

Efforts against Global Warming by the Sanitary Equipment Industry - FY 2021 Results for Carbon Neutrality Action Plan -



7th September 2022
Japan Sanitary Equipment Industry Association

0. Evaluation and Findings Pointed Out in Previous FY
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0. Evaluation and Findings Pointed Out in Previous FY

● Main comments and findings from the council

- ① It's said that revising the targets for FY2030 is being considered but what kind of schedule is being worked on?
- ② It's said that initiatives for 2030 and later are being considered toward carbon neutrality by 2050, please elaborate on the status of the considerations.



● Improvements and Additions for this Fiscal Year Based on the Findings Pointed Out

- ① Revisions Made to Phase II targets by 2030 based on the following.
 - The Association's FY2021 results (-63% compared to FY1990) meet the target level for 2030 (-55% compared to FY1990) updated in FY2017
 - Presentation of reduction targets for the government's industrial sector
 - ⇒ Industrial sector: -37.4% in 2030 compared to FY2013
 - Explanatory meeting of Ministry of Economy, Trade and Industry's Carbon Neutrality Action Plan (Held September 2021)
 - ⇒ Request for revision of 2030 targets (-38% recommended compared to 2013)

<FY 2030 Targets>

Compared to FY 2013 CO₂ Emissions -40% (Equivalent to -70% compared to FY1990)

- ② Toward the government's goal of "carbon neutrality by 2050" and "realization of a decarbonized society", the "2050 Carbon Neutrality Vision (Basic Policy, etc.)" of our industry association was formulated and through the website of the Association, information was made it known to participating companies of the Association and to the public. (See page 6)

1. Overview of Sanitary Equipment Manufacturing Industry (1)

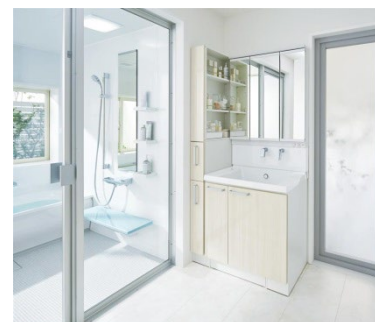
■ Manufacturing Industry of Sanitary Equipment

- Toilet bowls, urinals, wash basins, etc.
- Plumbing equipment (residential and public)



■ Industry size (FY 2021)

- Number of companies: 3
- Participating companies: Janis Ltd., LIXIL Corporation, TOTO LTD. (in alphabetical order)
- Market size: approximately 720.9 billion yen



