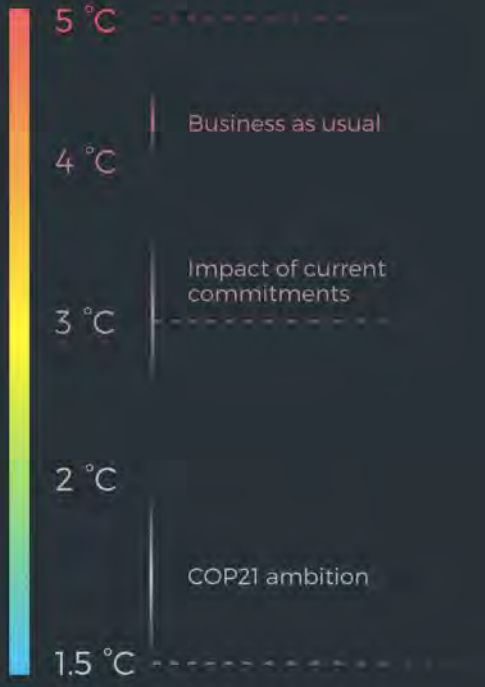
By 2060, C40 cities will have used up not just their own budget, but the entire world's carbon budget for the whole of the century

C40 CITIES CLIMATE LEADERSHIP GROUP

The Opportunity

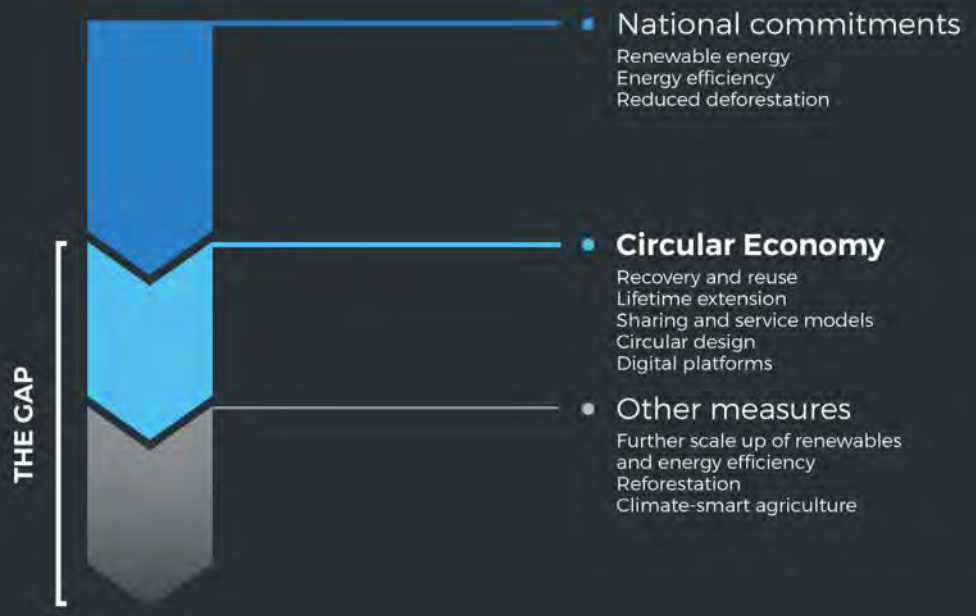
THE SITUATION

Under a business as usual scenario, the global temperature by 2100 will be more than 4°C above pre-industrial levels



