The Cement Industry in Japan 2026

The Cement Industry in JAPAN

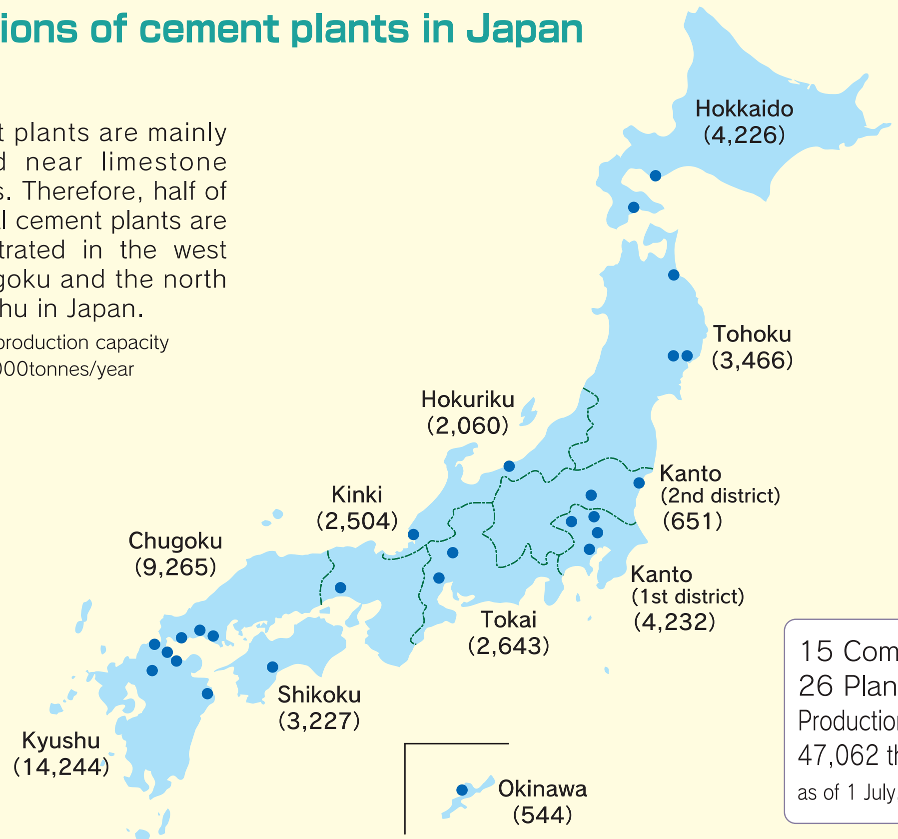
JAPAN CEMENT ASSOCIATION

Current state of the cement industry

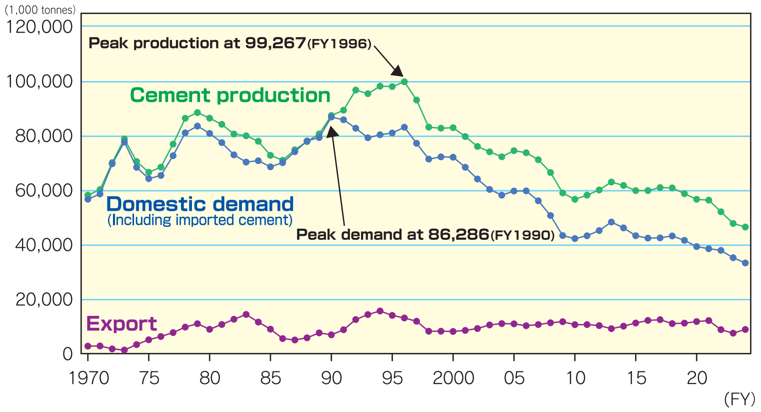
Locations of cement plants in Japan

Cement plants are mainly located near limestone quarries. Therefore, half of the total cement plants are concentrated in the west of Chugoku and the north of Kyushu in Japan.

※Clinker production capacity
Unit: 1,000tonnes/year



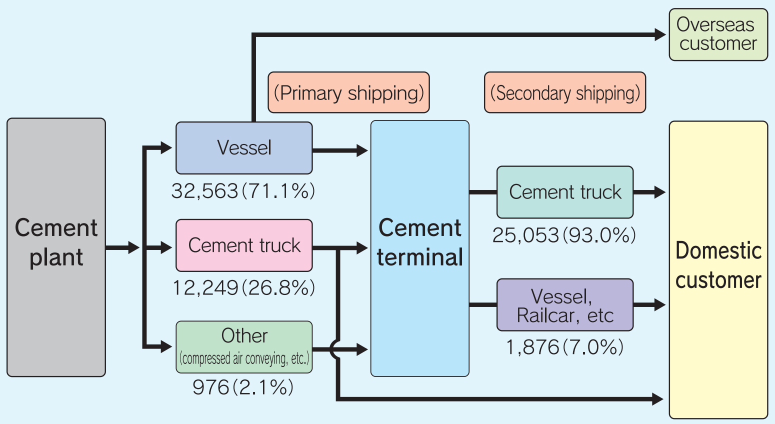
15 Companies
26 Plants
Production capacity :
47,062 thousand tonnes/year
as of 1 July, 2025



Supply and demand trend

Distribution system to users in Japan

Most cement is used in "concrete" and 70% of cement is shipped to ready-mixed concrete plants. Because ready-mixed concrete needs to be delivered to a construction site within 90 minutes of mixing, ready-mixed concrete plants are spread all over the country. In order to deliver cement to these users in the most economical as well as effective manner, cement manufacturers have their own service stations (cement terminals).



