6th Regional 3R forum in Asia and the Pacific
16th August 2015

Kawasaki City's Efforts in Creating a Recycling Society

Kawasaki 3 R Promotion Character
"Kawarun"

Kawasaki Environmental Research Institute
City of Kawasaki, Japan

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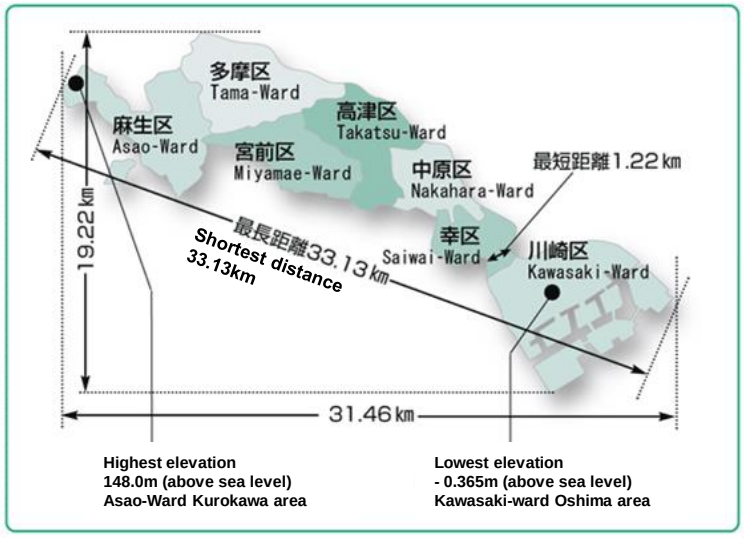
I. Profile and History of Kawasaki city

Profile of Kawasaki City
川崎市のプロフィール



Kawasaki City, called “Industrial City Kawasaki” was developed as a city of manufacturing; recently, the city is transforming drastically into a city of high-tech technology and industry, a base for industrial technology and research & development, which leads Japan.

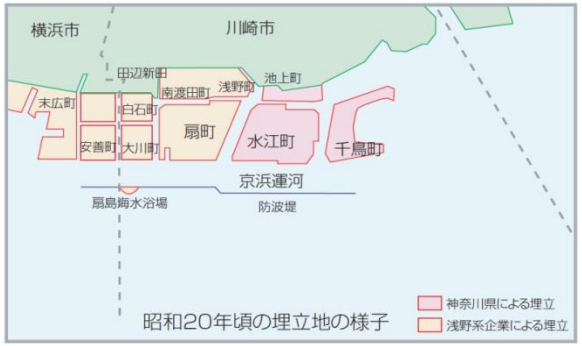
Population	**1,450,097 people (Jan.1,2014)**
Area	**144.35 Km²**
Gross production of the city	**5244.0 billion yen**
Major Industries	**Manufacturing Service Transportation・Service**
Major manufacturing industries	**General machinery Metal products Electric**
Developing industries	**New manufacturing technology Info / telecommunication Environment Welfare Lifestyle / culture**

Development as an Industrial Metropolis
産業都市としての発展

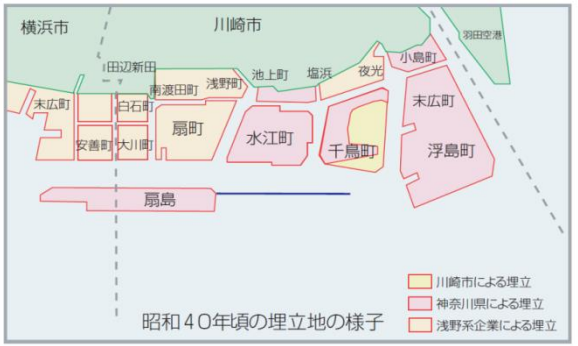
- Kawasaki city developed considerable efforts on attracting factories.

- Drastic changes in water front area of Kawasaki by land reclamation for developing “Kehin Industrial zone”.

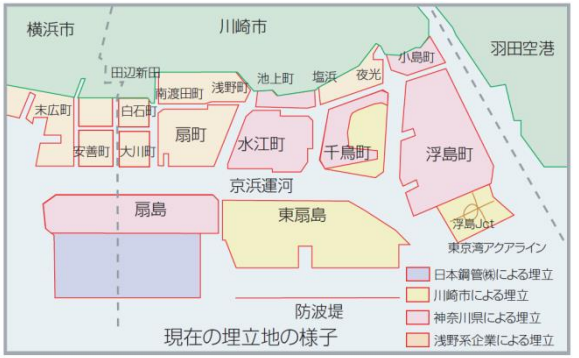
【In 1940’s】



【In 1960’s】



【In 2008】

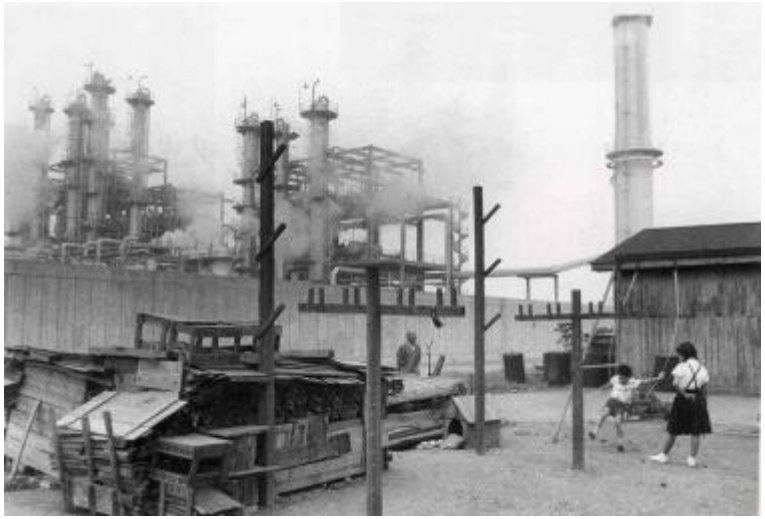


II. Efforts on environmental problems “Kogai”

Extensive and Serious Kogai problems in Kawasaki city
川崎市で発生した甚大な公害問題

○ As the core of Kawasaki City, Keihin industrial area towed a high economic growth in Japan. On the other hand, it triggered rapid environmental degradation. Serious pollution include air pollution and water contamination.

○ Many surrounding residents showed chronic bronchitis and bronchial asthma symptoms due to atmospheric pollutant discharged from factories and vehicles.



