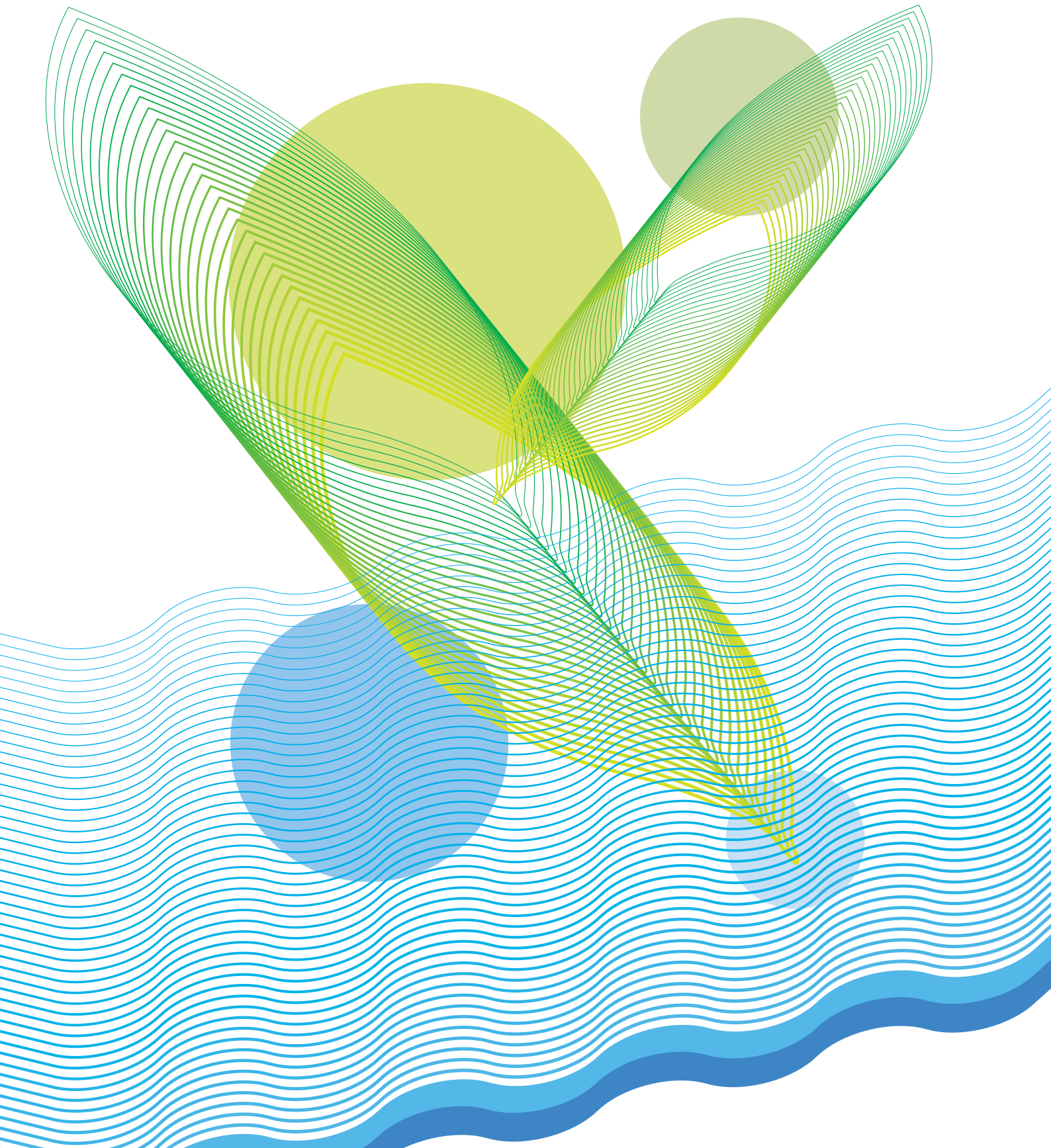


Safety & Environmental Report **2010**



Editorial Policy

- **Purpose of the report**

This report has been prepared to present information about Toyo and its group Companies' safety and environmental activities to stakeholders of Toyo.

- **Reference guideline**

This report has been prepared with reference to "Environment Guideline (2007)" of Japan's Ministry of the Environment.

- **Period**

The report covers the activities for fiscal year 2009 (from April 1, 2009, through March 31, 2010).

The data overseas cover those for calendar year 2009 (from January 1, 2009, through December 31, 2009).

- **Scope**

The report covers the activities of all the Divisions and Departments of Toyo and its group Companies as well as the domestic and overseas construction sites, i.e., "Global Toyo".

- **Next report**

The next issue is scheduled for August 2011.

- **Prepared by**

Safety, Quality and Environment Management
Division / HSE Management Department
(Phone 81-47-454-1678, Fax 81-47-454-1833)

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Aiming to be a Corporation trusted not only by Clients, but also by the Local and International Communities.

On behalf of everyone at Toyo Engineering Corporation (Toyo), I would like to express our sincere gratitude for your understanding and support for our activities over the years. Toyo provides its esteemed Clients all over the world with specialized services ranging from the project planning phase to the plant operation phase by utilizing its Project Management skills and comprehensive Engineering capabilities.

In the process of plant construction, we place the highest priority on safety, implementing a wide range of safety measures. However, unfortunate situations may arise as the construction work is carried out by humans, regardless of the best possible efforts for preventing errors or mistakes. Should any accident occurs, we immediately report it to the Client and the relevant authorities. We make a thorough audit on the situation, evaluate the cause and effect. The audit results are shared with all the group Companies and other construction sites, so that they can implement necessary and thorough safety measures.

While providing specialized services, Toyo fulfills its social responsibility to protect the global environment by evolving energy- and resource-saving designs and by paying the utmost attention to environmental concerns in plant construction. We will act as a Corporation trusted not only by our Clients, but also by the Local and International Communities.

We would be highly obliged if you could give your valued views on the activities in this "Safety and Environmental Report 2010".

August 2010



Yutaka Yamada
President and CEO



Corporate Profile (As of March 31, 2010)

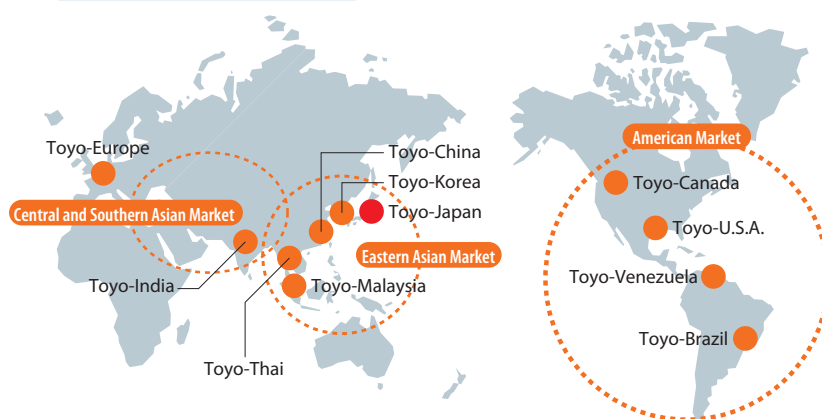
- **Corporate name** : Toyo Engineering Corporation
- **Founded** : May 1, 1961
- **Representative** : Yutaka Yamada, President and Chief Executive Officer
- **Common stock** : 18.2 billion yen
- **Number of employees**: 4,024 (consolidated basis)
- **Business activities** : Engineering, Procurement and Construction for Industrial Facilities
 - R&D support, design, engineering, procurement, construction, commissioning and technical assistance for industrial facilities: oil, gas, petrochemicals, chemicals, water treatment, transportation systems, power generation, nuclear power, advanced production systems, pharmaceutical, fine chemical, distribution systems, biotechnology, environmental and others
 - IT engineering services and system software supply

Global Toyo

"Global Toyo" is a globally networked Corporate entity in which the group Companies around the world collaborate with each other while maintaining close relationships with their respective local markets and Clients, carry out work for all Clients worldwide in the most efficient manner based on common work standards.

Through Global Toyo, we accumulate and share information on such topics as the market, human resources and technology, thereby enabling us to offer solutions and professional services that meet the Clients' needs precisely and promptly.

Worldwide Network



<Global Toyo>

- Toyo-Japan : Toyo Engineering Corporation, Japan
- Toyo-Korea : Toyo Engineering Korea Limited
- Toyo-China : Toyo Engineering Corporation, China
- Toyo-Malaysia : Toyo Engineering & Construction Sdn. Bhd.
- Toyo-India : Toyo Engineering India Limited
- Toyo-Europe : Toyo Engineering Europe S.A.
- Toyo-Canada : Toyo Canada Corporation
- Toyo-U.S.A. : Toyo U.S.A., Inc.
- Toyo-Venezuela : Toyo Ingenieria de Venezuela, C.A.
- Toyo-Brazil : Toyo do Brasil-Consultoria E Construcoes Industriais Ltda.

<Group Company>

- Toyo-Thai : Toyo-Thai Corporation Public Company Limited

Basic Policies on Health, Safety, Security and Environmental (HSSE) and Quality

Toyo Engineering Corporation and its group companies (hereafter TOYO) recognize that satisfying the HSSE and quality requirements called for by our clients and society is an indispensable prerequisite for us to conduct business activities and to fulfill social responsibilities, and abide by the following eight basic policies.