Cement logistics system(FY2024) (Unit: 1,000 tonnes)

Promoting efficiency in distribution costs and reducing environmental impact.

There are 331 service stations across the country, 80% of which are located in the coastal areas. Large vessels dedicated to cement shipping are widely used for mass transportation. They also transport blast furnace slag or coal ash on the way back, striving to reduce logistic costs. Furthermore, upsizing the capacity of trucks also contributes to streamlining the transportation sysytem. Such rigorous efforts for rationalisation also lead to reducing pressure on the environment.

Using wastes and by-products for cement production

A lot of wastes, by-products and garbage generated from industries and households actually consist of the same constituents as those found in cement. Taking advantage of the fact that no secondary waste, and only a negligible amount of dioxin, is generated in the process of cement production, the cement industry is striving to recycle waste materials and by-products. Effective use of waste materials and by-products not only contributes to saving natural resources but also helps with extension of a remaining life of final disposal sites for waste materials which is currently a nationwide issue.

The amount of wastes and by-products used for cement production

(Unit: 1,000 tonnes)

Type	Used for	FY1990	FY2000	FY2010	FY2020	FY2021	FY2022	FY2023	FY2024
Coal ash	Raw materials, Admixture	2,031	5,145	6,631	7,286	7,450	6,893	6,294	6,188
Blast furnace slag	Raw materials, Admixture	12,213	12,162	7,408	6,981	6,939	6,519	5,420	5,110
Sludge	Raw materials	341	1,906	2,627	2,950	2,904	2,864	2,653	2,627
By-product gypsum	Raw materials(Additive)	2,300	2,643	2,037	2,032	2,098	2,000	1,764	1,740
Incineration ash(excluding coal ash),Soot, Dust	Raw materials	468	734	1,307	1,482	1,471	1,534	1,418	1,324
Waste soil from construction	Raw materials	–	–	1,934	1,241	1,159	946	963	826
Waste plastic	Heat energy	0	102	445	746	774	784	794	820
Non-ferrous slag	Raw materials	1,559	1,500	682	725	708	612	539	511
Steel slag	Raw materials	779	795	400	364	439	388	385	450
Woodchips	Heat energy	7	2	574	437	400	379	406	367
Foundry sand	Raw materials	169	477	517	336	379	365	351	336
Recycled oil	Heat energy	51	239	195	282	236	256	266	284
Waste oil	Heat energy	90	120	275	245	302	273	257	284
Waste white clay	Raw materials, Heat energy	40	106	238	260	267	272	291	269
Cullet	Raw materials	0	151	111	154	151	142	162	121
Meat and Bone meal	Raw materials, Heat energy	0	0	68	71	71	68	62	58
RDF, RPF	Heat energy	0	27	48	46	34	39	51	53
Waste tire	Raw materials, Heat energy	101	323	89	69	68	80	62	52
Coal mining waste	Raw materials, Heat energy	1,600	675	0	0	0	0	0	0
Others	–	14	253	408	447	445	462	440	447
Total	–	21,763	27,359	25,995	26,155	26,294	24,878	22,579	21,867
Cement production		86,849	82,373	55,903	55,894	55,588	51,339	47,049	45,748
Consumption per ton of cement (kg/t)		251	332	465	468	473	485	480	478

Note 1) "Sludge" includes sewage sludge from waste water treatment plants.
Note 2) "Coal ash" includes not only coal ash from power plants, but also coal ash from other industries.

On the other hand, the cement industry supports the recovery and reconstruction of disaster areas by using disaster waste as a raw material and energy for cement production.

