



Japan's Minister of the Environment has recognized the REMATEC Group as an environmental leader in its industry.







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REMATEC Rebuilding stakeholder trust by transitioning to a new management structure: Team REMATEC

田中靖訓

Yasunori Tanaka President and CEO REMATEC Holdings Corporation

### Learning from the Kyushu Plant accident

We apologize to our stakeholders for the considerable inconvenience and concern caused by the explosion and fire at our Kyushu Plant on December 2, 2013. Industrial waste disposal companies tend to have a higher rate of accidents than companies in other industries, and the fact that the REMATEC Group handles hazardous materials (mainly waste oil) makes the probability of such accidents still higher. Given this, we regard ensuring safety as the cornerstone of our operations and have been working hard to maximize safety through measures such as acquiring certification for our Occupational Safety and Health Management System. Despite these efforts, however, we were unable to prevent an extremely serious accident.

We have investigated the causes of the accident, repeatedly discussed preventive measures, and explained the outcomes to local residents, government agencies and other concerned parties. As a result, we were able to obtain their consent for reopening the plant and resumed operations in December 2014.

This accident led to us not only losing one of our group's main plants, but also the trust of our stakeholders. As the head of the REMATEC Group, I fully recognize the seriousness of the accident and I am determined to prevent similar accidents from occurring in the future. Taking into account the advice we have received from all of the concerned parties, the entire REMATEC Group will do our utmost to ensure safe operations at our plants.

### Marking our 40th anniversary

REMATEC

REMATEC Corporation (formerly Kinki Environmental Industry Co., Ltd.) celebrated its 40th anniversary in April 2014 by converting itself into a holding company with a management structure comprised of nine group companies.

Until then, our core business activities were conducted by the founder of the REMATEC Group: REMATEC Corporation. However, for a company to contribute to its local community and further develop, it needs to be able to respond quickly and flexibly to business and community needs. If the authority to conduct business is delegated based on a holding company system and the holding company is allowed to focus on decision-making for the group as a whole, each group company's responsibilities are clarified and decisions can be made faster. We aim to increase the entire REMATEC Group's corporate value by allowing each group company to improve its skills through independently engaging in and handling its own business.

# Renewing our commitment to resolving environmental issues

Under the slogan of "Innovation for the Earth," our group has taken on the mission of creating innovations that will help resolve social problems in the environmental field. In fact, our company's history has been built upon an accumulation of efforts to resolve problems. A prime example of this is the Reclaimed Fuel (RF) business which was started in 1983. This coal-alternative fuel production business uses waste materials, mainly waste oil, as raw materials. Now our main line of business, it was established based on the results of a technology we developed to make effective use of waste oil, which contains plenty of water and solid content and at that time had to be disposed of through incineration. Ever since, we have remained committed to resolving social problems in the environmental field whenever they arise, such as restoring areas where large-scale illegal waste dumping has occurred, neutralizing and extracting useful components from harmful materials by using subcritical water, and disposing of disaster waste. We do so by fully leveraging our planning capabilities, technical expertise, and quick on-site responses.

# Taking on challenges in the renewable energy field

Society's needs change over time. The challenges faced in the environmental field have shifted from reducing pollution and taking measures to prevent illegal dumping to managing harmful materials. Following the Great East Japan Earthquake, energy problems have become the top priority issue in Japan.

To address these issues, we spun off part of REMATEC's R&D Department in February 2014 to establish Renagen Inc. Our goal was to establish a presence in the renewable energy field by commercializing a technology we had been developing since 2003 for the recovery of energy through the methane fermentation of biomass.

We aim to create a business model that enables coexistence with local communities by establishing an autonomous distributed energy source that makes use of communities' unused biomass resources.

#### 2014 CSR Report Contents

Message from the President	02
Kyushu Plant accident·····	04
Corporate history ·····	08
REMATEC Group overview ······	10
REMATEC Group CSR ······	12
Two key business domains ·····	14
Resource recycling business ······	16
Renewable energy business	18
Special feature: Regional projects	20
Communication with stakeholders ······	22
Moving forward with the reconstruction	of
the Kyushu Plant ·····	28

#### Data:

Occupational Safety and	
Health Management System ······	29
Environmental management system · · · · ·	30
Environmental performance data	32

External adviser feedback ······	34
Group company information	35

# Pursuing initiatives to resolve overseas problems

Japan is not alone in facing serious problems with regard to waste disposal. In 2007, the REMATEC Group started investigating the situation in other countries (mainly Thailand, Malaysia, Indonesia, and other Southeast Asian countries), and in September 2013 we established a subsidiary in Thailand.

The issue of waste disposal has been a growing concern in Southeast Asian countries as it puts a strain on the economic growth, and various initiatives to address this issue have been launched there. By leveraging our experience as a waste disposal company, we can help these countries overcome this issue, so we will work proactively to support problem solving overseas in the future.

#### Achieving balanced growth

The REMATEC Group plans to develop its business with the aim of delivering the environmental solutions that the world is demanding regardless of national borders. We will carry out these efforts as a business group that provides comprehensive environmental solutions through our planning capabilities, technical expertise, and quick on-site responses.

In addition, we recognize that ensuring safety is essential to all of our business activities and are promoting management aimed at achieving balanced growth.

We welcome candid feedback from our stakeholders and are committed to conducting our business activities in communication with them. We hope to enjoy a long-lasting relationship with you in the years to come.

# Kyushu Plant Accident

At about 9 p.m. on December 2, 2013, a fire broke out at REMATEC Corporation's Kyushu Plant (now operated by REMATEC KYUSHU Corporation). We would like to express our deepest apologies to local residents and other stakeholders for the considerable inconvenience and concern this event caused.