THE END GOAL

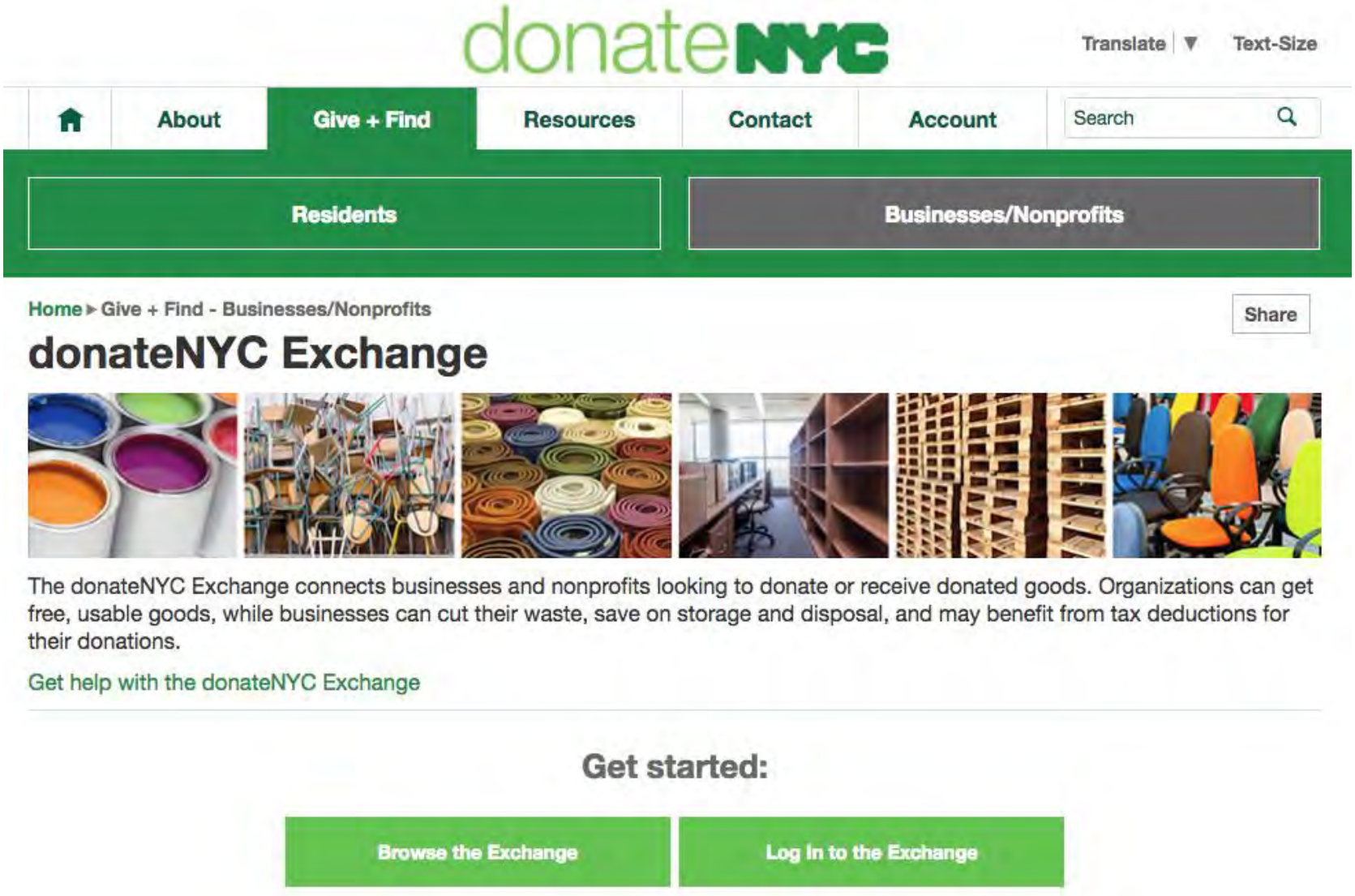
To limit temperature rise to 1.5°C, we need to cut greenhouse gas emissions from 65 to 39 billion tonnes CO_2e per annum by 2030



THE SOLUTION

Current national commitments achieve about half of the required emissions cuts. Circular economy may fill about half of the remaining gap

City smartness in NY



THANK YOU!