1. Continuously confirm and share the consensus that “Safety takes precedence over all other considerations”, and realize and maintain safe, sanitary conditions in all workplaces.
2. Strive to complete all jobs with no accidents and no harm to people by enforcing preventive safety measures.
3. Endeavor to provide our personnel with work environment and opportunities that enable them to maintain and improve their mental and physical health.
4. Ensure information security, and take appropriate safeguards against threats and risks to business assets.
5. Minimize environmental burden by saving resources and energy, detoxifying, reducing and recycling waste, and by preventing pollution during the course of our work duties.
6. Provide high-quality products and services that meet the HSSE requirements of our clients and society.
7. Comply with all relevant laws and regulations, the requirements agreed upon with the client, and our in-house rules relating to HSSE and quality.
8. Establish and continuously improve the effectiveness of management systems, including objective setting, hazard identification, risk evaluation, determination of countermeasures, execution control and review, and education and training, in line with management’s firm belief that the securement of HSSE and quality is a prerequisite for business continuity.

These policies shall apply to all staff members of TOYO in any region and country. TOYO will also share the spirit defined by these policies with clients, business partners, and other related parties, and cooperate with them to achieve these objectives.

September 1, 2009



Yutaka Yamada
President and Chief Executive Officer



Message on Safety

Safety

The premises for a Corporation that is trusted by the community include paying sufficient attention to safety.

We are confident that our efforts and initiatives, time and expenses to respect human life must take precedence over all other things. Loss of valuable human life must absolutely be prevented in the process of Toyo and its group Companies' business evolution, such as plant construction.

With the recognition that "safety takes precedence over all other things," Toyo will continuously implement safety education programs for all its employees to spread awareness of the Safety Culture.

"Safety" is the prime brand of Toyo. In order to boost the brand value by all group companies in the world, we are strongly promoting many safety measures and actively strive to consolidate a firm Safety Culture.

••• Clients' Commendations for Safety •••

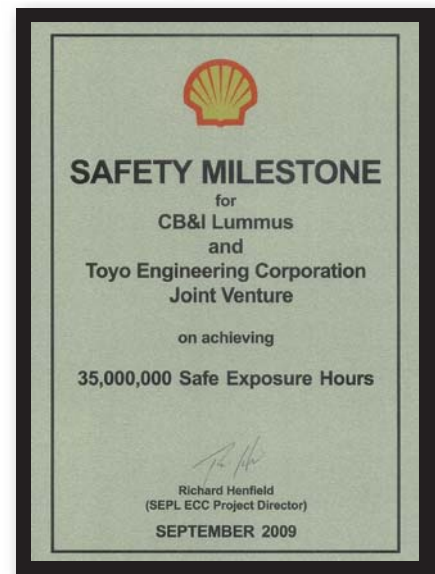
Our mission is to hand over superior facilities to our Clients through construction work completed without any accidents or injuries. For this purpose, the Head Office and construction site members, together with Clients and Partners, conduct safety management activities in a planned and positive manner, with an established Health, Safety, Security, Environment (HSSE) management system.

In September 2009, Toyo achieved a record of 35 million man-hours without lost time incidents at the Singapore site, which was highly appreciated by the Client, Shell Eastern Petroleum (Pte) Ltd.

In October 2009, Toyo received high commendations from (old) Nippon Petroleum Refining Company, Ltd. (new: JX Nippon Oil & Energy Corporation), for completing construction without lost time incidents.



Letter of appreciation from (old) Nippon Petroleum Refining Company, Ltd.



Plaque from Shell Eastern Petroleum (Pte) Ltd.

Toyo has received letters of appreciation from the Clients listed below in addition.

Commendations for Safety (January, 2009 – March, 2010)

Year and month	Reason for commendation	Client	Description
Mar. 2010	No lost time incidents	Qatar Shell GTL Ltd.	15 million hours without lost time incidents during the 4th quarter (October ~ December) of 2009 at QGTL Project, Qatar
Mar. 2010	No lost time incidents	Dow Corning (Zhangjiagang) Co., Ltd.	20 million hours continuous operation without lost time incidents at Silane Project, China
Aug. 2009	No lost time incidents	Petroleo Brasileiro S.A. (PETROBRAS)	6 million hours continuous operation without lost time incidents at CGPEX Project, Brazil
Aug. 2009	Less than 1.0 of TRI rate	Qatar Shell GTL Ltd.	Achieve less than 1.0 of Total Recordable Incidence (TRI) rate at QGTL Project, Qatar
Jun. 2009	No lost time incidents	Indian Oil Co., Ltd.	30 million hours continuous operation without lost time incidents at IPNC Project, India
May 2009	No lost time incidents	Dow Corning (Zhangjiagang) Co., Ltd.	10 million hours continuous operation without lost time incidents at Silane Project, China

• • • Efforts for Safety • • •

■ Safety Record

Toyo's safety record 2007 – 2009 (2010 partially included) is as follows.

Safety record over the past 4 years

Year	Employee Worked (Man-Day)	Employee Hours (A)	Number of Incident					LTI Rate*1	Total Recordable Incidence Rate*2
			Fatalities	Lost Time Incident	Medical Treatment (No Lost Time)	LTI Total (B)	Recordable (C)		
2007	9,012,650	89,334,017	1	16	326	17	343	0.19	3.84
2008	9,685,066	96,925,454	3	14	236	17	253	0.18	2.61
2009	10,524,345	104,229,724	0	8	131	8	139	0.08	1.33
2010*3	2,502,758	24,622,474	0	2	20	2	22	0.08	0.89

*1 Lost time incidence (LTI) rate = (B) x 1,000,000 / (A)

*2 Total recordable incidence (TRI) rate = (C) x 1,000,000 / (A)

*3 Figures for 2010 are up to the end of April.

Both LTI rate and TRI rate in 2009 show a downward trend compared to those in 2007 & 2008.

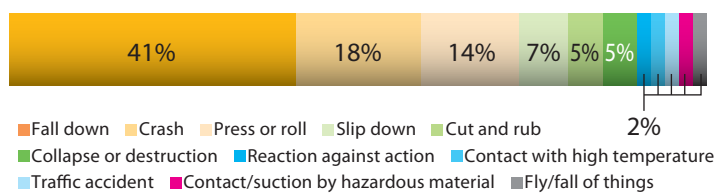
As of the end of September 2009, the total non - lost time incidents (non-LTI) hours of the ongoing projects*4 exceeded 120 million man-hours. This record is equal to employee hours when about 40,000 site members worked without LTI for one year. It is the first great safety record since Toyo's inception.

*4 The total non-LTI of ongoing projects is the latest sum of non-LTI hours of ongoing projects (excluding completed projects). Non-LTI of a project in which an accident occurred returns to zero and the count starts again.

● Number of injuries according to categories of incidents

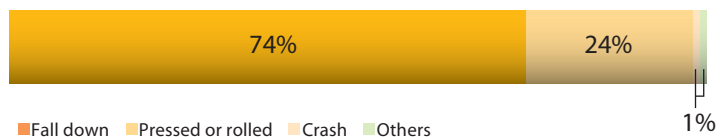
When the number of injuries during 2007 - 2010 (figures for 2010 are up to the end of April, 4 fatalities and 40 injured with lost time incidents, total 44) are divided in accident categories, 41% of the injuries were due to fall down accidents. Therefore, the implementation of safety management and preventive measures for elevated work places is essential.

Injuries by category of incidents (2007 - 2010*)



* Figures for 2010 are up to the end of April

Loss days by category of incidents (2007 - 2010*)



* Figures for 2010 are up to the end of April

When the incidents are analyzed on loss day basis, 74% of loss days was due to fall down and 24% of loss days due to press or roll, sum of which amounts to 98% of total loss days. Loss days due to fall down are more and have a large effect on total loss.

■ Safety in Construction: GTL Project in Qatar

This project, awarded by Qatar Shell GTL Ltd., is to construct Liquid Processing Unit (LPU) as a part of world's largest Gas to Liquids (GTL) plant.

The project is implemented by a consortium of Toyo and Hyundai Eng'g. & Const. Co., Ltd.

The plant site is located in Ras Laffan industrial city, about 100 km to the north of Doha. Approximately 4,600 workers are working at the site.

Under the firm commitment of the Client and Toyo's top management - "Safety takes precedence over all other things," Toyo has been working at the site without any accidents or injuries, achieving a high-level safety standard.

Incident and Injury Free (IIF) Management Meeting

Aiming at the realization of IIF at the construction site, Toyo reconfirms actions for achieving the goal through the IIF Management Meeting, held jointly with

- Client's representatives,
- Persons responsible for safety of individual work areas,
- Persons responsible for safety of all the Subcontractors.



IIF Management Meeting

12 Life Saving Rules

Aiming to let all the workers return safe and sound to their home, Toyo applies Client's "12 Life Saving Rules" (12 rules that shall be followed at site).



12 Life Saving Rules

Total Safety Task Instruction (TSTI)

TSTI, is KYK* activity implemented by the supervisor together with members of each work group at workplace before starting any construction work. This safety activity, including checking of ever changing risks, greatly contributes to the realization of safe working atmosphere.

*KYK (Kiken Yochi Katsudo) refers to Risk Prediction Activity to foresee any risk before work.



