

Worksites

Tokuyama Plant

Introduction to the Tokuyama Plant

The Tokuyama Plant, which started operating in 1965, is located in the Shunan Industrial Complex of Yamaguchi Prefecture. The plant manufactures butadiene with the GPB process, an extraction distillation technology developed by ZEON, and then uses the butadiene to produce synthetic rubber, a raw material in fuel-efficient tires; synthetic latex, a raw material in surgical rubber gloves; and polymerized toner for printers, a product that ZEON was first in the world to produce on an industrial scale. The Tokuyama Plant operates on a global level as ZEON Corporation's key synthetic rubber producer, exporting many of these products to overseas markets.



Aerial view of the Tokuyama Plant

The Shunan Industrial Complex is said to have had its start when Kodama Gentaro, general of the Japanese Imperial Army and native of Tokuyama, recognized the advantages of Tokuyama as a port location and, responding to military demand created by the Russo-Japanese War, decided to construct a coal briquette manufacturing plant there for the navy in 1905. Shunan has since become a manufacturing hub for the petrochemical industry and many other industries.

Wander around the Tokuyama Plant today and you will find various remnants from olden days when the site was used for the manufacture of coal briquettes. Most symbolic of this history is ZEON Shrine, built in 1966 in dedication to the divided portions (*bunshin*) of the three *kami* of Nachi Gongen, Sumiyoshi Myojin, Toishi Hachiman and to pray for safe operations, employee health, and business growth. To the west of the shrine is the "monument of martyrs," erected in 1924 to commemorate martyrs from the Tokuyama area, along with other artifacts.

While basing its operations on the principle of safety and stability first, the Tokuyama Plant tries to build rapport with its local community in various ways. For example, the plant hosts the annual Waraku Odori Dance Festival and has also invited local residents to observe its emergency-response drills.

CSR Efforts at the Tokuyama Plant

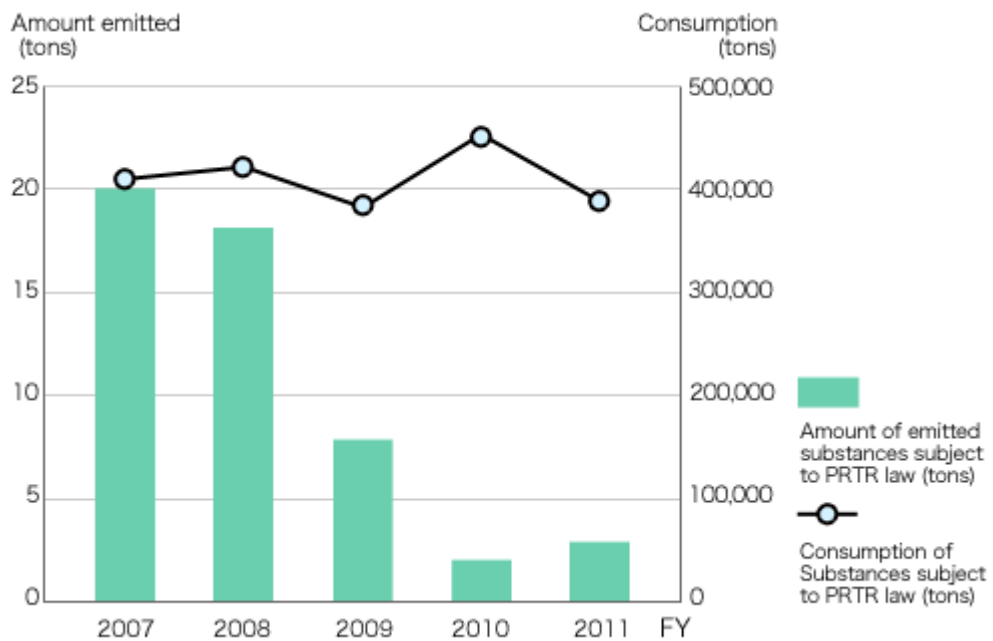
The Tokuyama Plant is located adjacent to the city center and residential areas around Tokuyama Station. To support the sustainable growth of society and earn the trust of the local community based on safe, stable operations, we are creating a dynamic and productive plant. To do this we introduce production innovations with the full participation of all employees under the banner, "Greetings and 3Ss (*seiri*, *seiton*, and *seisou*, or neatness, orderliness, and cleanliness) are the Foundation of Everything We Do." Employees at the plant actively collaborate with the local community to tackle various public issues, including collecting bottle caps and can tabs and cleaning nearby streets and the Higashi River, which flows alongside the plant.