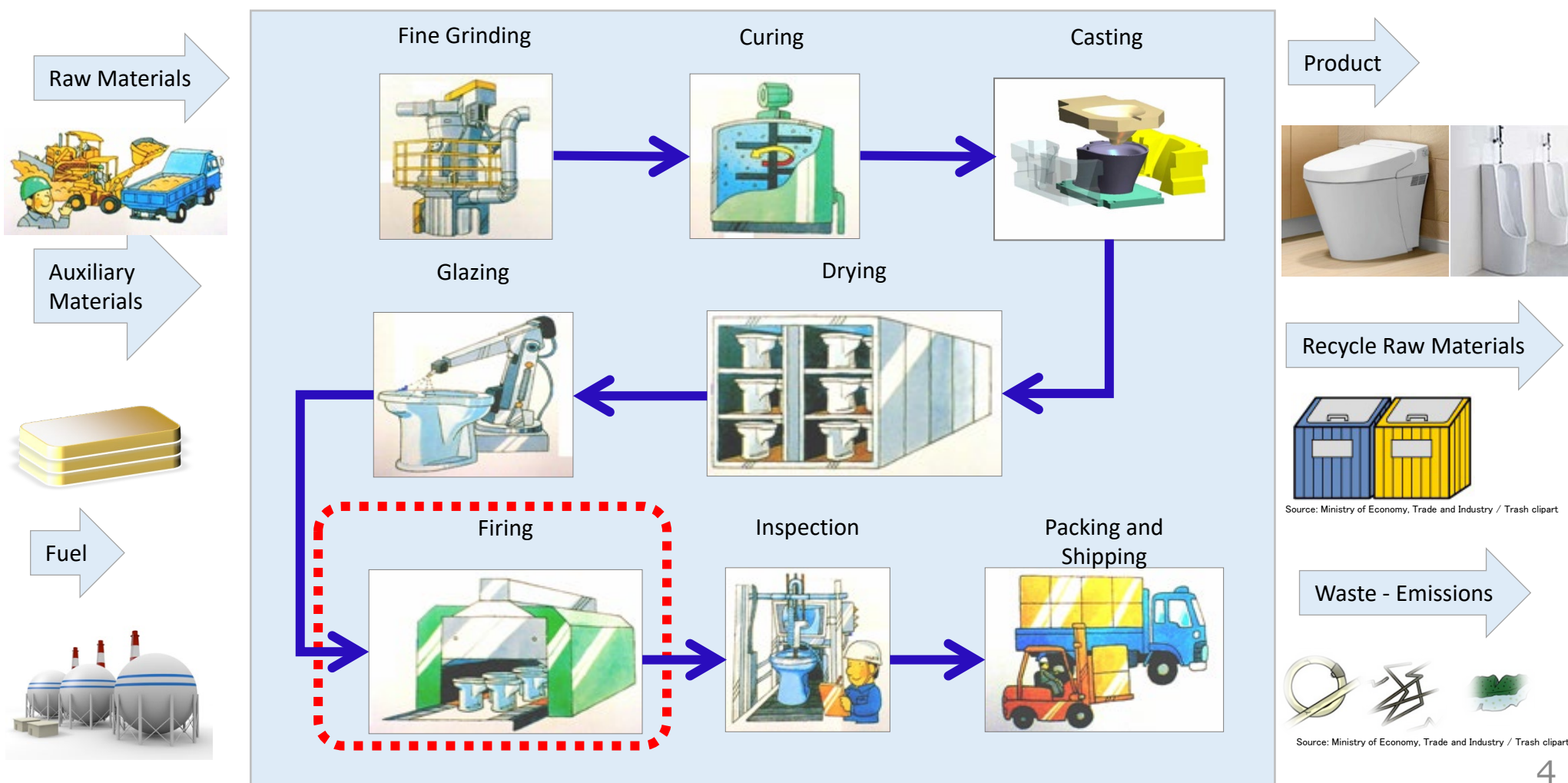
■ Current State of Industry

In FY2021, personal consumption recovered from the reaction to the previous fiscal year, when economic and social activities were significantly restrained due to the spread of the novel coronavirus pandemic, and in regard to housing investment, the number of new housing increased for the first time in three years to 866,000 units (up 6.6% from the same period last year), and the demand for renovation also increased.

The production value, which is an indicator of the amount of production activity in the industry, also increased from last year and was 720.9 billion yen (up 11.6% from the previous year, a 10.4% increase from FY 2013).

1. Overview of Sanitary Equipment Manufacturing Industry (2)

- Overview of sanitary ceramics production process (representative products of the industry)
 - About 60% of energy consumption in sanitary ceramics production process is in the firing process.
 - Energy consumption of the entire industry including other production processes is about 50% of electricity, about 50% of fuel.



1. Overview of Sanitary Equipment Manufacturing Industry (3)

- Participation in Environment Voluntary Action Plan (global warming countermeasures • low carbon society achievement plan • CN action plan)
 - In FY 2001, the former Japan Sanitary Equipment Industry Association set goals and launched Voluntary Action WG.
 - In April 2015, the “Japan Toilet Seat Association” was merged into the “Japan Sanitary Equipment Industry Association ” and each Sanitary Equipment Manufacturing company continued to work as Voluntary Action WG.

FY 2001	Participated in the 4th Japan Business Federation Voluntary Action Plan Follow-up (Global Warming Countermeasures). • The former Japan Sanitary Equipment Industry Association set goals. ⇒ "Reduce CO ₂ emissions from production plants in FY 2010 by 20% or more compared to FY 1990 levels ".
FY 2005	Started participating in and reporting for Ministry of Economy, Trade and Industry "Global Warming Countermeasure Efforts" .
FY 2007	• Target value increased. "Reduce the average amount of CO ₂ emissions of 5 years from FY 2008 to FY 2012 (first commitment period of the Kyoto Protocol) generated in production plants by 25% or more compared to FY 1990 levels "
FY 2010	• Reduction target of "Low Carbon Society Achievement Plan (Phase I) following Voluntary Action Plan" ⇒ "Reduce CO ₂ emissions from production bases in FY 2020 by 35% or more compared to FY 1990 levels. "
FY 2013	• End report for the first commitment period designated in the Kyoto Protocol. The target of Voluntary Action Plan was achieved . ⇒ Average amount of CO₂ emissions of the period from FY 2008 to FY 2012 : <u>reduction of 50.3%</u> (compared to FY 1990)
FY 2014	• Considered and reported the reduction target for FY 2020 and after (of Low Carbon Society Achievement Plan (Phase II))". ⇒ Improve CO₂ emissions basic unit from production bases in FY2030 by 49% compared to FY2005 levels.
FY 2018	• Revised and announced CO ₂ emission reduction targets for FY2020 and FY2030 in FY2017
FY 2021	- Reached the target of FY 2020, Low Carbon Society Achievement Plan (Phase I) ⇒ CO₂ emissions from production bases in FY2020 : <u>reduction of 63.3%</u> (compared to FY 1990) • Participated in the “Keidanren Carbon Neutrality Action Plan”
FY 2022	• Announced a vision for achieving carbon neutrality by 2050 • Revised and announced CO ₂ emission reduction targets for FY2030 (base year changed from FY1990 to FY2013)

Vision Towards Realization of Carbon Neutrality by 2050

Japan Sanitary Equipment Industry Association has been contributing to the betterment of living culture for people all over the world through sustainable development.

Going forward, we will continue our efforts in realizing a sustainable society by providing a safe, simple to use, and environmentally friendly restroom space.

