

# How Should Environmental Initiatives for China be Structured?

## In the rapidly developing economy of China, what kind of environmental preservation initiatives will be required? What action is needed?

The Teijin Group has continually endeavored to reduce the amount of CO<sub>2</sub>, chemical substances and waste produced as a result of our business activities. Owing to these efforts, emissions have been reduced year by year and we are advancing toward the achievement of mid-/long-term targets. We will continue to take up the challenge to identify and reduce substances that have a high impact on the environment. At the same time, the Teijin Group is expanding production and sales in the rapidly developing economy of China, and it must be said that this expansion will result in increased impact on the environment. As a response to this situation, we have invited environmental policy experts from China for their opinions regarding what kind of environmental initiatives should be implemented in China.

### The Teijin Group's Environmental Initiatives – Achievements and Plans

The Teijin Group has set, and is working hard to achieve, specific targets for the reduction of CO<sub>2</sub>, chemical substances and waste. The results of our efforts are as follows. In FY2010, CO<sub>2</sub> emissions were reduced 40%, achieving our target of a 20% reduction from the FY1990 level by FY2020 (in Japan). In addition, the target for China to reduce CO<sub>2</sub> emissions by 1% per year per production unit has been achieved by all companies. Regarding chemical substance emissions, we achieved a 62.2% reduction in emissions. The target for Japan is an 80% reduction from the FY1998 level by FY2020. For "waste with no effective use,"\*1 that is, waste which cannot be reused or recycled, we achieved an 89% reduction. The target for Japan is an 85% reduction from the FY1998 level by FY2020.

Given this progress, the Teijin Group formulated a new plan in December 2010 to further reduce environmental impact. In this plan, while the total

volumes for 2020 targets have not changed, the environmental impact of individual chemical substances are "visualized" in order to strengthen management of substances with significant impact. Utilizing the LIME2\*2 life cycle assessment method (LCA) method established by the Ministry of Economy, Trade and Industry, Japan, and the Japan Environmental Management Association for Industry, we will identify substances that have significant environmental impact, even in small amounts, and endeavor to reduce these substances.

We are also striving to reduce chemical substances that have a large impact in terms of air pollution even in small amounts, such as nitrogen oxides (NO<sub>x</sub>) and sulfur oxides (SO<sub>x</sub>).

At plants in China too, we will identify and try to reduce substances with high environmental impact while moving forward with efforts to reduce total plant emissions. A relevant upcoming issue will be how to respond to stricter emissions regulations which the government will likely put in place as economic growth continues.

▶ \*1 "Waste with no effective use" refers to waste that is either put directly into landfill or incinerated without heat recovery.

▶ \*2 LIME2 is the second version of LIME, the Life Cycle Impact Assessment Method Based on Endpoint Modeling, developed in the second phase of the LCA national project (April 2003 to March 2006). It involves use of a technique to measure and assess overall environmental impact according to 15 categories of environmental impact; for example, global warming.

#### ▶ Event Date/Time

February 21, 2011 (Monday) from 10:00AM to 12:30PM

#### ▶ Venue

Shanghai International Trade Centre (Yan An Xi Road, Shanghai)

#### Mr. Takeshi Muraoka

General Manager,  
Environment, Safety  
and Health Office  
Teijin Limited

#### Mr. Shinji Takeshita

President,  
Teijin Chemicals  
Plastic Compounds  
Shanghai Ltd.

#### Mr. Masao Tateba

Chief Advisor,  
Recycling-oriented Economic  
Promotion Project  
Japan International  
Cooperation Agency (JICA)

#### Dr. Chang Miao

General Manager,  
Environmental Management  
and Institute for Policy Studies  
School of Environment,  
Tsinghua University

#### Mr. Toshihiko Goto

Representative Director  
Sustainability Forum Japan



## Future Challenges: Effective Use of Office Waste in Synthetic Resin Production, and Reducing/Recycling Wastewater from Textile Production

**Mr. Goto:** Let's begin with a question directed to Mr. Muraoka, Manager of the Environment, Safety and Health Office. Please tell us about the group-wide approach to environmental issues, and the present status and issues in China.

