

Efforts against Global Warming by the Sanitary Equipment Industry - FY 2020 Results for Carbon Neutrality Action Plan -



3rd September 2021
Japan Sanitary Equipment Industry Association

0. Things pointed out from last year's council of CO₂ reduction
1. Overview of Sanitary Equipment Manufacturing Industry
2. Overview of "Carbon Neutrality Action Plan" of Sanitary Equipment Industry
3. Reduction of CO₂ emissions in FY2020
4. Contribution through other sectors' efforts for promotion of low-carbon products and services
5. Promotion of international contribution
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0. Things pointed out from the council of CO₂ reduction of the last year

- **Main comments and findings from the council**

On October 26, Prime Minister Yoshihide Suga set a goal of reducing greenhouse gas emissions to virtually zero by 2050 in his policy speech. It is expected that industry associations will also set a goal of greenhouse gas emissions virtually zero by 2050. As of now, does the goal for FY 2030 take this into account?

The report says the goal for FY 2030, which was set in 2017, will not be revised due to the impact of global pandemic. However, the goal has already been reached in 2020. It is recommended to revise the goal for FY 2030.



- **Revisions in FY2020 reflecting the comments described above**

Our Low Carbon Society Achievement Plan by FY2030 didn't take into account virtually greenhouse gas emissions zero by 2050. We will revise the goal for FY 2030 by considering the goal which Japanese government has set by 2050.

This year we will keep the goal for FY2030 as we set in 2017 because it's difficult to estimate our production activity due to the spread of Covid-19, however we will regularly keep checking whether the goal for FY 2030 needs to be revised.

1. Overview of Sanitary Equipment Manufacturing Industry ①

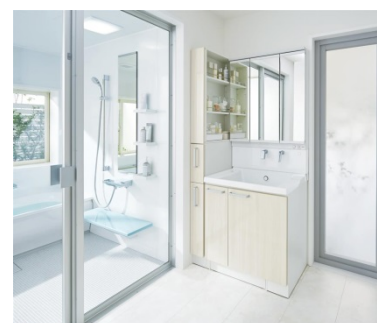
■ Manufacturing Industry of Sanitary Equipment

- Toilet bowls, urinals, wash basins, etc.
- Water related equipment (residential, public)



■ Industry size (FY 2020)

- Number of companies: 3
- Participating companies: Janis Ltd., LIXIL corporation, TOTO Ltd. (in alphabetical order)
- Market size: approximately 646.2 billion yen