We are taking this accident very seriously and are implementing measures to prevent similar accidents as well as to reinforce our group-wide safety management system.

#### Accident summary

- Site: Reclaimed Fuel (RF) Production Unit, Building A, Kyushu Plant, REMATEC Corporation
- Time: 9 p.m. on December 2, 2013; the fire was extinguished the same night at 11:15.
- Damage:
- (1) Injuries: None (2) Property damage: Building A burned down almost completely.
- Nine vehicles (owned by our subsidiary) in the car park were destroyed by the fire.

#### Background

Plant overview

including waste oil, oil mud, sludge, dust, waste acids, and waste alkalis.

Source of the fire

An investigation of the damaged facility identified TK-4B (an oil mud tank) as the main source of the fire. One of the plant's waste storage tanks, it was mainly used to store waste oil.

Accident response

Operation of the plant's production facilities was suspended. The next day, the fire department, the police department, the labor standards inspection office, Oita Prefecture's Department of Civil Life and Environment, and other relevant local authorities completed their on-site investigations. Shortly after that, the company set up a team to conduct its own investigation into the causes. We submitted our Fire Accident Report to the relevant administrative agencies and organized a briefing session for local residents to report on the causes identified and the actions taken.

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The fire was started by an explosion of hydrogen gas generated from a chemical reaction. The reaction was caused by aluminum metal powder mixing with waste oil that had turned into a strong alkaline solution.

	+				
	Indirect causes				
Factor	Indirect cause				
	The sensor for detecting abnormal reactions was inadequate.				
1. Machinery	The equipment for dealing with abnormal reactions was inadequate.				
	Ventilation inside the building housing the tank was inadequate.				
2 Matorials	Materials (i.e., the waste) were inadequately managed.				
2. Materials	Changes in the properties of the materials went unnoticed.				
3. Manpower The personnel handling the chemical materials had insufficient knowledge and experience.					
4 Martin	The waste quality control system was inadequate.				
4. Media	Not enough data was collected from the waste generators on the waste.				
	Only a few employees had expertise in chemistry.				
5. Methods	No department had been assigned to evaluate mixture risks.				
	The system for monitoring the plant after operating hours (at night) was inadequate				

Approach and measures taken at the plant prior to the accident							
Factor Approach Item Measures							
		Sensors	Liquid scales were installed.				
1. Machinery	The plant was regarded as just a mixture facility; no chemical reactions were expected to take place.     Tanks were installed indoors to avoid noise and odors	Alarms	Alarm systems were installed so that a buzzer or other alert would sound in the control room in the event of an abnormality in the liquid level, etc.				
	disturbing the surrounding area.	Combustible gas	Ventilation fans were installed for use during operation of the facility.				
		Received waste	The properties of waste were checked upon signing of the contract.				
2. Materials	- Materials were handled in lots.	- Materials were handled in lots.	Changes in received waste	Upon receipt of the waste, its current properties were compared against its properties at the time the contract was signed.			
3. Manpower	- Training focused on operation, maintenance, and other aspects of equipment management.	Training	OSHMS, ISO 14001, and other certifications were obtained after in-house training on work safety, health, and the environment had been conducted.				
	<ul> <li>Data management prioritized information on whether specific materials could be recycled by the company's equipment.</li> </ul>	Quality management	Quality management focused on the fuel production process.				
4. Media	- Waste evaluation was performed in terms of legal compliance and the risks posed by the constituents of the materials.	Waste data	Decisions on the acceptance or rejection of waste were made at in-house sessions to discuss recycling.				
		Personnel	The production team consisted of personnel for operating the production equipment and personnel for operating the analytical devices.				
5. Methods	<ul> <li>New risks posed by chemical reactions occurring gradually over a long period of time were not anticipated.</li> </ul>	Organizational structure	The production team managed both production and quality control.				
		Operation system	Receipt of waste was performed concurrently with fuel production. The plant was periodically monitored during its operation				





## Operation of the new plant and concept behind our preventive measures

In light of the serious nature of the Kyushu Plant accident, the REMATEC Group believes that the safety measures implemented in our design process for the RF production plant must be comparable to those for chemical plants. Otherwise, we will be unable to create the safest waste recycling plant in Japan. Accordingly, we have devised the following safety measures.

## 1. Machinery Factors related to equipment

## Overview of the new plant's design

The basic design for a chemical plant was adopted in accordance with the Guidelines for Chemical Plant Safety Assessments. A permit to use the fuel production building as a hazardous material production site was obtained.

- RF is not usually classified as a hazardous material under the Fire Service Act. Previously, the building had been registered as just a general site for handling hazardous materials. An application to register the building as a hazardous material production site was filed to implement stricter controls, and a permit was successfully obtained.

- The premises were divided into three zones. Two tank yards were separately installed outside the building. - Previously, storage tanks were installed indoors to contain odors. Under the new design, these tanks were installed outdoors. - The deodorizing unit was augmented so that exhaust from the tank vents can be collected for appropriate treatment.
- A neutralizing unit was installed to boost neutralization performance.

- Previously, waste acids and alkalis were neutralized in a mixing process conducted after their dilution in pretreatment tanks. The modified process minimizes the risks associated with this process by first neutralizing the waste acids and alkalis in neutralization tanks.

Continual nitrogen substitution was adopted for waste oil storage tanks, etc.

- A nitrogen gas generator was installed to prevent combustion and explosions by continually replacing any remaining combustible gas in the storage tanks with nitrogen.

New equipment for spraying cooling water was installed.

- New equipment was installed to spray cooling water outside the storage tanks if they experience a rapid increase in temperature due to the reaction heat, etc. The cooling water is

injected directly into the tanks whenever possible. Automatic pressure release valves were

installed on the storage tanks.