● Details about CO₂ Emission Reduction Activities and Vision Setting So Far

Our industry was the first to complete the fuel conversion for firing kilns, which consume the largest amount of energy. Additionally, we have set reduction targets for 2020 and 2030 in our Low Carbon Society Achievement Plan, and have been working to reduce emissions from our domestic business activities.

In the future, in order to contribute to the "realization of a Carbon Neutral Society by 2050" announced by the government, we will strive to further reduce CO₂ emissions under Keidanren's Carbon Neutrality Action Plan.

【First Pillar】 (Reduce Emissions from Domestic Business Activities)

Based on Keidanren's Carbon Neutrality Action Plan, targets have been set for 2030 to strive to reduce emissions from domestic business activities and contribute to the global warming countermeasure plan set by the Japanese government.

【Second Pillar】 (Strengthening Cooperation with other interested groups)

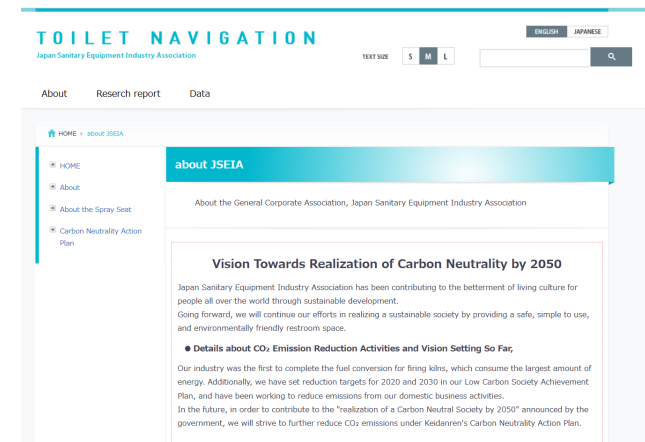
With the proliferation of water-saving toilets and energy-saving spray seat, households, businesses and other sectors, etc. will contribute to the reduction of CO₂ during use.

【Third Pillar】 (Promotion of International Contribution)

The proliferation of using water-saving toilets will contribute to the reduction of CO₂ during use overseas.

【Fourth Pillar】 (Development of Innovative Technologies Toward Carbon Neutrality by 2050)

Innovative technologies for carbon neutrality, which are being studied in other industries, will be applied to the production and business activities of sanitary ware of each member company, with the aim of practical application.



■ Target Index: FY 2030 (Phase II) (*revised in FY2022)

- Reduce CO₂ emissions in FY 2030 generated at production bases by **40% compared to FY 2013**.
(ref. Equivalent to a 70% reduction compared to FY1990)

■ Difference from the Previous Targets (background on FY2022 revision)

- The FY2021 results of the association (-63% compared to FY1990) meet the 2030 target level (-55% compared to FY1990) updated in FY2017
- Presentation of reduction targets for the government's industrial sector
⇒ Industrial Sector: -37.4% in 2030 compared to FY2013
- Ministry of Economy, Trade and Industry's Carbon Neutrality Action Plan briefing (held in September 2021)
⇒ Request for revision of 2030 targets (recommended -38% compared to 2013)

■ Reason for setting target level and its Validity

- As a result of forecasting the outlook using the average growth rate for the past 5 years, excluding the impact of Covid-19 in FY2020, production activity is expected to continue to increase in the future due to the expansion of the home renovation market, the development of high value-added products by various companies, and efforts to expand applications.
- CO₂ emissions have increased as a result of the above, however, efforts to reduce CO₂ by each participating company through energy-saving activities have exceeded the volume of production activities, and the target level has been set in consideration of this.