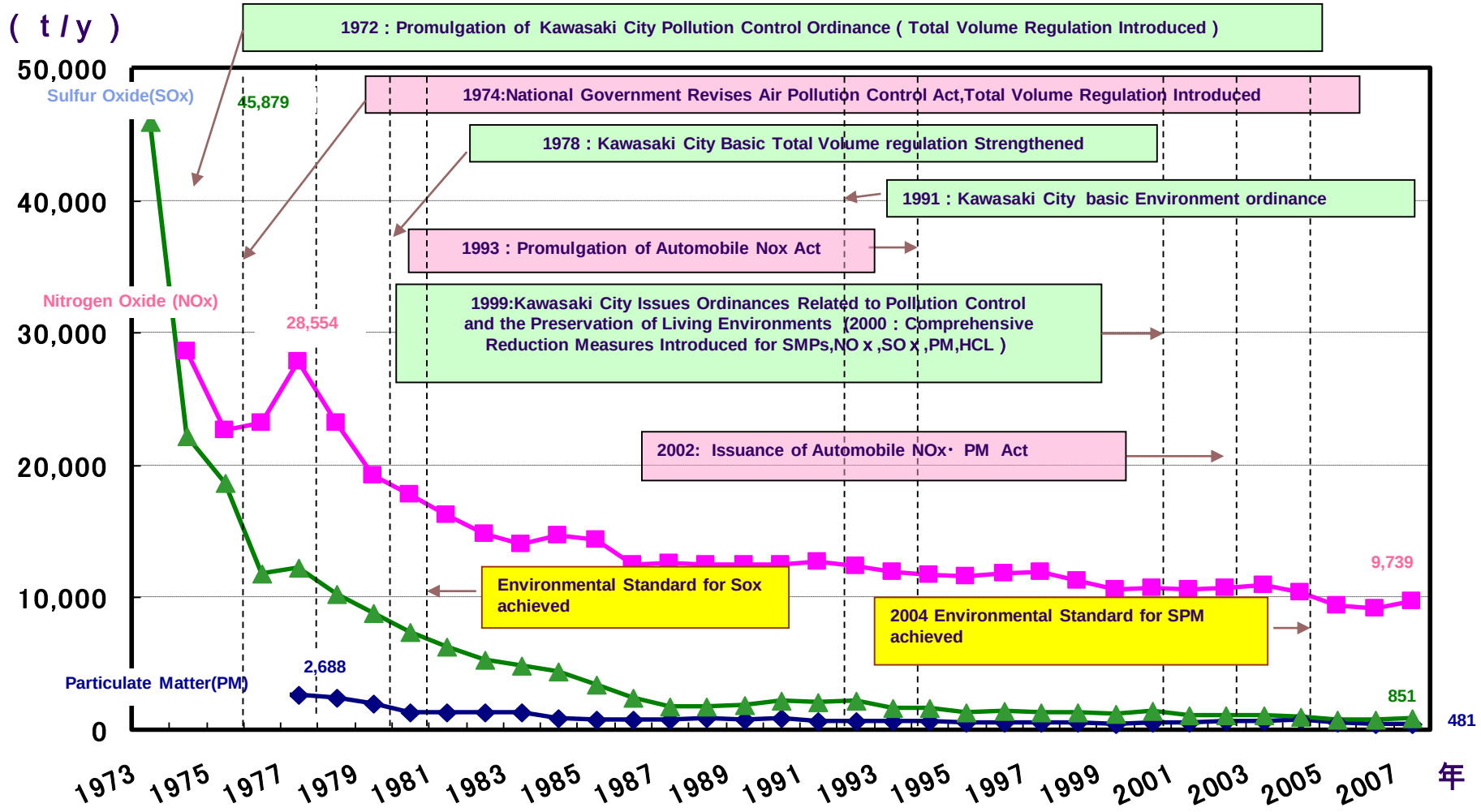
Kawasaki coastal industrial area in the 1960s

View of coastal area in the early 1970s

Major antipollution measures conducted by Kawasaki City
川崎市が実施した主要な公害克服にむけた取り組み

Year	Major countermeasures
1960	Promulgations and enactment of the Kawasaki City Ordinance for Pollution Prevention (former ordinance)
1968	Establishment of a continuous monitoring system for sulfur dioxides etc. through use of centralized air pollution monitoring equipment.
1969	Establishment and enforcement of “Regulations concerning Relief Measures for Persons Affected by Pollution ”and the beginning of relief for pollution victims
1970	Commencement of agreements signed with 39 factories within Kawasaki City regarding the prevention of air pollution to tighten antipollution measures aimed at polluting sources
1972	Promulgation of the Kawasaki City Ordinance for Pollution Prevention ,introduction of regulations on total emissions, and completion of the Pollution Monitor Center
1976	Completion of the Promulgation of the Kawasaki City Ordinance on Environmental Assessment and the introduction of a mechanism to prevent environmental degradation before it occurs
1978	Completion of an automatic system for monitoring nitrogen oxides at the source of release (achievement of the environmental standard for sulfur dioxide concentrations at 32 major factories in the city in all major areas)
1979	Concentration of sulfur dioxide reduction achieved by satisfying the environmental standard in the entire city area
1999	Establishment and promulgation of the Kawasaki City Ordinance for conservation of Living Environment including Pollution Prevention

Trend of total amount of SOx, NOx and PM emitted from factories/ 工場から排出量されるSOx, Nox及び煤塵の動向



Changes in Atmospheric Pollutant Outputs Emitted by Factories/Offices(All Cities)

III. Efforts towards resource circulation society

Collection of General Wastes / 3 Treatment Facilities

Waste Disposal Site of Kawasaki

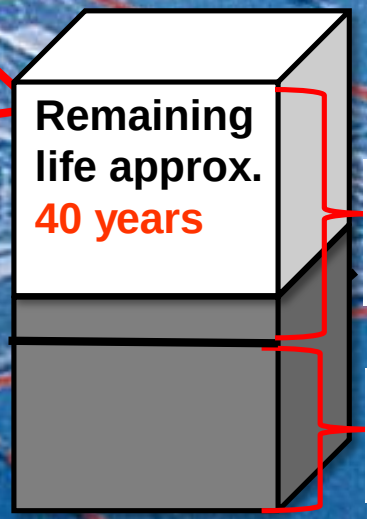
Ukishima Landfill Site (**1st period: 1978 - 2006**)
Commencement of utilisation in 1978
Closed in 2006
Ukishima Landfill Site (**2nd period: 2000- **)
Commencement of utlisation in 2000

Those sites deal with incinerated residues

Ukishima, 1st period

UKISHIMA Landfill Site
(deal with incinerated residues)

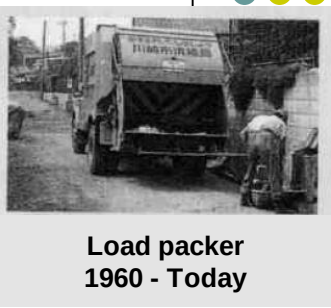
Ukishima, 2nd period



Tokyo Bay

History of Waste Management

- **Development of garbage trucks and collection started (1955)**
- **Daily collection (6 times per week) and Incineration for all burnable wastes（1961～）**



Load packer
1960 - Today

Initial concepts

Conserving the living environment

Improving public sanitation

Appropriate processing (incineration) was the central concept

mass production, mass consumption and mass waste disposal
along with high economic growth

