Water Tariff Design with Understanding of Customers:
Kyoto City

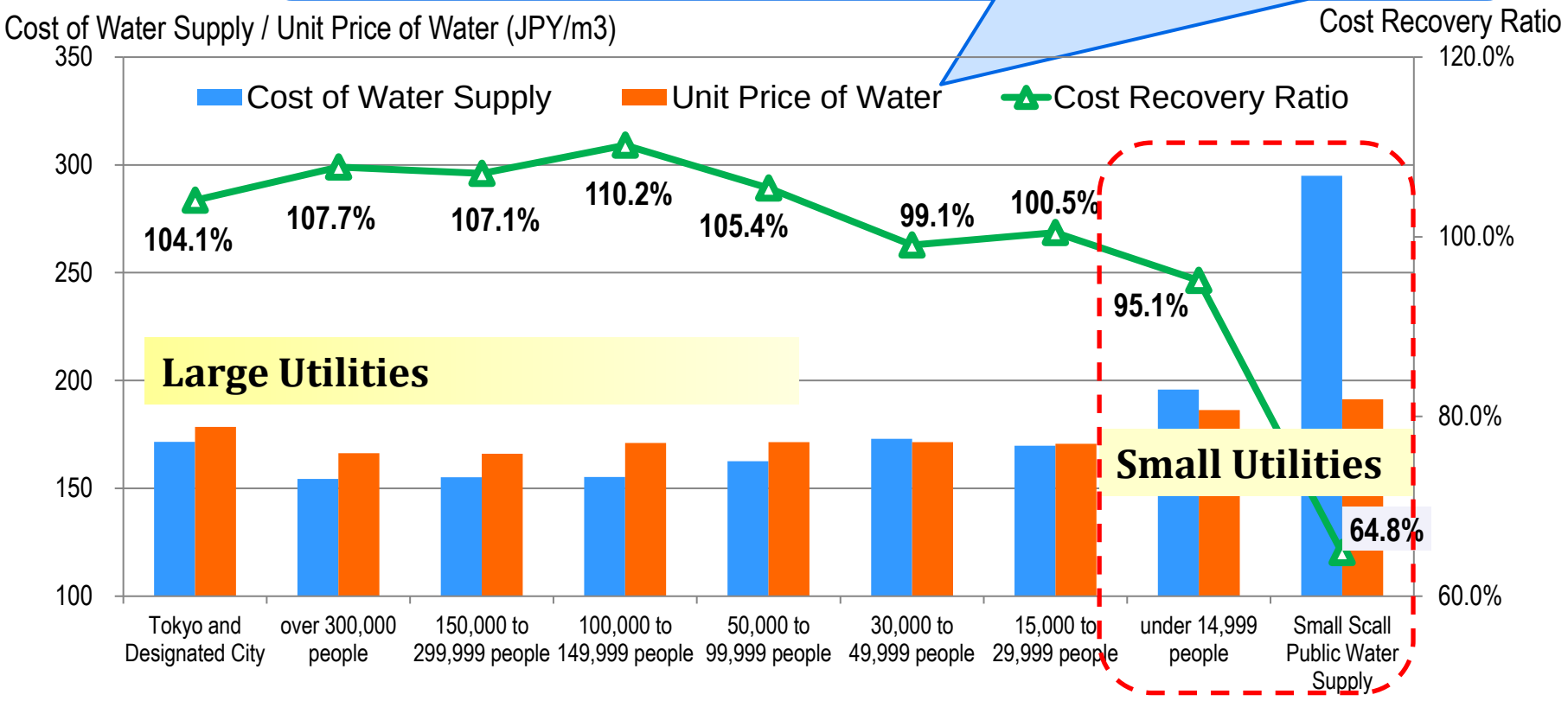
Public meeting to explain water tariff revision in
Source: Ikusaka Village in Nagano Prefecture
http://blog.village.ikusaka.nagano.jp/sontyo/index.php?blogid=254&archive=2013-01

No. C5 Ver. 1

Contents

1. Introduction

In Japan, tariff revenue can cover all the costs at large utilities but not at small-scale utilities.

