2014 High-level forum in Surabaya

Environmental Benefits by Water Saving

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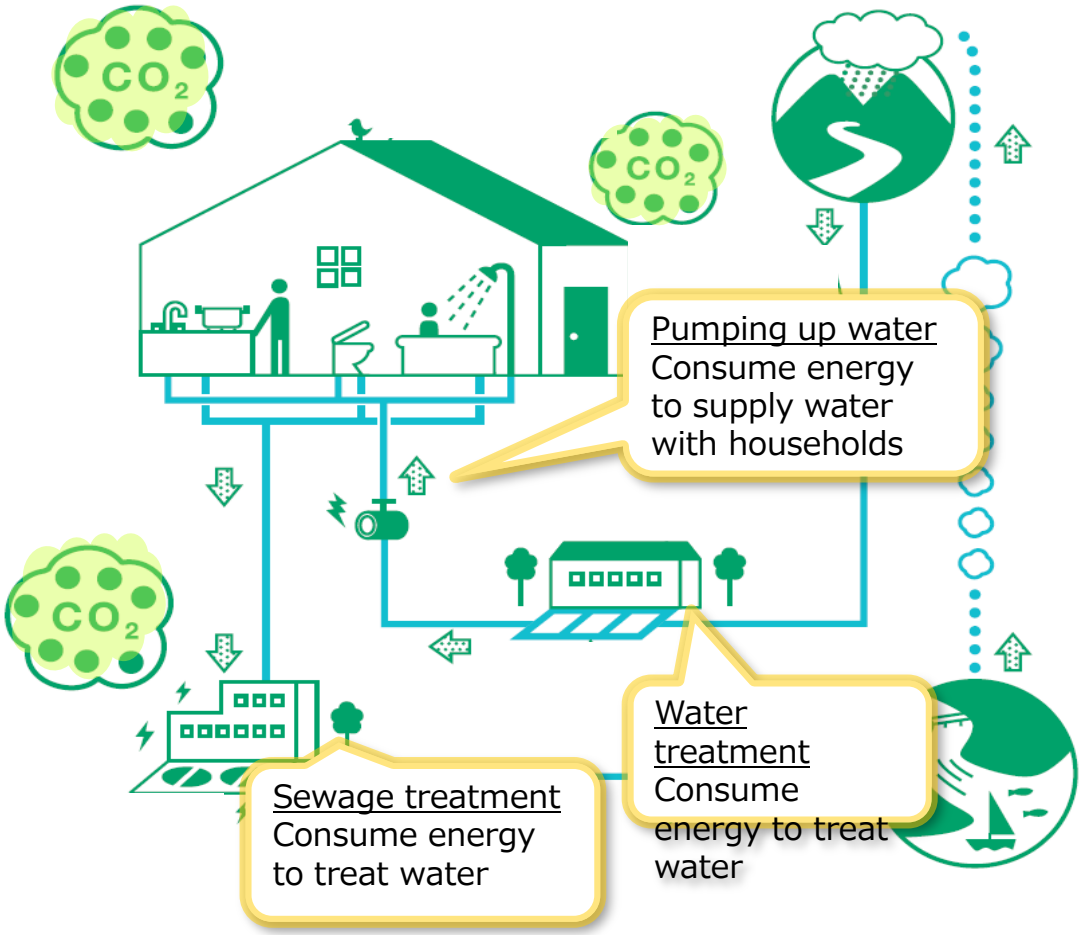
1. CO2 Emission Reduction by Water Saving

◆Water saving could reduce a lot of CO2 emission as below.

A lot of energy is consumed in the cycle of water supply: water treatment, pumping up to households and sewage treatment.

By saving the amount of water usage, CO2 emission can be reduced significantly.



2. Cost Saving by Water Saving

◆Water saving could cut electrical cost and water cost as below.

Reduction of water consumption leads to cost cut for water & sewerage charge in houses.