1990: "Waste Emergency" declared

Promoting the reduction of wastes and utilize them as a resource

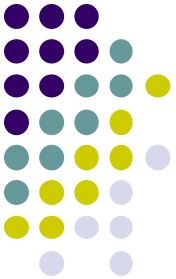
Changes in waste collection and disposal treatment by Kawasaki City （1968 ～present）

- Stated bulk waste collection (1968-)
- Started empty can collection (1977- , started city-wide collection in 1998)
- Started used dry cell collection （1984-）

- Started empty bottle collection (1991 - , started city-wide collection in 1999)
- Started railway transportation of garbage（1995-）
- Started small metal collection（1997-）
- Started plastic bottle collection（1999- , started city-wide collection in 2003)
- Started charging for over-sized trash（2004-）
- Started a pilot test for various papers collection (2006, started city-wide collection in 2011)
- Started garbage collection 3 days a week Started plastic containers and packaging collection （2011-, started city wide collection in2013）
- Started collection 2 days a week（2013-）

After announcement of garbage emergency declaration on wastes (1990), **Kawasaki City gradually started waste collection, and tried to reduce volumes of the garbage which goes to incineration process .**

Kawasaki City Basic Plan for Regular Waste Treatment (Kawasaki Challenge 3R)



○ **Basic principle:** Aiming at establishing a sustainable recycling city

○ **Targets of the Basic plan**

① **Promoting efforts to reduce waste:** Reduce waste produced by 180 grams per citizen per day.

② **Promoting recycling:** 200,000 tons of recycling for the entire city (35% recycling rate)

③ **Reducing incinerated waste:** Reduce incinerated waste by 130,000 tons

○ **Plan period:** FY 2005 to 2015

Desired Direction

○ **Lengthening the remaining life of final landfill sites**

○ **Achieving a structure using three processing centers**

- Establishing an effective and efficient waste management system by having three of the four incineration facilities in operation.

Main Efforts Based on the Basic Plan

① Starting a new separated waste collection system

Mixed paper ／ Plastic containers and packaging

② Changing the number of times regular waste is collected

Changing from four times a week to two times.

③ Subcontracting to private vendors

Subcontracting the collection and transport of resources.

④ Improving outreach activities

Using characters, idol groups, lectures (over 1,000 times), and idea contests.

Leaflet“How to Separate and Dispose of Recyclables and Waste”

- The City issues “How to Separate and Dispose of Recyclables and Waste” to inform citizens of the rules of waste separation in Kawasaki City.
- The sheet contains information on items to be separated, the days of the week for collection, as well as points to note when disposing of waste, and an index for reference when one is confused.
- The sheet is placed in public facilities such as ward offices, and is given to those moving into the City, in principle.
- The sheet is distributed to all households when there is a major change in the rules of disposal, such as a change in the rules of waste separation.


地域別収集日一覧

発行：平成26年4月

資源物・普通ごみ

区	町丁名	月	火	水	木	金	土
川崎区	浅田1～4丁目、大川町、小田1～7丁目、京町3丁目、白石町、田辺新田	普通ごみ	缶・ペットボトル、びん、電池	×	普通ごみ	ミックスペーパー	プラ容器
	大島1丁目、大島上町、小田栄1・2丁目、鋼管通4・5丁目、渡田1～4丁目、渡田山王町、渡田新町1～3丁目、渡田東町、渡田向町	普通ごみ	×	缶・ペットボトル、びん、電池	普通ごみ	プラ容器	ミックスペーパー
	浅野町、追分町、扇町、大島2丁目、大島3丁目(1～17,21～32,36,37)、大島4丁目(1～4,14～23)、大島5丁目(1～10,16～31)、鋼管通1～3丁目、旭町、扇町、浜町1～4丁目、鋼管通4丁目(1～4,9～16)、南渡田町	×	普通ごみ	プラ容器	ミックスペーパー	普通ごみ	缶・ペットボトル、びん、電池
	池上新町1～3丁目、池上町、大島3丁目(18～20,33～35,38)、扇町1・2丁目、桜本1・2丁目、堤根2・3丁目、台町(1～7)、東扇島、扇町3丁目(1～7)、鋼管4丁目(18～38)、水江町、夜光2・3丁目、四谷上町(1～7,10～29)、四谷下町	缶・ペットボトル、びん、電池	普通ごみ	ミックスペーパー	プラ容器	普通ごみ	×
	伊勢町、大島4丁目(5～13)、大島5丁目(11～15)、川中島1・2丁目、大師駅前1丁目(1～14)、大師駅前2丁目、大師町、台町(8～26)、中島1～3丁目、扇町1・2丁目、鋼管3丁目(8～15)、鋼管4丁目(5～8,17)、四谷上町(8,9)	プラ容器	ミックスペーパー	普通ごみ	缶・ペットボトル、びん、電池	×	普通ごみ
	浮島町、江川1・2丁目、小島町、塩浜1・4丁目、昭和1・2丁目、大師駅前1丁目(15～18)、大師河原1・2丁目、大師本町、旧町1～3丁目、千鳥町、出来野、殿町1～3丁目、中瀬2・3丁目、東門前1～3丁目、日ノ出1・2丁目、夜光1丁目	ミックスペーパー	プラ容器	普通ごみ	×	缶・ペットボトル、びん、電池	普通ごみ

小物金属 粗大ごみ
- 小物金属は申し込み不要です。
- 粗大ごみは「有料」です。●収集日の3日前（土・日・祝日を除く）までにお申し込みください。

祝日も収集します。（年末年始を除く）

粗大ごみの申し込み先 ☎044-930-5300 粗大ごみ受付センター 受付曜日：月曜日～土曜日（祝日、12月31日～1月3日を除く） 受付時間：午前8時～午後4時45分

毎月		町丁名
第1・3週目	月	藤崎1・2・3丁目、渡田山王町、渡田新町、渡田向町
	火	小田栄、川中島、渡田、渡田東町
	水	追分町、鋼管通、大師駅前、大師町、大師本町、台町、田島町、南渡田町
	木	浅野町、扇町、大師河原、出来野、中瀬2・3丁目、浜町
	金	池上町、桜本、四谷上町、四谷下町

毎月		町丁名
第2・4週目	月	池上新町、小田1・2・4丁目、藤崎4丁目
	火	伊勢町、小田3・5・6・7丁目、観音
	水	浅田、大川町、京町3丁目、昭和、白石町、田辺新田、東門前
	木	江川、大島4・5丁目、田町、殿町、中島
	金	浮島町、大島1・2・3丁目、大島上町、小島町、塩浜、千鳥町、東扇島、日ノ出、水江町、夜光

問い合わせ先 南部生活環境事業所 ☎044-266-5747 FAX044-287-1840 〒210-0822 川崎市川崎区浜町4-11-8（受付日時：月曜日から土曜日までの午前8時から午後4時45分まで）