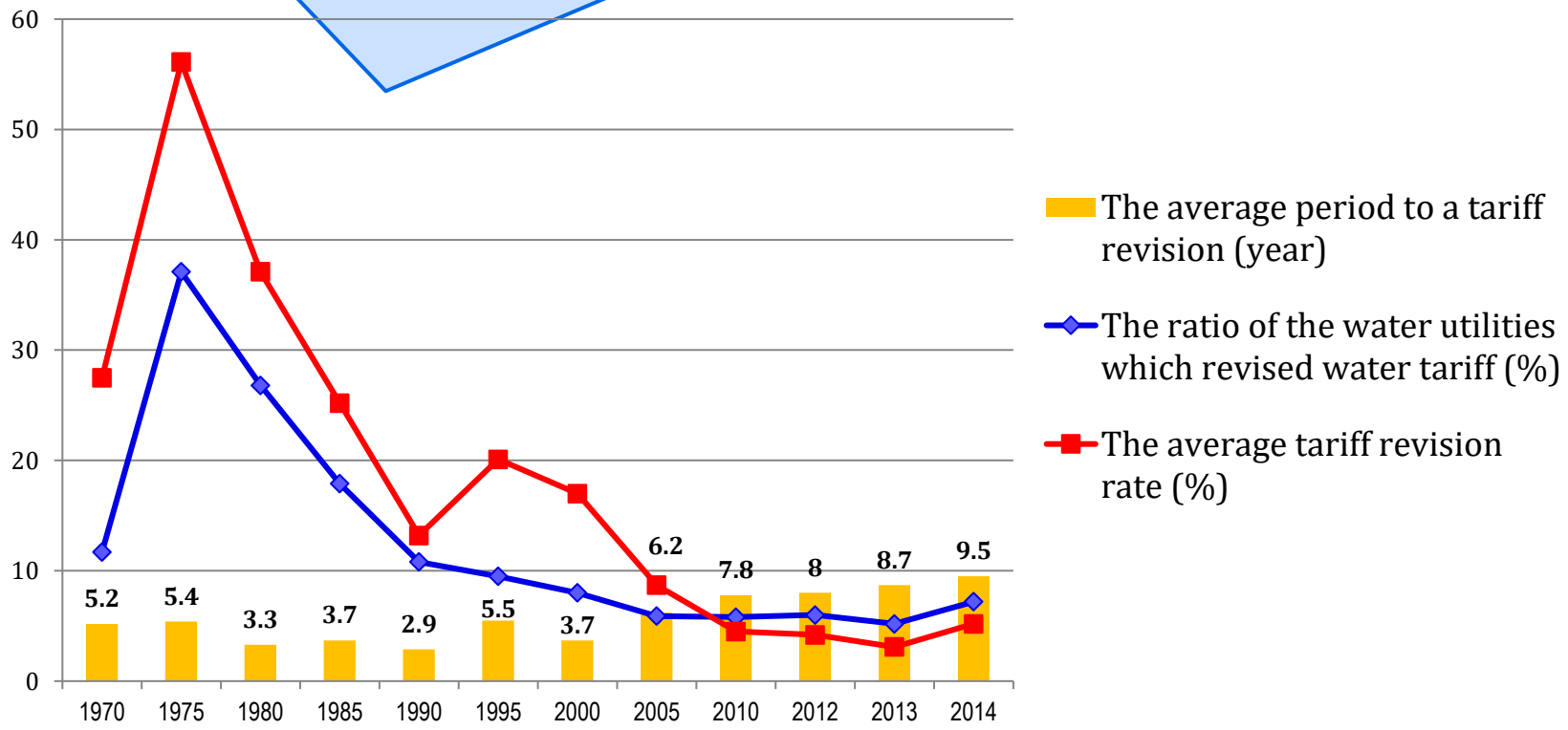


Source: Created from the data of The Ministry of Internal Affairs and Communications "*Survey of Financial Status of Local Public Enterprises, FY 2014*"

Cost recovery in water supply business by size of operation (2014)

1. Introduction

Water tariffs are revised periodically to reflect changing conditions.



Source: Created from the data of Japan Water Works Association “The Outline of Water Supply (6th ed.)”2015

Water Tariff Revisions from 1970 to 2014

1. Introduction

Self-supporting accounting system and **fully distributed cost method** as defined by Local Public Enterprise Act

Water Tariff Setting Manual guides the calculation of appropriate tariff level

Advisory committee and **public consultation** allow external input

Periodic revision of water tariffs

2. Water Tariff Revision Process

(1) Preparation of a fiscal plan

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(2) Discussion by an advisory committee & public consultations

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(3) Preparation of revised water tariffs

↓

(4) Discussion at the local assembly and adoption

↓

(5) Public notification

↓

(6) Report to the Ministry of Health, Labour and Welfare (or Governor of the prefecture)

2. Water Tariff Revision Process

(1) Preparation of fiscal plan

The **Fiscal plan** should indicate whether the existing tariffs would cover the O&M and capital costs (OPEX and CAPEX) for the next 3 to 5 years.

Components	Contents	Criteria
Demand & Supply Plan	Securing water source, water demand analysis, etc.	Water service coverage ratio, population served, number of connections, etc.
Facility Plan	New construction, expansion, rehabilitation, etc.	Annual amount of water distributed (daily maximum & average) and amount of revenue water..
Funding Plan	Capital income including bond issues, national subsidies and grants, transfers from the general account, contributions for construction, etc.	Amount of bond issued and repayment, amount of grant and subsidy, other income, etc.
Operation Plan	Operation & maintenance of facilities, staff allocation, outsourcing, etc.	Operation & maintenance cost including outsourcing cost, etc.

2. Water Tariff Revision Process

(2) Discussion by advisory committee & public consultations

An advisory committee is established to examine the tariff system and public consultations are held to seek customers input.

Advisory committee ensures:

1. accountability and information disclosure (utility has to make the case for revision);
2. objectivity in the decision-making process;
3. use of expert advice from members;
4. incorporation of customers' inputs from representatives in the committee.

Advisory committee on waterworks management in Koriyama City

Source:https://www.city.koriyama.fukushima.jp/481000/jogesuido/shingikai.html

2. Water Tariff Revision Process

(3) Preparation of revised water tariffs

Water Tariff is revised based on Fully Distributed Cost Method.