- Valves were installed to automatically relieve any rapid increase in pressure inside the storage tanks

Hydrogen detectors were installed in the building.

- The plant's new design includes a deodorizing unit that ensures constant ventilation of the building interior. In addition, hydrogen gas detectors are installed on the ceiling to automatically extract hydrogen gas via ceilingmounted roof fans whenever any is detected.

## 2. Materials Eactors related to materials

#### Assessing waste properties

#### The testing system for accepted waste was reinforced.

- Previously, inspections of waste were conducted in lots, but we now conduct comprehensive inspections of waste packed in drums.

- Waste is accepted after it has been confirmed that its properties have not changed since the contract was signed.

- If waste must be mixed, a mixture test is conducted in a beaker to check for reactions and to examine the mixture's condition.

#### Communication with waste generators was reinforced.

- Detailed information is requested from each waste generator (e.g., by means of a waste data sheet (WDS) and a safety data sheet (SDS)). Such data is evaluated when making decisions about whether to accept or reject waste.

- Waste generators are requested to provide information on changes to their waste generating processes and the chemical agents they employ so that waste can be checked regularly to ensure its properties have not changed since the contract was signed.

#### New installation and upgrading of analytical devices

- A fluorescent X-ray analyzer was installed and the existing flash point analyzer (fully automatic), pH meter, and viscometer were upgraded.

# Vard for hazardous-tank Utility building Truck scale el production building Fire w ing ral site for Foam fire extinguishe nt entrance

## 3. Manpower Factors related to the skills, experience, and knowledge of personnel

4. Media Factors related to documents, manuals, and other information Overhaul of personnel training and the standard operating procedure

#### Organization of special training sessions

- Before the new plant commenced operation, all employees participated in discussions on matter such as the workflow, which is based on the safety assessment guidelines.

- A lecturer from the Japan Industrial Safety & Health Association led a workshop on fires and explosions caused by chemical substances. The attendees were mainly managers and supervisors.

#### Organization of monthly training sessions

- Training sessions were held once a month (from May to September) for all employees to improve their knowledge of chemistry.

- A comprehension test was conducted one week after each of the monthly training sessions. Follow-up training was provided for employees who failed to obtain the minimum required score.
- Complete revision of the standard operating procedure
- The standard operating procedure was completely revised and re-introduced in accordance with the new workflow. - Competency was tested and certified according to the new standard operating procedure.

## 5. Methods Factors related to management, operation, and other aspects of the organization Overhaul of the organization and management system

## Shift to round-the-clock plant operation

- The workflow was changed as follows to minimize the risks associated with the mixing of waste.

New system

	Acceptance check     Storage		<ul> <li>Analysis and mixtu</li> <li>Mixture check and</li> </ul>
J 8:00		L 15:00	

Creation of the Production Technology Department

- Personnel with advanced knowledge of chemistry were recruited and assigned to establish the Production Technology Department. By leveraging the department's chemistry expertise, we were able to enhance the evaluation of risks associated with mixing waste, as well as quality management and the system for enhancing employees' skills.

In December 2014, REMATEC KYUSHU Corporation resumed operat the Kyushu Plant. To prevent any future accidents, we will intensify our group-wide efforts to ensure safety.







## Passionately pioneering global innovation for a better environment and brighter future

REMATEC Corporation (formerly Kinki Environmental Industry Co., Ltd.) was established in 1974 against the backdrop of worsening environmental pollution caused by Japan's efforts to achieve rapid economic growth. The company's founder, a fisherman from Osaka Bay, yearned to be able to restore Japan's bountiful fisheries by properly treating the waste oil and effluents that would otherwise pollute the ocean. Ever since then, the company has been committed to tackling local communities' unique environmental problems while keeping pace with the times. In April 2014, the REMATEC Group was restructured under a new holding company in order to develop innovations that address environmental challenges in a more flexible, community-based manner.



20225

**20**'

Kyushu Plant rebuilt



In December 2013, a fire broke out a REMATEC's Kyushu Plant. Committed to avoiding a recurrence, REMATEC investigates the causes and then implements thorough preventative measures. Thanks to the generous support of the local community and relevant administrative agencies, operations at the newly constructed plant are successfully resumed in December 2014.

## ፟/2(0)ጛ⊾ጛ

2013

Overseas subsidiary established

**REMATEC Corporation restructured to form** 

a holding company (REMATEC Group)



REMATEC establishes a subsidiary in Thailand to actively participate in local environmental projects by building on the experience it has built up in providing the country with environmental services as a member of Team E-Kansai (the Kansai Asia Environmental and Energy Saving Business Promotion Forum)

-namely, that doing our jobs correctly epitomizes our CSR commitment. The report also presents the findings of our investigation into the causes of the fire at the Kyushu Plant in December 2013, as well as the safety measures that we will implement based on critical reflection of the accident.

We invite you to review this report and learn more about our CSR activities.

# **Team REMATEC** works as one to lead local communities into the future

The REMATEC Group consists of nine group companies headed by REMATEC Holdings Corporation, which is responsible for the group's out their business activities independently while contributing to their shared mission of introducing innovations that will address society's environmental challenges. The REMATEC Group believes that



## **REMATEC Holdings Corporation**

Business activities : Management of affiliated companies, investments and lending, and associated activities Headquarters: 11-1 Jizohama-cho, Kishiwada-shi, Osaka 596-0015, Japan Representative : Yasunori Tanaka, President and CEO Capital: 100 million yen Other sites : Tokyo Office



Business activities : Industrial waste treatment and recycling, environmental restoration, etc.