川崎市 ～分ければ資源 混ぜればごみ～ CCかわさき エコ暮らし

資源物とごみの分け方・出し方

収集当日の朝8時までに出してください。 祝日も収集します。（年末年始を除く）

○・□の中にお住まいの地域の収集曜日等を記入してください。■マンション等で管理組合のルールがある場合は、そちらに従ってください。

資源物
- 空き缶・ペットボトル、空きびん、使用済み乾電池 毎週 ○ 曜日
- ミックスペーパー 毎週 ○ 曜日
- プラスチック製容器包装 ※マークのあるもの 毎週 ○ 曜日

普通ごみ 毎週 ○・○ 曜日
「資源物」、「小物金属」、「粗大ごみ」以外のもの

小物金属 毎月 第 □・□ 回目 ○ 曜日
30cm未満の金属製品、かさ、針金ハンガー

粗大ごみ 毎月 第 □・□ 回目 ○ 曜日
30cm以上の金属製品、50cm以上の家具類など

●粗大ごみは「有料」です。収集日の3日前（土・日・祝日を除く）までにお申し込みください。
※申し込みが多い場合は、次回の収集日になる場合があります。

粗大ごみの申し込み先 ☎044-930-5300 粗大ごみ受付センター 受付曜日：月曜日～土曜日（祝日、12月31日～1月3日を除く） 受付時間：午前8時～午後4時45分

インターネット 市ホームページ（http://www.city.kawasaki.jp）から ネット粗大ごみ 検索
年中無休（24時間受付）※はじめに利用者登録が必要です。

F A X 環境等に障がいのある方専用 FAX044-930-5310

注意 市では収集しないものについては、P18を参照。

環境局ごみ・リサイクルに関するホームページ ●市ホームページ（http://www.city.kawasaki.jp）から ごみ リサイクル 検索
がいこくご（English・中国語・한국어・Tagalog・Español・Português）や やさしいにほんご）でもしょうかいしています。


資源物やごみを出すときには

- 収集当日の朝8時までに出してください。
  8時以降順次収集していきますが、その日のごみの量、道路状況等の理由により収集時間が変わってしまうことがあります。
- 収集後や夜間には、出さないでください。
- 祝日も収集します。（年末年始を除く）
- 降雪時や荒天時には収集できない場合があります。（収集状況は市ホームページで確認できます。）
  http://www.city.kawasaki.jp から 資源物とごみの収集状況について 検索
- 粗大ごみは申し込み制です。粗大ごみ処理手数料がかかります。

粗大ごみ受付センター ☎044-930-5300
受付曜日：月曜日～土曜日（祝日、12月31日～1月3日を除く）
受付時間：午前8時～午後4時45分 ※12～14ページをご覧ください。

- 小物金属は、申し込み不要です。

資源物やごみの集積所

分け方、出し方を守らないと集積所周辺の方々に大変迷惑になります。資源物やごみは、分別ルールと排出マナーを守って正しく出してください。

よくある質問

Q 集積所とは？
A 資源物やごみを収集するまでの一時的な保管場所です。使用する市民の方に管理していただいております。

Q 集積所を新しく作りたい/変更したい/分散したいときは？
A 使用する地域のみなさんで相談して候補地を決めていただき、必ず生活環境事業所へご相談ください。

P1

Display Boards at Waste Collection Points

- Waste collection points are managed by the citizens who use them.
- Boards are set so that collection days of the week for respective waste collection points are known.

資源物とごみの収集日

Waste and Recyclables Collection Day

収集当日の朝8 時までに出してください。
Please take out your garbage by 8am on the collection Day
※収集後や夜間などには、ごみを出さないでください。

月曜日	普通ごみ Ordinary Waste
火曜日	空き缶・ペットボトル、空きびん、使用済乾電池 Empty Cans・PET Bottles　Empty Bottles、Used Batteries
水曜日	×
木曜日	普通ごみ Ordinary Waste
金曜日	プラスチック製容器包装 Plastic containers and packaging
土曜日	ミックスペーパー Mixed Paper
小物金属 Small Metal Articles	毎月 1・2 回目の 木 曜日
粗大ごみ Oversized Waste	粗大ごみ受付センター TEL 044(930)5300 へお申込みください。

ごみ等の出し方は「資源物とごみの分け方・出し方」をご覧ください。

川崎市南部生活環境事業所 Kawasaki City Waste Collection Office TEL 044(266)5747

Awareness Raising through Events and Other Opportunities (1)

- Implementation of awareness raising activities during events such as the Citizens' Festival.
- Making use of "Kawarun."
- Awareness raising of the 3Rs through quoits, garbage separation game, and other games.

Awareness Raising through Events and Other Opportunities (2)

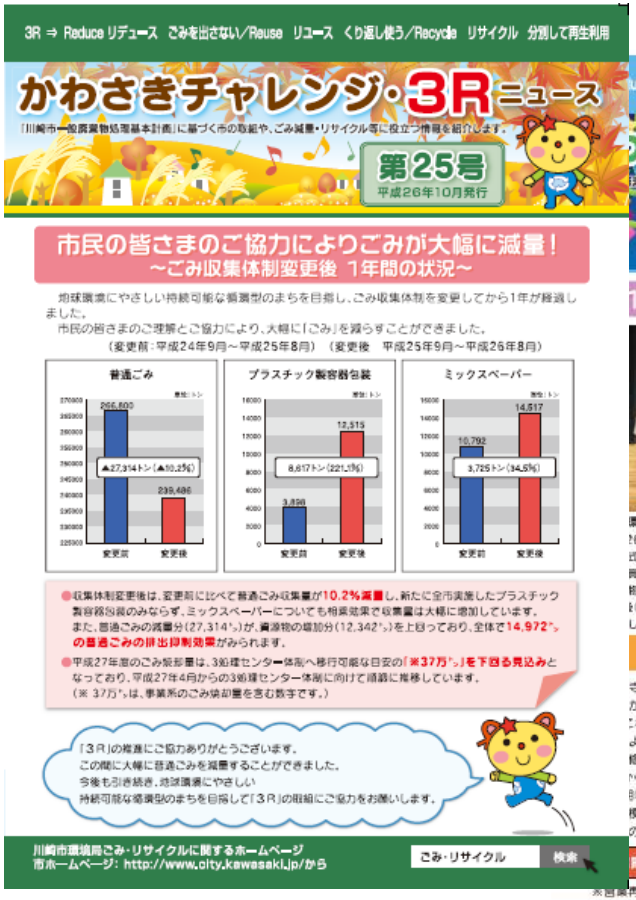
Garbage separation game at an event on the environment organized in cooperation with “Aeon Shinyurigaoka” shopping center

“Consultation on recycling kitchen waste” by experienced citizens

- **“Kawasaki junjo komachi ★,” a local star group of Kawasaki City, has been designated as the 3R Promotion Public Information Ambassador**
- **Awareness raising of the 3Rs during concerts, campaigns, and other events**

3R News

- Dissemination of Information on the “3Rs” familiar to citizens, such as on the status of waste disposal and progress made in recycling.
- Issued about three times a year and circulated by neighborhood associations.



