



**Specialist Group**  
on Statistics and  
Economics



ASOCIAȚIA ROMÂNĂ A APEI  
Romanian Water Association

## Regional Economic Workshop

### **Water tariffs and affordability**

# **Subsidies for Waterworks and Water Tariff Determination in Japan**

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# Water Supply in Japan

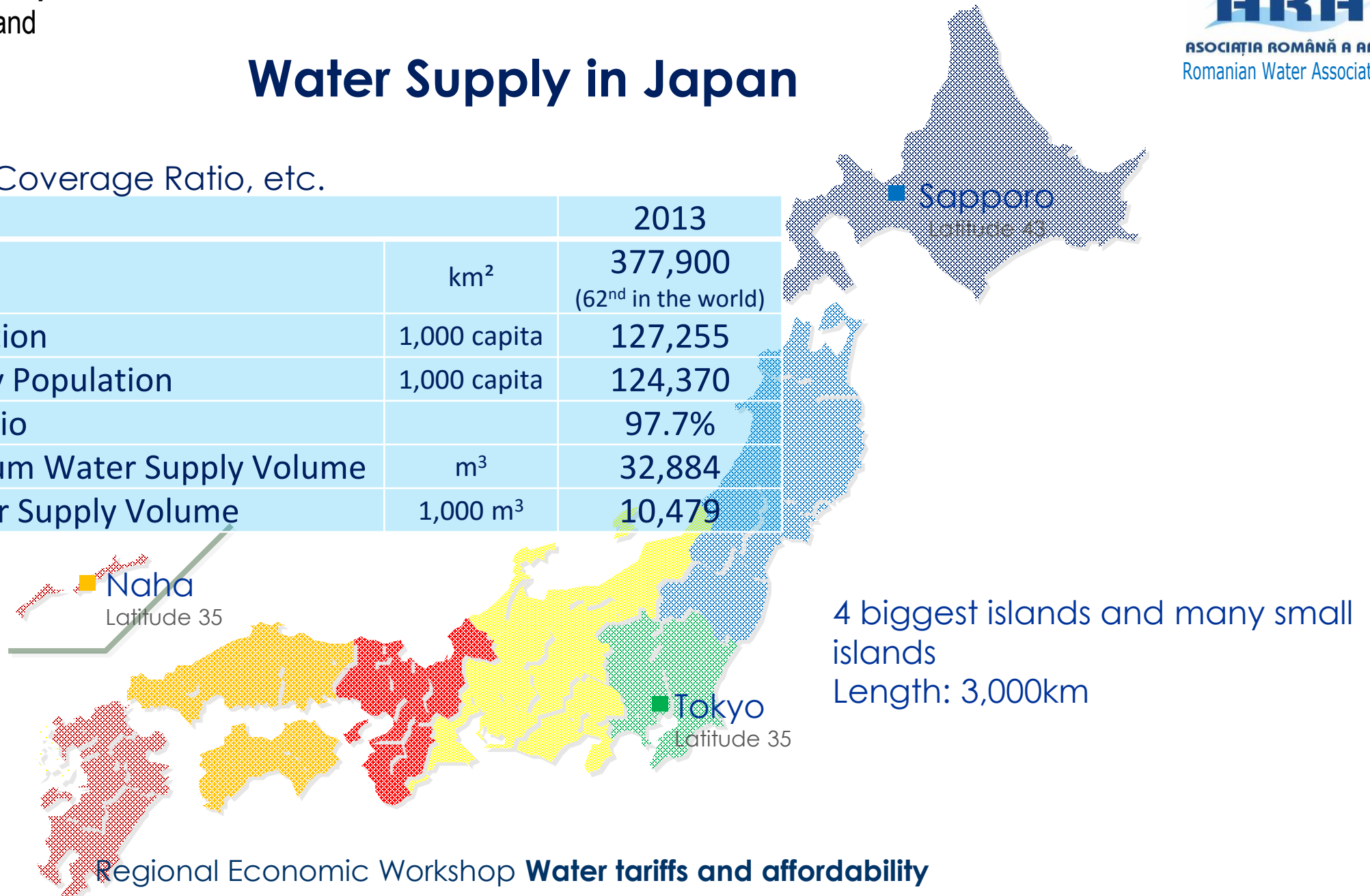
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# Water Supply in Japan

Population, Coverage Ratio, etc.