Headquarters: 11-1 Jizohama-cho, Kishiwada-shi, Osaka 596-0015, Japan Representative : Mitsuyuki Nishihara, Representative Director Capital: 100 million yen

Other sites : Sakai SC Plant, Tohoku Branch, Fujiwara Office, and Nanko Office





Business activities · Industrial waste treatment

Headquarters: 2-3 Kameida, Akasaki-cho, Ofunato-shi, Iwate 020-0007, Japan Representative : Aizo Takada, Representative Director C a p i t a l : 10 million yen



Business activities : Cleaning of pits and tanks (including oil-water separation tanks) Headquarters : 2F Wako BLDG., 1-9-23 Yanagi-machi, Moji-ku, Kitakyushu-shi, Fukuoka 800-0025, Japan

Representative : Mikio Imaizumi, Representative Director Capital: 10 million yen



Business activities · Consulting on and planning of biomass businesses, assistance in installing new biogas power generation facilities, etc. Headquarters: 8F Daiwa Jimbocho 3-chome BLDG., 3-2-3 Kanda-jimbo-cho, Chiyoda-ku, Tokyo 101-0051, Japan Representative : Daisuke Mishima, Representative Director Capital: 9 million yen Other sites : Iwate Office (in Morioka) and Sakai Technical Center





#### **REMATEC KYUSHU Corporation**

Business activities : Industrial waste treatment and recycling, environmental restoration, etc.

H e a d q u a r t e r s : 906 Oaza-Miyakobaru, Notsu-machi, Usuki-shi, Oita 875-0211, Japan Representative : Shigeharu Maeda, Representative Director Capital: 50 million yen

Other sites : Tsukumi Office



#### **REMATEC R&D Corporation**

Business activities : Development of new businesses and technologies, strategic planning and assistance for the group, etc. Headquarters: 8F Daiwa Jimbocho 3-chome BLDG., 3-2-3 Kanda-

jimbo-cho, Chiyoda-ku, Tokyo 101-0051, Japan

Representative : Yasunori Tanaka, Representative Director

Capital: 10 million ven Other sites : Sakai Office





## **RTT Corporation**

Business activities : Collection and transportation of industrial waste, transportation and forwarding of general cargo, cleaning of

pits and tanks (including oil-water separation tanks) Headguarters: 4-2-4 Chikko-Shinmachi, Nishi-ku, Sakai-shi, Osaka 592-8331, Japan Representative : Isamu Hisanaga, Representative Director

Capital: 9 million yen

Other sites : Osaka Branch, Kyushu Branch, Tohoku Branch, Tokyo Office, and Fujiwara Office



**REMATEC & KSN THAILAND** 



#### Business activities : Research and planning related to new businesses in Thailand, as well as fabrication, operation, and management of pilot plants and associated activities Headquarters: 13th Floor, 42 Tower, Room M4, No. 65 Sukhumvit Soi 42, Phakanong, Klongtoey, Bangkok 10110, Thailand Representative : Chanet Rattakunjara, Representative Director Capital: 3 million baht

Addressing society's environmental challenges epitomizes the REMATEC Group's CSR commitment



## A groundbreaking corporate management system that integrates our CSR commitment with our business activities

business and providing solutions to society's challenges, we bring together management systems focused on the following: business; the environment; and occupational





Two key business domains for tailoring solutions to local challenges and building a better future

The nature and causes of environmental problems vary from one country and region to the next. Taking a community-based approach, the REMATEC Group listens to local stakeholders' opinions and earns their support so as to jointly tackle the challenges of the individual community. To achieve this, we leverage our planning capabilities, technical expertise, and quick on-site responses, which are backed up by the knowhow and experience we have built up over our long history.

Unique technologies developed to tackle ocean pollution To page

Safer, more efficient resource recovery [ To page 1

**Restoration of** environments polluted by illegal dumping, maritime accidents, etc.

Resource recycling

Panina ca billing but the but

responses Renewable energy **business** 

backed up by

Maintenance service developed in response to customers' needs [ To page

**Solving environmental problems** 

**Innovation for the Earth** 

Transforming waste from daily activities into resources ( To page 19

st proplem-solving initiatives

Clean energy eliminates the risk of resource depletion

Supporting business through a stable supply of waste ( To page 17



## **RF** business

Technologies for making fossil fuel substitutes business

REMATEC REMATEC REMATEC & KSN

REMATEC

#### REMATEC core business

Marine pollution caused mainly by waste oil and effluents emerged as a social problem in Japan in the 1960s. Our desire to properly treat such pollution without imposing any additional burden on the environment led to the development of what is now known as Reclaimed Fuel (RF). Made by recycling waste, this reversible thixotropic fuel can be used for cement pyroprocessing (Japanese Patent No. 3039644). Our proprietary mixing technology can transform almost 100% of the industrial waste we receive into fuel without causing any secondary pollution, thereby helping to reduce CO<sub>2</sub> emissions and other environmental burdens. In recent years, we have transferred these technologies to other Asian countries.

#### RF production process



## SC business

Subcritical water treatment technologies

Next-generation resource recycling technologies

Subcritical water—which is liquid water kept at a temperature and pressure slightly below the critical points (375°C, 22 MPa)-can be used to produce a variety of useful materials from waste that cannot easily be recycled through normal processes. This recycling technology, which was developed through an industry-government-academia partnership, can handle a range of processes, from the decomposition of waste that cannot easily be broken down to the recovery of useful materials, by using safe and harmless water. Since the world's first commercial subcritical



water treatment plant went into operation in 2006, REMATEC has been contributing to a reduction in CO<sub>2</sub> emissions and the environmental burden of manufactured products



## Environmental restoration business

#### Environmental restoration scheme that leverages all of the group's resources

Soil being contaminated by the illegal dumping of industrial waste, oil being spilled in maritime accidents, and natural disasters leaving behind a huge amount of debris. In light of such problems, our shared wish is to restore a safe environment for local residents by treating such types of waste swiftly and properly. To this end, the REMATEC Group has developed a consistent waste treatment scheme that covers everything from waste transportation, analysis, and highly precise separation through to recycling. The group has also proposed and constructed a system for collecting and treating spilled oil. By mobilizing all of our resources, we are working to restore people's livelihoods and the environment.

