

Worksites

Mizushima Plant

Introduction to the Mizushima Plant

The eastern Seto Inland Sea, where the Mizushima Industrial Complex is located, is a body of water known for the beauty of its many small islands, namely the Shiwaku and Kasaoka islands, and the Kojima Peninsula, particularly at sunset. The stunning nighttime view of the Mizushima Industrial Complex from Mount Washu is also a source of local pride. The industrialization of this area of Japan officially started in 1943, when sediment from dredging the Takahashi River to reinforce its banks and dredging local ports to allow large ships to enter was used to reclaim the land.



Aerial view of the Mizushima Plant

The Mizushima Plant, situated in a corner of the Mizushima Industrial Complex, started operating in July 1969. The plant covers an area 900 meters long east-to-west and 300 meters wide north-to-south. As the largest diversified user of C5 fractions* in the world, we produce a variety of materials necessary for socioeconomic activities. Employees here are committed to operating a safe and stable plant in accordance with our motto, “Goanzenni”

Efforts to keep employees healthy and strong have continued unabated since we appeared on a TV program in September 2010 as a “plant whose workers have muscular legs.” Our employees are given physical fitness tests on a periodic basis and provided professional guidance when they fail to meet standard scores.

To earn the trust of our local community, we keep a careful watch on our environmental management performance by performing plant health check-ups, which include inspections of air and water quality, noise, and odor. We also host annual summer festivals, plant tours, and health walks to facilitate communication with local stakeholders.

Our mission is to be an environmentally friendly plant that is appreciated by the local community and meets the diverse needs of its customers by producing high-quality products in a safe and reliable manner.

* C5 fractions

Hydrocarbon molecules containing five carbon atoms. They are the byproduct of thermal cracking, or breaking down, of naphtha, and also include ingredients for raw materials of synthetic rubber and resin.

CSR Efforts at the Mizushima Plant

We at the Mizushima Plant are working to achieve innovation in production and, to that end, practicing “ABC,” which stands for *atarimae*, *bakashoujiki*, and *chanto*, or in English: to earnestly and properly perform all of the routine but necessary tasks. We believe that only by taking great care to follow operational rules and procedures in addition to obey laws and regulations can be upholding safety as our highest priority and continuously produce products with consistent quality. Our actions are based on the recognition that instilling this ABC culture in our workforce to continuously deliver high-quality products is what society expects from the Mizushima Plant.

Environmental and Safety Activities

1. Reducing toxic chemical emissions

Our plant has been butadiene-emission-free since fiscal 2002, when we adopted a closed recovery and processing system. By measuring and reducing our VOC*¹ emissions through PRTR*² activities, we will continue to help conserve the environment.

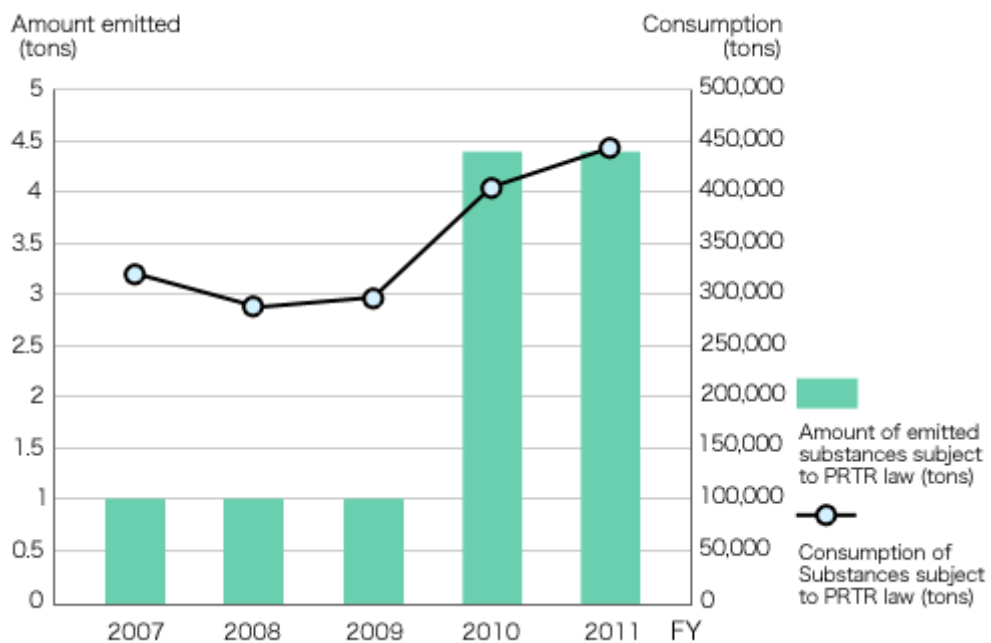
*1. Pollutant Release and Transfer Register