Environmental Education (1)

- **Environmental education for children, who will lead the next generation, is important.**
- **Children learn about the significance of waste reduction and recycling. They are expected to put knowledge into practice, which may also spread in their households and other places around them.**

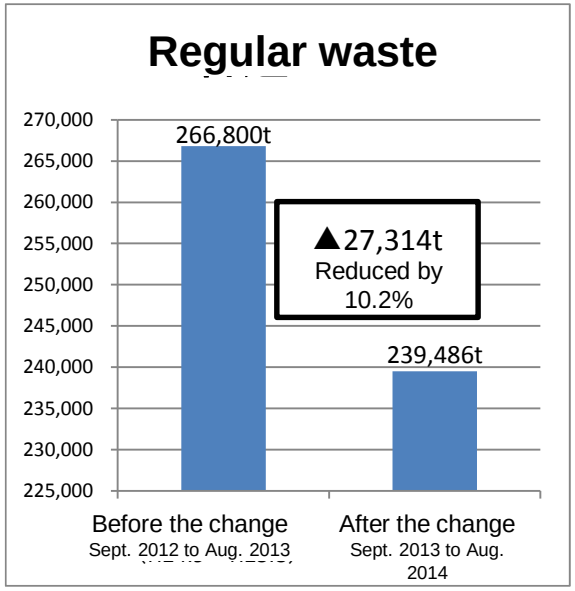
● **Supplementary reader “Our Lives and Garbage”**
Classes using the supplementary reader “Our Lives and the Garbage” are given as part of social science curriculum for the fourth grade in elementary school.

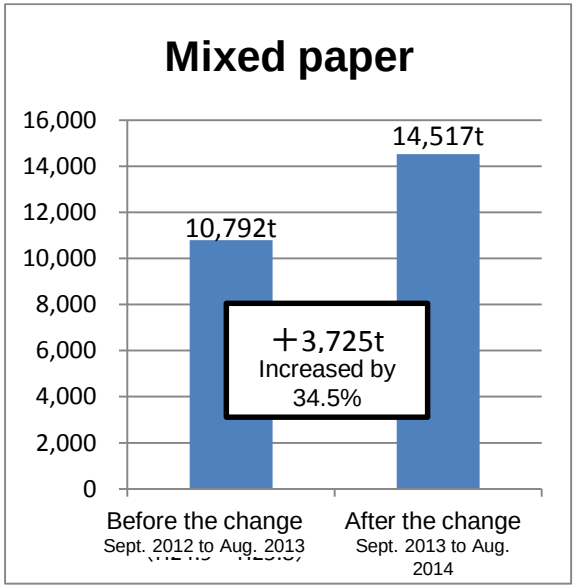
● **On-site Garbage School**
Garbage schools are held on-site, using the “skeleton truck” that allows children to see inside a garbage truck, and applying hands-on learning such as playing the garbage separation game.

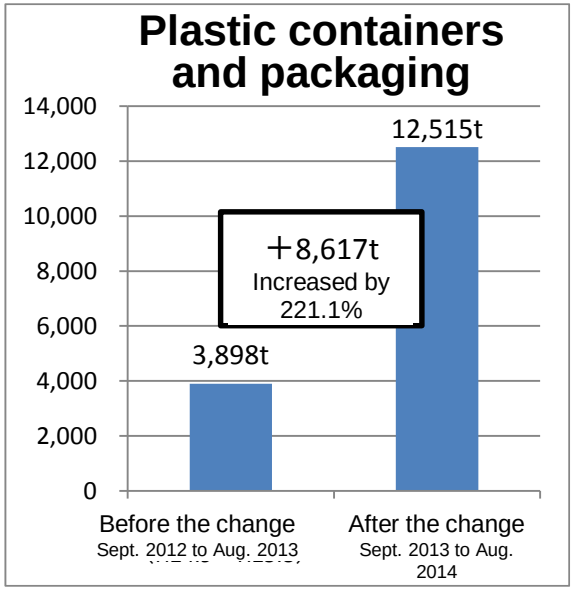
The Situation Before and After the Change in the Collection System in September 2013

Comparison of figures with the previous year, between the period after the change (Sept. 2013 to Aug. 2014) and before the change (Sept. 2012 to Aug. 2013)

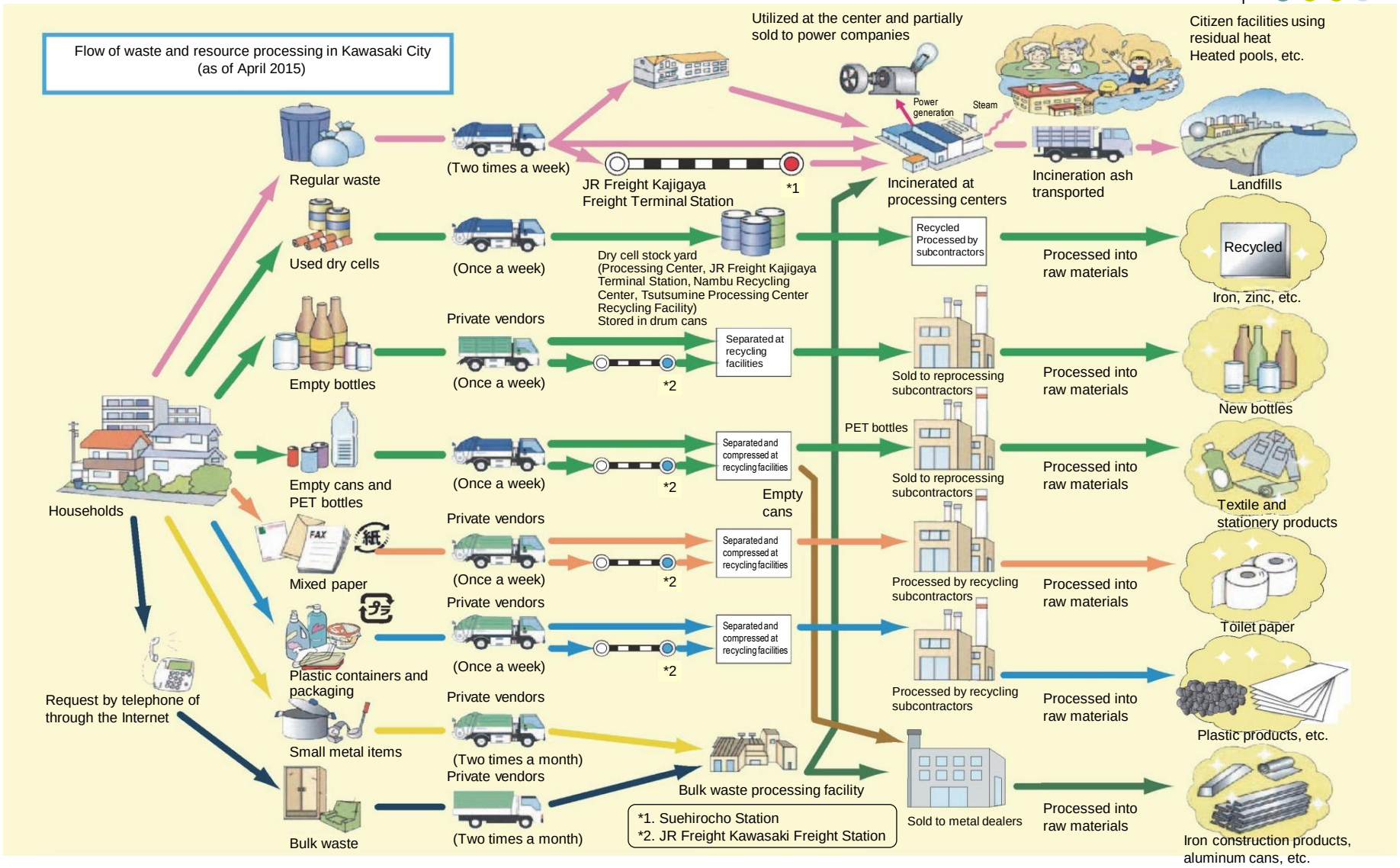
- **After the change in the collection system, the amount of regular waste was reduced by 27,314 tons, or approximately 10.2%, compared to the period before the change.**
- **In addition to plastic containers and packaging, for which collection was implemented in the entire city, the amount of mixed paper collected also increased drastically. Together, the amount of recyclables increased by 12,342 tons.**
- **The amount of regular waste reduced exceeded the increase of mixed paper and plastic containers and packaging collected. In total, there was an effect of reducing waste by 14,972 tons or by approximately 5.6%.**