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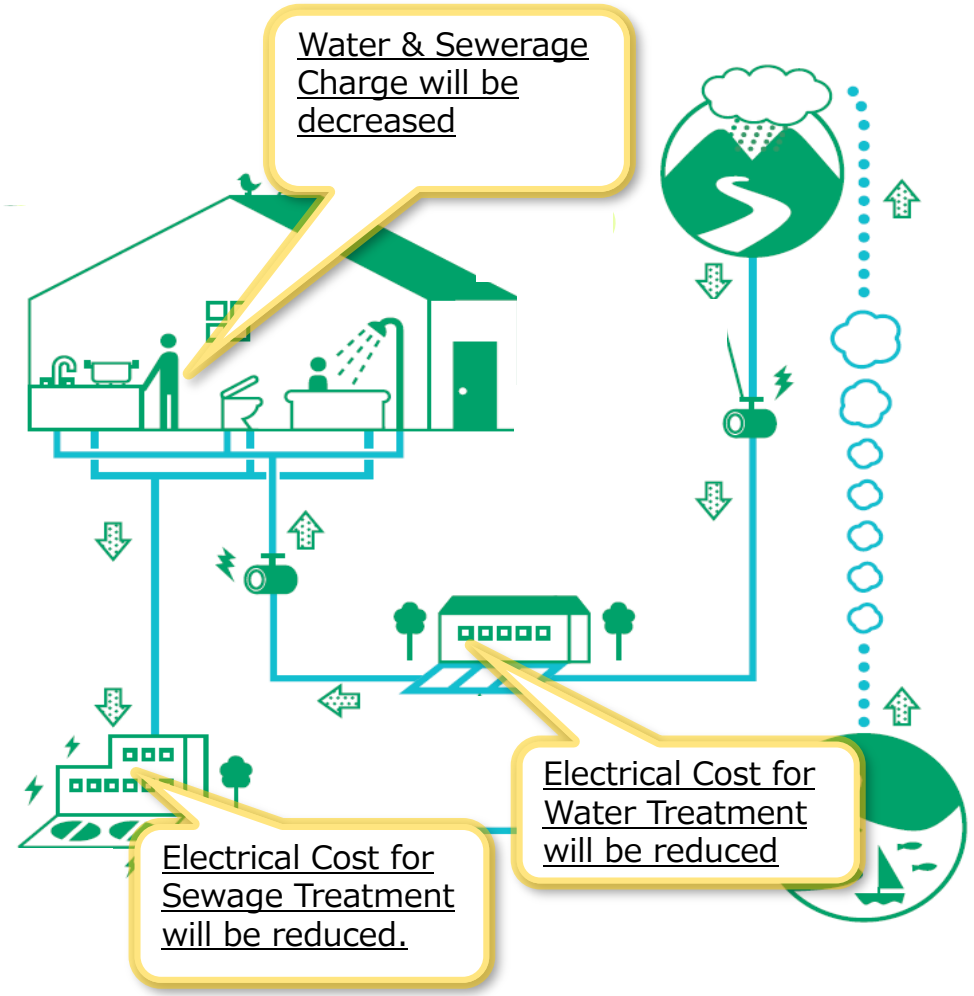
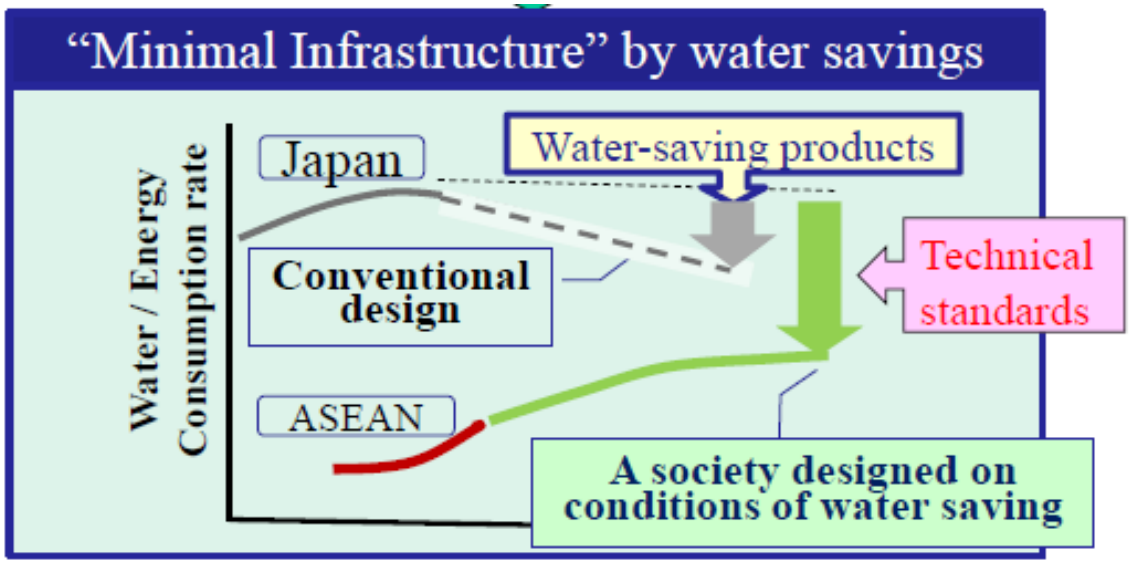
Reduction of water consumption leads to electrical cost cut for water & sewerage treatment facility.