- **Calculation period : 3 – 5 years**
- **Calculation of total cost:**

Total Cost = Total Tariff Revenue

Total Cost = Operating Cost + Capital Cost

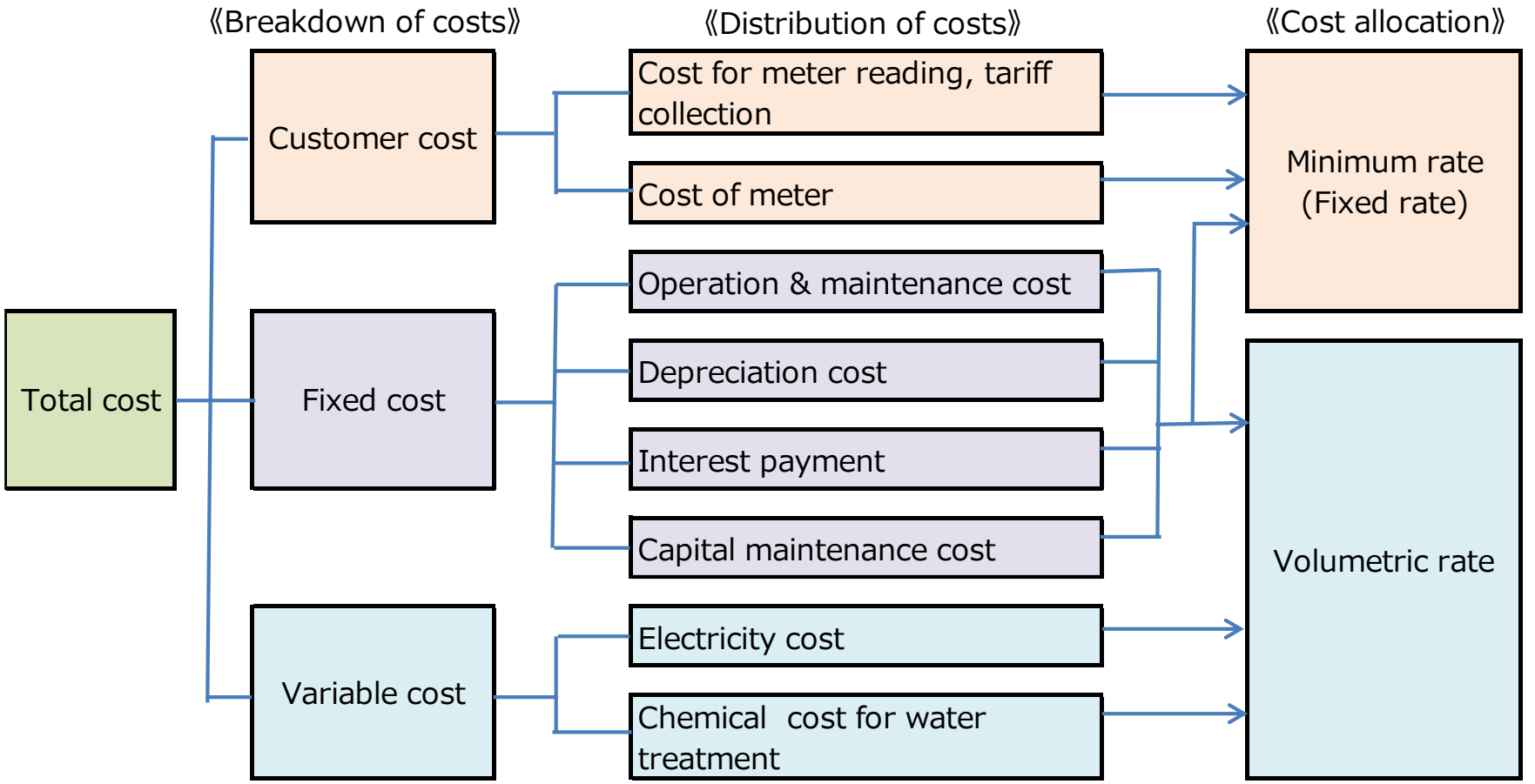
Operating Cost = Personnel Cost + Chemical Cost + Power Cost + Repair Cost + Bulk Water Cost + Depreciation Cost + Cost for retirement of fixed assets & stock losses + Other Maintenance Costs

Capital Cost = Interest Payment + Capital Maintenance Cost

Capital Maintenance Cost = Asset Price × Capital Maintenance Rate

2. Water Tariff Revision Process

(3) Preparation of revised water tariffs (Cont'd)



Calculation steps based on *the Water Tariff Setting Manual*

2. Water Tariff Revision Process

(4) Discussion at local assembly

Makinohara City bulletin announcing submission of proposed tariff revision to the local assembly for approval.