Examples of the disaster wastes
Left: Tatami mats wet with muddy water
Right: Rice straw mixed with sediment

Disasters and their disaster wastes utilized for cement production since 2004

Date	Type of Disaster(Location)	Main Disaster Wastes
2004.Oct.	Earthquake(Niigata-Chuetsu)	Wood chips
2007 Mar.	Earthquake(Noto peninsula)	Wood chips
2007 Jul	Earthquake (off the coast of Chuetsu)	Wood chips
2011 Mar.	Great East Japan Earthquake	Wood chips, Mixed disaster debris etc.
2014 Aug.	Sediment disaster due to heavy rain (Hiroshima)	Wood chips
2015 Sep.	Heavy rain and flood (Kanto/ Tohoku area)	Tatami mat
2015 Sep.	JCA joined in the D.Waste-Net (Disaster Waste Treatment Support Network) managed by the Ministry of the Environment	
2016 Apr.	Earthquake (Kumamoto)	Wood chips, Tiles, Mixed disaster debris
2016 Dec.	Large-scale fire (Itoigawa city)	Fire wastes
2017 Jul.	Heavy rain and flood (northern Kyushu)	Wood chips, Tiles, Mixed disaster debris.
2018 Jul.	Heavy rain and flood (western Japan)	Sediment, Sludge, Wood chips
2019 Apr.	Heavy rain and flood (northern Kyushu)	Sludge
2019 Oct.	Heavy rain and flood due to the Typhoon (Eastern Japan)	Sediment, Rice straw, Wood chips
2020 Jul.	Heavy rain and flood (Honsyu/Kyushu)	Tatami mat, Wood chips
2024 Jan.	Earthquake(Noto peninsula)	Wood chips
Total amount of treatment (2004~2024)		1.67million tonnes

Cement production

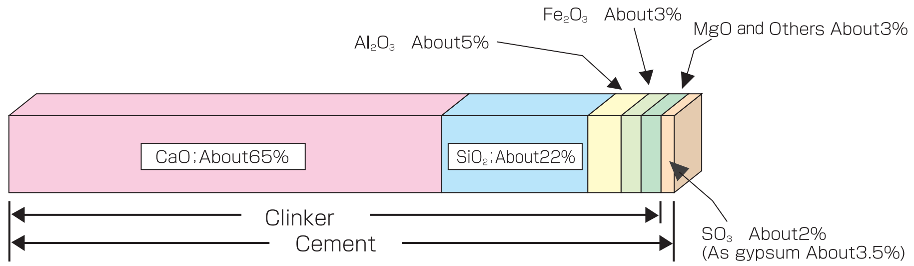
Manufacture of cement consists of the following three processes.

①Raw materials process ②Burning process ③Finishing process

Effective use of the thermal energy in manufacture of cement :

A lot of thermal energy is used in the cement plants. The orange line in the figure of burning process shows the flow of gas. The gases from rotary kiln and cooler are high temperature. When these gases are exhausted, the thermal energy of these gases is not used effectively. Then, the manufacturing processes of cement are designed to use the thermal energy of gases thoroughly. The gases from rotary kiln and cooler are led to the preheater. The thermal energy of these gases is used for the heating of raw materials including calcination of carbonate. And then, the gas from the preheter is led to the boiler (*) for generating steam of power generation. Finally, the gas from the boiler is led to the raw grinding mill at raw materials process, and the thermal energy of this gas is used for drying raw materials. Overall, the plant operates at over 80% thermal efficiency.

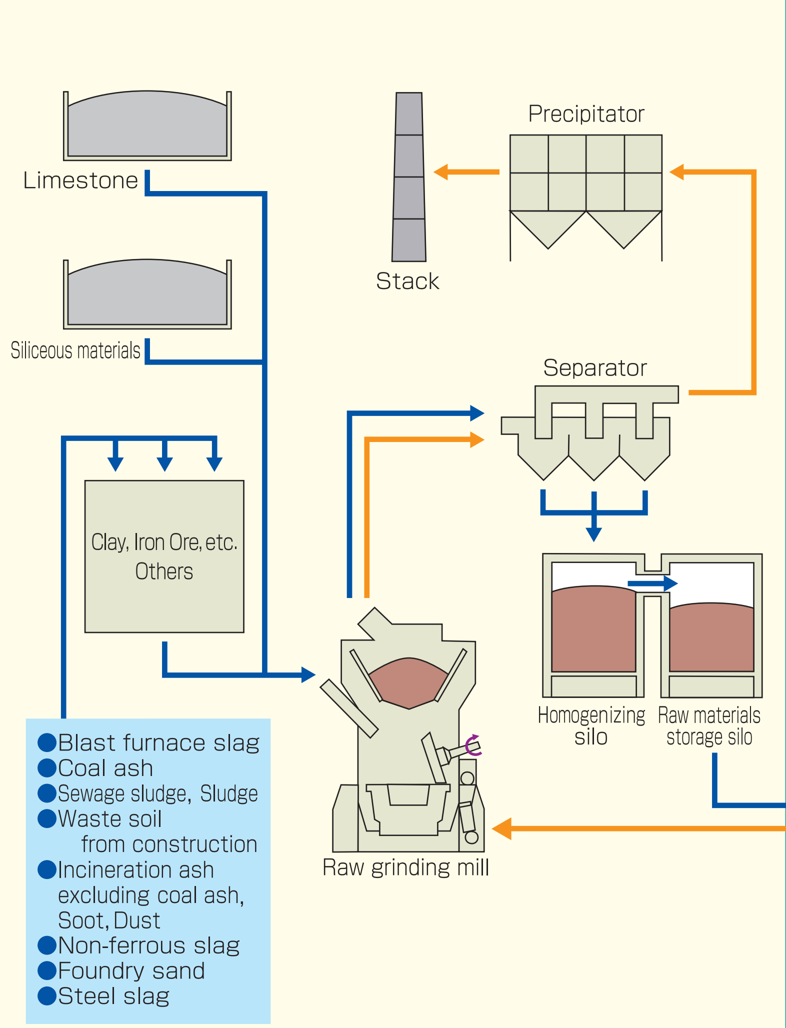
(*) The boiler may not be installed.