TSTI activity

■ Safety in Construction: Ethylene Project in Thailand

This project, awarded by PTT Polyethylene Co., Ltd., is to construct a world-class complex producing ethylene and related products. The project is implemented by a consortium of Toyo and Toyo-Thai.

At the plant site, located in Padaeng Industrial Estate, Map Tha Phut, Rayong, about 200 km to the Southeast from Bangkok, the construction work by Toyo-Thai is in its final stage, and safety activities are in place to cope with new risks that may emerge in commissioning.

Tool Box Meeting (TBM)

TBM refers to the short time meeting held every day morning, before start of work, by Supervisor to emphasize

- Work to be done,
- Procedure to be followed,
- Preparations to be done,
- Risk involved and Safety Precautions to be taken,
- Any major activities at site.

During this time general check on essential PPE (Personal Protection Equipment) worn by everybody is carried out.



Tool Box Meeting

Safety Training

Toyo implements the following training to all its employees and those of Subcontractors

- Safety Training (Preliminary, Working at Height, Confined Space etc.),
- Firefighting Training,
- First Aid Training,
- Evacuation Drill,
- Training to improve Safety Skills.

All the visitors and the Vendor Supervisors are given a safety instruction before entering the work area.



Safety Training (Firefighting Training)

Silent Steam Blowing

To clean the inside of piping with steam, the Silent Steam Blowing method* is employed to reduce noise for minimizing environmental impact.

* Silent Steam Blowing is a method to reduce steam blowing sound with a silencer installed.



Silent Steam Blowing

■ Safety in Construction: Monosilane Project in Japan (Yokkaichi)

Evonik Monosilane Japan Co., Ltd., awarded this Project, to construct Japan's largest monosilane gas producing plant. Monosilane gas is used to form silicon films for thin-film silicon solar cells and silicon films for a variety of electronic devices. At the construction site in Yokkaichi, Mie Prefecture, piling has been done successfully and full-swing foundation construction is about to begin. At the peak of the construction, more than 400 workers will be at the site.

Construction is scheduled with utmost priority always placed on safety, and risk assessment is carried out for operations including high-place scaffolding work, with awareness that everyone is the Safety Manager.

Special safety patrol by Site Managers of individual companies

Toyo's and Subcontractors' Site Managers patrol their work areas every day in the morning and in the afternoon to observe and correct unsafe work or unsafe conditions.



Safety patrol by Site Managers

Principle of wearing full-harness safety belt*

Practical training is given to inexperienced workers for wearing full-harness safety belts all the time in dangerous working places.

* Full-harness safety belt is the safety belt to be worn around the body to soften shock like a parachute, different from conventional belt to be worn only around the waist.



Training for wearing full-harness safety belt

Operation of Hiyari-Hatto system

Hiyari-Hatto (near loss) experience data is utilized as live information to establish minute safety measures. For this purpose, a software for touch screen has been developed, and a personal computer furnished with the software is installed at the entrance of workers' saloon to enable them to enter reports easily at any time.



Entering data into the Hiyari-Hatto system

■ Global Toyo HSSE Activities

Toyo and its group Companies have established Global Toyo HSSE Standard to ensure that safety management is conducted at the same level in all countries and regions. We promote Global Toyo HSSE activities in order to thoroughly follow these standards.

To promote Global Toyo HSSE activities, the persons in charge of HSSE from Toyo and its group Companies keep close communication through internet and video conferencing. They gather twice a year to exchange views and address the improvement of safety management activities.

The Hiyari-Hatto system, used at each of Toyo's domestic project sites, has been introduced and operated at Toyo group Companies since January 2010. We collect Hiyari-Hatto data from our group Companies, make analysis and develop feedback of information. This information is shared with its group Companies in order to reduce accidents in entire Toyo and its group Companies.



Global Toyo HSSE Meeting

Toyo and its group Companies participating in the meeting

- Toyo-Japan
- Toyo-China
- Toyo-Malaysia
- Toyo-Korea
- Toyo-India

■ Continuous Effort toward Improving Safety Culture

● In-house safety education

From 2006 to 2008, Toyo has been conducting safety education programs for all Corporate members, including directors, to enhance the safety awareness at Corporate level. Toyo also provides construction site workers with safety education continuously. Materials used for safety education are revised and supplemented, and revised materials are distributed to ex-trainees in a timely manner as a follow-up to firmly establish Safety Culture. Based on the information collected over the years on safety from all construction sites and analysis results, Toyo is revising the safety education materials. These materials will be formally launched during the second in-house safety education to be conducted in 2011.



In-house safety education materials

● HSSE Manager training session

Toyo strives to develop "HSSE Manager" to respond to changes in Clients' requirements as well as to increase both in scale and intensity of public concern about Health, Safety, Security & Environment (HSSE), and also to requirement for intensification of Project Management of complex systems. HSSE Manager is to integrate and control HSSE activities throughout the projects.

A procedure has been developed for HSSE Manager's responsibilities, and training sessions for senior staff of related Divisions and Departments is being carried out.



HSSE Manager training session

● Office risk assessment

Toyo carried out risk assessment of the Engineering Center in accordance with the established procedure in order to reduce unsafe or hazardous points. Persons in charge from related Departments and from HSSE Management Dept. participated in the activity to carry out risk assessment of cleaning operation, security guard operation, dining room and restaurant operation as well as of building facilities. Based on the assessment, corrective action was taken to remove all unsafe conditions.

● In-house safety commendation

Commendations are given to projects larger than a certain scale that have been completed without accidents and injuries, and to projects that have achieved a certain continuous time period without lost time incidents. In 2009, a total of seven projects were recognized by the President.

In addition, another 7 projects were recognized by the Chairperson of the SQE Promotion Committee.



President's commendation in August 2009

● Care for Health

At present, the number of young Japanese people is declining, a social phenomenon. This resulted in the increase of working class people, of age 50 or over, in the domestic construction site.

With such personnel organization, it is important for securing measures that all workers take care of their own health and continue to be healthy, physically and mentally.

All the domestic construction sites are obliged to carry out medical examinations of all the workers in compliance with the Industrial Safety and Health Act, the Ordinance on Prevention of Asbestos Poisoning, and other applicable regulations, and also to submit personal survey sheets (health check) on new site workers.

In order to enable all the workers to work actively every day in healthy shape, Toyo carries out medical examinations, including face-to-face check at morning assembly and blood-pressure check, and suggests proper job placement, taking into consideration of individuals' physical conditions.

Toyo's persons in charge of safety at the site, together with those of Subcontractors, check and make efforts to keep everyone's good health, encouraging them to follow everyday's "say something to each other" activity.



Blood-pressure and other health check at construction site

● Operating “Hiyari-Hatto” System

Hiyari-hatto (near loss) is an incident that was prevented just in time before it occurred. At construction sites, people sometimes experience potentially dangerous *Hiyari-hatto*. Repeated *Hiyari-hatto* may lead to a serious accident. The *Hiyari-hatto* data management system, developed by Toyo, has been employed since January 2008 at domestic construction sites.

Hiyari-hatto data at construction sites is collected and analyzed at the Head Office, then fed back to the group Companies and construction sites. In the following report, 217 incidents from November, 2008 to October, 2009 are analyzed.

(1) Summary of *Hiyari-Hatto* System analysis results (indicating the top five items)

Items		Order	No.1	(%)	No.2	(%)	No.3	(%)	No.4	(%)	No.5	(%)
Time of occurrence			In the morning	54.8	In the afternoon	41.9	Before noon	1.8	Night	0.9	Evening	0.5
Cause	Material		Fly or drop	44.4	Fire	18.5	Explosion or rupture	9.3	Leakage	3.7	Mudslide	1.9
	Person		Stumble or slip down	29.4	Tumble or fall down	17.6	Crushed	15.7	Press or roll	6.9	Foreign object in the eye	4.9
Reason for occurrence	Person		Inability to respond	23.4	Confirmation not made	17.0	Hurry for the work	10.0	Neglect of rules	8.2	Cut corners	7.0
	Work		Incompletion of training	37.5	Insufficient KYK*1	31.3	Work by one person	8.3	Default of KYK	6.1	Other	34.5
	Material		Personal protective equipment or tool insufficient or not used	25.8	Malfunction of machinery / tool	22.6	Lack of safety protection	19.4	No regular check	3.2	Other	25.8
								Insufficient safety equipment	3.2			

(2) Countermeasures based on analysis

Yellow marking in list means remarkable data comparing to previous analysis in March 2009.

The following measures are taken to prevent the recurrence of *Hiyari-hatto*.

1) Countermeasure in view of frequent occurrence in the morning.

- Thoroughly implement the morning meeting, KYK^{*1} and TBM^{*2} and confirm work procedures before morning work.
- Let all workers look around the workplace to identify conditions before the work is started.

2) Countermeasure in view of frequent incompletion of training.

- Review and improve training documents at the site and carry out refresh training.
- Carry out thorough meeting / confirmation of the work procedures and enforcement of KYK before a work is started.

3) Countermeasure in view of frequent Malfunction of machinery / tool.

- Check the function before use according to the check list of machinery / tool.
- Confirm the check results by the supervisor.

*1 “KYK” stands for *Kiken Yochi Katsudou* (risk prediction activities), which are activities for predicting work-related risks before work is started.

*2 “TBM” stands for “Tool Box Meeting”, which is an activity to briefly discuss the contents, methods, arrangements, safety risks, and problems of the work of the day before starting work at the workplace.