水道料金改定案 を
市議会２月定例会に提案

市では、昨年11月の市水道事業審議会からの答申を受けて水道料金改定の作業を進めています。安全で安心な水を皆さんにお届けするための料金改定に、ご理解をお願いします。

問い合わせ　水道課　不知　☎23-0081

料金引き上げとなる区域は

市では、水道料金の改定（引き上げ）案を盛り込んだ市水道事業給水条例の改正案を、２月21日に開会する市議会２月定例会に提案します。

今回の改定に伴い、料金引き上げの対象となるのは牧之原市上水道の給水区域です。（料金引き上げとなる給水区域参照）

市議会で承認された場合、新料金は24年６月の請求分から適用されます。一般家庭（口径13ミリ）で、昨年度の平均使用水量である22トンを使用した場合、１カ月の料金は525円ほどの引き上げになります。

赤字経営の背景にあるもの

昨年の本紙１月号と12月号でもお知らせしたように、水道事業会計は合併以降、平成19年度を除いて赤字経営が続いています。最大の原因は、料金収入の大幅な落ち込みによるもので、金額にして約１億円。その理由は、給水人口の減少、宅配水やペットボトル水および節水機器の普及、企業の水需要の減少であることを説明してきましたが、中でも大きな要因は次の３つです。

①合併時における一般家庭用（13ミリ・20ミリ）の料金調整

「住民負担は低いほうに」という合併時の基本的な考え方に基づき、料金の調整を行いました。（表１）この調整による影響額は、約5000万円です。

②大口需要企業の工業用水道への切り替え（平成20年度以降）

工業用水を導入したことにより、大口需要企業２社が上水道から切り替えました。影響額は約3300万円になります。

③リーマンショック以降の製造業を中心とした事業所の水需要の減少

近年の景気低迷は事業所の水需要にも大きな影響を与えています。23年度はこの問題が特に深刻化しており、22年度よりもさらに3000万円ほどの減収になる見込みです。

（表１）合併時の料金調整（消費税抜き）

■基本料金

	口径	合併前	合併後	（参考）改定案
旧相良町	13ミリ・20ミリ	1,560円	1,400円	1,600円
旧榛原町	13ミリ	1,400円		
	20ミリ	1,970円		

■従量料金

	口径	使用水量	合併前	合併後	改定案
旧相良町	13ミリ・20ミリ	11～25㎥	175円	11～25㎥ 150円	11～25㎥ 175円
		26～50㎥	180円	26～50㎥ 160円	26～50㎥ 180円
旧榛原町	全口径	11～25㎥	150円		
		26～50㎥	160円		

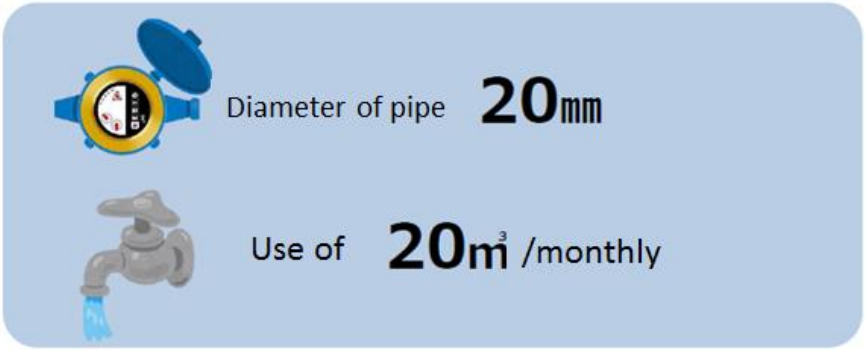
■料金引き上げとなる給水区域

Source:http://www.city.makinohara.shizuoka.jp/ftp/01gt01/koho/201202/201202_04_05.pdf

2. Water Tariff Revision Process

(5) Public notification

The public is informed of the new tariffs.



Monthly water tariff (excluding consumption tax, etc.)

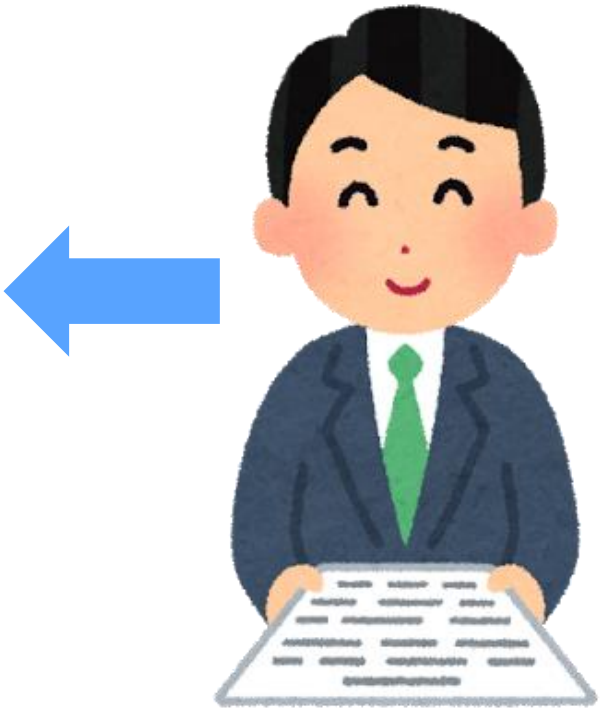
(Present) April, 2015	(Revised) April, 2016	(Revised) April, 2017
1,915 JPY	2,060 JPY	2,140 JPY
	+145 JPY	+80 JPY

Source: Suita City, http://www.city.suita.osaka.jp/var/rev0/0096/0282/11641310928.pdf

2. Water Tariff Revision Process

(6) Report to supervising authority

The water utility reports the change in tariffs to the Ministry of Health, Labour and Welfare (or the Governor of the prefecture).