A database of hazardous chemical substances released into the environment and transferred off-site in waste. It provides the public with important information such as where and how much pollutants are being released and transferred.

*2. Volatile Organic Compounds

Organic compounds that change easily to a gas phase and enter the air.

Substances subject to PRTR law

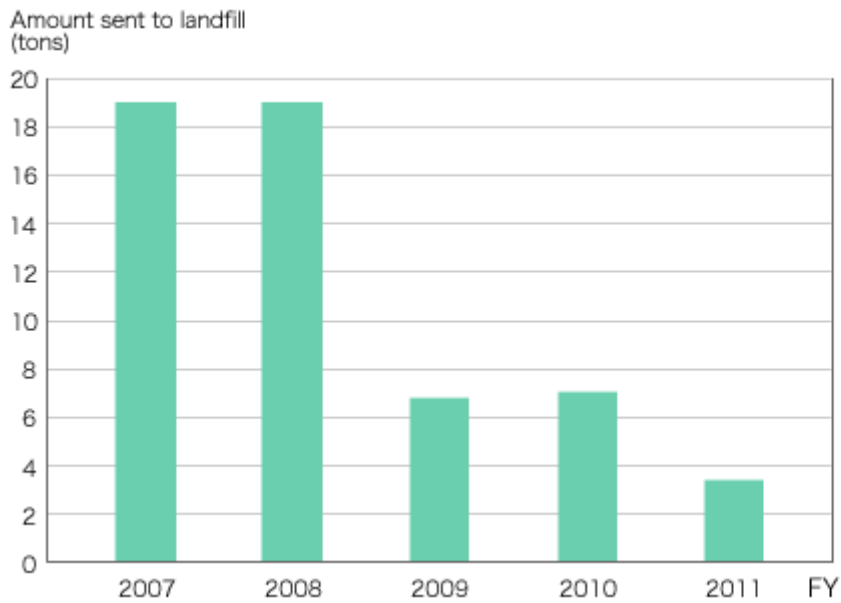


2. Reducing industrial waste

In fiscal 2011, we set a target of 5 tons or less for waste sent to the landfill and tried to reduce glassware waste generated in our assay operations. Through testing we figured out how to recycle more glass by melting it, and succeeded in reducing landfill waste to 3.7 tons.

We set 5 tons or less as our target for landfill waste in fiscal 2012, and hope to achieve further reductions in this area.