		2013
Land Area	km <sup>2</sup>	377,900 (62 <sup>nd</sup> in the world)
Total Population	1,000 capita	127,255
Water Supply Population	1,000 capita	124,370
Coverage Ratio		97.7%
Daily Maximum Water Supply Volume	m <sup>3</sup>	32,884
Annual Water Supply Volume	1,000 m <sup>3</sup>	10,479



## Water Supply in Japan (2013)

### Management Agency of Water Supply

	Organization	Number
Public Water Supply	Prefecture	5
	City	809
	Town	493
	Village	36
	Special District Authority	49
	Private	9
	Subtotal	1,401
Bulk Water Supply	Prefecture	42
	City, Town, Village	5
	Special District Authority	48
	Subtotal	95
	Public	5,536
Small Public Water Supply (Supply Population =<5,000)	Others	749
	Subtotal	6,105
	<b>Total</b>	<b>7,601</b>

**Local Governments Manage Waterworks.**

### Break Down by Water Supply Population

		Number of Supplies	Population Served
Public Water Supply	More than 1,000,000	15	39,850,000
	500,000 ~ 999,999	11	7,180,000
	250,000 ~ 499,999	56	19,340,000
	100,000 ~ 249,999	143	21,290,000
	50,000 ~ 99,999	208	14,490,000
	30,000 ~ 49,999	200	7,730,000
	20,000 ~ 29,999	150	3,710,000
	10,000 ~ 19,999	266	3,870,000
	5,000 ~ 9,999	252	1,800,000
	Less than 4,999	96	310,000
	Under Construction	4	-
	<b>Total</b>	<b>1,401</b>	<b>119,570,000</b>
<b>Small Public Water Supply</b>		<b>6,105</b>	<b>4,380,000</b>
<b>Total</b>		<b>7,506</b>	<b>124,370,000</b>

**The most of Public Water Supply is small utilities, supply population of which is less than 50,000.**

# State Government's Role on Water Supply



Waterworks Law  
Water Service Vision  
**MHLW** (Ministry of Health, Labour and Welfare)

Water Works Law promotes public health and improvement of the living environment by supplying Clean, Ample and Inexpensive water

Regional water  
service vision

**Water Supply Utilities**  
Plan for more Sustainable  
management

Local Public Enterprise Law is applied to municipal water supply utilities. It enforces water utilities to manage like 'private company'. That is, its **account shall be separated from the municipal's general account** and introduce **double-entry accounts**, the **cost shall be covered by tariff** (except for government subsidies) and the Director General of it shall have the independent **authority on personnel and budget** in principle.



Local Public Enterprise Law and other Laws  
Overall Checkout on Management  
**MIC** (Ministry of Internal Affairs and Communications)

# Water Utility's Financing

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## Subsidies by Ministry of Health, Labour and Welfare