• • • Lessons learned • • •

■ Collision

Situation

To allow a crane to move from a pipe rack area to a road, wooden boards were placed on the ground so as to disperse the load on the side ditch concrete cover. However, when a tire of the crane passed on the boards, one of the boards jumped up to hit directly the right leg of a worker who was 2.5 meter apart. The worker's leg bone was fractured.

Causes

- Although the procedure requires steel plates be used to disperse load, the workers placed thin wooden boards, neglecting the requirements because the step of side ditch was small.
- The worker was standing beside the moving heavy machine.
- KYK (Risk Prediction Activity) had not been done.

Countermeasures

- (1) To be carried out at the construction site
 - At a general meeting, it was explained and reconfirmed that steel plates should be used to disperse the load of a passing heavy machine, and unevenness under the steel plates should be filled with sand.
 - Special safety education was given to Equipment operation supervisors and related workers.
 - A temporary fence with barricade was installed to prevent workers to come closer to a moving heavy machine.
- (2) To be carried out by the Head Office
 - The accident was immediately reported to all construction sites and group Companies to prevent similar accidents from occurring and to promote safety awareness.
 - Construction sites were instructed to strictly follow the procedure and to thoroughly implement "KYK."



Crane passed over wooden boards

■ Drop and Fall Down Accidents

Situation

While two workers were dismantling a mobile scaffold (2 m wide, 5 m long, and 7 m high), the weld of one of the root of four wheels cracked and the entire scaffold turned over. As a result, two workers fell down from 3 m height of the first stage and from 5 m height of the second stage, respectively. Both the workers did not wear a safety belt.

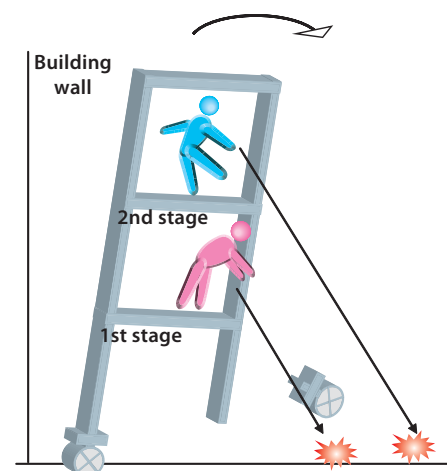
The worker who dropped from 3 m height (42 years of age) broke his right leg bone at one point while the other worker who dropped from 5 m height (38 years of age) broke his right leg bone at two points.

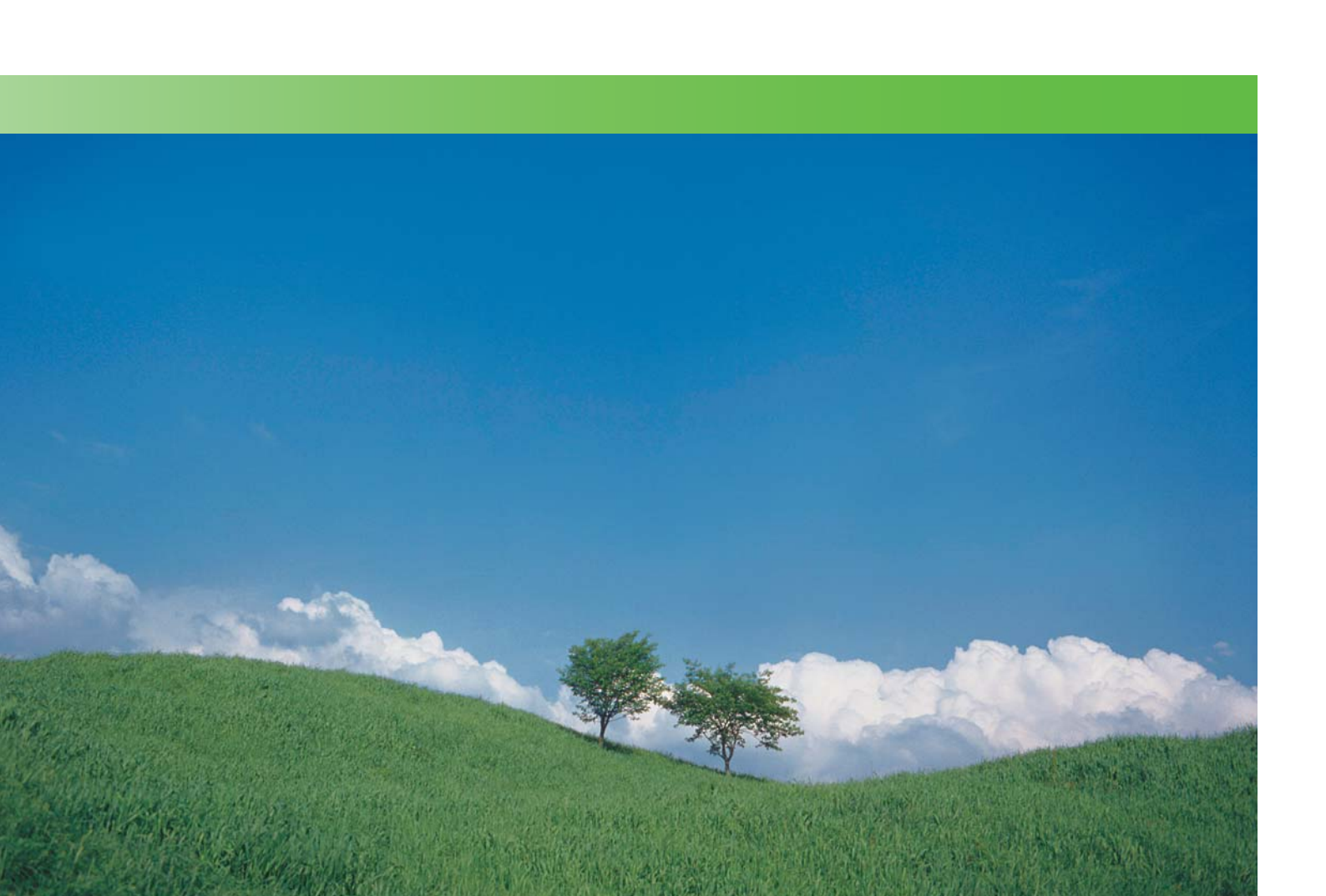
Causes

- Mechanical strength was insufficient because of the reduced wall thickness caused by corrosion.
- Pre-operation check tags specified by the procedure had not been attached. (After pre-operation check, green tags should have been attached to scaffolds permitted for use and red tags to scaffolds not permitted for use.)

Countermeasures

- (1) To be carried out at the construction site
 - All scaffolds are checked and tags were attached in accordance with the procedure.
 - Prohibited use of red-tagged scaffolds and tag-less scaffolds was re-confirmed at Tool Box Meeting (TBM).
- (2) To be carried out by Head Office
 - The accident was reported to all the construction sites immediately to promote safety awareness.
 - Special safety audit of the accident site was conducted to give instructions about the accident point and general safety instructions.
 - The procedure was revised to limit the mobile scaffolding operating height and to add requirement for providing outriggers to prevent scaffolds from turning over. The revision was communicated to all the construction sites.





Environment

Message on Environment

Since its inception, Toyo has been exerting advanced comprehensive engineering capabilities to reduce burdens on the global environment through project execution in the energy and material industries.

We are confident that it is Toyo's mission to contribute to "sustainable development" that can balance competing goals for economic development and conservation of the global environment.

In the execution of projects, Toyo focuses on reducing environmental loads of plants by actively employing such measures as energy - saving technology, appropriate wastewater treatment processes, and technologies for removing hazardous substances from emission gases.

As a global Corporation, Toyo will strive to develop, acquire, and expand global environment conservation technologies; to promote technology exchanges with Clients throughout the world; to make proposals on environmental issues; and to contribute actively to solving environmental issues such as global warming through international cooperation frameworks.

• • • Efforts for Environment • • •

■ Office Activities*

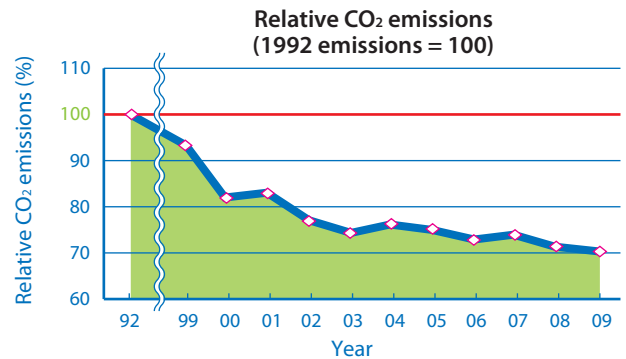
● Reduction of CO₂ emissions

CO₂ emissions from offices are calculated from electricity consumption, urban gas consumption, and consumption of fuel oil A used for emergency power supplies.

Toyo launched energy-saving activities in 2000. In 2001, we made energy saving investments, such as installing lighting inverter stabilizers, which produced positive results in 2002 and after.

CO₂ emissions in 2009 were reduced by 30% from the 1992 level.

* Office activities are defined as those of the Engineering Center.