Amount of Waste to Landfill



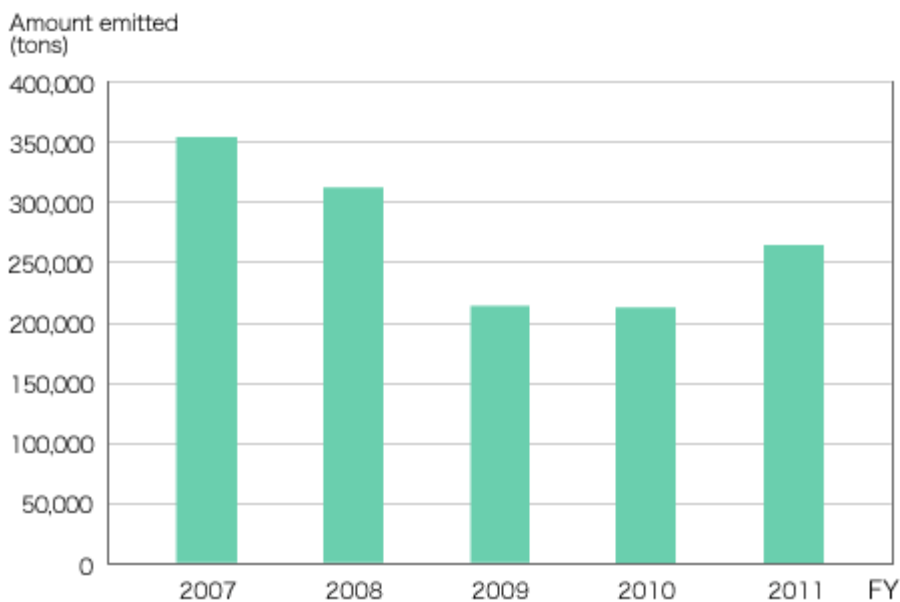
3. Reducing air and water pollution

We monitor emissions of hazardous substances to air and water on a daily basis and through regular third-party assessments. Wastewater from the Mizushima Plant flows into the Seto Inland Sea, a semi-closed body of water. Complying with environmental standards is the bare minimum we can do to show consideration to the many people whose lives and livelihoods are dependent on the Inland Sea, and we will continue to take due care to protect the environment.