**Mr. Muraoka:** Thanks to continued group-wide efforts, we have made progress in reducing the total waste produced and total CO<sub>2</sub> and chemical substances emissions. In China too, we have achieved annual targets through the outstanding efforts of all companies and offices. In this context, despite the difficulty in setting even stricter total emissions targets, we obviously hope to reduce our environmental impact even further.

Specifically, we are considering using the LCA method to identify substances that have high environmental impact for small amounts emitted. Through reducing such substances, we will be able to reduce the total environmental impact for the same total emissions. Furthermore, in China, where industrial output continues to increase, future regulations on total emissions are anticipated to become stricter and stricter. The challenge will be meeting these stricter restrictions.

**Mr. Goto:** To all of you working hard for environmental preservation at Teijin Group Chinese companies, do you have any comments?

**Ms. Xin:** Teijin Chemicals Plastic Compounds Shanghai



**Mr. Takeshi Muraoka**  
General Manager,  
Environment,  
Safety and  
Health Office  
Teijin Limited



**Mr. Toshihiko Goto**  
Representative  
Director  
Sustainability  
Forum Japan

Ltd., a manufacturer of composite resin, is focusing attention on reducing waste. In 2006, we received the Production Streamlining Award from the Pudong New-area Science and Technology Committee for our proposal of a dust collector "Dust Recycler." In 2007, we achieved zero emissions; that is, a stable ratio for "waste with no effective use" of 1% or less of the total waste. Continuing to improve, in 2008, we obtained approval to use the China Environmental Label (Type II)\*<sup>3</sup> for plastic waste and wastewater recycling systems. Furthermore, in 2010, we received high appraisal of our environmental performance in terms of both energy savings and reduced use of resources enabling us to pass the "clean-production" inspection.

We have three challenges for the future. The first is to increase the number of waste disposal contractors. Since there are few waste disposal contractors in China, effective use of certain types of waste, such as used copier cartridges and batteries, has not been achieved. This waste amounts to several tens of kilograms each year. The second challenge is reduce waste even further. The third challenge is strengthening internal waste management of processes such as sorting waste.

**Mr. Rong:** Nantong Teijin Co., Ltd. situated in Jiangsu manufactures textiles. As our manufacturing involves dyeing processes, treatment of wastewater is a big

### Profile

#### Mr. Toshihiko Goto

Mr. Goto has had roles including Representative Secretary of the Environmental Auditing Research Group, and as a member of the Environmental Quality Control Standard Committee EPE subcommittee and 14005WG committee, and committee reviewing matters relating to the state of disclosure of environmental information by corporations.

\*<sup>3</sup> China Environmental Label (Type II) is an environmental label used in China. For type II, inspections are performed based on the self-proclaimed environmental statements of a company. If the statements conform to ISO14021 standards, use of the label is permitted.



#### Ms. Xin Guifeng

Manager,  
Safety, Environment,  
and Quality Assurance  
Department  
Teijin Chemicals Plastic  
Compounds Shanghai Ltd.

#### Mr. Wang Xuxiang

Manager,  
General A  
Personnel Department  
Nantong Teijin Co., Ltd.

#### Mr. Hirotaka Nakagawa

President  
Nantong Teijin Co., Ltd.

#### Mr. Rong Shikun

Dye Plant No. 1 Production  
Manager,  
Nantong Teijin Co., Ltd.

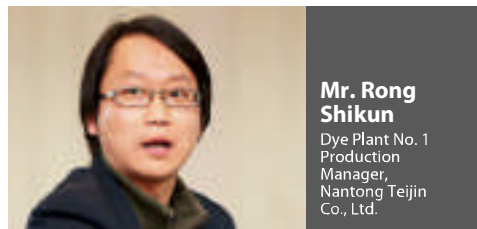


**The 5th Stakeholder Dialogue  
How Should Environmental Initiatives for China be Structured?**

▶ \*4 Chemical oxygen demand is the amount of oxygen consumed when organic matter in the water is dissolved by an oxidant. It is a common indicator used to measure the quality of seawater, and water in lakes and marshes according to the extent of pollution resulting from organic matter.

issue. After initial processing, wastewater is sent to the secondary treatment site, a public facility adjacent to our plant. However, of late, the Environmental Agency's management of wastewater from the dyeing plant has become much stricter. For instance, they have installed inspection equipment at our treatment site to collect daily chemical oxygen demand\*4 data, and inspections without prior notice are also conducted. Taking steps to improve wastewater treatment, we started wastewater recycling the year before last and now recycle 15% of the total wastewater.