Various raw materials:

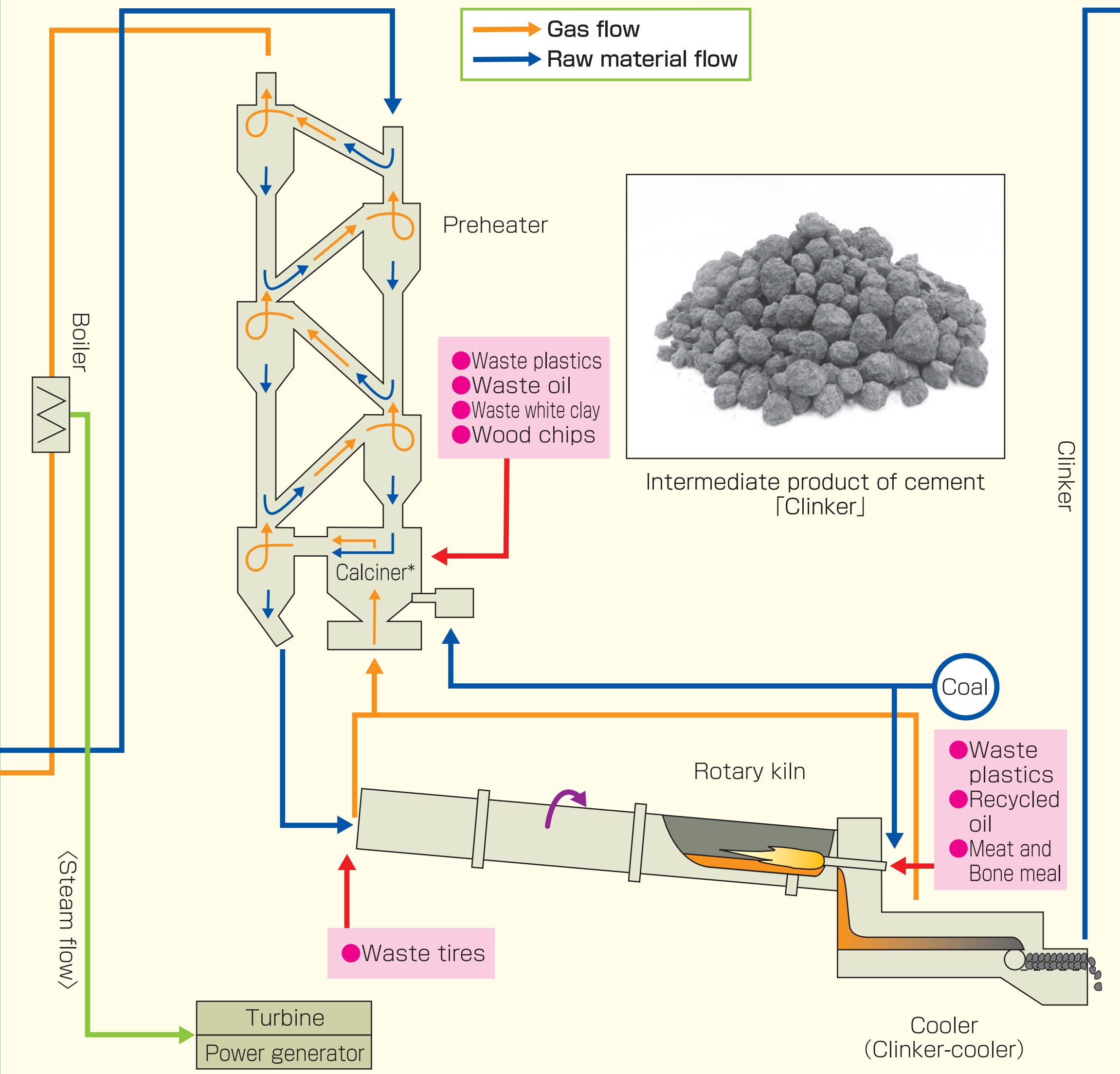
Primal constituents of cement clinker are CaO, SiO_2, Al_2O_3 and Fe_2O_3. The raw materials consist of limestone, clay, silica stones, iron oxide and the others. Since a lot of waste materials and by-products are composed of primal constituents of cement clinker, these are used effectively as some materials.