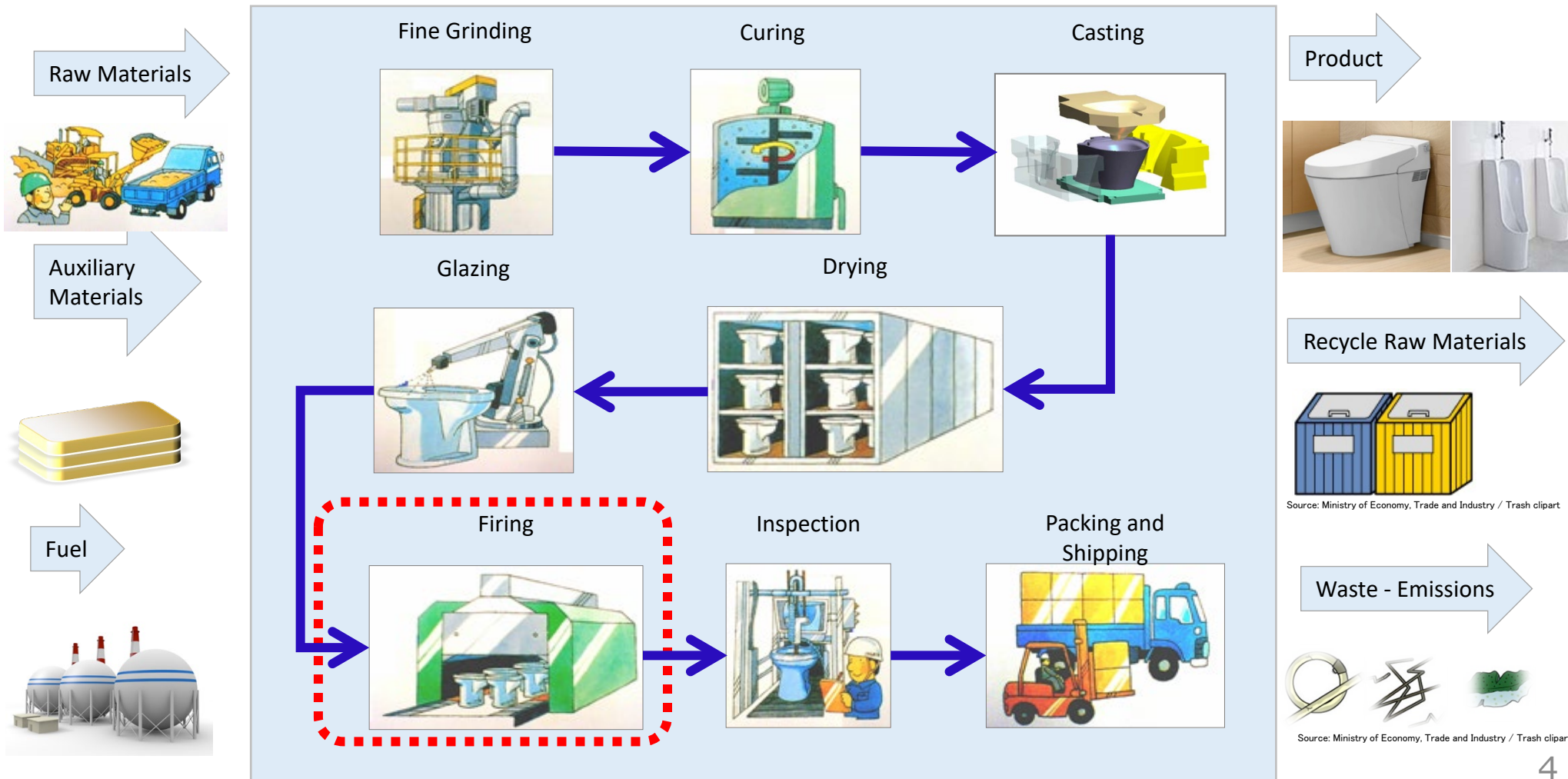
■ Current State of Industry

- In 2020, strong restrictions on economic and social activities due to the spread of Covid-19 caused consumer spending to drop drastically.
- In regards to housing investments, the number of new housing starts was 815,000 units (down 9.9% from the same term last year) ; it was still below the previous year's level.

The production value, an indicator of our industry's production activity, is 646.2 billion yen which decreased from last year (down 5.0% from the same term last year, up 20.6% from FY1990) .

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 60% of electricity, about 40% of fuel.



1. Overview of Sanitary Equipment Manufacturing Industry ③

■ Participation in the Japan Business Federation (Keidanren) Environment Voluntary Action Plan (global warming countermeasures • low carbon society achievement 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. ⇒ Launched Voluntary Action WG ⇒ "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 the Japan Business Federation Environmental Headquarters "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 | · Reviewed CO ₂ reduction target of both FY2020 and FY2030 in FY2017 and announced the target officially |
| 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) |

2. Overview of " Carbon Neutrality Action Plan "

■ Target Index: CO₂ emissions

- FY 2020 (Phase I) (*revised in 2017)

Reduce CO₂ emissions in FY 2020 generated at production bases by **50% compared to FY 1990**. (29.2% reduction of CO₂ emissions compared to FY2013)

- FY 2030 (Phase II) (*revised in 2017)

Reduce CO₂ emissions in FY 2030 generated at production bases by **55% compared to FY 1990**. (13.2% reduction of CO₂ emissions compared to FY2013)

■ Background on Target Revision

- The amount of reduced CO₂ emissions exceeded the Target level set in 2010 and 2015 due to the hard work of individual company.

■ Reason for setting target level and its Validity

The target level was set based on forecast of think tanks etc. by taking into consideration the following assumptions.

- Decrease in new housing starts
- Slight increase in renovation demand
- CO₂ emissions reduction through energy-saving activities of individual company
- CO₂ emissions increase due to the improvement of working environment (additional installation of air conditioning at factories, etc.) as part of work style reforms.