In addition, we are implementing energy-saving measures that take thoroughness to a new level. Based on expert advice, we replaced old transformers, air



**Mr. Rong Shikun**  
Dye Plant No. 1  
Production  
Manager,  
Nantong Teijin  
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**Ms. Xin Guifeng**  
Manager,  
Safety,  
Environment, and  
Quality Assurance  
Department  
Teijin Chemicals  
Plastic Compounds  
Shanghai Ltd.

conditioners, and even lighting with energy-efficient models, and invested in filters and heat-r

. The combined effect of these measures is an approximate 30% reduction in power consumption. For the past several years, we have taken thorough measures covering every aspect of energy savings, to the extent that it seems we have exhausted all means (smiles). Coupled with this, I am also in charge of cost management, so as you can imagine, there are difficult issues to grapple with. Finally, although chemical substance emissions in FY2010 were reduced 43.0% compared to those in 2005, and "waste with no effective use" was reduced 4.6% compared to the previous year, further efforts are required.

**Chinese Expert Discusses Future Environmental Challenges**

**Environmental Pollution Regulations: The No. 1 Priority in China  
Compliance with Total Emission Regulations Will Also be Important**

**Mr. Goto:** W llenges of the Teijin Group in China. Now, let's ask Dr. Chang of Tsinghua University about the characteristics of Chinese environmental administration.



**Dr. Chang Miao**  
General Manager,  
Environmental  
Management  
and Institute for  
Policy Studies  
School of  
Environment,  
Tsinghua University

**Dr. Chang:** Above all, I would like you to understand that environmental administration in China prioritizes environmental pollution regulations. This places the Chinese approach in a different phase to the approach in Japan. Currently in China, environmental countermeasures are needed most for pollutants emitted as a result of corporate activities and daily life. Specifically , air, waste, soil and noise pollution.

Three systems already established are the Environmental Impact Assessment System, the Three-step System, and the Pollutant Emissions Fee Collection System. The Three-step System is a measure to reduce new sources of pollution through requiring pollution-preventing facilities to be installed when a new business starts. The Pollutant Emissions Fee Collection System is a system

enabling collection of fees from organizations which discharge more pollutants than the standard values. There are also five relatively new systems that focus on measures to reduce pollution.

**Mr. Goto:** You are saying that the present situation in China corresponds to the time when environmental pollution became a problem in Japan?

**Dr. Chang:** Yes. CO<sub>2</sub> reduction is considered less important than the environmental pollution measures. At the moment, demand for energy is increasing rapidly, so there is a focus on energy savings. Although CO<sub>2</sub> emissions are reduced as a result of energy savings, the priority is definitely on energy savings. At the same time, the most important environmental policy in China now relates to total emission regulations. As part of this, a Pollutant Emissions Permit System has been implemented. In this system, companies apply to a local Environmental Agency office for approval on the types and amount of pollutant to be emitted. There is also a time-limit-based system for areas of high pollution whereby non-complying companies may be forced to suspend operations for a certain time, with resumption of operations subject to improvement.

Regulations governing both the total sulfur dioxide (SO<sub>2</sub>) emitted into the atmosphere and the COD level, which is used to determine water quality, were successful policies of the 11th Five-year Plan\*5

**Profile**

**Dr. Chang Miao**

Dr. Chang has been engaged in water-related infrastructure issues in Japan from an early stage as a staff member of the Institute for Global Environmental Strategies. She also has a central role in environmental policy exchanges between Japan and China.

(2006–2010). In this plan, the central government set total emissions targets and allocated them to local governments. In the 12th Five-year Plan (2011–2015), an Emissions Trading System is expected to be implemented. I am engaged in research on the Emissions Trading System, and I am designing the systems for Shandong, Shanxi, and Tangshan in Hebei. In this system, emission quota such as for SO<sub>2</sub> and COD are set for each company and trading is based on this quota. A growing emphasis is expected on substances such as ammonia nitrogen\*6, heavy metals and NO<sub>x</sub>.