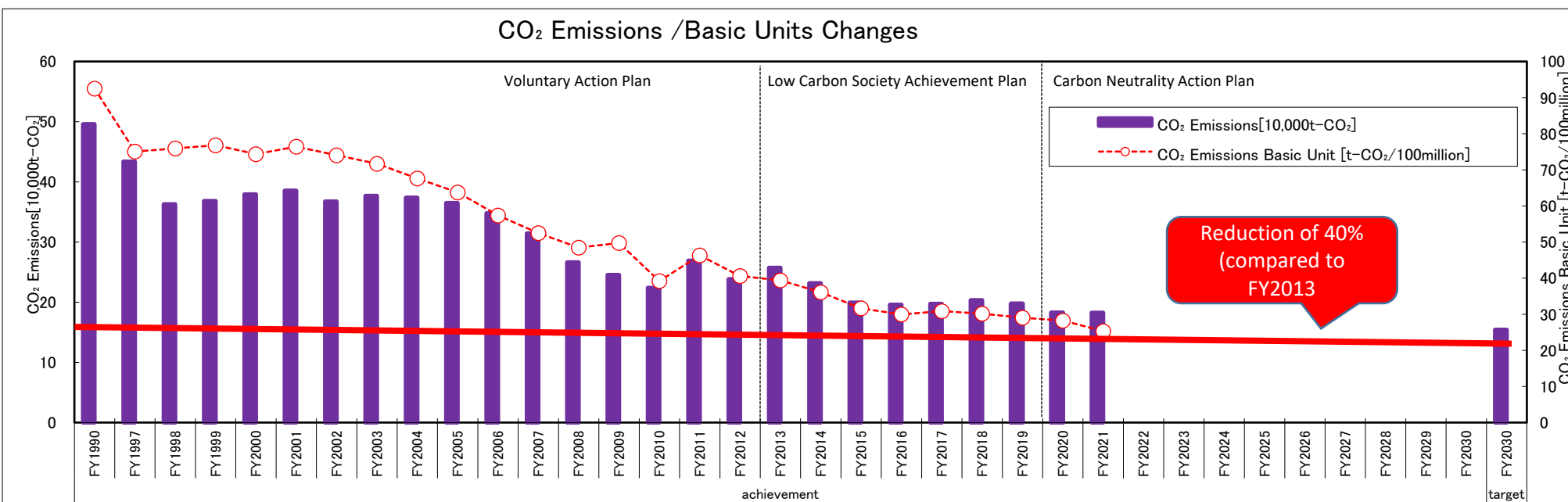
■ Applicable business scope

- **Domestic production bases** for sanitary equipment of each company which participates in Carbon Neutrality Action Plan. *The title of this plan has changed from “Low carbon Society Plan” to “Carbon Neutrality Action Plan” from FY2021.

3. Reduction of CO₂ emissions in FY2021 (1)

■ FY 2021 Achievements

- CO₂ Emissions: 183,000 t- CO₂ (reduction of 28.8% vs. FY 2013)



【Factor analysis】

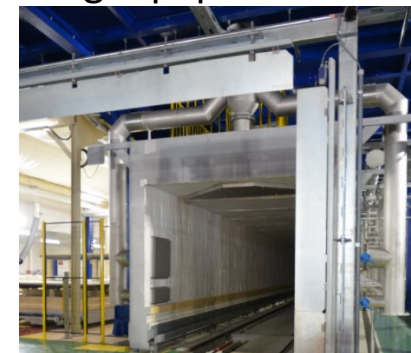
Energy consumption in FY2021 remained flat from the previous year, despite an increase in production activity (up 11.6% from the previous year). While there were factors that increased energy consumption, such as the deterioration of air conditioning efficiency from opening windows as a measure to prevent infection and the expansion of in-house production, the main reason is that the energy consumption rate improved by 9.5% from the previous fiscal year due to continuous energy-saving improvements such as switching to LEDs and replacing with high-efficiency equipment, and the consolidation and abolition of kilns.

The electricity emission factor in FY2021 was 4.36 t-CO₂/10,000 kWh, with CO₂ emissions down 28.8% from the base year and unchanged from the previous year, while CO₂ basic units decreased by 35.7% from the base year and decreased 10.2% from the previous year

3. Reduction of CO₂ emissions in FY2021 (2)

- Continued highly efficient manufacturing through renovation of manufacturing facilities also in FY 2021.
 - Each company promoted energy-saving measures, such as upgrading to energy-saving equipment and improving equipment efficiency.
 - Shifting to frequent and smaller measures and yet continuing investment in CO₂ reduction projects.

Major measures implemented in FY 2021	CO ₂ Reduction per FY (t-CO ₂)	Investment Amount (thousand yen)
Equipment efficiency improvement, energy saving measures, introduction of renewable energy	5,790	118,602
Consolidation and enhancement of process	749	1,358,400
Update of deteriorated equipment	472	242,600
Building renovation / Others	336	148,300
Conversion to LED lighting fixtures	3	1,000
Reduction of drying energy by consolidation of production bases	320	30,000
Total	7,670	1,898,902



eg. Latest energy saving firing kiln



eg. updating to the latest compressor (high efficiency top runner specifications)



eg. Combination of high-efficiency hydraulic motor and INV control

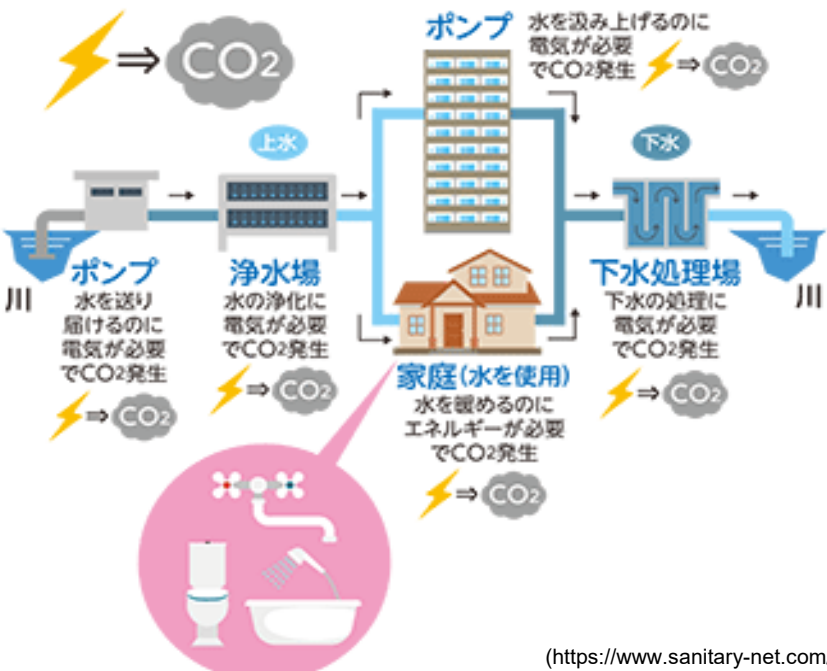
■ Contribution to CO2 Reduction from Saving Water