Prefectures Shiga Prefecture

## Tank cleaning business

Assistance in ensuring safe plant operation



We not only provide safe, efficient cleaning services for tanks at customers' plants based on their shape, their size, and the properties of their content, but we can also collect, transport, and treat the waste that we remove when cleaning them. With our cleaning technologies and the host of resources that our group has built up, we can cater to a diverse range of needs.

## Networking and logistics business

## Highly efficient service innovation

Our networking and logistics business connects waste recycling industries with the waste producing industries that supply raw materials, products, and energy. Our fleet of vehicles, most of which can handle hazardous materials, caters to our customers' diverse needs. We also provide a comprehensive, one-stop service for collecting, transporting, recycling, and transforming waste into valuable materials by combining technologies and knowhow applied in waste recycling and waste producing industries. This service not only reduces carbon emissions through efficient waste recycling, reduced waste, and efficient logistics, but also cuts customers' waste disposal costs.



#### Key achievements in recent years

#### [Responses to illegal dumping]

2002~ Cleanup of an illegal dumping site near the border of Iwate and Aomori

2012~ Removal of contamination caused by the illegal dumping of drums in Otsu,

#### [Responses to maritime accidents]

2010 Collection and treatment of spilled heavy oil and oil-contaminated objects from a clinker carrieraccident in Tsukumi Bay, Oita Prefecture, as well as the coastline cleanup 2011 Collection and treatment of spilled heavy oil and oil-contaminated objects from a stranded freighter in Port of Kanazawa, Toyama Prefecture

2014 Consulting service provided for collection and treatment of spilled heavy oil and oilcontaminated objects from a freighter that sank in the Uraga Channel off the coast of Miura, Kanagawa Prefecture

#### [Response to natural disasters]

2011~ Planning for disaster waste disposal in Ofunato and Rikuzentakata, Iwate Prefecture, after the Great East Japan Earthquake







Disposal of disaster waste (2011)



RTT



# **Renewable energy business**



## SILES

Production of biogas from sewage sludge

REMATEC REMATEC R&D Renagen

#### Generating clean energy from waste

The Sakai Illuvies Lutum Energy System (SILES) is a technology for producing biogas from sewage sludge using subcritical (SC) water. The methane fermentation process can be completed more quickly thanks to SC technology and it increases the methane gas output by more than 20 to 30%.

Today, roughly 2.30 million tons (dry weight) of sewage sludge is disposed of as waste in Japan annually. The amount of energy potentially available from such waste has been reported to be equivalent to 1.10 million kL of crude oil.

In October 2013, encouraged by mounting expectations concerning renewable energy in the aftermath of the Great East Japan Earthquake, REMATEC built a demonstration plant in Ofunato, Iwate Prefecture, in order to effectively harness this untapped source of energy. The sewage sludge is supplied from the city's wastewater treatment plant. Efforts are being made in partnership with local companies and the government to build a new, recyclingoriented community where energy is locally produced for local consumption.



SILES system process





#### Next-generation energy using organic waste

Biogas power generation is a method of generating electricity that involves using biogas, which is a combination of the methane gas and carbon dioxide that is released during the microbial fermentation of organic waste (e.g., livestock manure, food waste, sewage sludge, and energy crops).

This method offers a number of advantages, including the fact that no additional CO<sub>2</sub> is emitted during the power generation process, that it offers a highly efficient means of recovering energy from organic waste with high water content, and that the waste material produced during the fermentation process (i.e., the digestate) can be used as liquid fertilizer. Renagen provides comprehensive

support for the stable operation of biogas generation plants. This support ranges from securing access to both the input materials for the process (raw biomass) and end users (electricity buyers and digestate users) through to handling the operational management and maintenance of the plants.





Food

ctories

Food processing

residue

## 

#### Effective use of solar energy

Sunlight is directly converted into electricity using photovoltaic cells. Making effective use of sunlight as a naturally available energy source helps curb CO2 emissions and fossil fuel consumption. The REMATEC Group is implementing solar power generation projects at power plants in Kumamoto (Yamaga) and Kagoshima (Makurazaki), and construction of another plant in Okayama (Kasaoka) is underway. When all these power plants become operational, we expect the annual reduction in CO2 emissions to be 2,738 tons.



![](_page_9_Picture_28.jpeg)

C lose bonds with individual communities underpin our joint efforts to shape a better future, and various projects are underway

![](_page_10_Figure_1.jpeg)

# The Ofunato Project brings people, the ocean, and mountains together under a local renewable energy system

# Japan's Reconstruction Agency selects our project as a leading model for building a "new Tohoku"

A virtuous cycle must be developed to effectively employ untapped local resources if we are to build communities where energy is both produced and consumed locally. Success depends on whether such a system can be tailored to each community by closely observing the livelihoods of the local residents. A good example of such a system is the one devised by the REMATEC Group for the "evolutionary reconstruction" pursued by Ofunato (lwate Prefecture) in partnership with the local companies, universities, and government. We envision a future where producing and consuming energy locally will allow our grandchildren to live safely in environmentally friendly cities. To this end, we are making steady progress in our collaborative efforts with supportive local companies and residents to apply the results of SILES demonstration tests (for the production of biogas from sewage sludge) and integrate more new technologies.