3. Minimal Infrastructure by Water Saving

- If water saving equipments are widely diffused, necessary capacity of Water & Sewage Treatment Facility would be decreased or the same capacity of the Facility could cover more households.
- Areas where Water Infrastructure will be constructed from now would enjoy social design based on water saving.

Minimal Infrastructure by Water Saving



Overview of Our Activity

【Activity in Surabaya(Indonesia)】

- Conducted Quantification of CO2 Emission Reduction. Data was collected in Surabaya(Indonesia)& Johor Bahru(Malaysia) and Potential was estimated.

【Activity in Vietnam】

- Proposed water saving standard toward Vietnamese government

【Study of Water Saving Infrastructure for ASEAN】

- Held the committee named “Minimal Infrastructure Committee” to study what kinds of positive & negative effects is considered by introducing water saving infrastructure in ASEAN.

Quantification of CO2 Emission Reduction

Outline of Quantification of CO2 Emission Reduction

We conducted the below activity to quantify CO2 emission reduction by water saving.

Outline of Our Activity

Activities

Preliminary Survey
- Organize survey group, including Pusdakota in Surabaya
- Quick survey about the field, Surabaya

Organize survey group

Pusdakota (NGO in Surabaya)

TOTO

NTT

Kitakyushu-City

Bibliographic survey

Report

WEB

Field Survey
- Household survey
- Water infrastructure visit
- Discuss with public sector

Household survey (Interview & Questionnaire)

Question naire

Visit PDAM Plant

Discussion

NTT, TOTO

BAPEKO, PDAM

Data

Reporting
- Estimate CO2 emission reduction potential through introducing water saving equipments

Survey Report

Results of field survey

Estimation of reduction potential

Water Saving Equipments

Water saving equipments made by TOTO are capable of reducing water consumption, leading to emission reduction of CO2 derived from the process of water supply.

Water Saving Equipments

Product	● Water Saving Showers named “Air-in shower” ● Water Saving Toilets
Manufacturer	● Both equipments are made by TOTO † TOTO Ltd. is the world's largest toilet manufacturer based in Kitakyushu-City, Japan.
Effects	● Reduction of water usage leads to reduction of energy consumption, and enables to shrink water and sewer infrastructure. ➢ Conventional vast amount of energy consumed in water treatment and pumping will be reduced. ● Reduction of energy reduces CO2 emission.