Environmental and Safety Activities

1. Reducing toxic chemical substances

In fiscal 2011, we introduced an exhaust gas purification system, which, as its benefits materialize in fiscal 2012 and thereafter, will allow us to further reduce emissions of substances subject to PRTR regulations. PRTR emissions in fiscal 2011 were 3.1 tons. Making the most of our new exhaust gas purification system to move one step closer to zero emissions, our target in fiscal 2012 will be 2.2 tons or less.

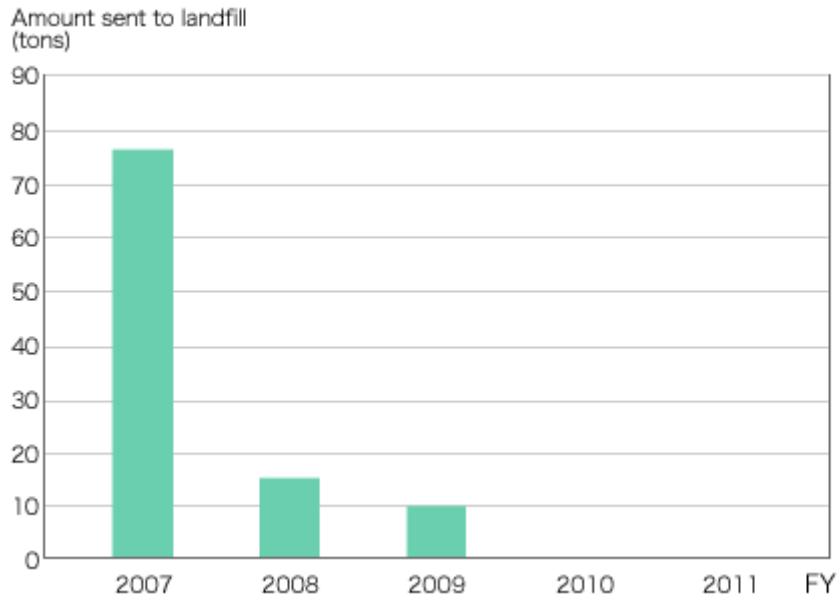
Substances subject to PRTR law



2. Reducing industrial waste

In fiscal 2008, we set a zero emissions plan for industrial waste sent to landfills. In fiscal 2010, we achieved zero tons per year by meticulously separating waste generated at the plant and through recycling and reuse efforts (we expect the same results for fiscal 2011). Going forward, we intend to maintain our zero-landfill-waste performance and further promote and manage 3R (reduce, reuse, and recycle) activities to contribute to a more sustainable society.

Amount of Waste to Landfill

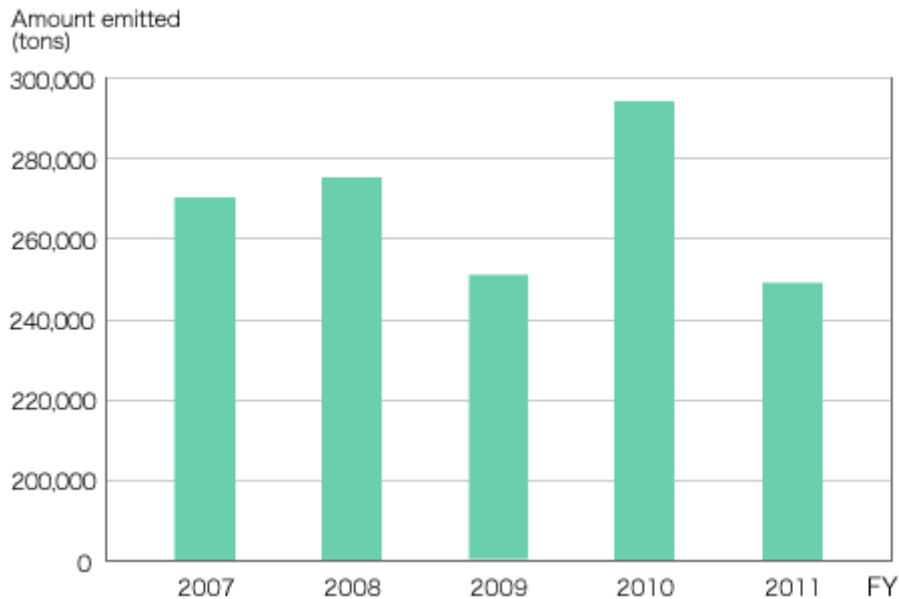


3. Reducing air and water pollution

We were able to steadily reduce NO_x emissions into the air through energy conservation and improved combustion by installing dry air emission processing equipment and optimizing the amount of combustible air of the boilers. We also switched to lower sulfur fuel in an aim to slash SO_x emissions. For water pollution, we are reducing COD and total nitrogen discharge every year by upgrading our wastewater treatment facilities and improving our treatment methods.