3. Case Study : Kyoto City

(1) Background

FY2012

Population served	1,455,904 persons
Water service coverage ratio	99.90%
Number of connection	750,822
Facility capacity	771,000m^3/day
Length of distributed pipeline	3,890km
Maximum daily supply	587,840m^3
Average daily supply	539,272m^3

Source: Kyoto City Waterworks Bureau's website
http://www.city.kyoto.lg.jp/suido/page/0000008776.html

Poster commending the superior water quality of Kyoto City

3. Case Study : Kyoto City

(1) Background (Cont'd)

Preparation of Water Vision and medium-term business plan

Cumulative deficit forecasted to occur

Maintain existing tariffs and rely on other means to balance budget until FY 2012

(Million JPY)

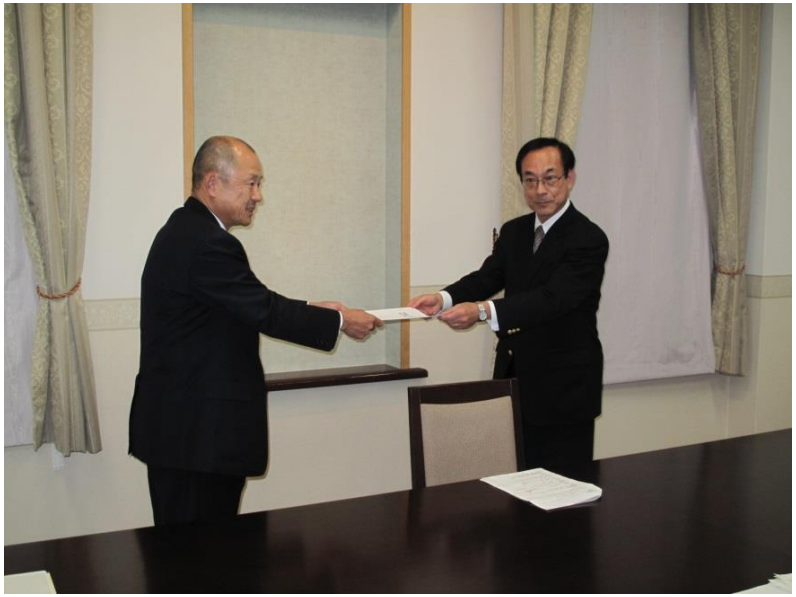
Fiscal Year	2007	2008	2009	2010	2011	2012
Net profit or loss	-709	-1,575	-1,830	-2,116	-2,360	-2,502
Accumulated profit or loss	4,018	2,443	613	-1,503	-3,863	-6,365

Source: Kyoto City Waterworks Bureau "Kyoto City Waterworks' Medium-Term Management Plan (2008 – 2012)," December, 2007

3. Case Study : Kyoto City

(2) Advisory committee on water tariff revision

- Period: 2011.11– 2012.11
- Members:
  - Academic experts
  - Tax accountant
  - Representative from women's group
  - Representative from chamber of commerce
  - Representative from social welfare workers' group
  - Representative from Japan Water Works Association
  - Representative from public



Submission of the recommendations from the Advisory committee
Source:http://www.city.kyoto.lg.jp/suido/page/0000132114.html

3. Case Study : Kyoto City

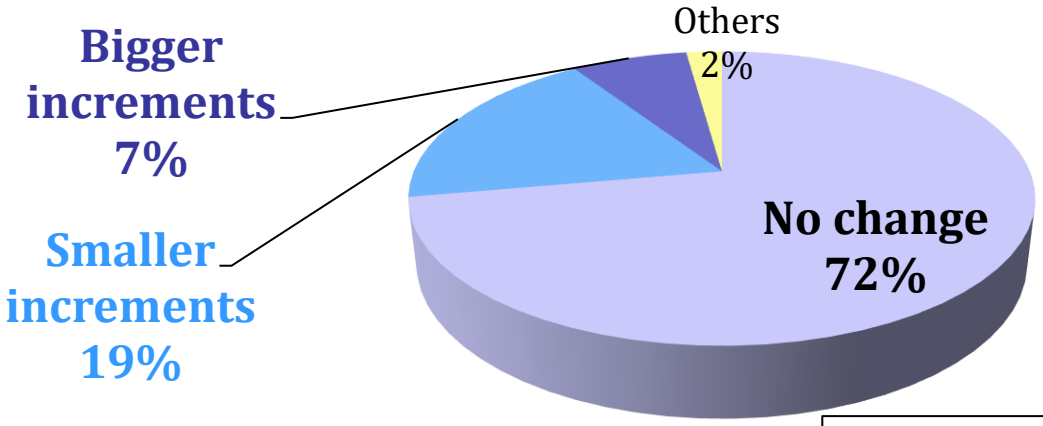
(3) Public Survey

- Objective: To input citizen's opinions into discussions of the Advisory Committee
- Period: April to May, 2012 (1 month)
- Questionnaire: Asked following 6 points
  - **Differences among fixed rates** based on diameters of pipes
  - **Minimum volume water** ($20m^3$/two months) included in the fixed rates
  - **Increasing-block system and the rates**
  - **Number of blocks** in the increasing-block system
  - **Measures against groundwater users** who connect to large diameter pipes and pay much less for piped water
  - **Payment methods**
- Collected: **1,200 answers**