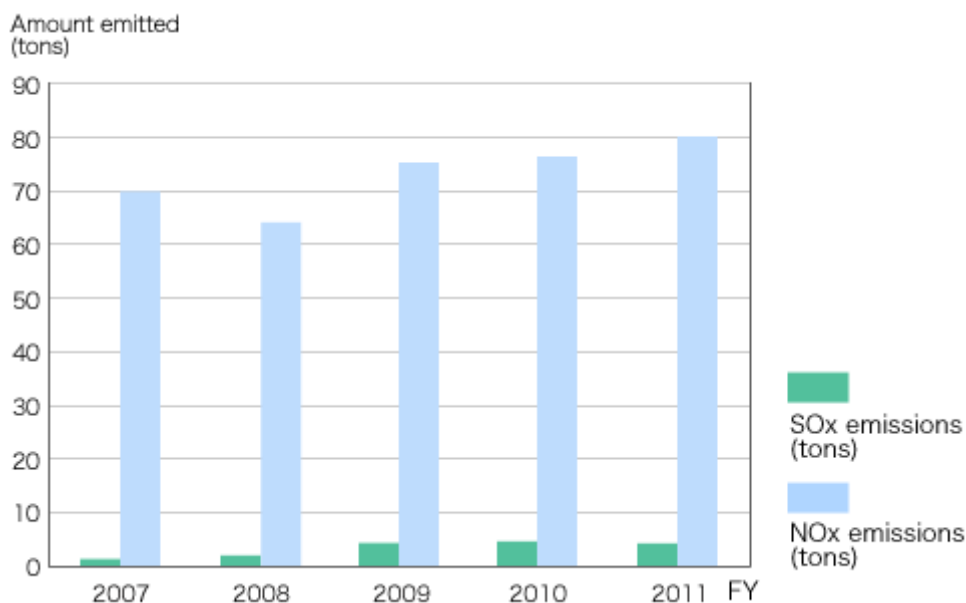


Waste water treatment facility

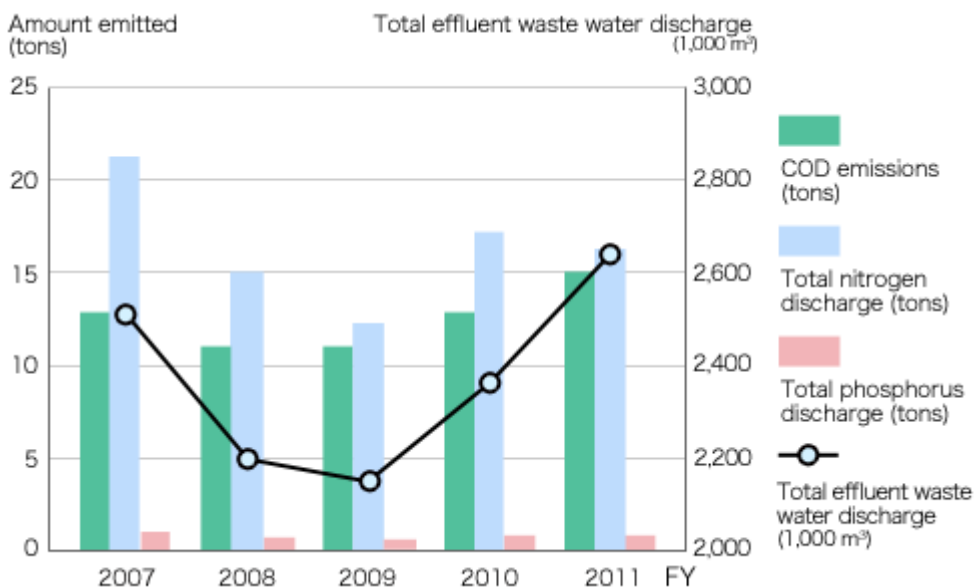
CO₂ emissions



SO_x and NO_x emissions



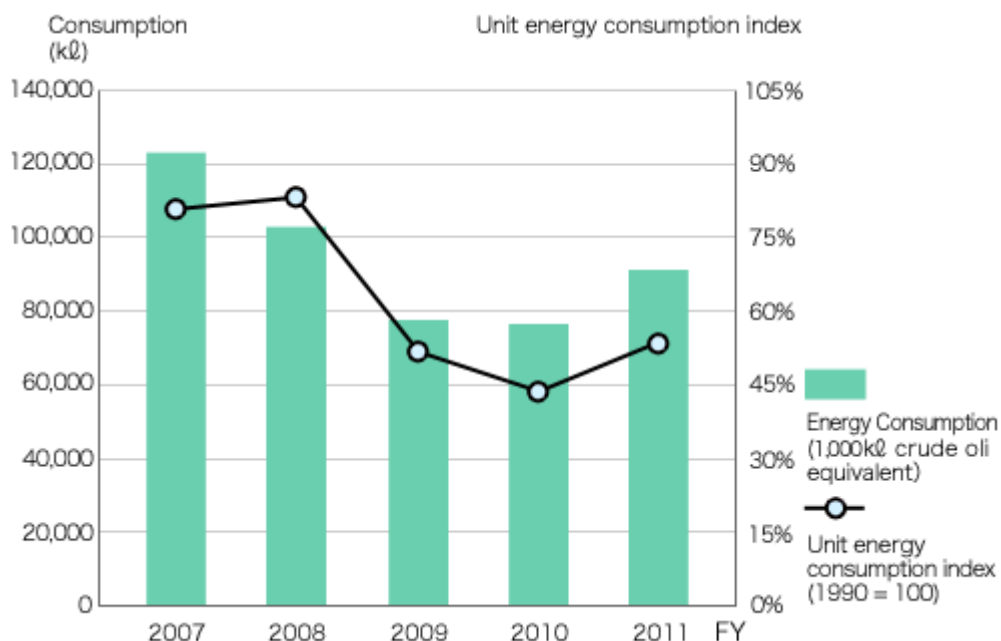
Total effluent waste water discharge, COD emissions, total nitrogen discharge and total phosphorus discharge



4. Saving resources and energy

In response to the deteriorating power situation in fiscal 2011, we switched to energy-efficient LED lighting in our offices. We took other actions that yielded immediate benefits, such as using light-blocking films and paints to curb indoor temperatures and turning off lights during the day. We will continue efforts like these to conserve energy.