Water consumed by toilets is connected to the water supply and sewage systems, and electricity is consumed in the process of passing through these water supply and sewage infrastructures, resulting in the emission of CO₂ (Fig. 1). Therefore, we think that saving water through the spread of water-saving toilets will contribute not only to the conservation of water resources but also to "CO₂ reduction".

■ Publication of CO₂ Conversion Coefficient of Water

The industry association has compiled and published the recommendation value of " CO₂ Conversion Coefficient of Water" so that the amount of CO₂ reduction from conserving water can be calculated, and this conversion coefficient "0.54kg CO₂ / m³ (value announced in 2021 * 1 ~ * 4)" is recommended in calculations.

In Japan, it was published that if a household using flush toilets with a flush water volume of 13 liters is replaced with a water-conserving flush toilet with a flush water volume of 6 liters, the amount of CO₂ reduction converted from the amount of water conserved would be about 24.4 kg per unit per year.



(<https://www.sanitary-net.com/saving/>)

Fig. 1: Image of power saving and CO₂ reduction at water purification and sewage treatment plant due to water conservation

規格・基準



水のCO₂換算係数について

上下水道に接続される水まわり製品を使用することによって発生する水使用に由来するCO₂排出量の算出に当たり、当工業会では、次の換算係数を用いて計算することを推奨しています。

水のCO ₂ 換算係数	
0.54kgCO ₂ /m ³	(https://www.sanitary-net.com/trend/standard/standard-co2.html)

- * 1 Source: "Waterworks Statistics" published by Japan Water Works Association, "National Sewage Works Database" published by Japan Sewage Works Association
- * 2 Calculation of CO₂ emissions from factory wastewater, etc., are not considered.
- * 3 CO₂ conversion coefficient: water supply CO₂ conversion coefficient (CO₂ emission volume ÷ water supply volume) + sewage CO₂ conversion coefficient (CO₂ emission volume ÷ sewage treated water volume)
- * 4 Published value: CO₂ conversion coefficients is calculated based on actual data published for the past 5 years and average of the 5 years
<https://www.sanitary-net.com/news/news1292>

- Improving the performance of water saving toilets and promoting their use. Enlightenment on the website of the association.

Water Saving Toilet Bowl

● **Contribution to reducing CO2 emissions through the spread of water saving toilets: 7,800 t-CO2/year**

<Association Web Pages "Toilet Bowl Water Conservation/CO2 Reduction"> <https://www.sanitary-net.com/saving/>

トイレットの節水・CO2削減

Eco-friendly toilets

Water-saving toilets • CO₂ reduction



Does the toilet save the Earth?

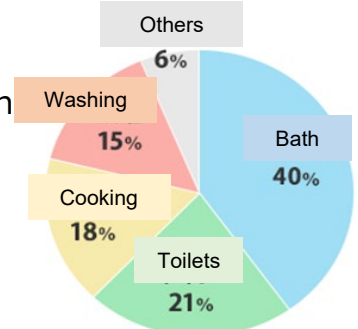
If a 13-liter flush toilet is replaced by 6-liter flush toilet, it is going to reduce 24.4kg CO₂ a year.

This means changing to the latest model with small flush water volume saves not only water, but also reduces CO₂ emissions. This leads to Eco-friendly life.

(Reference) Water consumption when using sanitary facilities at home

According to a survey by the Tokyo Metropolitan Government Bureau of Waterworks in FY2015, among water consumed at home, water used in toilets was said to be the second largest after baths, and can contribute to the conservation of water resources by conserving the amount of wash water used each time. The amount of water flushed in toilets, which was 13L until around 1996, has improved since 2006 by the efforts of companies participating in this industry, and the performance of water saving toilets has improved and their use has progressed, resulting in water saving toilets of 6L or less. 6L water saving toilets contribute to water saving by about 60% compared to 13L toilets.

(For a family of 4, about 45,260L per year, industry estimate)



Source: Bureau of Waterworks, Tokyo Metropolitan Government, FY2015 Fact-finding Survey by Purpose of General Household Water Use

- Amount of contribution to CO2 emission reduction: Amount estimated by multiplying the annual amount of flush water per unit of non-water saving and water saving toilets by the number of water saving toilets shipped this fiscal year and using the CO2 conversion factor for water.
- Non-water saving toilets: Toilets with average flush water volume in the market stock (estimated by the Association)
- Water saving toilets: All water saving toilets are calculated as toilet bowls, large flush: 6L, small flush: 5L.