KATHRIN ZELLER

Network Manager
Waste to Resources Network
kzeller@c40.org

www.C40.org

C40 CITIES
CLIMATE LEADERSHIP GROUP

Commercial Scale Waste Plastic Recycling in Cebu, Philippines

Ministry of the Environment
Government of Japan

Financing Programme to Demonstrate Advanced Low-Carbon Technology Innovation for Further Deployment in Developing Countries (2016)

Asia Smart City Conference, Oct. 27, 2017

Takeshi Konishi, Senior Managing Director,

GUUN Co., Ltd. (GUUN)

Overview of the Waste Plastic Recycling Facility-1

	Description
Location: Tayud, Consolacion, Cebu	
Started from	May, 2017
Land	Appx. 6,600m^2
Building	Appx. 2,400m^2
Capacity	50 ～ 75 tons per day
Employees	General Manager and 20 local staff

Overview of the Facility-2

Waste Plastic Recycling Flow

Facilities	*Function*	*Responsibility*	*Social Cost*
Each Plant, Offices, Households, LGU's	Segregation of Waste Plastic at Source	Each Plant, Office, LGU's	**Each Plant, Offices, LGU's :Tipping Fee (or + Collection Fee) Would Be Charged**
	Transportation	Each Plant, Offices, LGU's or GUUN	
Segregation (MRF) and Fluff Fuel Production Facility	**Segregation and Shredding and Baling to Produce Fluff Fuel**	**GUUN**	Managed by GUUN
	Transportation of Fluff Fuel	GUUN or Fluff User	
Cement Kiln, Calciner etc. (Cement Factory)	Utilization of Fluff Fuel as an Alternative Fuel	Fluff User	Managed by Fluff User

Infra. are ready. *It is time to ACT!*

Segregating at source and utilizing GUUN's waste plastic recycling facility : *Definitive step towards the improvement in waste management*

Shift to sustainable waste management system: Reduce landfilling

CO_2 Reduction: 11,299ton/y

Equivalent to 209 units of 20KL truck lorry !!

Preventing Flood

Creating job opportunity

JBIC's Financing to WtE

October 2017

Social Infrastructure Finance Department
Infrastructure and Environment Finance Group
Japan Bank for International Cooperation (JBIC)

JAPAN BANK FOR INTERNATIONAL COOPERATION
JBIC

JBIC Profile

Japan Bank for International Cooperation (JBIC) is a policy-based financial institution wholly owned by the Japanese government.