# Demonstration tests for biogas production have begun at the SILES demonstration plant

In October 2014, demonstration tests for producing biogas from sewage sludge were completed in Ofunato. Subsequently, demonstration tests for producing biogas from organic waste (e.g., garbage) were begun. Further tests will be conducted in order to effectively use other kinds of local community waste in the production of renewable energy.

![](_page_10_Picture_8.jpeg)

# Experimental cultivation of resource crops in Rikuzentakata and other areas

Renagen aims to create a new agricultural system for harnessing biogas energy. As a first step, it began conducting a cultivation trial for resource crops (e.g., dent corn and sorghum) in Rikuzentakata, which is located right next to Ofunato, and other areas to determine whether such crops can be used to produce biogas.

![](_page_10_Picture_11.jpeg)

# Solving environmental problems in Thailand through optimal waste treatment

# **Establishing an energy production business in Thailand through effective** use of general waste

Environmental pollution has emerged as a serious problem in Thailand as the country's economy grows rapidly in tandem with the cycle of mass production, mass consumption, and mass disposal. Illegal dumping continues to be rife, reflecting the sluggish progress being made in efforts to promote proper waste treatment. This is a serious social problem because major fires sometimes break out at dumping sites, forcing local residents to evacuate or suffer health problems. Public demand for proper waste treatment has prompted the Thai government to make solving environmental problems a top priority. The REMATEC Group has proposed a system to the Thai Pollution Control Department that is designed to optimize waste treatment, make effective use of resources, and create jobs by leveraging the resource

![](_page_10_Picture_15.jpeg)

#### Ceremony to celebrate the signing of a Memorandum of Understanding (MoU) with the local partner company

![](_page_10_Figure_17.jpeg)

#### Significance of this project

Realizes proper waste treatment and reduces the use of landfill sites, both of which are top priorities in Thailand.
 Contributes to global efforts to curb CO<sub>2</sub> emissions and fossil fuel consumption by encouraging the wider application of renewable energy in the dynamically growing ASEAN region.

- To promote optimal waste treatment, the entire process—from collection to final disposal—needs to be properly designed, rather than introducing different technologies in a patchwork fashion. The Thai authorities are quite interested in this project. Provided the project's initial phase is successful, it should be possible to expand the application of this technology throughout Thailand.

recycling and renewable energy technologies that the group has built up over the years. In September 2013, the group established a local subsidiary, REMATEC & KSN Thailand (RKT), to begin conducting demonstration tests. A full-scale project to tackle Thailand's waste problems will commence after the results of the demonstration tests have been obtained.

![](_page_10_Figure_23.jpeg)

fermentation tank to generate and collect methane gas for power generation. Liquid fertilizer, a byproduct of the process, can be delivered to nearby farms to increase their yields.

## Communicating our message by engaging with individual communities as we grow together...

#### Appreciation for our assistance in post-earthquake recovery and reconstruction work

On April 22, 2014, REMATEC Corporation received a letter of appreciation from Taiheiyo Cement Corporation (Tokyo Headquarters) for the disaster waste treatment we performed in an area affected by the Great East Japan Earthquake. In a joint effort with Taiheiyo Cement's Ofunato Plant, we set up a salt removal plant and contaminated water treatment plant in Ofunato, Iwate Prefecture at an early stage, in order to recycle disaster debris into cement.

That same year, we received two more letters: one from the Ofunato Fisheries Cooperative Association on June 24 and another from Sakarigawa Fisheries Cooperative Association (also located in Ofunato) on November 14. Both expressed their appreciation for our assistance in the recovery and reconstruction work conducted after the Great East Japan Earthquake.

#### Participation in the 21st Port Cleanup Campaign

On June 29, 2014, a group of 10 cleanup volunteers made up of REMATEC employees and members of their families participated in the Port Cleanup Campaign organized by Kishiwada City (Osaka) and the Kishiwada Port Association.

This campaign is held annually under the slogan of "Clean up trash and restore clean water!" as part of an awareness program designed to discourage littering and encourage people to stop others from littering. The campaign's objective is to realize a beautiful, attractive port environment. A total of 967 local citizens and company employees have participated in this campaign to clean up the port area, which extends from Jizohama

#### Volunteers from Eco-First companies work to rid Lake Biwa of invasive fish

On September 6, 2014, nine accredited Eco-First companies based in the Kansai region organized a voluntary fishing event to help get rid of the invasive fish infesting Lake Biwa.

The lake is home to more than 50 indigenous species. Recently, however, the lake's bountiful ecosystem has been threatened as invasive fish with higher reproductivity have caused a sharp decline in the number of indigenous species such as nigoro-buna and hon-moroko.

The REMATEC Group encouraged its employees and their families to participate in this event to promote awareness of this ongoing invasion of Lake Biwa.

# **Communication with** stakeholders drives our growth

Communication with stakeholders is indispensable when companies engage in CSR activities. Since this business objective epitomizes the REMATEC Group's CSR commitment, daily interaction with its customers, the local community, and its employees is an essential driving force behind our growth. We believe that responding sincerely to the expectations and concerns of all our stakeholders will develop the deep level of trust required for us to address society's environmental challenges.

#### Who are our stakeholders?

Generally speaking, a company's stakeholders are any individuals and groups affected by a company's activities. They include not only the company's shareholders, managers, business partners, customers, and employees, but also members of the local community.

![](_page_11_Figure_15.jpeg)

Customers

partners

Local communities and governments

![](_page_11_Picture_19.jpeg)

Immediately after the earthquake, our company began working in affected areas with local community members to aid in the recovery and reconstruction efforts. We will continue to do all that we can to contribute to the redevelopment of these areas.