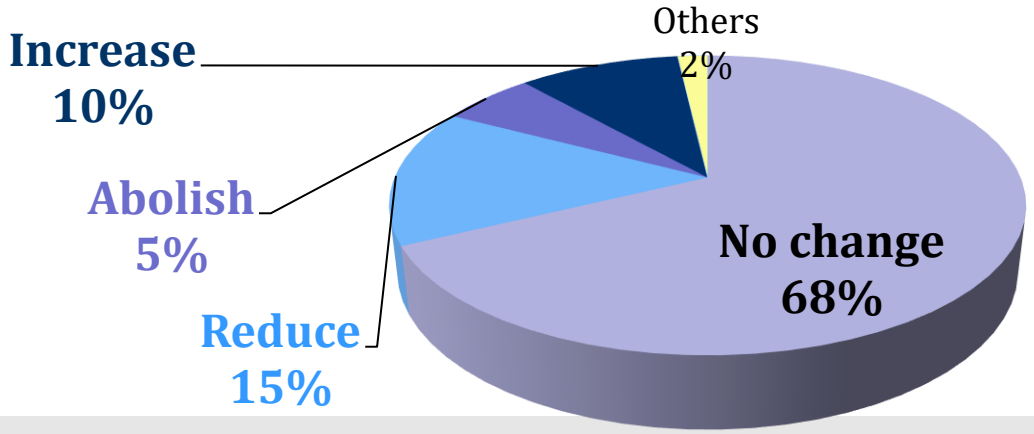
3. Case Study : Kyoto City

(3) Public Survey - Results

Difference among fixed rates based on diameters of pipes

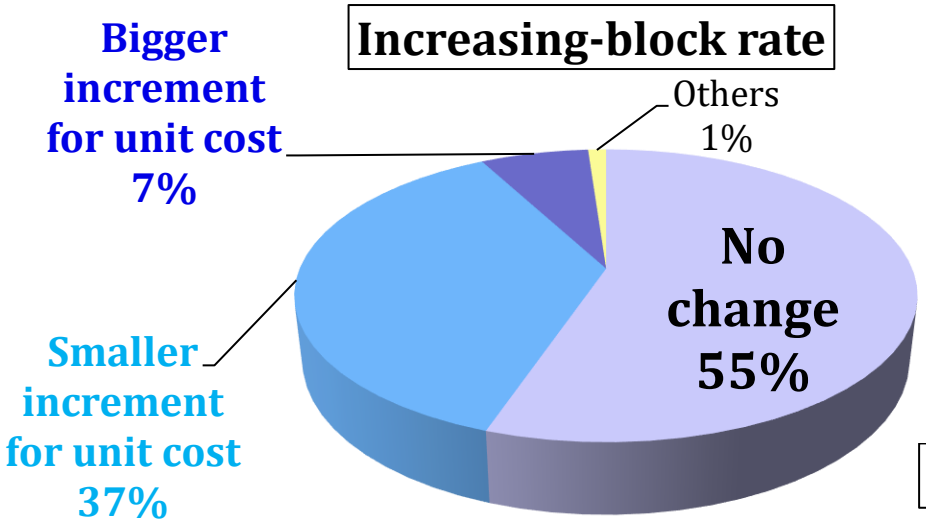


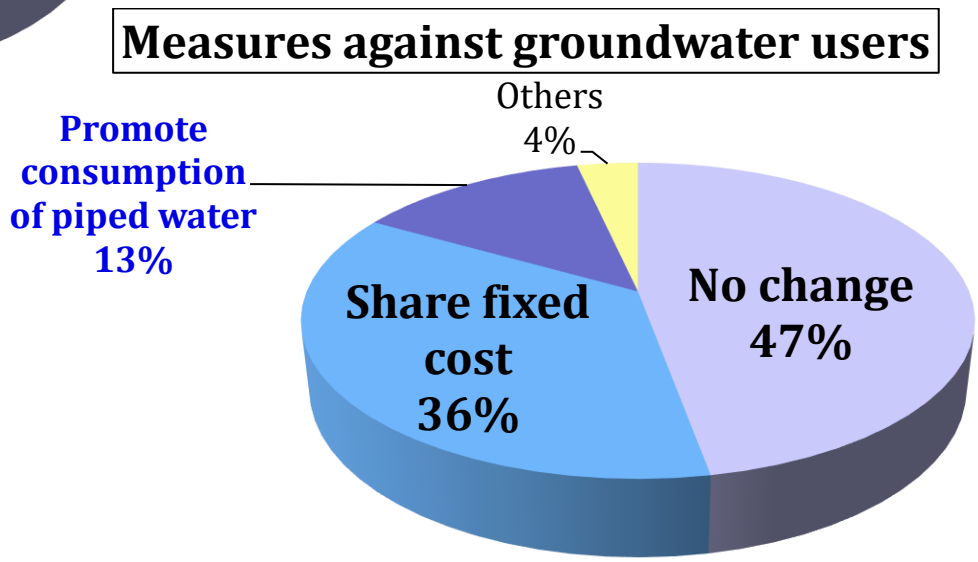
Bi-monthly minimum volume covered by the fixed rate (20 m^3)



3. Case Study : Kyoto City

(3) Public Survey - Results (Cont'd)





3. Case Study : Kyoto City

(4) Issues Identified & Recommendations by the Committee

Issues		Recommendations
Minimum volume of water	More than 1/3 of households use less than $10m^3$/month (monthly water volume covered by the fixed rates).	Reduce the minimum volume by half.
Block tariff system	The number of blocks and the volume in each block do not correspond to the water consumption pattern.	Sub-divide small volumetric blocks into more narrow bands and consolidate large volumetric blocks into larger bands.
Fixed cost	Along with the reduced water demand, it would be difficult to cover the fixed cost in future.	Increase the amount of fixed costs allocated to the fixed rate.
Rate increment	Difference between the highest and the lowest unit price of the volumetric rate is bigger than other major cities	Reduce the rate difference within the water tariff structure, bringing the rate levels closer to those of other cities.