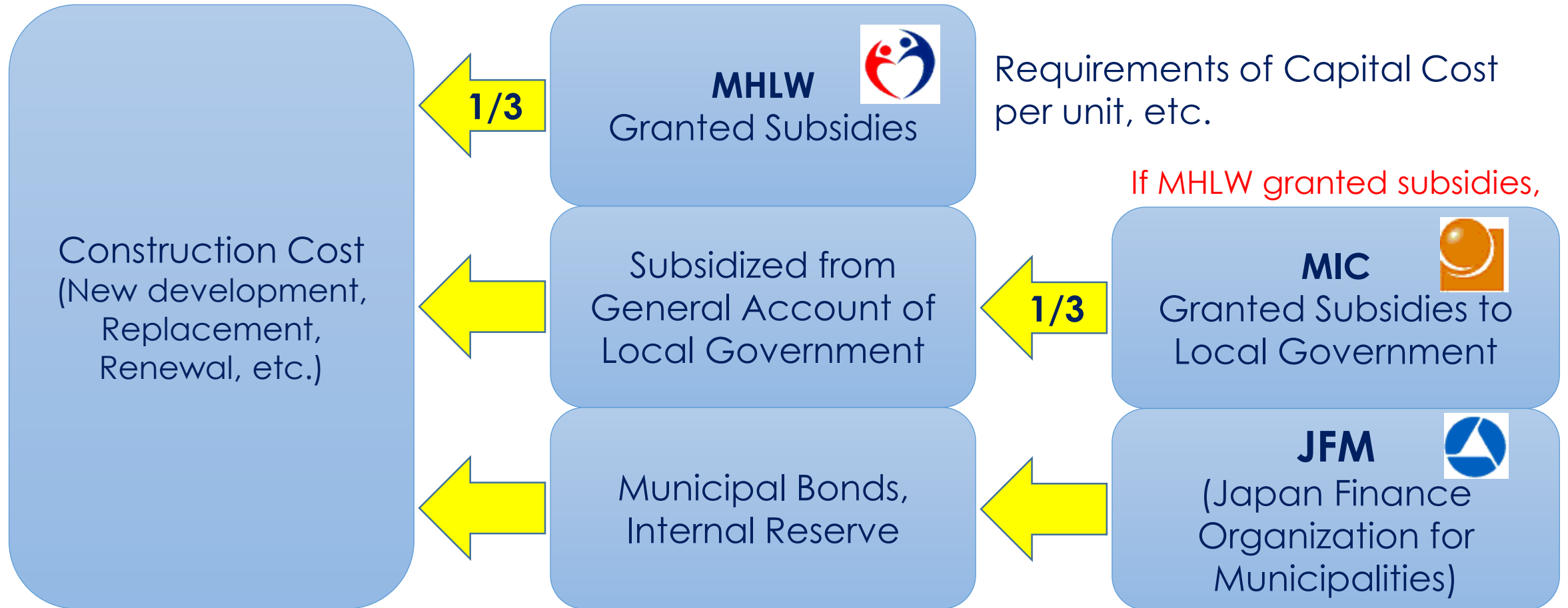
- The Waterworks Law allows the national government to subsidize part of their business costs to local governments.
- Subsidies are basically applied to construction cost of facilities which need to be strongly promoted under national policy.
- **Category of Subsidies** (Basically, 1/3 of construction costs are subsidized)
  - ① Water resources development. (Construction of Dam, Water Channel, etc.)
  - ② Construction of advanced water treatment plant by water utilities.
  - ③ Construction of facilities for regionalization (consolidation) of plural water utilities.
  - ④ Replacement of aging pipelines.
  - ⑤ Subsidies for high level water tariff. Especially, Small Public Water Supply (<5,000)
- **Category of Subsidies in Chronological order**
  - 1967: Water resources development (1/3)
  - 1967: Construction of facilities for regionalization (consolidation) facilities (1/4)
  - 1972: Sludge treatment facilities construction (1/4)
  - 1976: Regionalization (consolidation) construction under the approved plan (1/3)
  - 1988: Advanced water treatment facility construction (1/3)
  - 1991: Emergency water supply station construction (1/3)
  - 1995: Replacement of old pipelines (1/3, 1/4)





# Water Utility's Financing in Japan

## - Basic Case (MHLW Granted Subsidy)-



# Financing Sources in Japan

<b>P/L Account (Revenue)</b>						
(Unit:1 million yen)						
Type of Utilities	Tariff (A)	A/C %	Subsidies from National & Local Government (B)	B/C %	Total Income (C)	Number of Utilities
Public Water Supply	2,771,419	91.4%	62,746	2.0%	3,030,659	1,372
Small Public Water Supply	66,313	71.9%	22,275	24.1%	92,280	773
Sewerage Utilities	1,496,278	48.4%	1,318,591	42.6%	3,091,685	3,637

<b>Capital Account (Capital Revenue)</b>						
(Unit:1 million yen)						
Type of Utilities	Bond (Loan) (X)	X/Z %	Subsidies from National & Local Government (Y)	Y/Z %	Total Income (Z)	Number of Utilities
Water Utilities	348,840	56.0%	168,993	27.1%	623,442	1,372
Water Utilities (Small)	31,472	34.4%	55,494	60.7%	91,454	773
Sewerage Utilities	1,382,636	53.0%	1,080,443	41.4%	2,609,087	3,637