Raw materials process



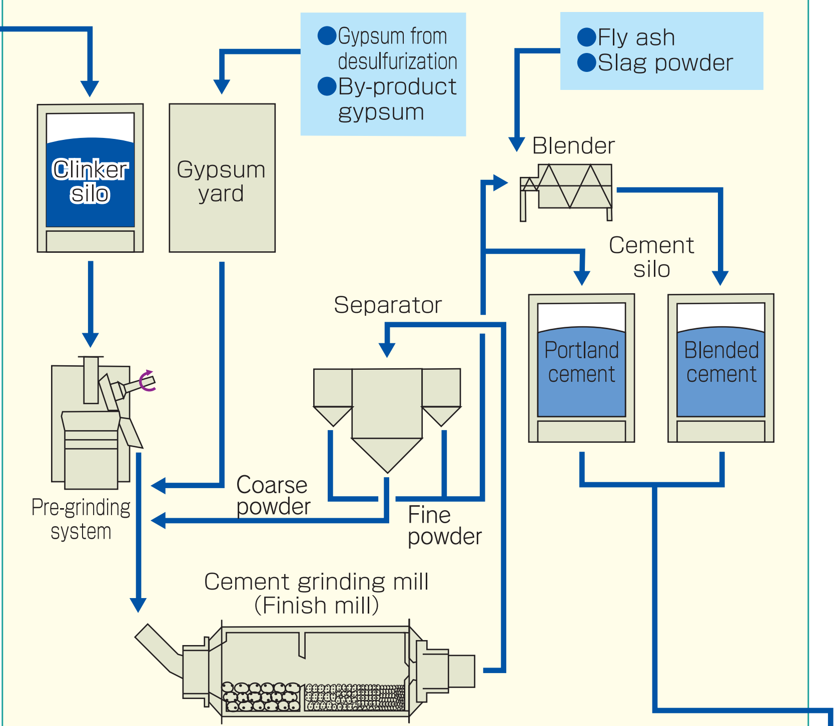
①**Raw materials process :** The raw materials of cement clinker are prepared by granulating the mixture of limestone, clay, silica stones, iron oxide and the others in raw grinding mill. The proportions in mass of each material are carefully controlled so that the chemical compositions of raw materials may be set to the designated compositions.
A lot of waste materials and by-products are used as some materials these days.

Burning process



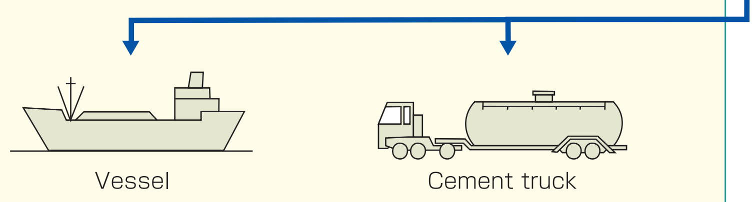
②**Burning process :** Powdered raw materials is heated and sintered in order to produce cement clinker in this process. The temperature of sintering of cement clinker in rotary kiln is 1450℃ or more.
At all plants in Japan, the raw materials are fed to the top of preheater. And, the raw materials passed through preheater are fed to rotary kiln.
This system is adopted in order to raise efficiency of thermal energy. The sintered cement clinker are quickly cooled down in the air quenching cooler.

Finishing process



③**Finishing process :** Portland cements are produced by granulating finely the cement clinker and gypsum in cement grinding mill. And, the blended cements are produced usually by blending Portland cement and admixtures.

Shipping



Strategies for carbon neutrality in the cement industry

In March 2022, Japan Cement Association announced the "Long-term Vision for the Cement Industry toward Carbon Neutrality" subject to the direction of the Japanese government's green growth strategy and others. (https://www.jcassoc.or.jp/cement/1jpn/220324.html)

1. The vision shows a forecasted cement demand and our actions and challenges

1. Direction of our vision
2. National broad demand
3. Roles of the cement industry: "Supply of basic material," "Contribution to an establishment of a recycling-based society," "Contribution to local community," "Cooperation in disaster debris treatments," etc.
4. Direction of measures and issues to be challenged: "Reducing clinker to cement ratio" "Switching to low carbon raw materials and thermal energy" "Improving thermal energy efficiency" "Development of low carbon binding materials and new cement" "Challenging to CCUS" "Taking up CO_2 by cement carbonation" etc.

2. Outline of Action Plan on the Carbon Neutrality

1) Target by 2030:

① Reduce a specific overall energy consumption of cement production (*1) (*2) 327 MJ/ton-cem. in FY 2030 from the FY 2013 level.

(*1) "Specific overall energy consumption of cement production" is calculated as the summation of "Specific thermal energy consumption of cement production", "Specific thermal energy consumption for on-site power generation" and "Specific electrical power energy purchased from the grid" divided by "Cement production volume", where alternative thermal energy from combustible wastes is excluded.

(*2) "Specific overall energy consumption of cement production measured for the fiscal assessment year" is slightly compensated by taking into account of fluctuations of "cement production volume" and "clinker/cement ratio" from the base year (FY2013) levels as "specific overall energy consumption of cement production".