Total amount of energy and Unit energy consumption index



5. Environmental Data

Mizushima Plant		FY2007	FY2008	FY2009	FY2010	FY2011
Toxic substances	Butadiene consumption (tons)	150,281	133,483	139,340	144,820	136,385
	Butadiene emissions (tons)	0.0	0.0	0.0	0.0	0.0
Substances subject to PRTR law	Consumption (tons)	317,673	285,584	293,497	405,671	442,900
	Amount emitted (tons)	1.0	1.0	1.0	4.4	4.4
Industrial waste	Amount generated (before volume reduction) (tons)	58,983	35,488	45,093	60,045	60,400
	Amount generated (after volume reduction) (tons)	6,750	4,849	5,006	5,374	5,935
	Amount sent to landfill (tons)	19	19	6.6	6.8	3.7
Atmospheric emissions	CO ₂ emissions (tons)	351,881	315,893	219,343	217,000	259,630
	SO _x emissions (tons)	1.5	1.9	4.3	4.6	3.8
	NO _x emissions (tons)	70	63	75	77	80
Water resources (Industrial water + Ground water + Waterworks) consumption (1,000 m ³)		-	-	-	2,378	2,481
Waste water	Total effluent waste water discharge (1,000 m ³)	2,550	2,200	2,150	2,382	2,640
	COD emissions (tons)	13	11	11	13	15
	Total phosphorus discharge (tons)	0.7	0.5	0.4	0.6	0.6
	Total nitrogen discharge (tons)	21	15	12	17	16
Energy	Total consumption (crude oil equivalent, kℓ)	123,793	110,690	77,930	77,852	91,500
	Unit consumption index (1990 = 100)	79%	84%	51%	44%	54%
Production of PDR equivalent (tons)		668,413	563,495	648,665	760,900	731,500

Quality Assurance Initiatives

In line with ZEON's Mid-Term Management Plan, SZ-20, including the Enterprise Blueprint for 2020: "ZEON creates the future today through the power of chemistry," the Mizushima Plant aims to realize global production technologies that, through appropriate management of what we call the 4Ms—Material, Machine, Method, and Man—enable anyone anywhere in the world to produce great products with consistent quality. We hope to realize the Enterprise Blueprint by using our quality management systems to improve the technologies we develop.

VOICE In Preparation for 2020

In fiscal 2011, the Mizushima Plant launched an initiative to raise yield rates*¹ to 100%. First, in an effort to stabilize product quality, we created CAPD action sheets (CAPD is our version of the PDCA cycle that starts with Checking to see that existing systems have no problems or inadequacies, and then taking Action) to manage quality through control charts and visually organize day-to-day actions over the long term. As a result, the percentage of processes with a low capability index*² declined, resulting in more consistent quality. However, our work has only begun, as we have yet to achieve 100% yield rates. By synthesizing practical manufacturing know-how with theoretical knowledge acquired through research, completing the control plan we started in fiscal 2011 will be a major challenge.

Another task we need to accomplish by fiscal 2020 is standardizing technologies so that overseas plants can manufacture products with the same level of quality. This is our responsibility as a mother plant*³, something we hope to achieve through collaboration between our plant and engineering staff.



Toru Nishijima, Corporate Officer and Mizushima Plant Manager

*1.Yield rate

The percentage of products rolling off the production line that pass quality inspections. A 100% yield rate means that no defective products were produced.

*2.Process capability index

An indicator that quantitatively assesses the ability of a given process to meet certain quality standards.

*3.Mother plant

A plant that applies new technologies developed in Japan before they are adopted at overseas subsidiary plants.

Living Together with the Local Community

1. Engaging the Local Community

Our combined plant tour and health walk event has been held every year since 2006 and is now an annual fall event. We welcomed some 200 people, many local residents, to last year's event in November 2011. After taking the plant tour, participants trekked the "Kaze no Michi" road from the Kojima Culture Center to Shimotsui, enjoying the brisk late-autumn weather along the way. We plan to continue this event in coming years since it is the perfect way to interact with local residents and show them what we do at the Mizushima Plant.



Getting ready for the walk

2. Comprehensive emergency drill

The Mizushima Plant conducts comprehensive emergency drills every September in conjunction with Disaster Prevention Day. Local fire departments and the Mizushima Industrial Complex's joint disaster prevention team join our in-house fire fighting team in training, with each team perfecting their own response skills.



An emergency response drill

3. Local volunteering

In an effort to support and cheer up local residents, the Mizushima Plant held its first volunteer neighborhood cleanup on April 27, 2006. We counted our 22nd cleanup in 2011. Our original intention will continue to inspire us as we hold this activity in future years.



Plant volunteers picking up litter