**Mr. Goto:** Which areas you think the Teijin Group Chinese companies should focus on in the future?

**Dr. Chang:** In relation to Nantong Teijin, I would say that plant wastewater treatment will remain important. With increasing demand for industrial water, water recycling technology should be enhanced. I think Teijin's membrane processing is very promising.

In view of the ever-increasing industrial output and consumption in China, the 3Rs\*7 relating to resources are also important and I expect

recycle-oriented statutory regulations to be enforced successively. Teijin Chemicals has indicated that they are looking for waste disposal contractors who can effectively use waste such as used copier cartridges. Moreover, I think there will be an increase in waste disposal contractors who can respond to such needs in the future. While still few in number, there are reportedly Japanese waste disposal contractors who already provide these services.

Attention must also be paid to the total power-consumption regulations relating to energy. In 2010, there were areas where power outages were necessary in order to achieve the energy-saving targets for the final year of the 11th Five-year Plan.



**Mr. Shinji Takeshita**  
President,  
Teijin Chemicals  
Plastic Compounds  
Shanghai Ltd.

▶ \*5 11th Five-year Plan: Mid-term plan for the five-year period from 2006 to 2010 that includes goals for the development of society and the Chinese economy, and incorporates priority projects, measures and industrial policies that aim to achieve these goals.

▶ \*6 Ammonia nitrogen: Nitrogen that is found in water as an ammonium salt. The source is industrial wastewater, and decomposed human excrement and organic matter in household sewage. Ammonia nitrogen is an important indicator of water pollution, and is one substance that causes eutrophication of ocean areas, lakes and other bodies of water.

▶ \*7 3Rs: Reduce, Reuse and Recycle. The 3Rs is an important concept in realizing a recycling-oriented society and minimized environmental impact.

## Chinese Experts Discuss Future Environmental Challenges

### Guidelines for Reporting Corporate Environmental Information to the Public and the Corporate Environmental Supervisor System

**Mr. Goto:** Mr. Tateba, from the viewpoint of JICA, what do you think deserves our attention in relation to corporate activities for environmental preservation in China?



**Mr. Masao Tateba**  
Chief Advisor,  
Recycling-oriented  
Economic  
Promotion Project  
Japan International  
Cooperation  
Agency (JICA)

**Mr. Tateba:** China has taken a positive approach to environmental issues, as evidenced by the Environmental Protection Law established in 1989, and the Japanese government has supported these efforts. JICA established the Sino-Japan Friendship Center for Environmental Protection, which is now being used as a base for various cooperative projects in four fields; corporate activities from the input of resources through to production and sales; education to enhance environmental awareness, mainly focusing on consumers; recycling and reuse of resources from consumer waste; and appropriate disposal and management of waste.

Recent movements related to corporate activities are the formulation of Guidelines for Reporting Corporate Environmental Information to the Public (draft) and support for the creation of a Corporate

Environmental Supervisor System. This latter system corresponds to the Pollution Control Manager System in Japan.

These two measures are an important part of cooperative efforts for the Recycling-oriented Economic Promotion Project that I am engaged in.

**Mr. Goto:** Both these measures closely concern Japanese companies operating in China, don't they?

**Mr. Tateba:** That's right. The Guidelines for Reporting Corporate Environmental Information to the Public (draft), which were started during your visit to China in September, 2009, have been completed. For listed companies, we also invite public comment relating to these guidelines on our website. In addition, there are discussions among relevant departments and agencies relating to the introduction of environmental accounting. This will involve technical difficulties, and we are now discussing how to make it practical.

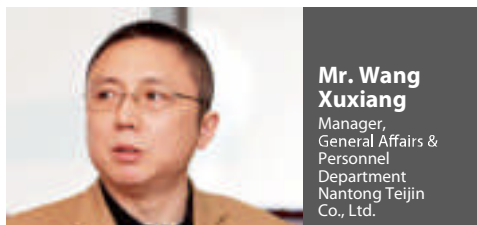
Meanwhile, support for the Corporate Environmental Supervisor System, which uses the Japan's Pollution Control Manager System as a reference, is underway with trial training already initiated at 7,000 companies (so far 6,678 people have attended lectures). The training is currently centered on large, major Chinese companies in the electric power and steel industries, but when the systems reaches full-scale, many more companies are expected to be included in the initiative.