Ministry of Internal Affairs and Communication FY2010

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# Statistics of Water Tariff

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# Trend Analysis of Water Tariff

(JWWA "Statistics of Water Tariff")

## Trends of Tariff Structure

Tariff Structure	1965		1975		1985		1995		2005		2015	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
by Meter Size	11	1.0	295	18.8	705	38.2	829	43.5	783	49.3	721	56.6
by Customer Use	1,095	99.0	1,100	70.2	868	47.1	818	42.9	613	38.7	415	32.6
Others	-	-	172	11.0	270	14.7	259	13.6	190	12.0	13.8	10.8
Total	1,106	100.0	1,567	100.0	1,843	100.0	1,906	100.0	1,586	100.0	1,274	100.0

**1. Fixed Charge + Variable Charge = 100%**

**2. Fixed Charge**

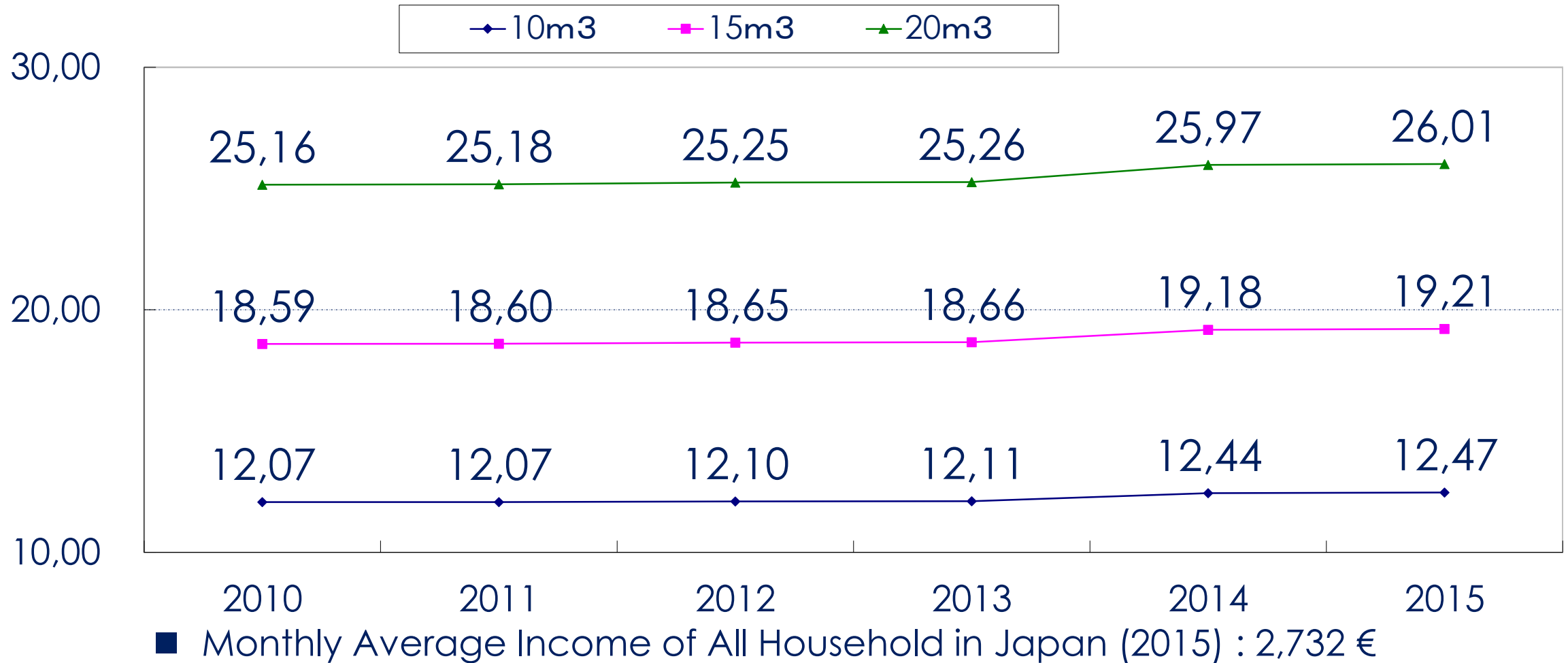
- 75% of Fixed Charge included minimum water volume.