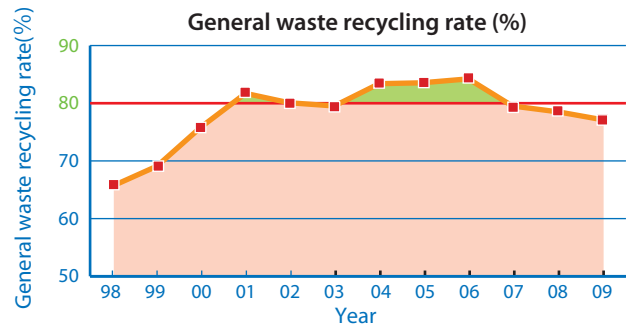
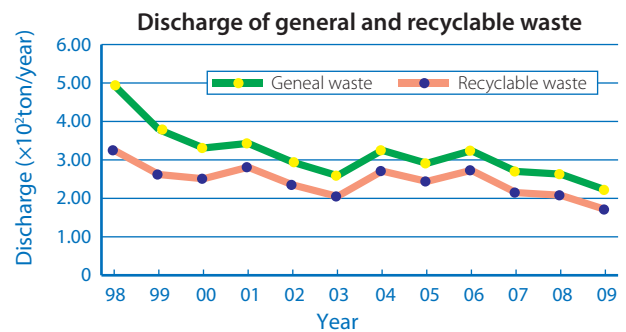
● Reduction of general waste and improvement of general waste recycling rate

Discharge of general and recycling waste* decrease gradually over the year and each waste is reduced to 220 ton and 170 ton respectively in 2009.

Since 2001, when separation of general waste and double-sided printing were encouraged for the first time, the general waste recycling rate has been more than about 80%, as is required by guidelines.

However, the general waste recycling rate in 2009 decreased to 77.1%. We will make more efforts to reduce the discharge of general and recyclable wastes to improve the general waste recycling rate.

*Recycling waste is the recyclable general waste including paper output from personal computer and photo-copy machine, newspaper, shredded paper, cardboard, pet bottle, glass bottle, can and garbage.



■ Construction Waste Gross Discharge

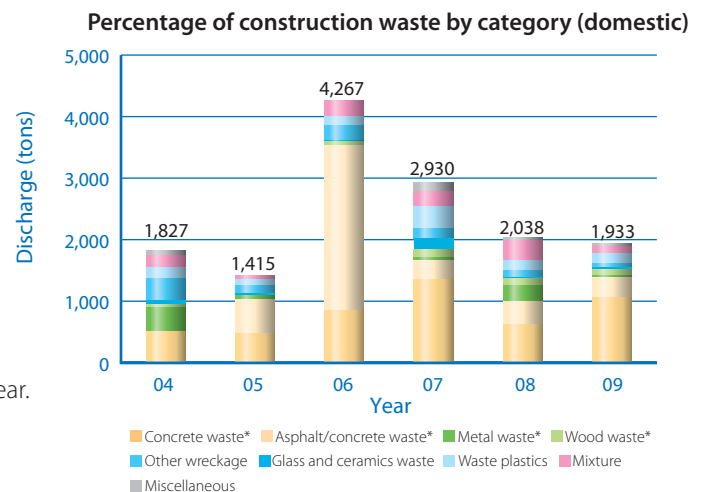
● Domestic construction sites

(1) Percentage of construction waste by category

The figure to the right shows the weight of construction waste and its categories in proportion.

The weight of construction waste discharge from domestic construction sites in 2009 was 1,933 tons, 105 tons less than discharged in 2008. Toyo implements various kinds of construction and percentage of waste by category tends to be different in each year.

The total discharge of four categories of waste marked with (*) amount to 83%, comparatively high value, in 2009.



(2) Percentage of construction waste by disposal methods

Percentage of construction waste by disposal method (recycle, landfill, and incineration) is shown in the figure to the right.

Percentage of recycle was 94.9% in 2009.

In 2009, the weight of construction waste discharged from large and medium scale sites was 95% of total discharge and its recycling rate was high value 97%. This is the cause of largely improved recycling rate.

Recyclable wastes separated from other wreckage, glass, ceramics, and waste plastics contribute to high recycling rate in addition to recyclable wastes including concrete waste etc..

(3) Recycling rates of four items specified by the Construction Material Recycling Act

The recycling rates of four items specified by the Construction Material Recycling Act are illustrated to the right.

The recycling rates for concrete waste and asphalt/concrete waste have been kept to almost 100%.

The recycling rate of metal waste was as high as 100%, with the exception of 2005.

The recycling rate of wood waste was largely improved to 99.7% in 2009.

●Overseas project sites

Weight of construction waste discharge and percentage by category

The total discharge weight in 2009 was 55.5 thousand tons, about a fifth of that in 2007 and decreased by about 13 percent from 2008. This is because some large-scale projects in 2007 were completed, reducing largely the weight of construction surplus earth/sludge.

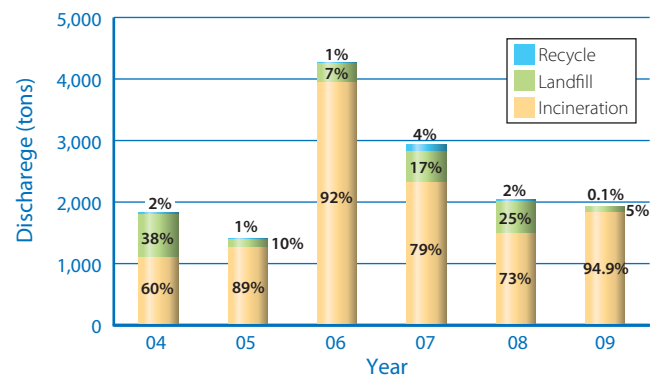
Comparison of weight of construction waste discharge, except construction surplus earth/sludge, between each year was made to eliminate the special factor of extremely large percentage, 75%, of construction surplus earth/sludge in 2007.

Toyo implements various kinds of construction method and percentage of waste by category tends to be different in each year.

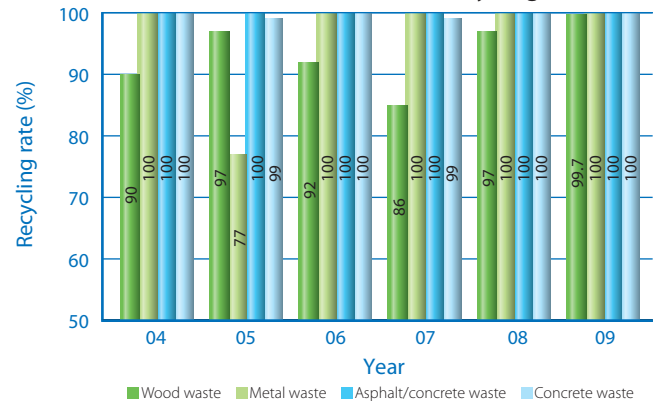
Camp garbage and wood waste in 2009 were larger in weight than those in past two years.

Toyo will continue to summarize the construction waste discharge weights at overseas project sites to utilize the data for reducing the environmental load.

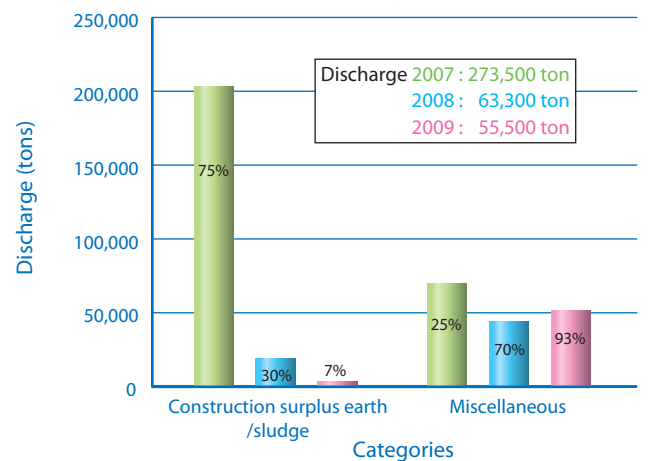
Percentage of construction waste by disposal method



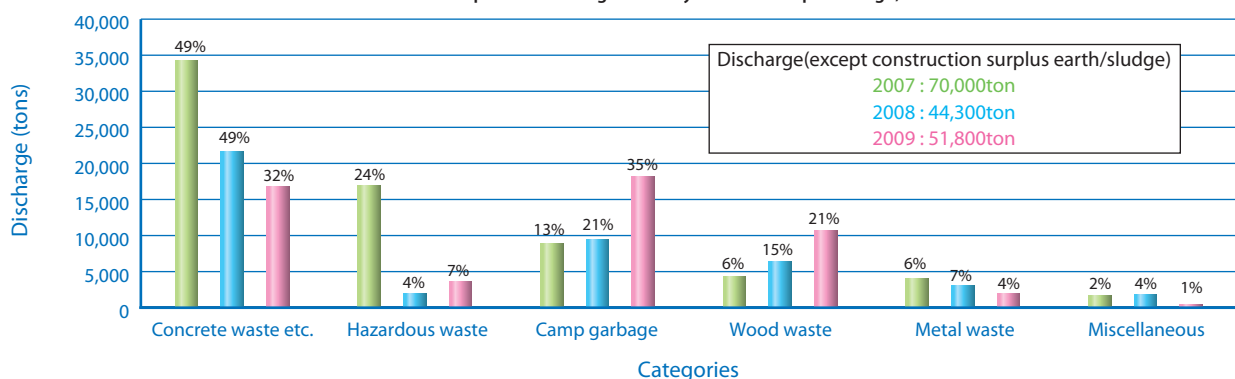
Recycling rates for four items specified by the Construction Material Recycling Act



**Weight of construction waste discharge and percentage by category
Comparison between construction surplus earth/sludge and miscellaneous
(Proportions of individual waste categories to the total discharge weight in each year shown as percentage)**



**Weight of construction waste discharge and percentage by category
(Proportions of individual waste categories to the total discharge weight except construction surplus earth/sludge in each year shown as percentage)**



■ Engineering, Procurement, and Construction Activities

● Engineering

Toyo makes efforts to reduce the environmental load in plant operation. These efforts start in the engineering stage. Based on ISO 14001 and ISO 9001, Toyo reduces the environmental load that occurs in plant operation, through the following work processes:

- (1) Clarification and confirmation of Client requirements (environmental specifications)
- (2) Design review
- (3) Design verification
- (4) Design validation

Toyo makes efforts to reduce environmental load in design work through “Eliminate 3M - Principle” (Eliminating *muri* (overdoing), *muda* (wasting), and *mura* (irregularity)) , while striving for efficient design work and methodology as an environmental target.