![](_page_11_Picture_23.jpeg)

Taiheiyo Cement presents us with a letter of appreciation (left) Letter of appreciation from Taiheiyo Cement (bottom left) etter of appreciation from Ofunato Fisheries Cooperative Association (bottom center) Letter of appreciation from Sakarigawa Fisherie Cooperative Association (bottom right)

![](_page_11_Picture_25.jpeg)

in Hamakougyo Park to Hannan District 1.

Luckily, despite the unpredictability of the weather during the monsoon season, the sky was clear on cleanup day. With a comforting sea breeze helping to make the humidity more tolerable, the volunteers had an enjoyable day and managed to collect 2,250 kg of trash.

![](_page_11_Picture_28.jpeg)

The venue was Otsu Port in Otsu City's Hama-Otsu District and 241 volunteers participated in the event. Motivated by a little friendly competition, the volunteers managed to catch a total of 803 invasive fish, including bluegills and black basses.

![](_page_11_Picture_31.jpeg)

#### Participation in exchange events in Ofunato, Iwate Prefecture

On August 2, 2014, REMATEC Corporation's Tohoku Branch participated in the Citizen's Street Dancing event at the Sanriku-Ofunato Summer Festival for the third consecutive year.

The Ofunato Chamber of Commerce first held this festival 44 years ago. Although it was cancelled in 2011 due to the Great East Japan Earthquake, the festival was resumed in 2012 as it is an important rite of summer for the local community.

This year, 1,400 people organized into 27 groups participated in the street dancing event. Lively music and dancing helped the 23 participants from REMATEC Corporation and REMATEC TOHOKU Corporation to establish closer ties with the local community.

On November 15, we held a thank-you barbecue party together with Taiheiyo Cement Corporation's Ofunato Plant to celebrate the completion of salt removal from disaster waste. The president of REMATEC Holdings, Mr. Tanaka, joined about 100 other participants, including local workers, at the party.

Despite the windy weather and a temperature of just 5°C, the event proved to be a wonderful occasion to discuss the activities carried out in response to the

March 2011 earthquake, to appreciate one another's hard work, and to reaffirm our commitment to assisting affected communities.

![](_page_12_Picture_7.jpeg)

![](_page_12_Picture_8.jpeg)

## Employee comments

Shunji Inoue Assistant Manager, Community Partnership Office, REMATEC KYUSHU Corporation

![](_page_12_Picture_11.jpeg)

Striving to preserve the local environment

REMATEC KYUSHU Corporation is working together with the local community to preserve the environment through a variety of activities.

On June 6, 2014, joined by members of the local community, we planted 700 marigolds in flowerbeds along National Route 502 in the hope that their appearance will give pleasure to drivers.

On July 26, we cleared some of the undergrowth and pruned trees in the Forest of Symbiosis, where 990 trees had been planted in October 2008 as part of a forest development initiative carried out with corporate participation according to an agreement with Oita Prefecture's Usuki City. These trees are expected to absorb CO<sub>2</sub> as they grow. In addition, we continue to perform our monthly garbage cleanup along the expressway. We apologize to the local community for the significant inconvenience and concern caused by the fire at our plant in December 2013. Thanks to the understanding and support of our stakeholders, we were able to resume operations at our new plant after organizing a guided tour for local residents in early November. We vow to operate the plant safely, and remain committed to working with the local community to preserve the environment.

![](_page_12_Picture_17.jpeg)

#### Comments

Chairman and Director, Taiheiyo Cement Corporation Co-Chairman, Committee on Environment and Safety, Keidanren (Japan Business Federation)

# Working with our partners to achieve another 40 years of safety, security, and trust

I would like to start by saying what a privilege it is to contribute to REMATEC's 15th CSR report on the occasion of its fortieth anniversary. I hope that REMATEC will make further progress through its adoption of a holding company system under its new president.

REMATEC's history over the last 40 years is intertwined with the development of environmental economics in Japan. The company's development began in the era of pollution and environmental contamination, and has since continued through the era of the recycling-oriented society into today's era of biodiversity and global environmental conservation. Since its establishment, Taiheiyo Cement has shared nearly the same experiences as REMATEC (formerly Kinki Environmental Industry). During these eras, both companies have firmly established recycling measures centered on cement factories, and have also built and implemented a system for realizing inter-company cooperation.

Today, Japanese industry promotes various activities by developing voluntary action plans aimed at establishing a recyclingoriented society. Over the last 20 years, while the amount of industrial waste put through final disposal has fallen dramatically, the rate at which this amount is being reduced is decreasing and our ability to make further reductions is approaching its limit. Establishing a recycling-oriented society requires still further technological developments, a review of legal frameworks, operational improvements, and so on. Although the cement industry remains at the heart of the recycling process, it is suffering from a lack of growth in orders due to the recent slowdown in public-works projects. Meanwhile, REMATEC's corporate and CSR activities are always in sync. This is not simply because the company's business is categorized as being related to the environment-it is because of the company's DNA, which is rooted in its experience of fighting against marine pollution in Osaka Bay.

#### Keiji Tokuue

![](_page_12_Picture_26.jpeg)

The first report in this document describes the fire that occurred at its Kyushu Plant, which illustrates the company's enviable ability to turn even an accident into the basis for innovation and to use it as a catalyst for action. The company demonstrated this ability to fullest in the waste disposal it performed after the tsunami that followed the Great East Japan Earthquake. Mr. Tanaka (the chairman of REMATEC Holdings Corporation) and I have known each other since the Nakhodka Tanker oil spill. In the week following the March 11 disaster, he met with us in Tokyo, and from there we went directly to a prefectural office to give a presentation. His speed and sense of duty to overcome the crisis were amazing. When I had the opportunity to inspect the scene of the Kyushu Plant fire, I could see in the faces of the company's employees an increasing resolve to learn from this failure and enhance the business. This demonstrates the true value of REMATEC.