Waste and Resource Processing Flow



Environmental Actions in Kawasaki Coastal Area

1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007

Eco Town

Approved by governments

Plan for Eco-Town →

Various recycling facilities are opened →

Special District Plan
International Environment

Zero Emissions Industrial Park →

- Industries activation and revitalization through environmental technologies
- Sending Information on performance to the world

Study Group among industrial, academic and administration sectors →

Coastal Area Reactivation Programme →

Kawasaki Coastal Area Reactivation Association
(Collaboration between Companies, Academies, Administration & Citizens) →

Liaison Center with Companies →

Collaboration with UNEP →

Asian Venture Business Town →

Realization of a Mutually Beneficial Cycle between the Environment and Industry/エコタウン構想の推進

【Kawasaki's Fundamental Plan to create the Town harmonizing with Environment（Kawasaki Eco-Town Plan)】

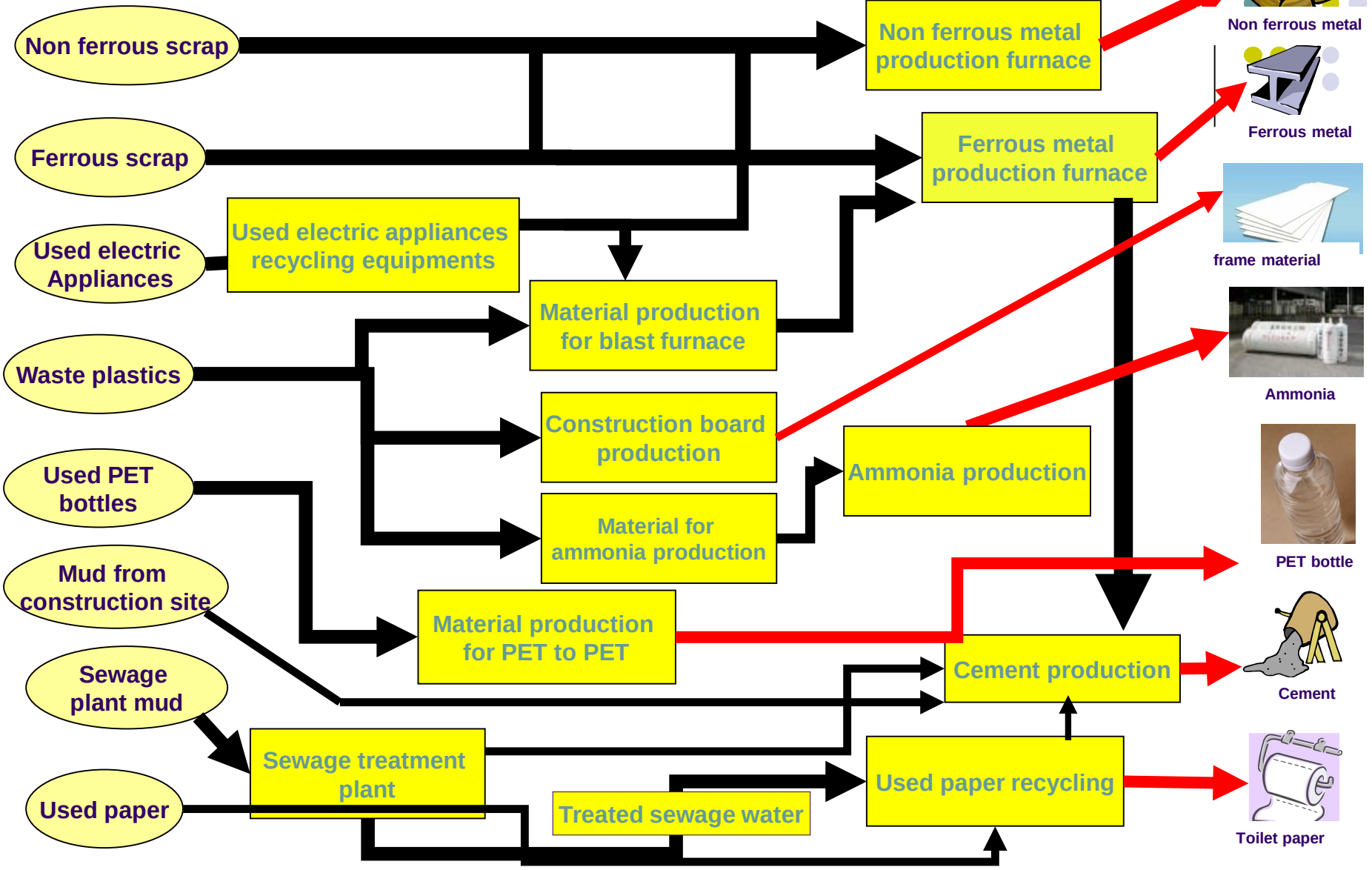
- ○Companies go for eco-friendly
- ○Companies collaborate together for eco-friendly on site
- ○Research for sustainable development of coastal area on environment
- ○Contribution for international communication and sending performance

Appointed zone

- The plan was approved by MITI (at present, METI) in 1997
- Appointed area : Whole Kawasaki Coastal zone (2,800ha）
- Purpose 1: Facilitate companies operating there to develop resources recycling production and install new technologies for resources recycling
- Purpose 2 : Construct Kawasaki Zero Emissions Industrial Park oriented to waste reuse and recycling

Realization of a Mutually Beneficial Cycle between the Environment and Industry

Resource circulation within Kawasaki Eco-Town
エコタウン内における企業間の連携



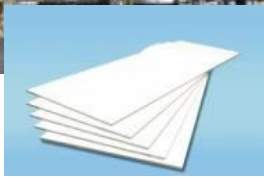
Accumulation of Advanced Recycling Facilities/
先進的なリサイクル施設の集積

Recycled cement production facility
(D.C.)