4 . Contributions in Other Sectors through Low-Carbon Products and Services (3)

- Improve the performance and promote the use of energy saving warm water bidet toilet seats, and raise awareness on the website of the Association.

Warm Water Bidet Toilet Seat
●Energy saving (compared to 2008) Hot water storage type: Approx. 19% energy saving Instantaneous type: Approx. 29% energy saving
●Contribution to reducing CO2 emissions through the proliferation of energy-saving warm-water bidet toilet seats: 47,900 t-CO2/year

<Industry Association web pages "Energy-saving warm-water bidet toilet seat">
<http://www.sanitary-net.com/saving/ecology.html>

Eco-friendly toilets

Energy-saving of warm water bidet toilet seats



Bidet toilet seat is "a seat that has function to cleanse bottom with hot water". According to the Cabinet survey (March 2017), penetration rate for households is about 80%. This means many families use Bidet toilet seats. Energy-saving products save electricity charge and reduce CO₂ emissions.

Annual power consumption is the amount of power consumed in one year when the warm-water bidet toilet seat is used in an average manner at home.

■ Comparison of annual power consumption with warm water bidet toilet seats in 2008



* Source: Agency for Natural Resources and Energy, Ministry of Economy, Trade and Industry, "Energy Saving Performance Catalog Winter 2008 Edition", "Energy Saving Performance Catalog Simple average value in the model list described in the "2021 edition"

<Industry Association web pages "How to choose a warm water bidet toilet seat">
<http://www.sanitary-net.com/saving/ecology02.html>

Various Power Saving Function are Included for Points to Select Products
*Energy saving technology of evolving warm-water bidet toilet seats.

Power saving control	Timer power saving	Stop power to the heated toilet seat and hot water tank for a certain period of time.
	Automatic power saving	-Power saving with learning function- Learn what time period the toilet is not being used much and lower heating during that time.
Automatic open and close toilet Lid	Sensor will automatically open the lid when approached and close when leaving and prevents forgetting to close the lid. This improves the warming function of the heated seat and is effective in power saving.	
Instantaneous type (hot water)	Since water is heated only when using the bidet or rear wash, there is no need to maintain heating and saves power.	
Momentary heating toilet seat	Saves power when heating seat is not in use.	
Toilet lid that fits shape of toilet seat	Prevents heat dissipation from sides of toilet seat.	
Toilet lid that covers main unit	Prevents heat dissipation from gaps between toilet seat and main unit.	

● Contribution to CO2 emission reduction: Based on the annual power consumption of the current standard (FY2012 standard), the difference in the annual power consumption of each energy-saving product shipped, in other words, the amount of electricity saved, is multiplied by the CO2 conversion factor of electricity, and the total amount is the contribution to CO2 emission reduction. (The CO2 conversion factor for electricity is calculated based on Electricity Business Council for a Low Carbon Society source: 4.36t-CO2/10,000 kWh)

● Hot water storage type: The water in the tank is heated by a heater, and can be cleaned with plenty of hot water at once, but electricity is required to keep the hot water warm.

● Instantaneous type: There is no tank, and the water is heated with an instantaneous water heater for each use. Since no electricity is required to keep the hot water warm, the power consumption is lower than the "storage type", but the amount of hot water is limited. It also momentarily requires a large amount of power.

4. Contributions in Other Sectors through Low-Carbon Products and Services (4) *JSEIA*

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■ Popularization of water saving appliances due to revision of JIS A5207 (sanitary equipment - toilets and basins)

- By establishing classifications for the volume of water flushed in urinals and unifying the test methods, we will promote the development of water saving equipment and it will serve as a guideline for procurement and product selection, and it is expected that the proliferation of these products will contribute to water resource conservation and CO2 reduction. This year, we are promoting a review of JIS A5207, which is consistent with ISO 31600 (being formulated).

Contribute to water resource conservation and CO2 reduction by revising JIS A5207 (sanitary equipment) that is compliant with ISO 31600 (water efficiency labelling programme- requirements with guidance for implementation)

● In addition to aligning urinal standards with ISO 31600, a new classification based on the amount of flushing water will be established, and flushing water volume test methods and performance test methods that ensure quality that balances water conservation and hygiene will be specified. We are aiming to publish the revision in 2022

[Flushing Water Volume Classification and Type (draft)]

Type	Category	Flush water Volume (L)	
Urinal	Type I	4.0 or less	Water saving type
	Type II	2.0 or less	Water saving type

Type	Type Name			Symbol	
	Water supply system	Installation	size	Type I	Type II
Urinal	Cleaning valve system	On floor	Large	U510	—
			Small	U511	—
		Wall hanging	Large	U520	—
			Small	U521	—
	Dedicated Cleaning valve system	On floor	Large	—	U610
			Small	—	—
		Wall hanging	Large	—	U620
			Small	—	—