Moreover, Toyo contributes to Client satisfaction with energy and resource conservation at the production plants by actively proposing Toyo’s energy- and resource-saving technologies to the Clients.

● Procurement

As one of its environmental targets, Toyo has set up “promotion of green procurement.” Toyo actively promotes the procurement of equipment and materials from environmentally conscious green enterprises*.

In 2006, Toyo issued an in-house guideline titled “Guideline for Green Procurement.” In line with this, we continue green procurement, aiming to achieve a green procurement rate of more than 90%.

In 2009, the amount of procurement from green corporations reached 90% of the total procurement amount and increased by 3% since 2008. Toyo regards this percentage as the green procurement rate.

Toyo promotes paperless work to contribute to resource saving by computerizing inquiries from Clients, quotation requests to vendors, quotations from vendors, and inspection reports.

* Environmentally conscious green corporations are vendors that have acquired ISO 14001 or that are carrying out environmental conservation activities, selected from the 100 largest vendors to Toyo.

● Construction

Among Toyo’s business activities, site construction work creates the largest environment load. At construction sites, the following environmental targets are set up and efforts are made to reduce the environment load:

- (1) Appropriate treatment of construction waste
- (2) Appropriate treatment of chemicals (paint, etc.)
- (3) Environmentally conscious construction method
- (4) Environmentally conscious material transportation
- (5) Turbid water treatment and oily water separation



Safety and environmental meeting at construction site
Meetings are held regularly at construction sites to familiarize workers with knowledge regarding safety and environmental management.

■ In-house Environmental Education

Toyo started in-house environmental education to familiarize all employees including directors with the necessity of Environmental Management System (EMS) activities since April, 2009.

EMS is associated with the reduction of paper, waste, electricity, and water consumption in offices as well as environmental conservation activities at construction sites. However attention is also paid to the fact that “Eliminate 3M - Principle” (Eradication of *muri* (overdoing), *muda* (wasting), and *mura* (irregularity)) in overall engineering work are significant environmental aspects. Toyo provides education focusing on these environmental aspects.

Toyo held the regular course once a week for employees and uses video conferencing equipment for attendees at overseas sites. In 2009, 82% of the employees underwent this course.

In-house environmental education



Attendees’ side
Sao Jose dos Campos, State of Sao Paulo
Brazil time: AM 8:00



Lecturer’s side
Engineering Center, Teleconference room
Japan time: PM 8:00

• • • Environmental Conservation Activities at Sites • • •

■ Ammonia and Urea Project in Venezuela

Petroquímica de Venezuela, S.A. (PEQUIVEN) awarded this plant to the Consortium of Toyo, Ferrostaal A.G., Germany, and Y&V Ingeniería y Construcción, C.A., Venezuela. The plant is to produce ammonia and urea by natural gas as raw material. The plant is located in Morón, Carabobo State, 150 km west of Caracas.

Environmental Survey

The neighborhoods of the plant area is rich in wildlife such as turtle, iguana, birds etc.. The Project team took environmental protection measures as follows

- Protection of the water resources and prevention of water pollution
- Noise control of equipments
- Study of atmospheric phenomena and others.

The environmental measures are categorized for each item and controlled to ensure that it is followed by one and all. The results are periodically informed to Client and Local Government body.



A turtle returning to the sea after laying eggs



Birds near the complex



An iguana found in the complex

Voluntary activity of picking up garbage at coast

The plant is located along the sea coast. On the annual Marine Day (the third Saturday, September), representatives of PEQUIVEN, Local Community, Local Environmental Study Group joined hands with Consortium members to pick up garbage on the shore. About 60 people participated. A video was recorded.



Volunteer garbage pick up on the coast

Waste Management

Construction waste and general waste are separated by type. A person is placed in charge of managing each type of waste and the majority of the waste is recycled. For example, ferrous metals are sold to recycling companies, or donated along with wood to the local technical school for use as teaching materials. Soil is also donated to restore roads in flood-prone areas.



Soil donation for road restoration



Equipment installed for the study of atmospheric phenomena

■ Silane & Siloxane Project in China

This project, awarded by Dow Corning Co.,Ltd., is for construction of Silane & Siloxane plant in the suburbs of Zhangjiagang city, Jiangsu province, China. Aker Solutions China and Toyo have been jointly awarded and executed the Project Management. Now the construction is at final stage.

Ground contamination control

Under this requirement, all users of chemical including paint, diesel, need to provide with drip tray for control of spillage. Drip tray is also required to be provided under any stationary fuel operated equipment to contain any leakages. Paint store need to be concrete-paved in addition to drip tray so that all contaminated concrete can be removed and disposed as waste at project completion.



Drip tray for ground contamination control

Waste control

All construction wastes are disposed at a central scrap collection center and all scrap divided into different categories. Project has different compartments for wood waste, paper waste, concrete waste, general waste, scrap metal, hazardous/contaminated waste.



Sorting & storage compartment for construction waste

Dust control

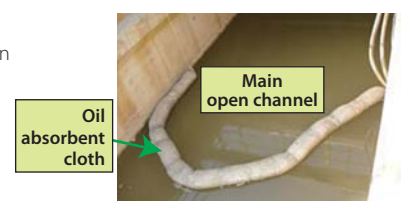
A water truck is provided on site to sprinkle water for dust control.



Water sprinkling truck

Water pollution control

All the rain water and surface water go to main open channel which goes to a public river. To prevent contamination to public water, oil absorbent cloth is being provided before the outlet. The water in the channel is also being tested at laboratory every week. Whenever any spillage into the channel is reported, immediate cleaning is activated.



Oil absorbent cloth equipped at outlet of main open channel

■ Project for Taiyo Oil Co., Ltd. in Japan (Shikoku Plant)

The project is to construct C3 splitter, Alkylolation Unit, Gasoline Desulfurization Unit, and Waste Water Treatment facility in the Residual Oil Fluidized Catalytic Cracker (RFCC), awarded by Taiyo Oil Co., Ltd. The construction site is at Shikoku Plant of Taiyo Oil Co., Ltd., located in Kikuma, Imabari-shi, Ehime Prefecture. The project is now at the final stage of construction.

Waste Storage Management

All construction waste is sorted into mixed waste, cardboard, wood waste, metal waste, etc., and collected into local refuse collection cages, and conveyed and stored in large containers located at a place in the plant. The large containers are transported to intermediate treatment vendors by a waste carrier.



Local refuse collection cages



Large container replacing work

Cleaning of nearby roads

Site Manager and a few members of each of the Contractors (total 20 participants) clean the public road for about 1 km from the main gate of the plant to the material storage every third Saturday. This is highly appreciated by local residents.



Departure of Site Manager for cleaning work

Traffic control and walking guidance for workers

Every morning, Site Managers of contractors give guidance to workers for proper walking, together with traffic control, along the side walk from the site office to the plant premises. At the entrance of the site office, a guard is located for traffic control.



Scene of traffic control



Guard near the site office entrance

■ Project for Mitsui Chemicals, Inc. in Japan (Osaka Works)

Here is another example of environmental conservation activities in a construction project performed by Toyo at Mitsui Chemicals' Osaka Works.

Control of vehicles entering Mitsui Chemicals premises

Trucks, buses and other vehicles to be operated in the premises should conform to the regulations, under the Ordinance Relating Conservation of Life Environment of Osaka Prefecture. Construction vehicles are not permitted to enter the premises without a sticker "Conforming Vehicle" certifying that the vehicle meets the emission standards.



Construction vehicle permitted to enter the premises

Enlarged



Regulation-conformance sticker

Soil dust scatter prevention measures

After unloading soil in the premises, construction vehicles and platforms must be washed with water to prevent mud or pollutants from scattering when vehicles pass through open roads.



Washing construction vehicle wheels before departure

Concrete mixer chute washing

Concrete mixers are washed after the concrete is poured. In this case, washing water is not thrown away into soil. It is stored in a tank or in bags, brought back to a concrete plant, and neutralized in a waste water treatment facility.