Waste plastic ammonia feedstock production facility
(Showa Denko K.K.)

ECO ANN

Waste plastic blast furnace feed facility/ Waste plastic concrete form panel production facility/ Appliance recycling facility
(JFE Group)



PET-to-PETrecycling facility
PET Rebirth Co., Ltd.

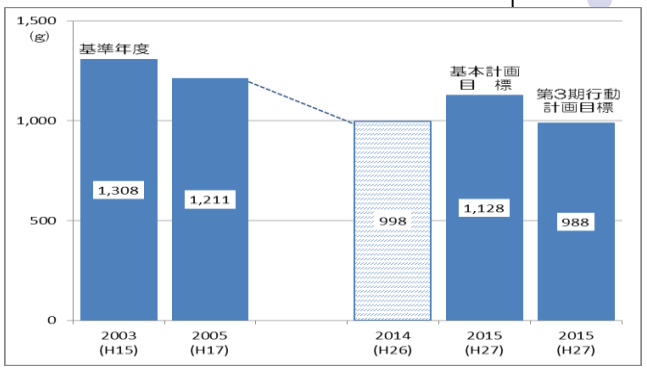
Hard-to-recycle waste paper recycling facility
(SAN-EI Regulator Co., Ltd.)

Results of the Plan (1)
Status of Achieving the Goals

① Promote reduction of waste generated

○ Reduction of garbage per person per day
1人1日あたりのごみ排出量の減少

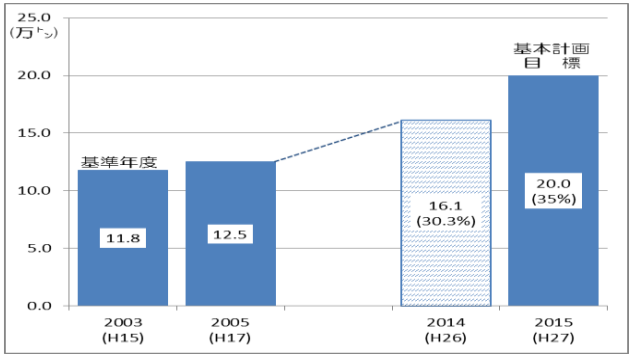
FY2003	⇒	FY2014
1，308g		998g



② Promotion of recycling

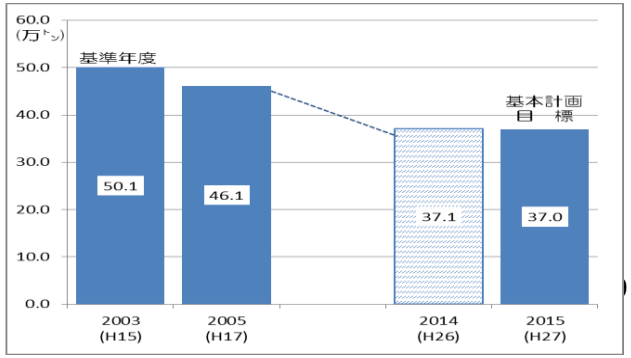
○Increase of recycling rate資源率の増加

FY2003	⇒	FY2014
0．11 Mt		0．16 Mt

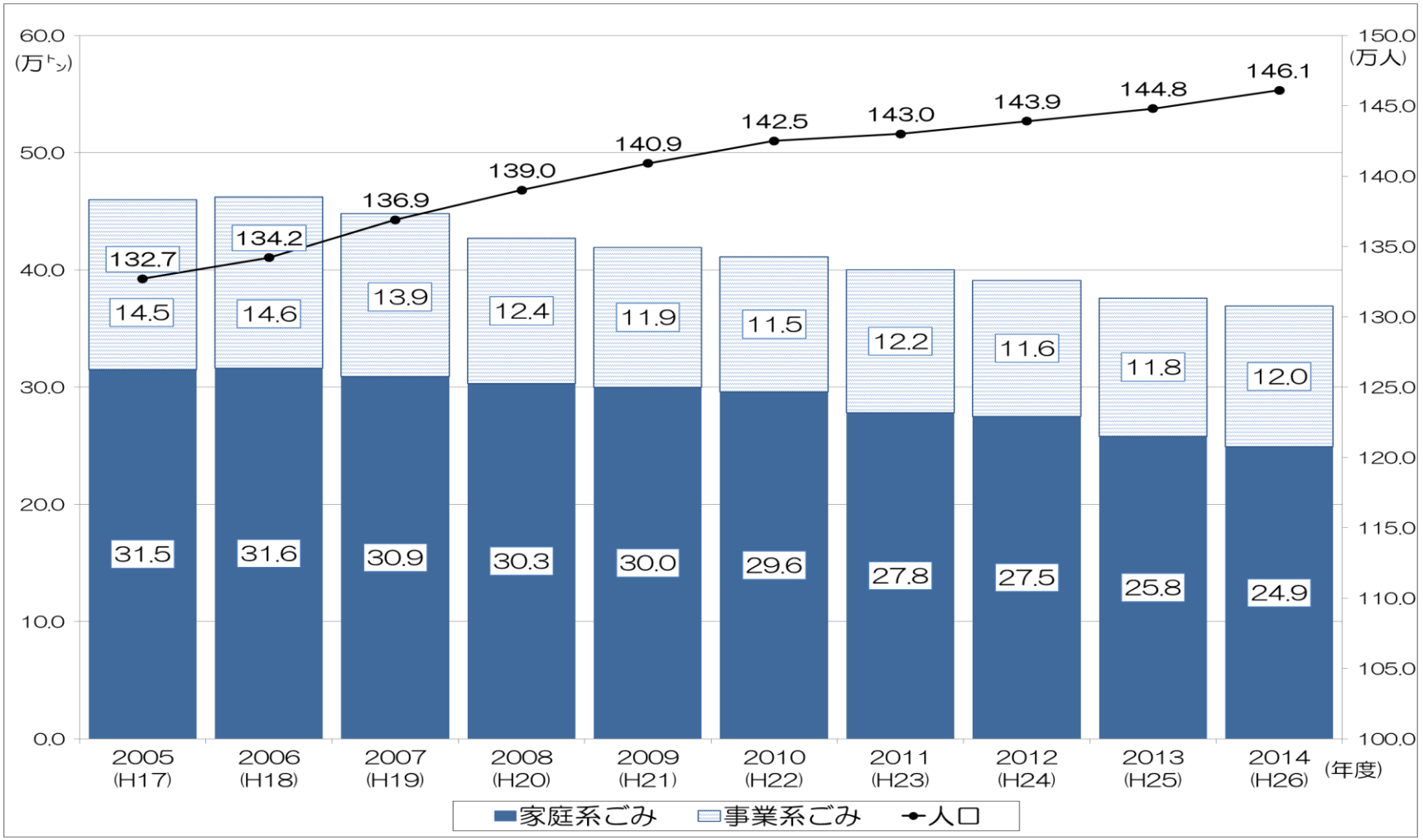


③ Reduction of incineration 焼却量の削減

FY2003	⇒	FY2014
0．5 Mt		0．37 Mt

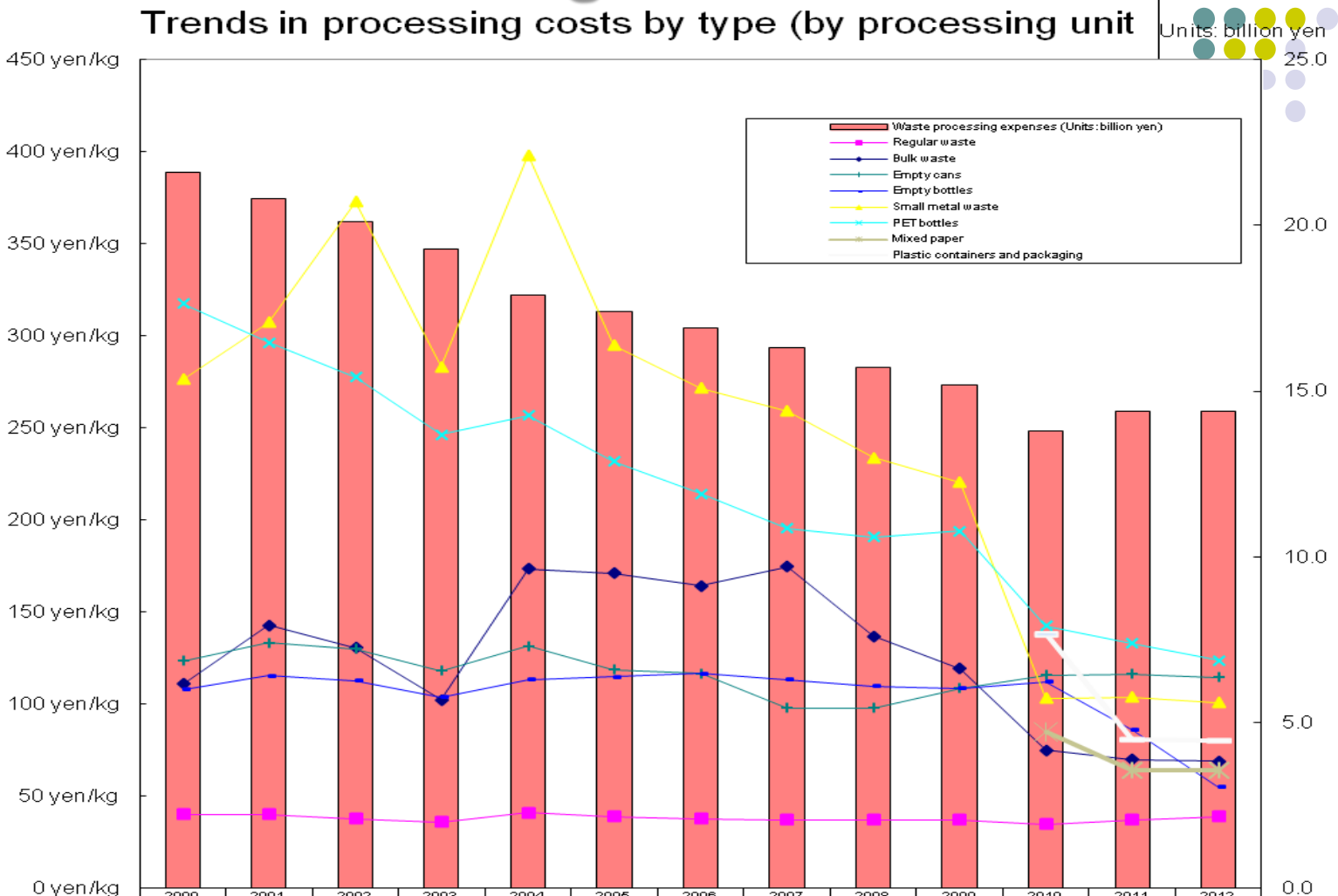


Results of the Plan (2)
Trends in the Amount of Waste Discharged



Total amount discharged (the amount recycled plus the amount incinerated) is decreasing while the population is continuing to increase.

Trends in Waste Management Costs



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Waste processing expenses (Units: billion yen)	21.6	20.8	20.1	19.3	17.9	17.4	16.9	16.3	15.7	15.2	13.8	14.4	14.4