Based on these efforts we were able to clear all our environmental standards, and in fiscal 2012 we plan to maintain our current performance.

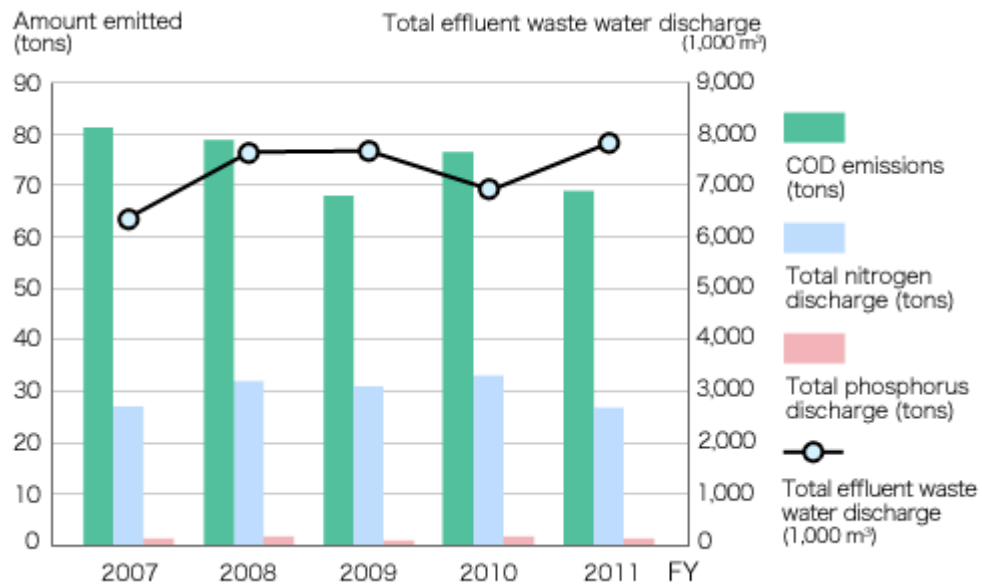
CO₂ emissions



SO_x and NO_x emissions



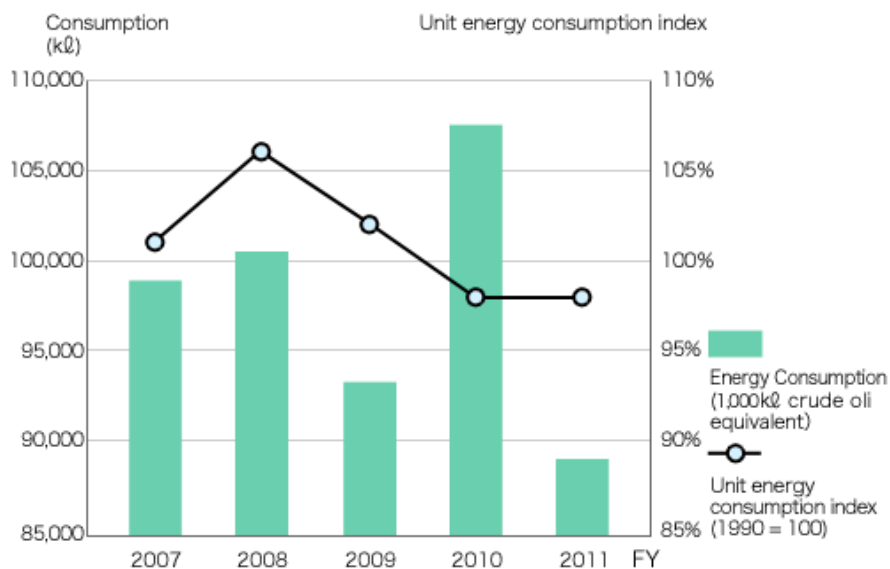
Total effluent waste water discharge, COD emissions, total nitrogen discharge and total phosphorus discharge



4. Saving resources and energy

To aggressively address technical issues associated with energy-hungry facilities, we organized an energy conservation work group and promotion committee at the plant that draws upon the expertise of a professional consultant. We are also mobilizing the collective knowledge of all employees to achieve our target for reducing unit energy consumption to less than 90% of 1990 levels through day-to-day operational management. While progress in solving this extremely difficult problem has been unremarkable so far, we are steadfastly seeking improvements by reviewing actions from every perspective and introducing innovative technologies.