■ Outstanding Amount

JPY 17,042 billion * (USD 150.8 billion) **

■ Annual Commitment Amount in FY2016

JPY 2,200 billion * (USD 19.5 billion) **

■ Capital

JPY 1,683 billion * (USD 14.9 billion) **

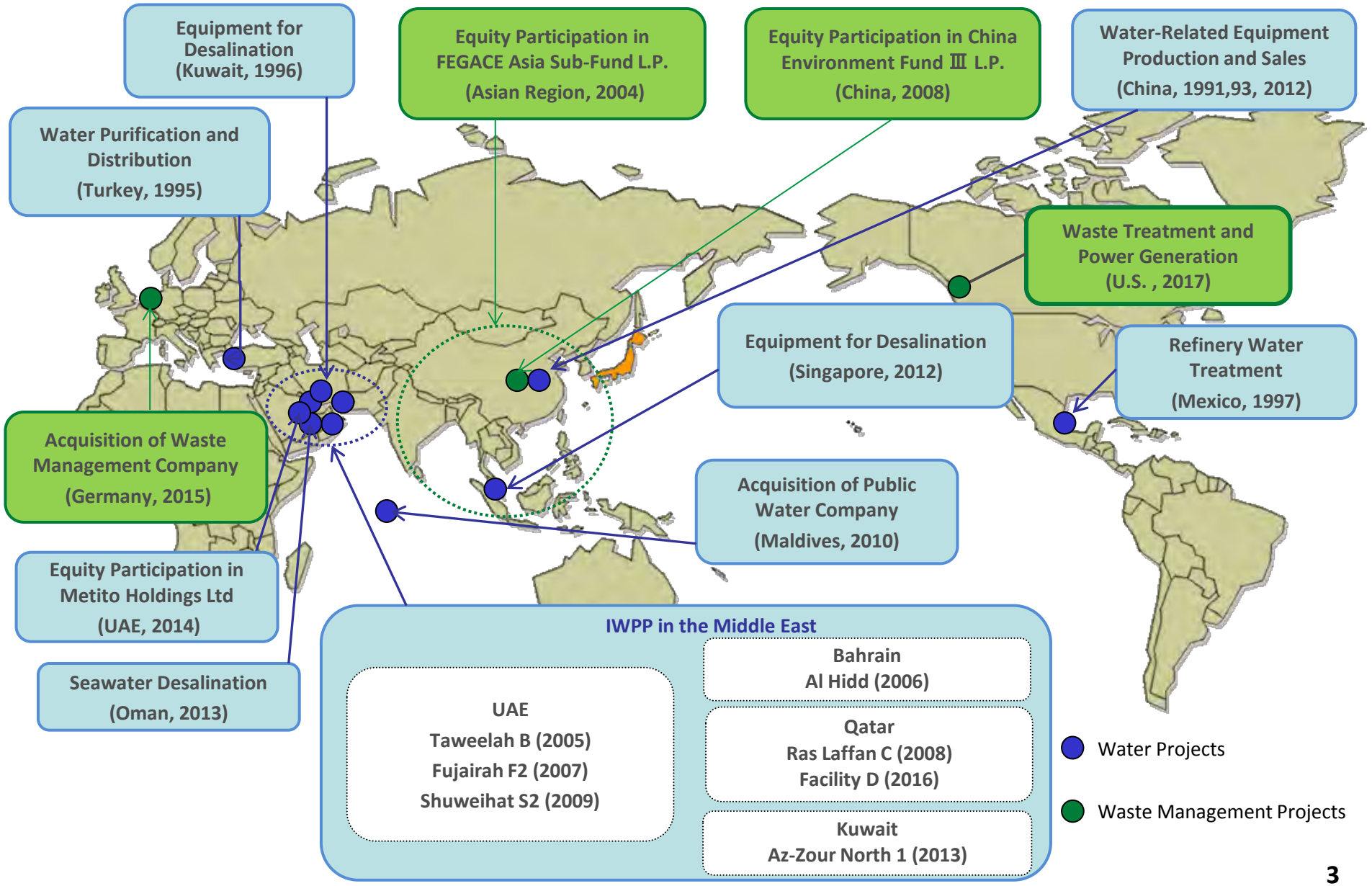
■ Office

4-1 Ohtemachi 1-chome, Chiyoda-ku,
Tokyo 100-8144, Japan

*** As of the end of March 2017**

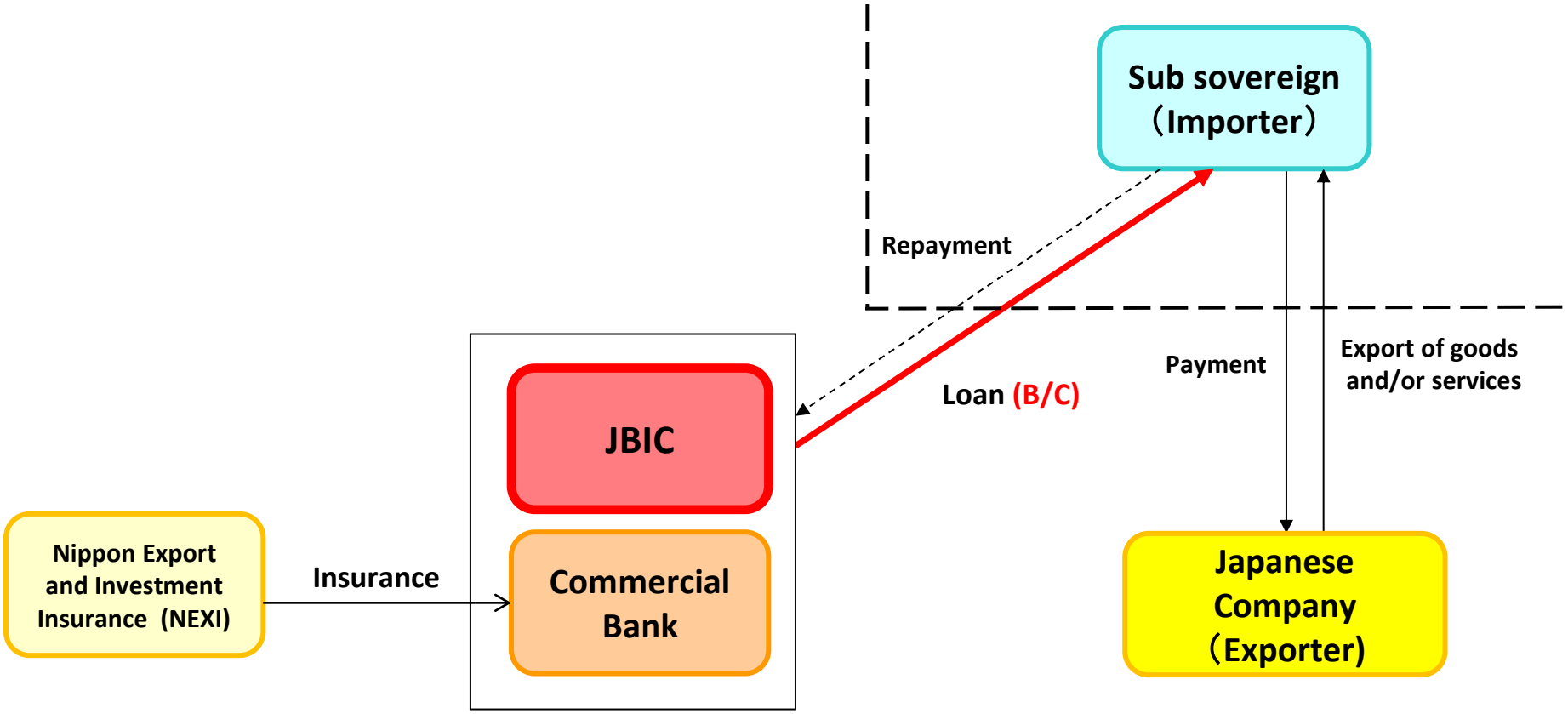
**** 1 USD = 113 JPY**

JBIC Track Records of Water Projects and Waste Management Projects



Export Loans

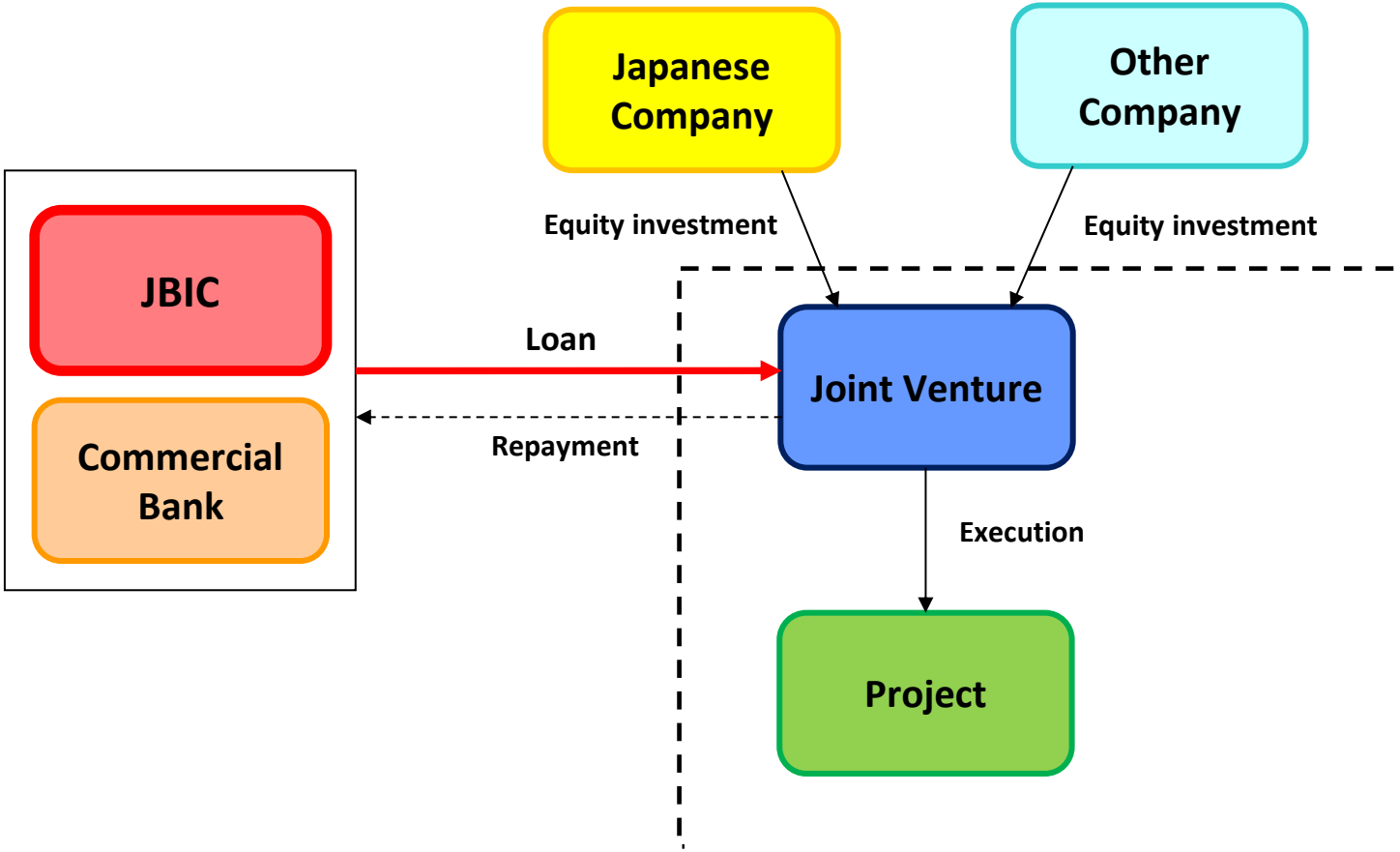
(Example)- Public Service type
Municipality Imports goods and/or services from Japanese Company.



Overseas Investment Loans

(Example) – PPP type

Japanese Company establish a JV with other company to execute a Project.



WtE Project Risks (PPP)

■ There are some prominent risks in WtE projects in respect of waste supply、off-take, tariff and foreign exchange.

waste supply	✓ Waste collection, Feed rate, Calorific value are specific risk factor for WtE, basically municipal government has responsibility⇒exposing sponsors and lenders to sub-sovereign risk.
Off-take	✓ Waste supplier : municipal government or public waste disposers ✓ Electricity offtaker : national electricity company or private company ✓ Heat offtaker: public heat supplier
Tariff	✓ Revenue in WtE projects arisen from several sources like gate fee, electricity sales, (heat sales).. , ⇒necessity of stable CF like Availability Payment, FIT etc.
Foreign Exchange	✓ Tariffs are often set in local currency, exposing sponsors and lenders to foreign exchange risk. ⇒necessity of exchange rate adjustment mechanism, central bank's conversion guarantee

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