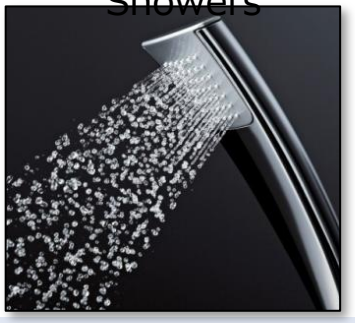
Conventional Toilets

Replace

Water Saving Toilets

Conventional Showers

Water Saving Showers



Emission Reduction Potential：Water Saving Shower

900,608[tCO2/year] can be reduced by introducing water saving showers in Indonesia.

Reduction Potential by introducing water saving showers

Potential of CO2 emission reduction is estimated as bellow, based on the values obtained through our survey.

Reduction Potential 900,608[tCO2/year]

Calculation Formula

ERy=REy-PEy

- ERy: Emission Reduction[tCO2/y]
- REy: Reference Emission[tCO2/y]
- PEy: Project Emission[tCO2/y]

➢REy=PEy/（1-EERpj)

- EERpj: water saving effect rate（%）

➢PEy=（Qshower*EFw,y)
+(Qshower*EFwp,y)+(Qshower*EFwh,y)

- Qshower: Quantity of water consumption by water saving shower
- EFw,y: Emission factor for water supply and sewage[tCO2/year]
- EFwp,y: Emission factor for pumping up[tCO2/year]
- EFwh,y: Emission factor for hot water usage[tCO2/year]

Numerical values

Category	Figure	Unit
EERpj	30.4	%
Qshower	105,061,230	m3/year
EFw,y	0.00106	tCO2/year
EFwh,y:	0.00848	tCO2/year
EFwp,y	† this figure cannot be estimated because measurement was impossible due to plumbing system.	

Emission Reduction Potential：Water Saving Toilets

9,743[tCO2/year] can be reduced by introducing water saving toilets in Surabaya.

Reduction Potential by introducing water saving showers

Potential of CO2 emission reduction is estimated as bellow, based on the values obtained through our survey.

Reduction Potential

9,743[tCO2/year]
※in Surabaya

Calculation Formula

ERy=REy-PEy

- ERy: Emission Reduction[tCO2/y]
- REy: Reference Emission[tCO2/y]
- PEy: Project Emission[tCO2/y]

➢REy=PEy/（1-EERpj)

- EERpj: water saving effect rate（%）

➢PEy=（Qtoilet*EFw,y）+(Qtoilet*EFwp,y)

- Qtoilet: Quantity of water consumption by water saving toilet
- EFw,y: Emission factor for water supply and sewage[tCO2/year]
- EFwp,y: Emission factor for pumping up[tCO2/year]

Numerical values

Category	Figure	Unit
EERpj	43.5	%
Qtoilet	21,053,207	m3/year
EFw,y	0.00106	tCO2/year
EFwp,y	† this figure cannot be estimated because measurement was impossible due to plumbing system.	

CO2 Emission Reduction Activity by Water Saving in Vietnam

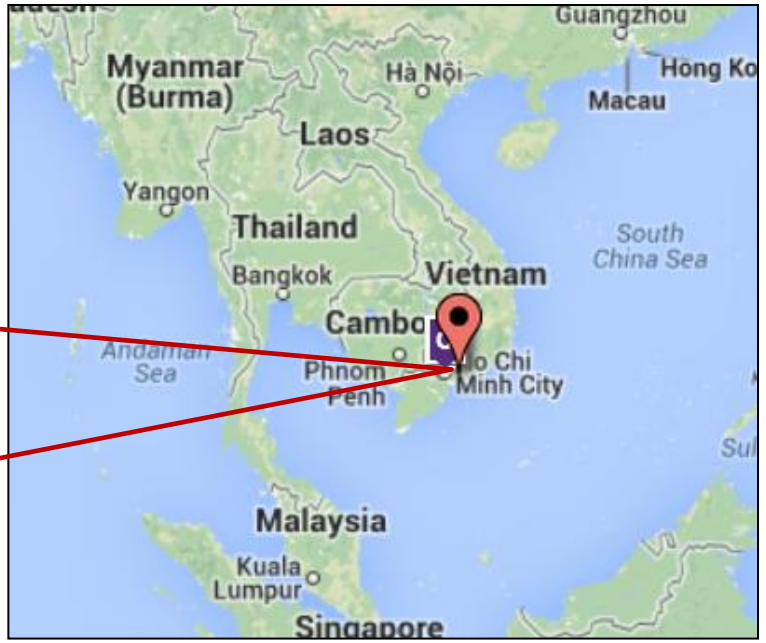
Conducted a similar activity at large hotel in Vietnam.