Concrete-mixer-washing water receiving bag

Chute



Tank vehicle receiving chute-washing water

Tank facility

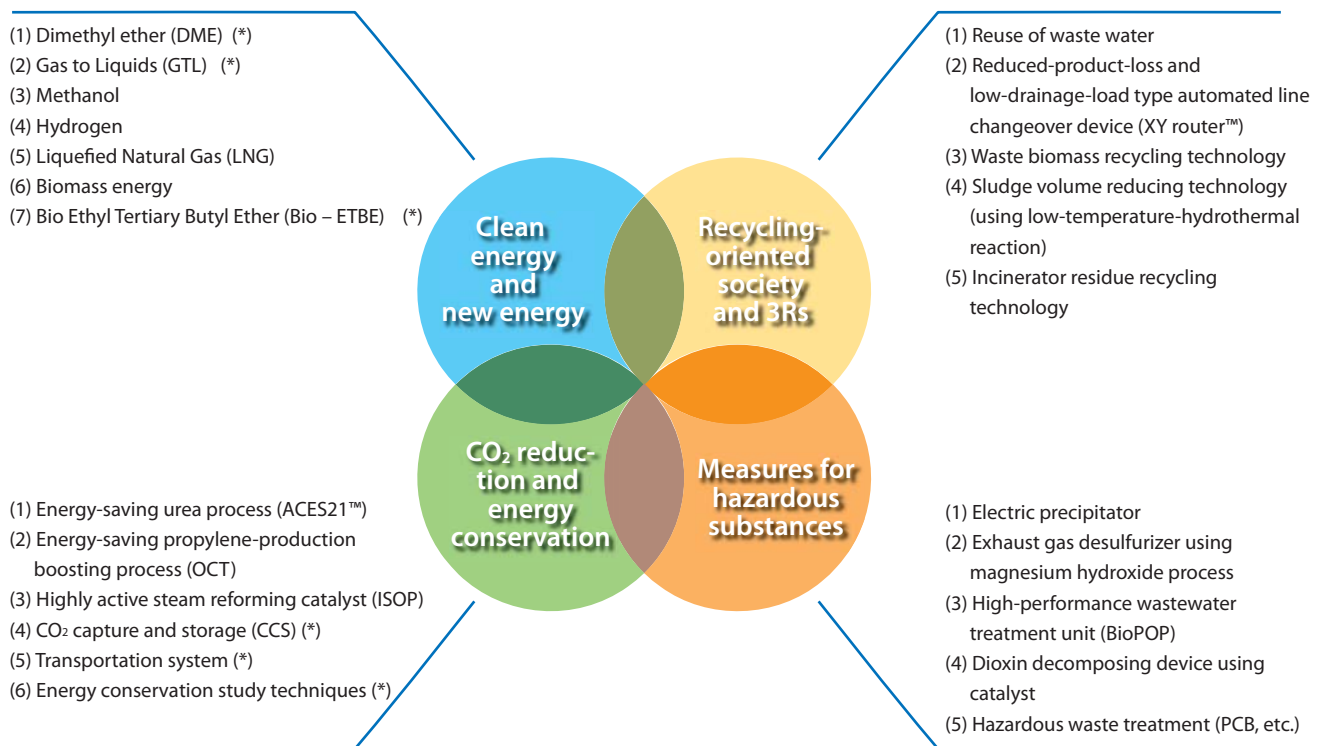
Receiving bag

••• Toyo's Environmental Technologies •••

Toyo actively promotes development, introduction, and improvement of technologies that contribute to the environment. Through utilizing these technologies, Toyo provides a variety of solutions to environmental conservation.

On the basis of accumulated knowledge and experience, Toyo aggressively applies R&D engineering* in the field of environmental conservation, making various approaches to clean energy and new energy, CO₂ reduction and energy conservation, a recycling-oriented society, the Reduce, Reuse, Recycle (3Rs) campaign, and measures for hazardous substances.

* R&D engineering is a technical service to facilitate the quick commercialization of laboratory scale technologies that Clients have developed.



(*) Details are shown in the following pages.

■ Toyo's Solutions Contributing to Clean Energy and New Energy

● Dimethyl Ether (DME)

DME is a clean fuel that does not generate sulfur oxides or particulate matter when combusted because DME does not contain sulfur or ash. Toyo has developed indirect DME production technologies, by adding the DME synthesis process to the methanol plant. In the indirect method, methanol and DME may be produced together and production can be adjusted to suit market demand, enabling a highly flexible production strategy. In China, four DME plants under Toyo's license are operating successfully.

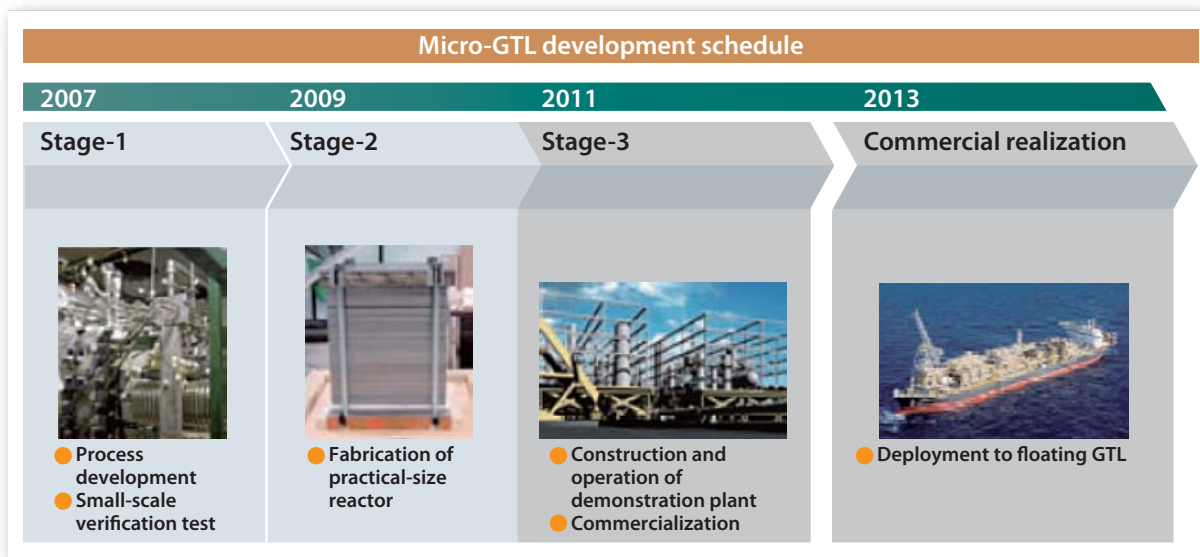


DME plant for Shanxi Lanhua Clean Energy Co., Ltd., China (140,000 t/y)

●Gas to Liquids (GTL)

GTL is a process that transforms natural gas or associated gas into a clean diesel fuel or naphtha containing less impurities than petroleum-derived products.

Since November 2007, Toyo has been developing micro-GTL process, which is compact and cost-efficient, jointly with Velocys Inc., the United States, and MODEC, Inc., Japan. The joint development project has been conducted successfully, aiming to achieve commercialization by the end of 2011 after constructing and operating a demonstration plant. Because of the compactness, the micro-GTL plant can be installed not only on shore but also on board a ship. Early commercialization of on-board GTL (floating GTL) is expected because it will allow deep-sea natural gas that has not been easily exploited to be effectively developed and utilized.



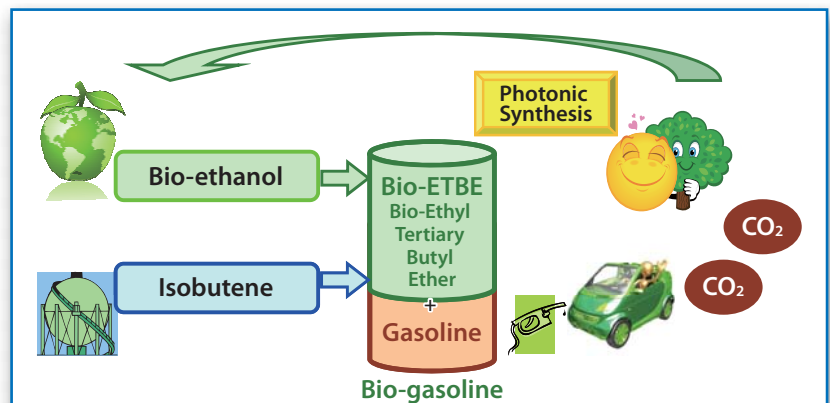
●Bio Ethyl Tertiary Buthyl Ether (Bio-ETBE)

Bio-ETBE is produced by synthesizing Agricultural or Organic derived bio-ethanol and petroleum-derived isobutene. Bio-gasoline containing bio-ETBE is supplied to all automobiles at gas stations in the same manner as gasoline refilling.

When an automobile runs with bio-gasoline, a reduction of greenhouse gas emissions (mainly CO₂) from the automobile is expected from the carbon neutral concept*. The number of gas stations supplying bio-gasoline will greatly increase as permanent introduction of bio-gasoline is scheduled for 2010.

Toyo is implementing an engineering, procurement, and construction project to convert an existing MTBE (synthesized from natural gas-derived methanol and isobutene) facility to a bio-ETBE facility of JX Nippon Oil & Energy Corporation Negishi Refinery. This facility will be the first Bio-ETBE commercial plant in Japan.