Total amount of energy and Unit energy consumption index



5. Environmental Data

Tokuyama Plant		FY2007	FY2008	FY2009	FY2010	FY2011
Toxic substances	Butadiene consumption (tons)	201,815	191,364	188,743	217,074	186,784
	Butadiene emissions (tons)	17	15	2.8	0.7	1.4
	Acrylonitrile consumption (tons)	13,477	12,263	14,366	16,916	13,697
	Acrylonitrile emissions (tons)	0.7	0.7	0.7	0.6	0.6
Substances subject to PRTR law	Consumption (tons)	407,934	417,519	386,572	464,767	388,603
	Amount emitted (tons)	20	18	7.6	2.2	3.1
Industrial waste	Amount generated (before volume reduction) (tons)	30,650	25,881	19,845	21,516	18,718
	Amount generated (after volume reduction) (tons)	10,211	4,512	3,857	3,756	3,762
	Amount sent to landfill (tons)	77	15	10	0.0	0.0
Atmospheric emissions	CO ₂ emissions (tons)	270,000	275,000	252,091	294,112	248,000
	SO _x emissions (tons)	647	547	447	483	502
	NO _x emissions (tons)	280	311	308	358	272
Water resources (Industrial water + Ground water + Waterworks) consumption (1,000 m³)		-	-	-	7,824	9,482
Waste water	Total effluent waste water discharge (1,000 m ³)	6,331	7,704	7,713	6,942	7,884
	COD emissions (tons)	81	79	68	77	69
	Total phosphorus discharge (tons)	0.6	0.8	0.5	0.7	0.6
	Total nitrogen discharge (tons)	27	32	31	33	27
Energy	Total consumption (crude oil equivalent, kL)	98,938	100,502	93,485	107,497	89,173
	Unit consumption index (1990 = 100)	101%	106%	102%	98%	98%
Production of PDR equivalent (tons)		535,323	518,702	503,567	599,400	498,167

Quality Assurance Initiatives

In line with ZEON's Mid-Term Management Plan, including the Enterprise Blueprint for 2020: "ZEON creates the future today through the power of chemistry," the Tokuyama Plant continuously improves and innovates its production technologies to achieve a 100% yield rate* and build certifiable quality into all of its products. We aim to be a plant that consistently delivers high-quality products that satisfy our customers.

*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.

VOICE For Safer, More Reliable, More Socially Responsible Products

Our mission at the Tokuyama Plant is not just to produce products that satisfy standards. Our products should have a greater purpose: to contribute to society's sustainable growth, to help improve the global environment, and to fulfill ZEON's CSR Policy. To achieve this, zero accidents, zero injuries, and zero pollution are obviously important. But we also need to achieve zero PRTR emissions, reduce CO₂ emissions, and by stabilizing manufacturing operations, develop a cost structure by which we can secure a profit even at low capacity utilization.

As the mother plant* of a plant currently under construction in Singapore that will produce synthetic rubber for fuel-efficient tires, the Tokuyama Plant also needs to support its overseas production centers, not only technically but by developing human resources that can drive reforms and improvements from a global perspective. I hope to draw on the knowledge of all our employees in our quest for greater innovation in production.

*Mother plant

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



Shinichi Hirakawa,
Tokuyama Plant Manager

Living Together with the Local Community

1. Interaction with the local community (37th ZEON Waraku Odori Dance Festival)

ZEON's Waraku Odori Dance Festival is one of Shunan district's annual summer evening events and is organized by Tokuyama Plant employees. Since 1974, this old-fashioned summer festival has fostered connections among our most valued stakeholders, including local residents and plant employees and their families. The event is a popular attraction every year, but last year's festival saw an attendance of more than 2,000 people, making it a great success. Employees talked with local residents as they served up foods such as *yakitori* and *oden*. The Waraku Odori, a simple dance that encourages everyone to join, topped off the evening. One highlight of last year's festival was artwork made from old bottle caps. Seeing so many bottle caps patiently collected and reorganized in a visually pleasing way brought enjoyment to lots of people. The Tokuyama Plant will forever cherish its relationship with local residents and contribute to environmental protection and social welfare.



Doing the ZEON Waraku Odori



Bottle cap artwork

2. Local Public Relations (Emergency-Response Training)

In fiscal 2011, the Tokuyama Plant invited local residents to visit the plant and observe comprehensive emergency drills carried out by plant employees. This was the first time we opened the plant during drills to communicate what we do on a regular basis to maintain safety.

Visitors watched from close by as employees poured their energies into fire fighting and life-rescue training. After the drills, visitors gave us important feedback, expressing their hopes that the plant would do more to ensure safety and also that they were pleased to see the seriousness with which ZEON approaches this issue. We will continue efforts like this to keep our local community and the broader public safe and worry-free.



Local community members also attended



Comprehensive emergency drill