Project Site

Project Site

■150 Rooms of Large Hotel (total room number is 380.)
（Ho Chi Minh City, Vietnam）

【Location of Project Site】



STUDY OF MINIMAL INFRASTRUCTURE

Minimal Infrastructure Committee

Our study named Minimal Infrastructure Committee in FY2013 shows that “Minimal Infrastructure” could contribute to water-resources preservation and CO2 reductions in ASEAN counties by water-saving technologies.

Summary of our activity

Studied the influences of water saving equipments for Buildings and Infrastructure in Minimal Infrastructure Committee(split into 2 Working Groups as bellow).

Water and Sewage WG

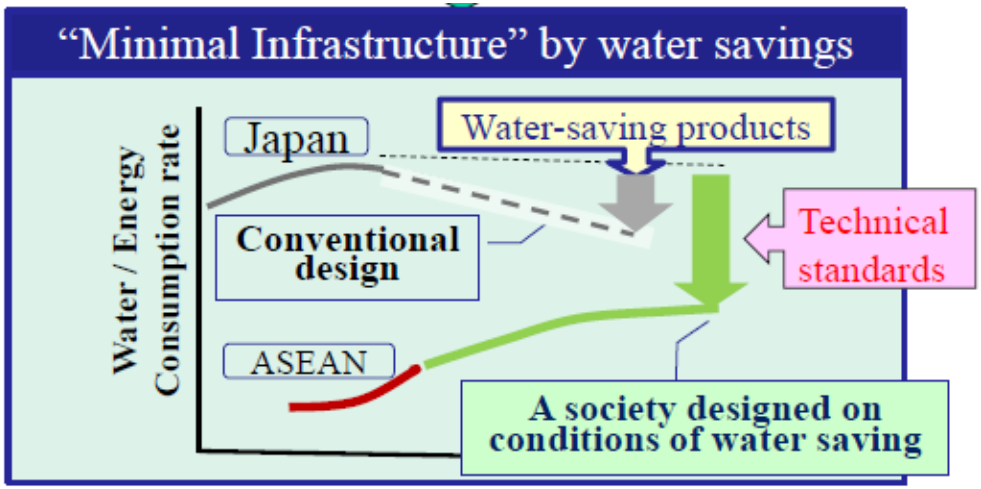
- Study about the influences of installing water saving equipments on water and sewage infrastructure.
- Taking for instance, it turned out that such equipments contribute to the reduction both of energy and water consumption.

Water Supply and Drainage WG

- Study about the influences of installing water saving equipments on water supply and drainage system of buildings.
- Taking for instance, it turned out that such equipments contribute to the miniaturization of water tanks and diameters of plumbing.

Expected Outcome of Minimal Infrastructure

Minimal Infrastructure by water-saving activities will minimize the emission of CO2 emitted from through supply-chain as well as the consumption of water.



Our Study in FY2014

TOTO and NTT DATA IOMC are planning to hold the committee aiming the optimization of the infrastructure for water saving society in FY2014, targeting realization of large scale JCM in Indonesia.

Planning Project in FY2014

~~Details of the committee are considered~~ now...

Contents

- Expected experiments are as bellow.
  - Discussing Optimization of water infrastructure in Indonesia for water saving society.
  - The committee will be held among Indonesian intellectuals and Japanese intellectuals who are familiar with water saving equipments and infrastructure.

EXPECTED OUTCOME

- The outcome of the committee will contribute to Municipality's master plan for low carbon society.

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変える力を、ともに生み出す。