② Reduce 15% of total CO_2 emission (*3) in FY 2030 from the FY 2013 level (*4).

(*3) This includes both of energy and process-related CO_2 emissions.

(*4) Each target will be revised according to progress results or market circumstances.

2) Other actions on low-carbon products and services

① Encouragement of diffusion of concrete pavement: CO_2 emitted from a heavy vehicle to drive on concrete pavement is reduced due to an improvement of mileage on a point of view of a life cycle assessment (LCA).

② Contributions to the establishment of the recycling-based society: Utilization of many types of combustible wastes and by-products from other industries for cement production results in extension of a remaining life capacity of existing landfill sites.

3) Contributions to the global mitigation:

Statistical national information on energy consumption, diffusion rate of energy conservation technologies (equipment) and utilization of alternative fuels has been published to the public in order to contribute both to the reduction of an energy consumption to produce cement and the establishment of the recycled-based society globally.

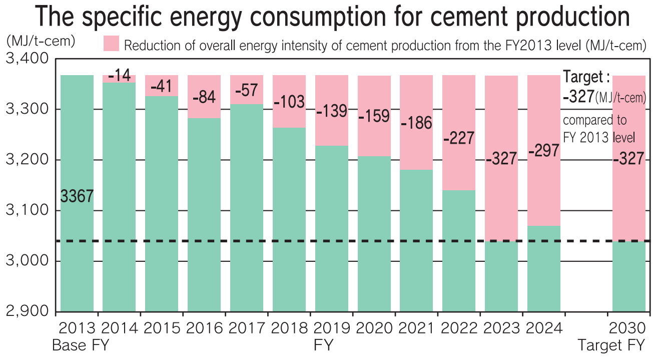
4) Development of technologies (Plan after FY 2022) (*5)

① Specific thermal energy consumption of cement production can be reduced by using mineralizer which decrease the burning temperature of clinker.

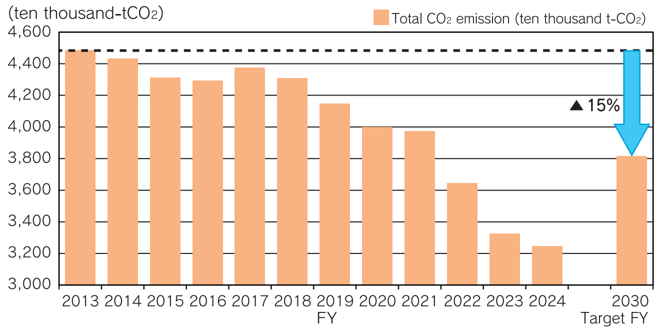
② Specific thermal energy consumption of cement production can be reduced by increasing the amount of C3A in the clinker and clinker substitutions in cement.

(*5) Under the right conditions of expected circumstances and technique such as availability of material containing fluorine, optimized clinker production conditions and quality control method for the aimed clinker, a feasible study for the clinker production would be carried out in an appropriate plant for the pilot test.

The specific energy consumption for cement production

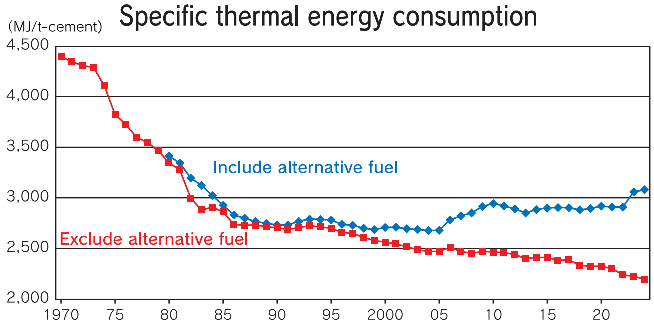


Total CO_2 emissions



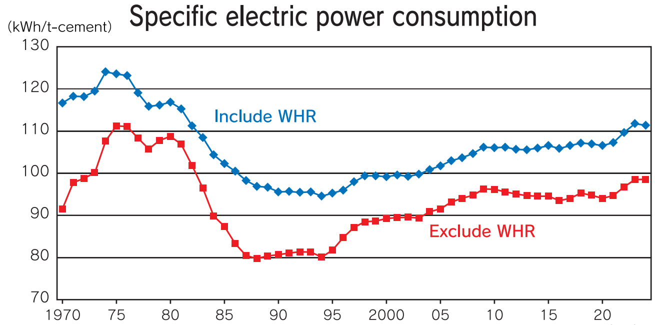
The cement industry has tackled energy efficiency for cement production, this action has played an important key role in the Carbon Neutrality Action Plan.