* According to the Kyoto Protocol, CO₂ discharged from biofuel while it is burnt is not calculated as greenhouse gas emissions, because the organic plant from which biofuel is produced, absorbs CO₂ through photonic, and therefore CO₂ discharged as the biofuel burns does not increase the total amount of CO₂.

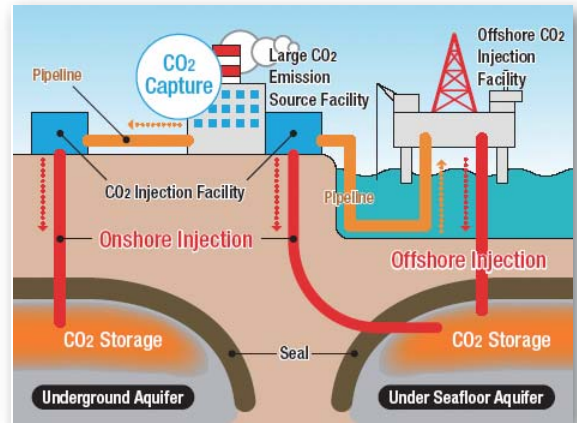


■ Toyo's Solutions to CO₂ Reduction and Energy Conservation

● CCS (Carbon dioxide Capture and Storage)

CCS is one of prospective measures for CO₂ reduction on a large scale. The Intergovernmental Panel on Climate Change estimates in its special report "Carbon dioxide Capture and Storage" (2005) that CCS could contribute to greenhouse gas reduction at a rate of 15% - 55% until the year 2100.

Toyo has participated in the activities of Japan CCS Co., Ltd., established in 2008 for the early realization of large-scale CCS demonstration testing in Japan and is working as a founding member of the Global CCS Institute (GCCSI), which was established in 2009.



CCS image

● Transportation system

Railway systems are re-evaluated worldwide as public transportation means which are environmentally friendly compared with automobiles and aircraft. Demand for railways as urban transportation means is increasing in countries that are suffering from chronic traffic congestion caused by poorly developed transportation infrastructure.

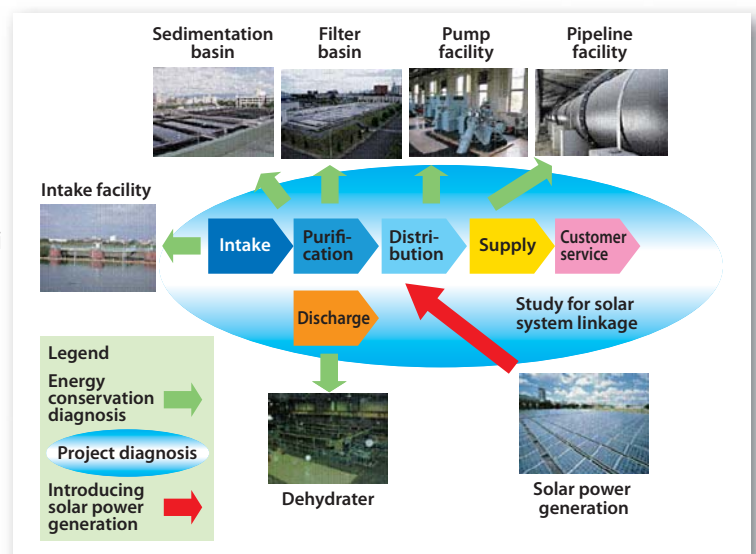
To respond to such demand, Toyo founded Toyo Transport Engineering Co., Ltd. in October 2007, jointly with Mitsui & Co., Ltd., establishing a framework to support technologies distinctive to railway construction. As a system integrator, Toyo aims to provide high-quality railway systems improving convenience with environmental friendliness and creating employment, and thus contributing to local communities.



● Energy conservation study techniques

As economic development progresses, demand for water increases, causing serious water-shortage in many countries due to insufficient water sources and leakage from water piping.

Jointly with Osaka Municipal Waterworks Bureau, Kansai Economic Federation and some companies backed up by the Japanese government, Toyo diagnosed energy and water conservation on the total waterworks system from water sources to faucets in Ho Chi Minh City in Vietnam. As a result, Toyo proposed some improvement ideas of plural waterworks systems by streamlining energy use at water purification and water conveyance and distribution facilities and by utilizing solar and other renewable energy resources.



Source: Osaka Municipal Waterworks Bureau

Selecting an idea contributing to the largest improvement, Toyo will design, install, and operate facilities for the purpose of project verification.

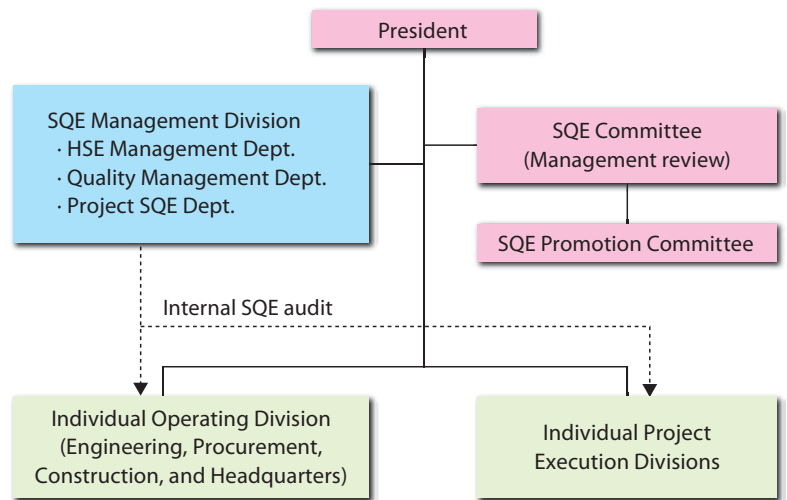
• • • Safety, Quality, and Environment (SQE) Management Structure • • •

Toyo has set up the SQE Committee, which reports directly to the President, to review companywide SQE management activities. The Committee establishes the operating policies and assesses and approves the results of SQE activities.

The SQE Promotion Committee promotes companywide activities in line with the basic policy of the SQE Committee, and also promotes specific SQE activities of Individual Operating Divisions and Individual Project Execution Divisions.

The SQE Management Division monitors the SQE activities performed by Individual Operating Divisions and Individual Project Execution Divisions, conducts internal SQE audits and reports the audit results to the SQE Promotion Committee and the SQE Committee.

The SQE Promotion Committee and the SQE Management Division cooperate systematically on the axis of SQE Committee, which is connected directly to the management, to implement the Plan-Do-Check-Act (PDCA) cycle of the Individual Operating Divisions and Individual Project Execution Divisions for continual improvement of the SQE management system and performance.



company wide SQE management structure

• • • ISO Approval and Internal Audit • • •

■ ISO approval

In March 1994, Toyo acquired Quality Management Standard ISO 9001:1987 certification from the United Kingdom Accreditation Service (UKAS) and the Japan Accreditation Board for Conformity Assessment (JAB) after surveillance by Lloyd's Register Quality Assurance (LRQA). In March 2009, Toyo passed the Renewal Assessment for ISO 9001:2000. In March 2010, Toyo passed the Transition Assessment for ISO 9001:2008.

In October 2004, Toyo obtained Environmental Management Standard ISO 14001:1996 certification, which covers the Head Office and domestic construction sites. The certification was given by UKAS and JAB. In March 2009, Toyo passed the Renewal Assessment for ISO 14001:2004.



Closing meeting of LRQA's surveillance



ISO 9001 Certificate of Approval



ISO 14001 Certificate of Approval

LRQA's surveillance is carried out simultaneously for the above two standards once a year (in February) since 2010. Toyo takes corrective actions following LRQA's recommendations so as to continually improve Toyo's quality and environmental management systems and performance.

In March 2006, Toyo obtained the BS 7799 Certificate of Approval for the Information Security Management System with LRQA as the certification body. In March 2009, Toyo passed the first Renewal Assessment for ISO/IEC 27001:2005.

In activities not related to ISO certification, Toyo follows OHSAS 18001, an international occupational health and safety management system specification.

■ Internal audit

In order to make sure that Toyo's Quality and Environmental Management is effectively carried out, internal audit at Head Office is conducted by internal auditors simultaneously for Quality and Environment. The audits aim to be useful for Corporate Management, contributing to enhancing the Corporate value.

Environmental audits on sites are performed partially along with safety audits.

● ● ● SQE Education ● ● ●

Toyo's SQE education includes "TEC Special Course: Quality and HSSE Management" held regularly and "Internal Safety, Quality and Environmental Auditor Training Course," in addition to in-house education for safety, quality, and the environment.

All employees are obliged to attend in-house education. Special education by outside instructors is also carried out as required.

■ "TEC Special Course: Quality and HSSE Management"

TEC Special Courses cover a wide range of engineering and management fields for the purpose of "promptly educating young employees as professionals" and "complementing intra-division education and extending peripheral knowledge" by in-house instructors. "Quality and HSSE Management" has been added to the series of TEC Special Courses to implement education on Safety, Quality, and the Environment.

■ Internal, Quality and Environmental Auditor Training Course

Selected candidates for internal, Quality and Environmental Auditors are educated by an external auditor training institute.

 **TOYO ENGINEERING CORPORATION**

2-8-1 Akanehama,
Narashino-shi, Chiba 275-0024, Japan
Tel: 81-47-451-1111
Fax: 81-47-454-1800
<http://www.toyo-eng.co.jp/en/>