Cleaning valve system urinal



Dedicated Cleaning valve system
urinal

5. Contribution to Reduction Overseas

■ Contributing Internationally by Popularizing Water Saving Toilets

- In order to popularize water saving toilets overseas, participated in the promotion of the Green Building Materials Project (common name for the Ministry of Economy, Trade and Industry project commissioned by the Japan Building Materials and Housing Equipment Industries Association) and is continuing activities to introduce Japan water saving toilet standards to ASEAN countries. In addition, we participate in ISO/PC316 as a P member and are engaged in developing international standards for water saving rules.
- In the industry, we continuously raise awareness that we can contribute to water resource conservation and CO2 reduction with water saving toilets through various media such as our website and other media.

ISO/PC316 Development activities for international standards on water saving rules for the proliferation of water saving equipment

- In January 2018, Australia's proposal to study international standardization was approved, and the standardization project committee (PC316) was launched. It aims to be enacted in 2022.

[Formulation of water efficiency standards]

- Toilets and urinals
- Faucets, showers



[Draft ISO 31600 Requirements]

Should include the following in existing national standards of each country:

- ① Product testing method
- ② Water saving effect evaluation criteria
- ③ Labelling &/or Rating

Conforms to ISO if compliant

Raising awareness of contributions to water resource conservation and CO2 reduction through the spread of water saving toilet

- Raise awareness through media such as websites, using the effects of water saving and CO2 reduction through the introduction of water saving toilets in Japan as examples.

<Association Web Pages "Toilet Bowl Water Conservation/CO2 Reduction"> <https://www.sanitary-net.com/saving/>

Eco-friendly toilets

Water-saving toilets • CO₂ reduction



Does the toilet save the Earth?

If a 13-liter flush toilet is replaced by 6-liter flush toilet, it is going to reduce 24.4kg CO₂ a year.

This means changing to the latest model with small flush water volume saves not only water, but also reduces CO₂ emissions. This leads to Eco-friendly life.

6. Status of Development and Introduction of Innovative Technologies, BAT, Best Practice Progress and Introduction

■ Best Practice, Introduction and promotion of BAT*

- Innovative technologies are being studied by individual companies. Maximum introduction of top-runner equipment is being promoted.

Introduction of BAT



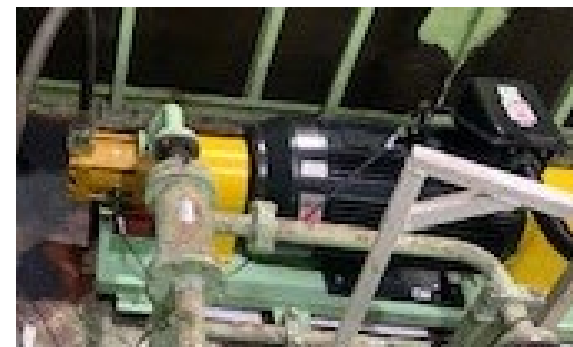
eg. Latest energy-saving firing kiln



eg. Compressor efficiency
(Equipped with visualization system)



eg. Solar power generation installation



eg. Combination of hydraulic motor and INV control

* BAT : Best Available Technology

7. Other efforts (1)

■ Efforts by Operations Division

- Each individual company promotes company-wide CO₂ reduction activities involving Operations Division.

■ Initiatives by Transport Division

- Each company as a consignor, collaborates with transport companies to carry out measures to improve transport efficiency.

- 1) Review logistics plan (development of redistribution bases, routine routes pickup, etc.)
- 2) Improve transport efficiency (loading efficiency, request eco-driving to drivers etc.)
- 3) Periodically report as a specific consignor of Energy Saving Act.
- 4) No idling while loading
- 5) CO₂ reduction by reducing use of trucks
- 6) Use of joint delivery

■ Efforts to dispatch information (in Japan)

- Industry Association: Introduce CO₂ emissions reduction efforts through water conservation on website.
- Individual Companies: Posted environmental initiatives on each company's website.