## Profile

### Mr. Masao Tateba

Mr. Tateba joins the present project with a wealth of experience at JICA in the Training Center, Medical Cooperation Department, Social Development and Research Department, Thailand Office, and the Sino-Japan Friendship Clinic Project.

## What Kind of Environmental Initiatives are Required in China?

Reinforce Capability to Comply with Total Emissions Regulations,  
and Communicate Corporate Opinions to Policymakers

**Mr. Wang Xuxiang**  
Manager,  
General Affairs &  
Personnel  
Department  
Nantong Teijin  
Co., Ltd.

**Mr. Goto:** Thank you for your contributions, Dr. Chang from Tsinghua University and Mr. Tateba from JICA. Now there will be an opportunity for those of you from Teijin Group companies to express your opinion or ask questions.

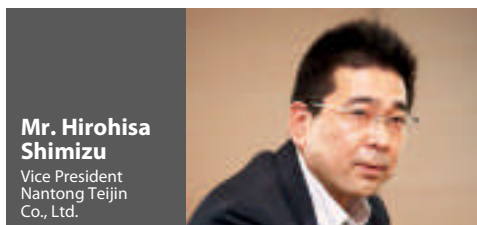
**Mr. Wang:** As a manager at Nantong Teijin, I have recently become acutely aware of the importance of preventing wastewater pollution. In the 17 years since Nantong Teijin was established, management of water quality is now at its strictest level. When the company was established, the dyeing industry was still in its initial stages. The situation has changed dramatically. Nantong City is still eager to invite companies, but the dyeing industry is refusing.

**Mr. Shimizu:** Currently in China, COD regulations imposed on the dyeing industry are levels up to 100mg for class 1, 180mg for class 2, and 500mg for class 3. Nantong Teijin, situated adjacent to the secondary treatment site, is subject to class 3 regulations. However, there have been recent opinions voiced by the relevant authorities that permissible emissions should be reduced from 500mg to 100mg. Is there a possibility that regulations will become this strict?

**Dr. Chang:** Nantong City in Jiangsu is near Lake Tai. Regulations as strict as this are quite possible in the vicinity of important lakes, marshes and rivers.

**Mr. Goto:** Water pollution has become a significant issue globally. Solutions emphasize environmental impact on water rather than the amount of pollutants released. Therefore, in areas where water pollution is severe or where there is a high necessity for preserving water quality, it is quite possible that regulations stricter than the national standard will be imposed.

**Mr. Nakagawa:** Considering the total emissions regulations that Dr. Chang stressed, thought must be



**Mr. Hirohisa Shimizu**  
Vice President  
Nantong Teijin  
Co., Ltd.

given to how we should respond to these regulations while increasing production output. This will be an issue not only for Nantong Teijin but all Teijin Group. A clear group-wide policy of the Teijin Group is to expand activities in China. As such, we need to quickly understand Chinese environmental regulation trends and share the information with all group companies.



**Mr. Hiroataka Nakagawa**  
President  
Nantong Teijin  
Co., Ltd.

**Mr. Yamamoto (Regional CEO for China/ Participating as an observer):** In China, our plastics business includes our Zhejiang plant and Teijin Chemicals Plastic Compounds Shanghai Ltd. The Zhejiang plant uses a lot of water, so we have been focusing on measures to reduce/recycle wastewater in addition to our efforts to reach the various environmental targets of the Teijin Group. However, we may have to change our stance depending on the future environmental regulations in China. Earlier, Mr. Tateba spoke about the possibility of the public commenting on the Guidelines for Reporting Corporate Environmental Information to the Public (draft). Adding to this, I feel that corporate opinions should be reflected in the environmental regulations. This has already started to some extent with the subcommittee of the Japan Chamber of Commerce and Industry in Beijing and Shanghai submitting proposals to the Chinese government via the Japanese Embassy.