Specific thermal energy consumption



(Note) Energy substitution waste started in 1980

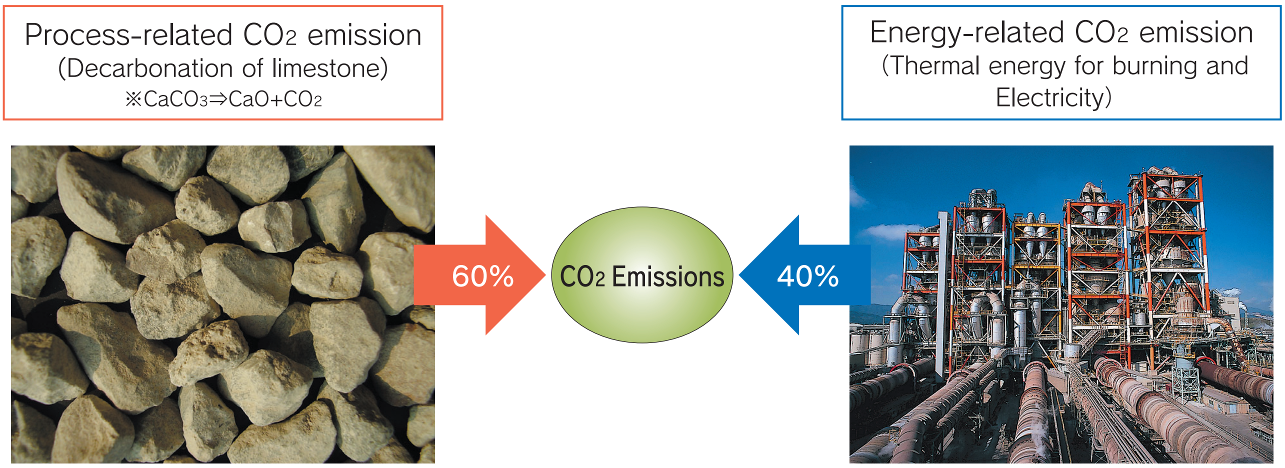
Specific electric power consumption

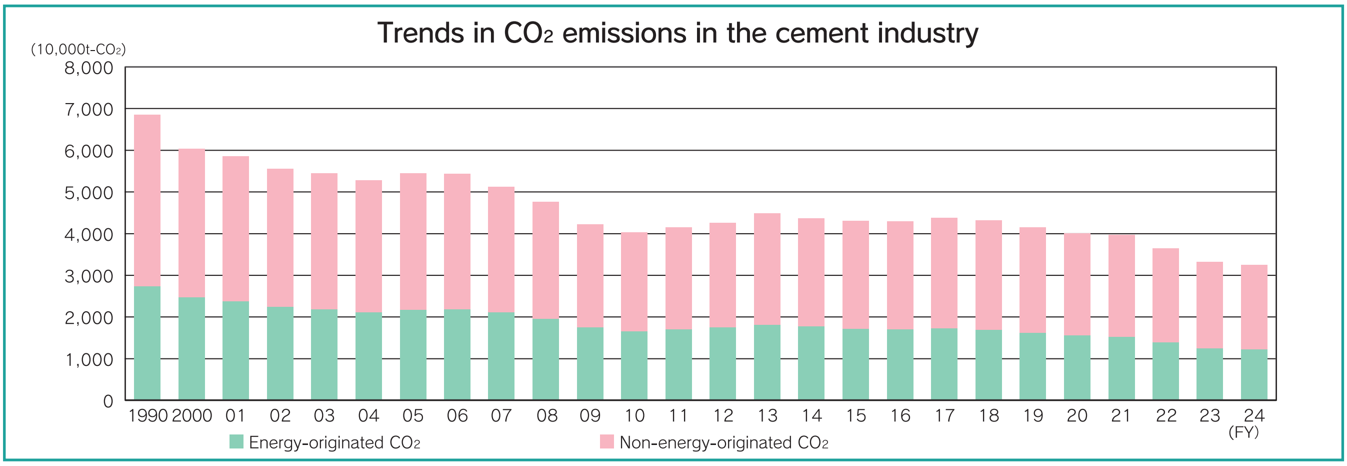


WHR: Power consumption from Waste Heat

3. Challenges to CO_2 reduction and measures towards 2050

CO_2 emission from the cement industry is consisted of both decarbonation of limestone as main raw material (process-related CO_2 emission) and emission from energy used in cement manufacturing (energy-related CO_2 emission).





The cement industry has worked on reducing specific energy consumption of cement manufacturing by the voluntary action plan. In order to contribute to Japan's carbon neutrality in 2050, we continue to reducing both “process-related CO_2 emission” and “energy-related CO_2 emission” as possible.

Measures towards a Carbon Neutrality in 2050

(1) Process-related CO_2 Emissions

- Aiming at reducing a clinker to cement ratio from 0.85 to 0.825 by adding mainly minor additional constituent for the ordinary portland cement.
- Taking into consideration that substantial natural CO_2 uptake by cement carbonation has been reported. However, since no accounting methodology is internationally established, a range of estimated volume presents as a contribution to the carbon neutrality by the cement industry.