- 51.7% of Water Utilities are Planning to Increase the ratio of fixed charge against total income.

**3. Variable Charge**

- Increasing Block: 67%, Decreasing Block: 1%, Uniform Rate and Others: 32%

# Monthly Tariff for Water Supply (€)



# Statistical Analysis of Water Tariff

(JWWA "Statistics of Water Tariff")

## Trends of Tariff Revision

	2009	2010	2011	2012	2013	2014
Number of Tariff Revised Utilities	96	75	133	77	67	92
	8.3%	5.8%	10.4%	6.0%	5.2%	7.2%
Average Rate of Tariff Revision	5.0%	4.5%	3.8%	4.2%	3.1%	5.2%
Average Period from Last Revision	7.9 years	7.8 years	8.7 years	8.0 years	8.7 years	9.5 years
Ratio of Utilities Reduced Tariff Rate among Tariff Revised Utilities	(31.3%)	(34.7%)	(40.6%)	(36.4%)	(40.3%)	(31.5%)

## Survey Results for Tariff Revised water Utilities

### ■ Reason why some utilities reduced tariff rate

**Unit price reduction of Bulk Water: 42.5%**

**Fixing tariff rate difference between areas, according to Municipal merger: 27.5%**

**Political reason (Water tariff is decided by the Municipal Council), etc.: 23.0%**

### ■ Tariff Calculation Method

**Full Cost Recovery Method: 86.2%, Cash Flow Based Method: 13.8%**

**Large water utilities tend to use Cash Flow Based Method**

# JWWA Manual for Water Tariff Determination

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# Summary of JWWA Manual for Water Tariff Determination (JWWA Recommendation for Tariff Revision)

## ■ Tariff Calculation Method

**JWWA recommend Full Cost Recovery Method.**

## ■ Tariff Structure

**JWWA recommend the tariff structure by meter size, because it is acceptable.**

## ■ Balance of Fixed Charge and Variable Charge

According to the data of 30 utilities in Iwate Prefecture, the ratio of fixed charge among total income occupies 20%. **JWWA recommend to increase the ratio of fixed charge more (approx. 50%), as a means of coping with population decline.**

## ■ Variable Charge

The most of Water Utilities in Japan are introducing Increasing Block. (67%) However, the Period of facility expansion has already ended. **JWWA Recommend Uniform rate, because it is acceptable.**



## Procedure to Decide Water Tariff in Japan

- **Formulation of the Capital Investment Plan in the Future**  
Asset Management, Renewal, Earthquake Resisting, etc.
- **Water Demand Prediction**  
Population Declining in Japan, Downsizing, etc.
- **Financial Simulation**  
Income of Tariff, Internal reserve, Subsidy, Municipal Bonds, etc.
- **Determination of Tariff Level by Full Cost Recovery Method**  
All the costs, Expense of Maintaining Assets (Marginal Profit), etc.
- **Establish Tariff Structure**  
Tariff structure by meter size, Increase the ratio of Fixed Charge, Uniform rate of Variable Charge, etc.
- **Verification, Explanation for Residents, Decision by Municipal Council**

# Concept of Full Cost Recovery in Japan

## Full Costs must be included:

### ■ Operation and Maintenance Costs

Personnel Costs

Depreciation Costs

Interest Expense, etc.

### ■ Future Costs

Depreciation Costs for Future Investment

Expansion

Improvement (modernization)

Renewing Existing infrastructure

### ■ Expense of Maintaining Assets (Marginal Profit)



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16-21 September 2018 @ Tokyo Big Sight



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 BUREAU of SEWERAGE  
TOKYO METROPOLITAN GOVERNMENT

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Works Association

 Japan Society on Water  
Environment

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*Thank you for your time.*

Photo: April 2014 at Ichigaya, Tokyo

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