3. Case Study : Kyoto City

(4) Issues Identified & Recommendations by the Committee (Cont'd)

Issues		Recommendations
Groundwater use	Groundwater users pay much less for water and are not sharing the financial burden equitably with other users.	Raise the fixed rate and increase the amount of fixed water for customers with large pipe diameter and reduce unit price of volumetric rate.
Credit card payment	Customers are interested in using credit card to make payments. The commission charge to the utility for credit card payment is more expensive than bank transfer fees.	Introduce credit card payment. Split the difference with the customers by giving them a discount as an incentive for payment using bank transfer.
Connection charge	Income generated by the connection charges would decrease.	Introduce capital maintenance cost.
Capital maintenance cost	Capital maintenance costs are not included in the calculation of water tariffs.	Include capital maintenance costs when setting water tariffs.

3. Case Study : Kyoto City

(4) Comparison of Old and New Tariff s Schedule

	Diameter /Block	Old Tariffs		Revised Tariffs	
		Price (JPY)	(Minimum volume)	Price (JPY)	(Minimum volume)
Fixed Rate (Minimum Charge)	13/20mm	870	10m³	920	5m³
	25mm	1,690		1,900	10m³
				2,780	
	40mm	2,470		18,300	50m³
	50mm	9,250		35,910	100m³
	75mm	15,470		71,600	250m³
	100mm				
	150mm			134,260	500m³
	200mm			281,520	1000m³
Volumetric Rate (Volumetric Charge) (/m³)	6m³	0		10	
	11m³~20m³	162		177	
	21m³~30m³			180	
	31m³~100m³	189		208	
	101m³~200m³	206		226	
	201m³~500m³	223		243	
	501m³~5,000m³	262		284	
	5001m³~10,000m³	301		326	
	10,000m³~	339			

Source: Kyoto City Waterworks Bureau

3. Case Study : Kyoto City

(5) Effect of Tariff Revision (FY2013-FY2017)

Unit: Million JPY

	Before cost-saving	After cost-saving		After water tariff revision	
			Effect		Effect
Revenue	142,043	142,165	122	152,982	10,817
Water tariff	129,594	129,594	0	140,804	11,210
Others	12,449	12,571	122	12,178	-393
Expenditure	150,136	144,395	-5,741	144,550	155
Personnel cost	33,991	30,191	-3,800	30,191	0
Salary	28,656	26,501	-2,155	26,501	0
Retirement allowance	5,335	3,690	-1,645	3,690	0
Maintenance costs	38,788	36,600	-2,188	36,587	-13
Depreciation	55,725	55,725	0	55,725	0
Interest payment, etc.	16,703	16,703	0	16,335	-368
Consumption tax, etc.	4,929	5,176	247	5,712	536
Net profit or loss	-8,093	-2,230	5,863	8,432	10,662
Earned surplus	0	0	0	-8,134	-8,134
Accumulated profit or loss in the end of FY2017	-8,391	-2,528	5,863	0	2,528

No accumulated loss

Source: Kyoto City Waterworks Bureau

3. Case Study : Kyoto City

(6) Public Notification

"Revised Water and Sewerage Tariffs to Start October, 2013."

Source:
http://www.mhlw.go.jp/seisakunitsuite/bunya/topics/bukyoku/kenkou/suido/newvision/chiikikondan/04/suishin_kondan_04-4.pdf

3. Case Study : Kyoto City

(6) Public Notification (Cont'd)

New Tariff Table - Effective from 1st June 2014

京都市上下水道局　料金早見表（2カ月料金・税込）

WATERWORKS BUREAU, CITY OF KYOTO

Water and Sewage Service Charges

per 2 months, 8% consumption tax incl.