(2) Energy-related CO_2 Emissions

- Enhancing a reduction of energy consumption for cement production using energy conservation technologies, increasing alterative energies delivered from wastes and reducing the clinker to cement ratio.
- Aiming at replacing at least by 50% of zero-emission alternative energies from fossil energies for calcination using co-firing of hydrogen and ammonia and furthermore methanation, and co-processing with various wastes and biomass.
- Aiming at achieving net-zero emissions from the on-site power generation facility converting to alternative energies and biomass.

(3) Carbon Capture, Utilization and Storage (CCUS) for both CO_2 Emissions

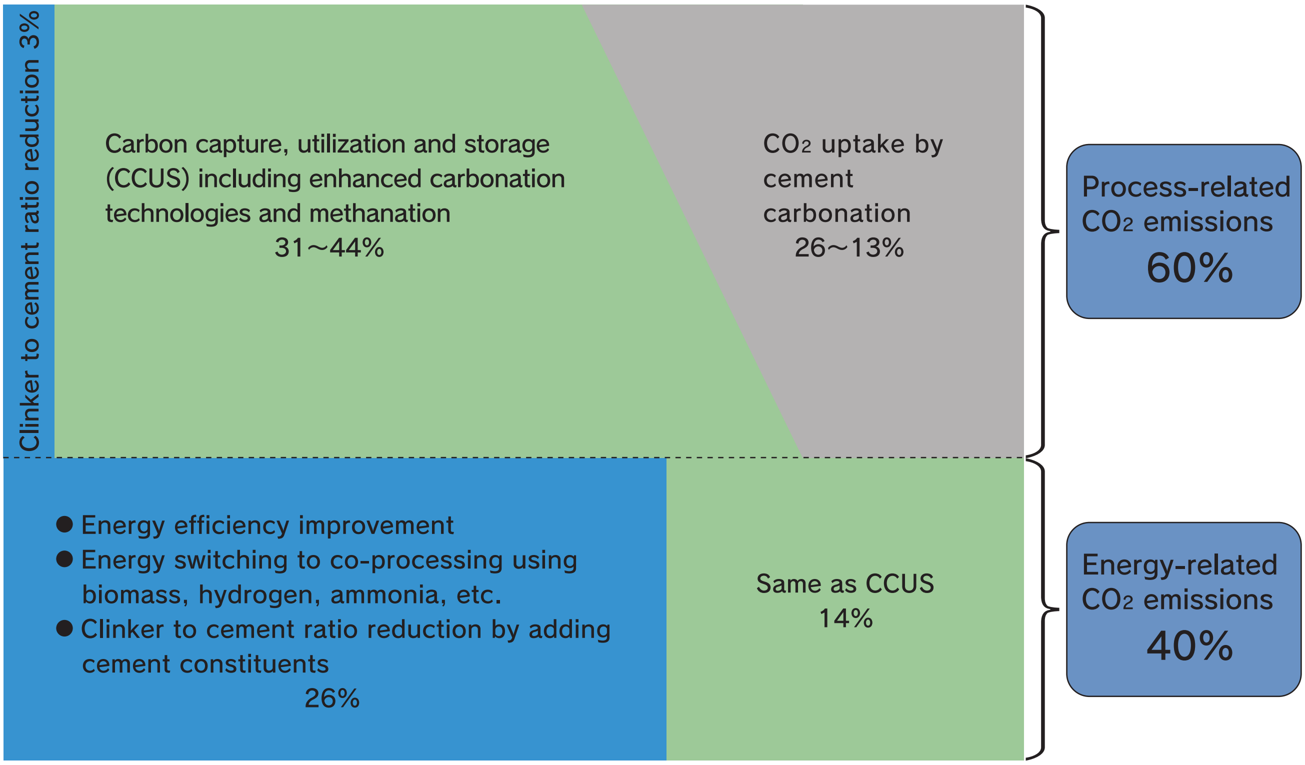
- Aiming at reducing CO_2 emissions through CCUS technologies while promoting technology developments in line with the national Green Growth Strategy through Achieving Carbon Neutrality in 2050, etc.

(4) Further Reduction in Future

- As an increase in users awareness of the need for zero carbon products, further innovative technologies are considered and also the clinker to cement ratio targeted at 0.825 in 2030 is expected to be 0.8 in 2050 by adding additional cement constituents.

4. Our Visions on a Carbon Neutrality of the Cement Industry in 2050

The schematic figure shows potential measurers for the cement industry to achieve the carbon neutrally in 2050. However, each implementation requires to ensure comprehensive understanding and supports by stakeholders including a construction sector, and a development of specific technology as well.



Conventional technologies to be conducted by the cement industry
Innovative technologies such CCUS to be developed by our member companies and other organizations
Contribution to the carbon neutrality by the cement industry

Note: A reduction ratio of process-related CO_2 emissions using CCUS is corresponded to an amount of CO_2 uptake by the cement carbonation using each estimation model.

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