**Mr. Goto:** I think it very important that opinions of the industry are reflected in government policies. Dr. Chang and Mr. T

**Dr. Chang:** An effective way of achieving this may be to direct opinions to organizations such as the research institution of our university. Research institutes are usually involved in policy research and drawing up policy drafts to be deliberated on. The Sino-Japan Friendship Center for Environmental Protection to which Mr. Tateba belongs is another of these institutions.

**Mr. Tateba:** I would like Japanese corporate members to understand that when the Japanese government extends assistance relating to design of institutional systems in China through JICA and others, reference is made to past experiences in

Japan, the current situation and future orientations. This approach benefits China, Japan and the rest of the world. Bearing this in mind, it is necessary to resolve issues on a case-by-case basis, through actively keeping a close eye on government websites, maintaining close relations with local

Environmental Agencies, and approaching university and other research institutions.

**Mr. Goto:** Thank you all very much for a lively discussion.

**Mr. Muraoka:** We appreciate your valuable comments. Thank you very much.

#### Summary by the Coordinator

##### Mr. Toshihiko Goto

Representative Secretary, Environmental Auditing Research Group

As Mr. Tateba of JICA mentioned, in the capacity of JICA temporary advisor, I officially support the formulation of Guidelines for Reporting Corporate Environmental Information to the Public set by the Chinese government. The 2010 training team was received by Teijin for a half-day visit and an explanation of initiatives was provided. Teijin also participated in the Chinese CSR Investigative Team organized by CBCC of Keidanren (Japan Business Federation) to observe and rank CSR report initiatives of the Chinese Academy of Social Sciences. On this basis, the necessity of creating a Chinese version of the CSR report and a dialogue in China was recognized. Subsequently, a dialogue in Shanghai was arranged. Although similar dialogues have been conducted by several Japanese companies in the past, I would like to express my deep respect for Teijin for their wise decision and highly advanced efforts. Based on the experiences above, I agreed to act as a coordinator and had the pleasure of working with long-time acquaintances, Dr. Chang and Mr. Tateba.

I am pleased to say that the dialogue was very effective and is something to be proud of. I consider the largest contributing factor to be the fact that Teijin deployed local personnel responsible for environmental issues rather than the local Japanese management personnel. This decision was a manifestation of the company's policy to value and select local people. I was deeply impressed by the local people involved. They reminded me of the Japanese people making sincere efforts to tackle pollution problems during the years of steep economic growth in Japan.

Points emphasized in the dialogue were that China has had a serious stance on environmental issues for quite a few years, and that under the 12th Five-year Plan starting this year, the reduction of pollution and water pollution measures in particular, will be extremely important. Although not mentioned in the main text, I was also surprised to find that China closely follows world trends, even closer than Japan; for example the Bluesign Standard certification\*8.

\*8 Bluesign Standard certification: Standards for evaluating the environmental impact resulting from dyeing and final processing in the fiber/textiles field. The standards relate to five areas: resources and productivity, wastewater, atmospheric emissions, workplace hygiene and workplace environments.

#### Comment from Teijin

##### Opinions and Requests Received from Stakeholders

For the stakeholder dialogue this time, we adopted the theme "Efforts for Environmental Preservation in China," invited Chinese environmental policy experts, had our activities evaluated, and created an opportunity to learn about future orientations.

From Dr. Chang of Tsinghua University, Mr. Tateba of JICA, and the coordinator Mr. Goto, we heard timely and frank opinions from broad spectrum of viewpoints regarding environmental policy trends in areas such as reducing CO<sub>2</sub>, regulations on total SO<sub>2</sub> emissions and wastewater COD levels, the 3Rs of resources, and environmental education. The dialogue was an extremely valuable time in which a lively exchange of views with local personnel responsible for environment was possible. We would like to express our sincere appreciation to

those involved for taking time out of busy schedules to participate.

Many challenges still remain for our environmental preservation activities. One such challenge will be to consider the overall reduction in environmental impact achieved through identifying substances with high environmental impact. How we respond to changes in total emissions regulations that accompany economic growth will also be important. Referring to the valuable opinions we received, we will make all possible efforts to make further improvements in terms of reducing/recycling wastewater and energy-saving measures at production and marketing sites in China. The Teijin Group appreciates your continued guidance and support.