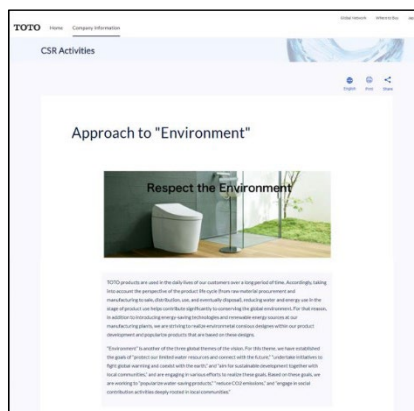
eg. Light Switch Array



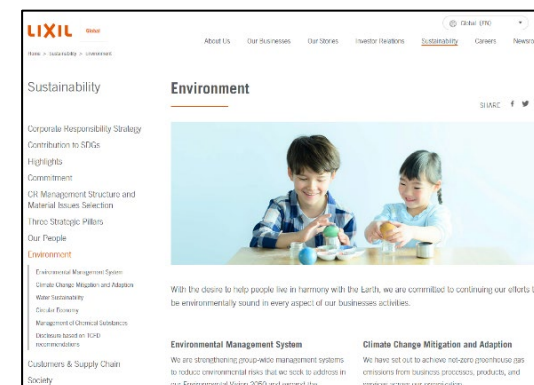
eg. Reduction of showroom lighting



http://www.janis-kogyo.co.jp/aboutus/quality_control.html



<https://jp.toto.com/en/company/csr/environment/>



<https://www.lixil.com/en/sustainability/environment>

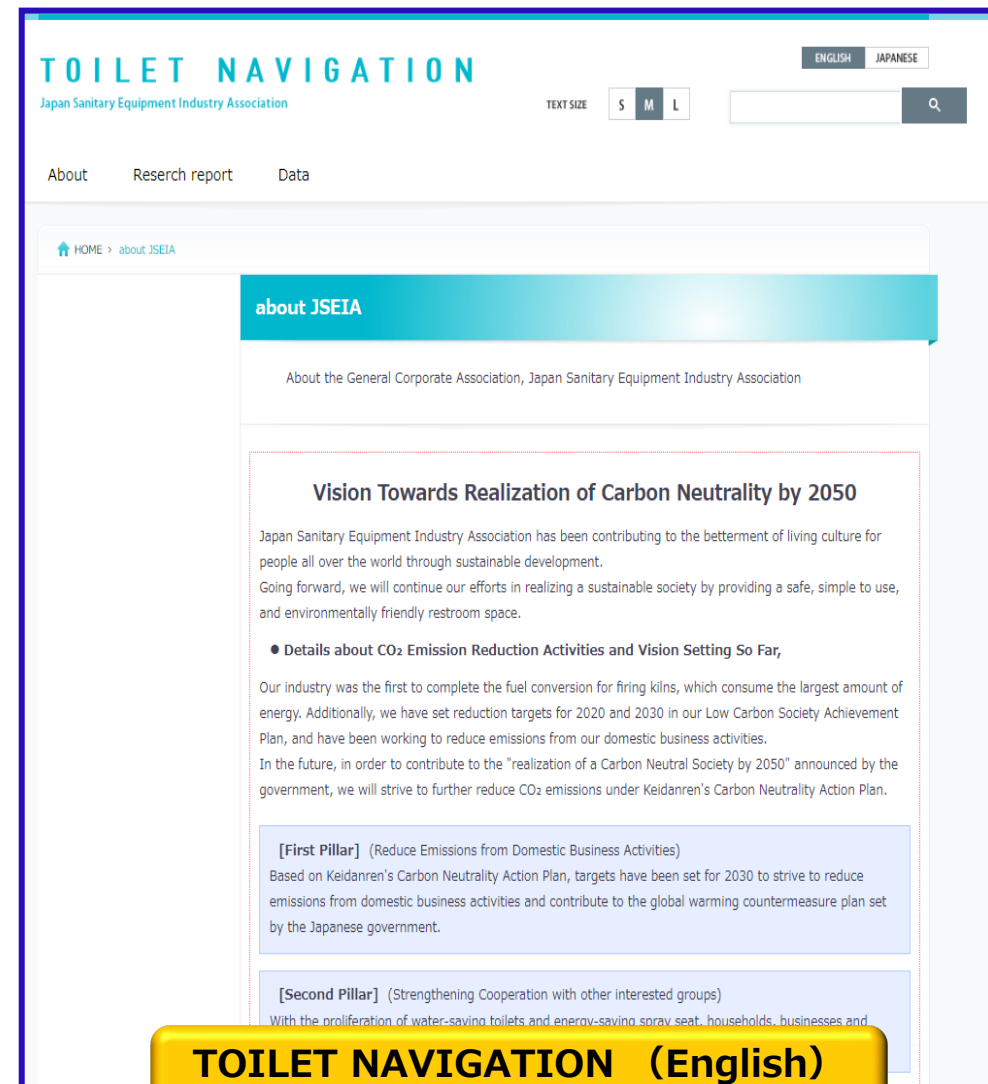
7. Other efforts (2)

■ Dispatch information (to overseas)

— Contribution to the environment is introduced on the Association's web site, "Toilet Navigation".






TOILET NAVIGATION (Japanese)
<http://www.sanitary-net.com/>



TOILET NAVIGATION (English)
<http://www.sanitary-net.com/global>

7. Other efforts (3)

■ The number of companies participating in International Initiatives

TCFD Task force on Climate related Financial Disclosures	SBT Long-term target for CO2 reduction according to scientific basis	RE100 Renewable Energy100%
		
4 companies	4 companies	3 companies

A photograph showing a person in white clothing walking a light-colored dog on a leash. To the right of the person is a modern, white smart toilet. The scene is set outdoors with a blurred green background. A semi-transparent blue circle is drawn around the dog's head, and the text "Happy life with Toilets" is overlaid on this circle.

Happy life with Toilets

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<https://www.sanitary-net.com/>