■ 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"

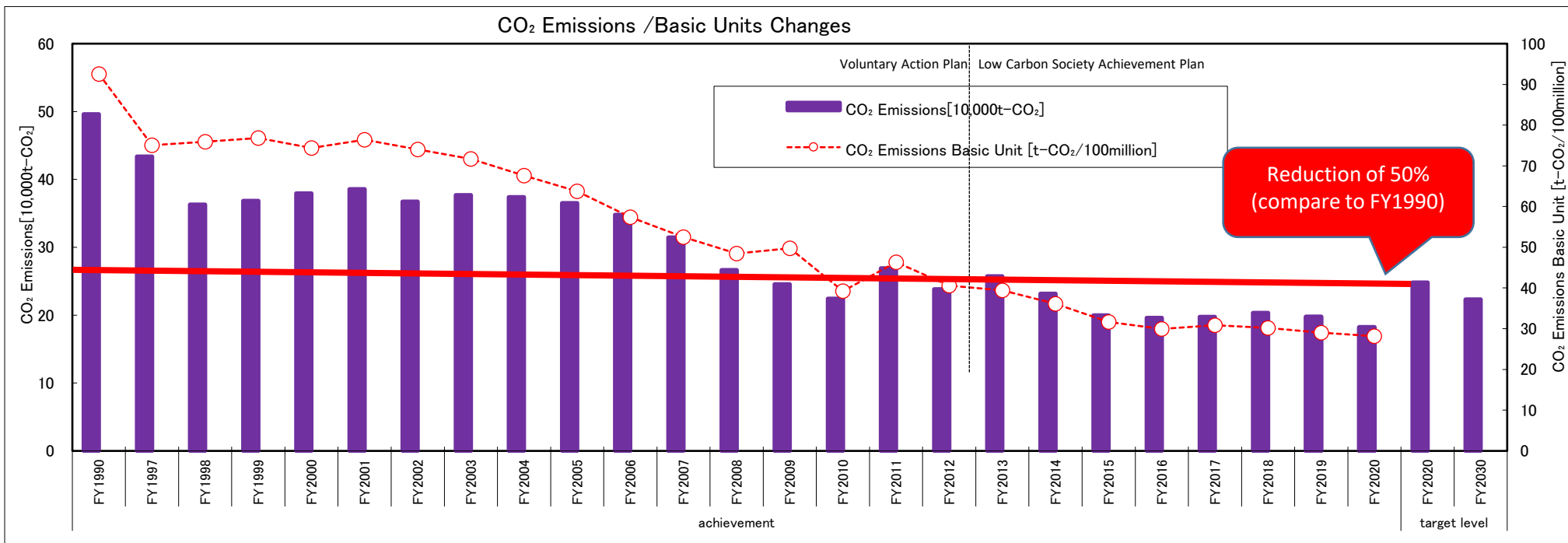
■ Vision for carbon neutrality

- As we ensure consistency with the government's 2030 targets, and base on our achievements and summary of Phase I of Low Carbon Society Achievement Plan, we will continue to review the industry's policy and vision for 2050.

3. Reduction of CO₂ emissions in FY2020 ①

■ FY 2020 Achievements

- CO₂ Emissions: 182,000 t- CO₂ (reduction of 63.3% vs. FY 1990)



Reduction of 50% (compare to FY1990)

【Factor analysis】

The volume of energy consumption in FY2020 decreased by 6.8% from the previous year. While there were factors to increase energy consumption, such as the deterioration of air conditioning efficiency due to opening windows as a measure to prevent infection and the expansion of in-house production, the energy consumption basic units improved by 2.0% from the previous year owing to 5% production activity decrease due to the spread of COVID-19, continued energy-saving improvements such as switching to LEDs and replacement with highly efficient equipment, as well as the elimination and consolidation of kilns. Therefore these would be the main factors to decrease CO₂ emissions. The electricity emission factor was 4.39kg-CO₂/kWh in FY2020 and CO₂ emissions decreased by 63.3% from FY1990 and by 8.1% from the previous year. CO₂ emissions basic units decreased by 69.5% from FY1990 and by 2.8% from the previous year.

3. Reduction of CO₂ emissions in FY2020 ②

- Continued highly efficient manufacturing through renovation of manufacturing facilities also in FY 2020.
 - 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 2020 | CO ₂ Reduction per FY (t-CO ₂) | Investment Amount (thousand yen) |
|--|---|----------------------------------|
| Energy-saving measures eg. Introduction of Renewable energies | 11,048 | 9,266 |
| Consolidation and enhancement of process | 364 | 419,020 |
| Update of deteriorated equipment | 283 | 112,500 |
| Update of substation | 1 | 24,700 |
| Building renovation | 159 | 17,339 |
| Change to LED lights | 1 | 600 |
| Reduction of firing energy by consolidation of production bases | 1,919 | 15,000 |
| Total | 13,775 | 598, 425 |



Upgraded to the latest compressor(w/ highly efficient , visualization system)



LED lights



Top runner spec.(best energy efficient) pump unit 8

4. Contribution through other sectors' efforts for promotion of low-carbon products and services ①

■ Improvement and dissemination of low-carbon products

- Improved performance of water conserving toilets, integrated bidet toilet seats, etc.
- Educational activities on Japan Sanitary Equipment Industry Association website.