Regular waste	40 yen/kg	40 yen/kg	38 yen/kg	36 yen/kg	41 yen/kg	39 yen/kg	38 yen/kg	37 yen/kg	37 yen/kg	37 yen/kg	35 yen/kg	37 yen/kg	39 yen/kg
Bulk waste	111.1 yen/kg	142.9 yen/kg	130.5 yen/kg	102.3 yen/kg	173.6 yen/kg	171.2 yen/kg	164.2 yen/kg	174.5 yen/kg	136.9 yen/kg	119.3 yen/kg	75 yen/kg	70 yen/kg	69 yen/kg
Empty cans	123.6 yen/kg	133.4 yen/kg	130.2 yen/kg	118.3 yen/kg	131.6 yen/kg	118.9 yen/kg	116.7 yen/kg	98 yen/kg	98 yen/kg	108.5 yen/kg	115.6 yen/kg	116.2 yen/kg	114.4 yen/kg
Empty bottles	107.9 yen/kg	115.5 yen/kg	112.7 yen/kg	103.9 yen/kg	113.5 yen/kg	114.9 yen/kg	116.6 yen/kg	113.4 yen/kg	109.9 yen/kg	108.7 yen/kg	112.1 yen/kg	86 yen/kg	55 yen/kg
Small metal waste	276.5 yen/kg	307.4 yen/kg	372.7 yen/kg	283.2 yen/kg	398.2 yen/kg	295 yen/kg	271.8 yen/kg	259.2 yen/kg	233.8 yen/kg	220.5 yen/kg	103.1 yen/kg	104 yen/kg	100.8 yen/kg
PET bottles	317.5 yen/kg	296.4 yen/kg	277.8 yen/kg	246.3 yen/kg	256.6 yen/kg	231.7 yen/kg	214.3 yen/kg	195.3 yen/kg	190.9 yen/kg	194 yen/kg	142.4 yen/kg	133 yen/kg	123.7 yen/kg
Mixed paper											85 yen/kg	64 yen/kg	64 yen/kg
Plastic containers and packaging											138 yen/kg	81 yen/kg	80 yen/kg

Aiming at realizing a sustainable & recyclable city for global environment

Thank you for your attention!!