呼び径 diameter of water supply pipe **13&20** mm

2014年6月1日検針分から適用

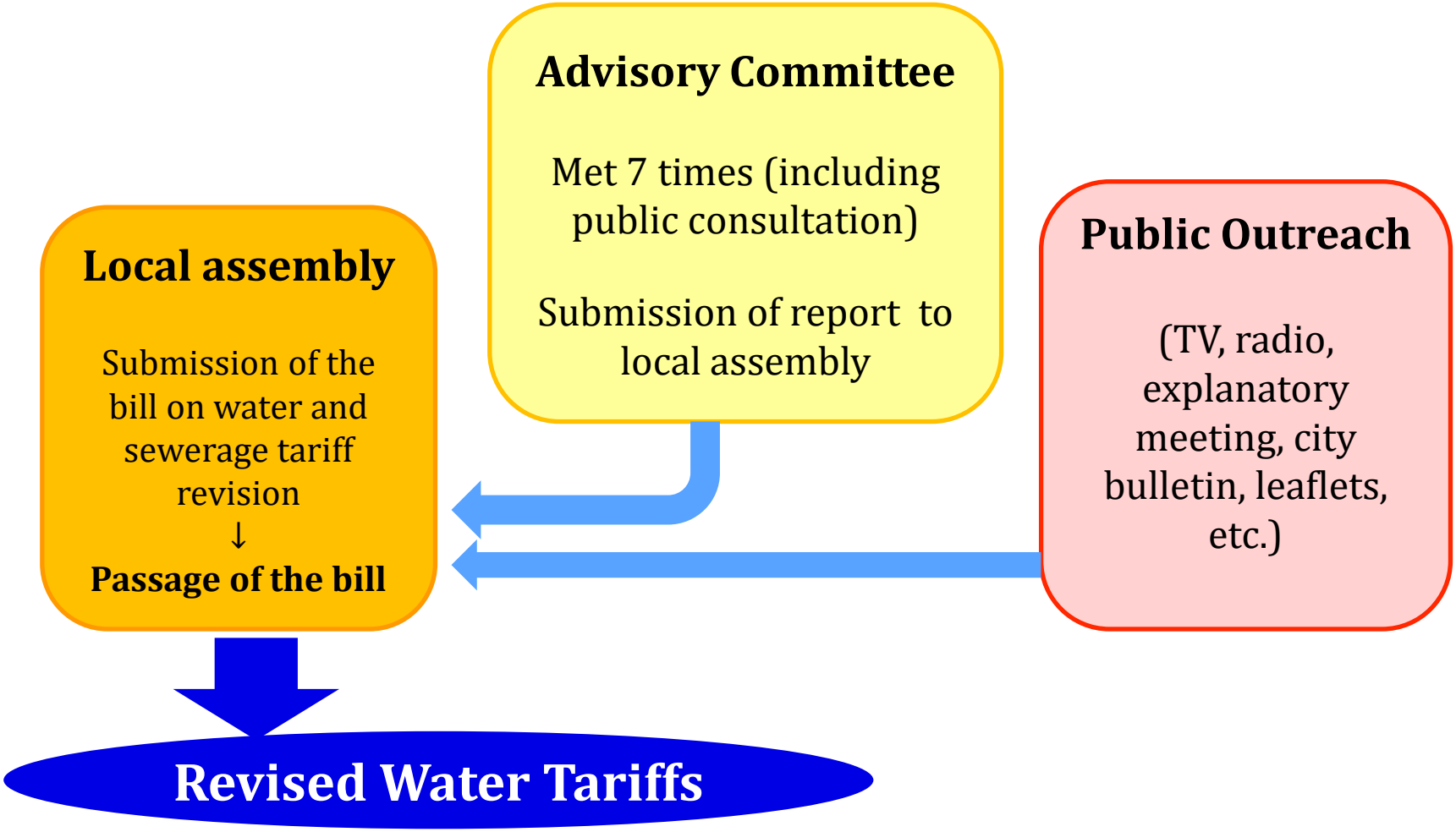
Effective from 1st June 2014

水量 amount of water used (m^3)	水道料金（円） water charge (yen)	下水道使用料（円） sewage charge (yen)	合計（円） total (yen)	水量 amount of water used (m^3)	水道料金（円） water charge (yen)	下水道使用料（円） sewage charge (yen)	合計（円） total (yen)
0-10	1,987	1,404	3,391				
11	1,998	1,414	3,412	56	9,028	5,957	14,985
12	2,008	1,425	3,433	57	9,223	6,082	15,305
13	2,019	1,436	3,455	58	9,417	6,207	15,624
14	2,030	1,447	3,477	59	9,612	6,333	15,945
15	2,041	1,458	3,499	60	9,806	6,458	16,264
16	2,052	1,468	3,520	61	10,031	6,633	16,664
17	2,062	1,479	3,541	62	10,255	6,808	17,063
18	2,073	1,490	3,563	63	10,480	6,983	17,463
19	2,084	1,501	3,585	64	10,704	7,158	17,862
20	2,095	1,512	3,607	65	10,929	7,333	18,262

Source: Kyoto City Waterworks Bureau

3. Case Study : Kyoto City

Water Tariff Revision Process



4. Lessons Learned (1)

- **(Cost Recovery)** Water tariffs are set based on the principle of the fully distributed cost method as stipulated by acts in Japan. The *Water Tariff Setting Manual* provides guidance on the standardized method for the calculation of water tariffs based cost recovery.
- **(Bases of Tariff Revision)** The water utility releases financial and operational information, showing the facilities replacement costs and funding sources. This is necessary if it were to continue to provide sustainable, reliable, and safe water supply in the medium and long term.
- **(Utility's Efforts)** It is also necessary to explain the utility's management efforts (control on staff size, cost savings with outsourcing, measures for unpaid water tariffs, asset management, etc.).

4. Lessons Learned (2)

- **(Understanding of Customers)** Tariff revision must have the support of the local government and residents. It is important to forecast the financial conditions in a credible manner and explain the need for the rate increase convincingly. The discussions by the advisory committee and public consultations are useful opportunities to engage the public and gather customer input. The utility's business and fiscal plans must be well understood and supported by the customers. It is desirable that tariffs are revised for customers' benefit (improved service and fairness).