Toilet Bowl Flush Water Volume

1970s: 13 liters ⇒ 1990s: 8 liters ⇒ 2006 and later: 6 liters

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.

If all toilets are replaced by 6-liter flush toilets...

※The following figures include toilets in public and commercial facilities.

The amount of water saved will be 1,432,522m³ a day and 522,870,530m³ a year !

Energy saving bidet toilet seat (FY 2020vs FY 2010)

Hot water storage type: about 11% energy saving
On-demand type: about 10% energy saving

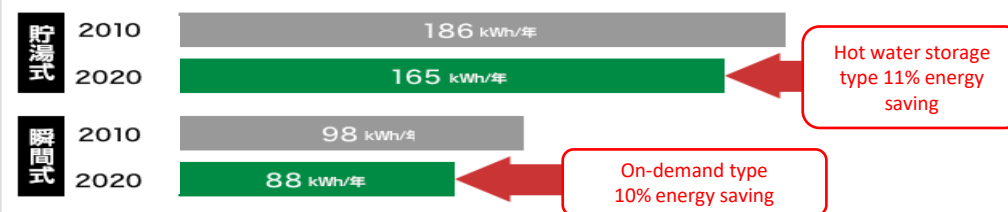
Eco-friendly toilets

Energy-saving 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.



Hot water storage type: System where water in tank is heated with a heater, and abundant amount of hot water is available. However, electricity to maintain heated water is necessary.

On-demand type: No tank, water is instantly heated each time used. Electricity to maintain heat is unnecessary and power consumption is less than "Hot water storage type", however the amount of hot water is limited. Additionally, a large amount of power is needed instantly.

4. Contribution through other sectors' efforts for promotion of low-carbon products and services ②

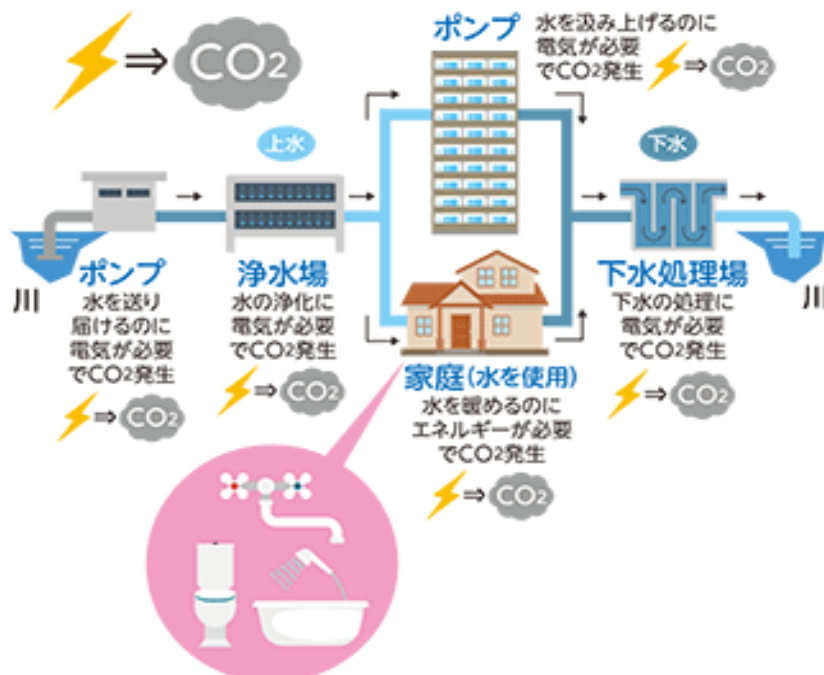
■ Summary of Low-Carbon Products, Services, etc.

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 ~ * 5)" 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.



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CO₂換算係数

0.54kgCO₂/m³

- * 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 up to FY2018 and average of the 5 years
- * 5 Confirmed in April 2021

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

4. Contribution through other sectors' efforts for promotion of low-carbon products and services ③

■ 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.



Light Switch Array



Reduction of showroom lighting



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



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



<http://www.lixil.com/jp/sustainability/environment/>

4. Contribution through other sectors' efforts for promotion of low-carbon products and services ④

■ 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>

5. Promotion of International Contribution

■ International Contribution through Dissemination of Water Conserving Toilets

- Through participation in the promotion (Ministry of Economy, Trade and Industry Policy, Construction Materials Industry Association Contracted Project) of Green Construction Materials Business (common name), disseminate Japan's water conserving toilet standards to ASEAN countries.
- In this industry, we are continuing to raise awareness through various media such as our website that contributing to the conservation of water resources and the reduction of CO₂ is possible through the spread of water-saving toilets.

Introduction support of overseas standards for Dissemination of Water Conserving Toilets

● In FY2020, we decided not to visit ASEAN countries because of the pandemic, but we presented Japan's water conserving toilet standards to the countries online by using video

(Reference) Regular Support by visiting following countries

■ Vietnam (Water-saving labeling system for water-related products)

- Promotion of introduction to Vietnam national standards regarding "water-saving labeling system for water-related products"

■ Indonesia

- Follow up on the process of issuing "water conserving toilet" standard

■ Other ASEAN countries (Philippine, Malaysia and Singapore)

- Considering starting new projects

Raising awareness of water resources conservation and reduction of CO₂ emissions by the spread of water-saving toilets

● Raising awareness through various media such as our website, introducing the effects of water-saving and reduction of CO₂ with the introduction of water-saving toilets in Japan

トイレでエコ

大便器の節水・CO₂削減



トイレが地球を救う！？

洗浄水量13リットルの便器（※）をお使いのご家庭で、洗浄水量6リットルの節水型便器に交換した場合、節水量から換算されるCO₂削減量は、年間約24.4kgになります。

（※）1996年ころまでの主な出荷品の水量

つまり、洗浄水量の少ない最新型の便器に交換するだけで、「節水」だけでなく、「CO₂」削減につながる「エコライフ活動」を行っていることになります。

6. Development and Introduction of Innovative Technologies

■ Best Practice, Introduction and promotion of BAT*

- Promote maximum introduction of the latest energy saving equipment for production base infrastructure.

Introduction of BAT



eg. Upgraded to highly efficient, visualization system mounted compressor



eg. Higher-efficient air conditioning (individually controllable, ductless multi-



eg. LED lights






eg. Top runner spec. energy efficient pump unit

* BAT : Best Available Technology

7. Other efforts

■ The number of companies participating in International Initiatives

| | | |
|--|--|---|
| <p>TCFD Task force on Climate related Financial Disclosures</p> | <p>SBT Long-term target for CO2 reduction according to scientific basis</p> | <p>RE100 Renewable Energy100%</p> |
|  |  |  |
| <p>2 companies</p> | <p>2 companies</p> | <p>2 companies</p> |

References (Major achievements)

Fuel conversion of existing kilns (shift to small CO₂ emission factor fuel) , which can expect significant CO₂ emissions reduction, has completed. While measures are shifting to more frequent and smaller ones, investment in CO₂ reduction projects continues. The total reduction of CO₂ emissions and investment amount: about 118 thousands t- CO₂, 17.0 billion yen.

| FY | Total reduction of CO ₂ (t -CO ₂) | Total investment amount (thousand yen) |
|--------------|--|--|
| 2000 | 2,075 | 54,000 |
| 2001 | 5,460 | 98,200 |
| 2002 | 6,200 | 127,000 |
| 2003 | 3,523 | 46,400 |
| 2004 | 5,580 | 292,450 |
| 2005 | 1,669 | 333,800 |
| 2006 | 2,591 | 201,222 |
| 2007 | 4,823 | 521,586 |
| 2008 | 2,266 | 152,224 |
| 2009 | 3,783 | 534,014 |
| 2010 | 4,074 | 173,780 |
| 2011 | 4,657 | 4,081,050 |
| 2012 | 7,168 | 1,103,650 |
| 2013 | 15,083 | 1,963,178 |
| 2014 | 4,420 | 289,867 |
| 2015 | 5,606 | 1,052,126 |
| 2016 | 6,387 | 659,563 |
| 2017 | 3,050 | 1,588,286 |
| 2018 | 3,948 | 1,172,679 |
| 2019 | 12,297 | 1,925,500 |
| 2020 | 13,775 | 598,425 |
| Total | 118,435 | 16,969,000 |



Happy life with Toilets

JAPAN SANITARY EQUIPMENT INDUSTRY ASSOCIATION

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