One challenge that REMATEC will face in the future is to create a new model that will go beyond the framework of arterial industries and the waste processing industry. This will offer an opportunity to enhance the process beyond the 3S's of resource recycling. This enhancement will be complete when new value is added to the concept of promoting recycling to contribute to the conservation of natural resources, environmental restoration, and society as a whole.

During its economic development, Japan has continued to encounter unforeseen difficulties. It has fallen into many traps: pollution, resource depletion, the bubble economy, energy challenges, and even financial crises. In fact, recent years may have seen consumption patterns or growth strategies set new traps. REMATEC has shown great strength in standing by its convictions in the face of 40 years of a moderate and tolerant attitude toward its business and—as their business partner—I hope that this strength will allow them to avoid the risks posed by such traps as they aim to become a recycling pioneer.

## Comments

Jiro Tsuji

Representative Senior Managing Director The Senshu Ikeda Bank, Ltd.

![](_page_13_Picture_3.jpeg)

First of all, I would like to congratulate REMATEC on the 40th anniversary of its establishment.

As a local financial institution, we have developed close ties with you since your foundation in Senshu Kishiwada in 1974, and we are deeply honored to have been given this opportunity to contribute a message in this memorable milestone year that also saw you establish REMATEC Holdings Corporation in April.

When the Great East Japan Earthquake struck in March 2011, REMATEC established its Tohoku Branch as a frontline base from which it could respond immediately to events in affected areas, which at that time were constantly changing. It was from this base that we were able to overcome the major hurdle posed by salt damage, a challenge that Japan had never before experienced, even during the Great Hanshin-Awaji Earthquake. I greatly admire the fact that the company succeeded in disposing of all the debris in Ofunato City and Rikuzentakata City as planned. This success was down to the concerted efforts of the REMATEC Group, which employed its people, tools, and technologies to help the Tohoku region recover.

You could say that the key factor behind the company's successful completion of the project was its corporate philosophy of generating innovation, where each of its employees in the field finds meaning in his or her work while recycling resources, always keeping environmental protection in mind. This philosophy is based on the company's years of environmental research efforts under the strong leadership of its top management.

During this same period, we launched an Environmental Rating Loan Mechanism to financially support companies committed to sustainable, environmentally responsible management, and REMATEC was the first of our customers to receive financing under this mechanism.

In 2008, the Minister of the Environment certified the REMATEC Group as having committed itself to the "Eco-first Promise." As a forward-looking and creative front-running company, you have also been expanding over the past few years not only in Japan, but also globally into areas such as the ASEAN region. This is due partly to requests from the Ministry of Economy, Trade and Industry and other government agencies. We have heard that, as a result of these forward-looking efforts, you will soon be launching a business in Thailand as your first overseas base of operations. As your main financing bank, we would like to express our admiration for your contributions to international environmental conservation. In addition, we would very much like to assist your company's advance into overseas markets.

Finally, with a view to realizing harmonious relationships with local communities, our bank is committed not only to supporting and sponsoring local culture, art, and sports activities and various regional contribution activities including environment conservation, but also to strengthening collaboration with local municipal governments. We believe that these efforts have something in common with your philosophy. Going forward, as we continue to cherish the philosophy we have held since our foundation of being a friendly and innovative bank, we hope to be of service to local residents for the benefit of the community, as with the case of REMATEC.

#### Comments

### Assisting the recovery of the fisheries industry through disaster waste disposal

Congratulations on your 40th anniversary. I hope that your company will continue to prosper.

The March 11, 2011 Great East Japan Earthquake damaged our association's three branch offices, its two sub-offices, an ice works, a goods unpacking and sorting center, and four stationary workboats. It also put 40 of our 53 buildings out of commission.

A total of 34 association members lost their lives or went missing as a result of the earthquake and its aftermath, and many of our members' houses, workshops, and vehicles were washed away or rendered unusable. In addition, 995 out of 1,397 fishing boats were washed away, and the aquaculture facilities for oysters and seaweed-our association's main farmed seafood-were destroyed.

After the disaster, the ocean was filled with debris, making it impossible for us to redevelop the aquaculture facilities. Even sailing fishing boats was difficult and relief supplies could not be transported by ship without incident. The debris urgently needed to be removed.

It is no exaggeration to say that the considerable progress made in removing debris from both the sea and land is largely due to REMATEC Corporation's outstanding technologies for improving the sorting and crushing of disaster waste as well as sea salt removal.

Fortunately, our association's fishing grounds are now usable again, and in June 2011 we ordered seaweed farming materials for the first time since the earthquake struck after consulting with association members who engage in such farming. We also set up aquaculture facilities in November of that year. Due to such efforts, we were able to harvest seaweed in spring 2012, resulting in the production of farmed seaweed worth 600 million yen. These efforts also helped to motivate fishery operators who had suffered catastrophic damage to their businesses to put their lives back in order and to rehabilitate and reconstruct their production platforms.

![](_page_13_Picture_22.jpeg)

Yoichi lwawaki

Representative Director and President Ofunato Fisheries Cooperative Association

Now, three years and eight months after the disaster, despite delays to the development of fishing ports due to subsidence and other reasons, the development of aquaculture facilities, shipping boats, and workshops for oyster farming and other mariculture activities has been completed and seaweed farming restored just as association members had hoped, thereby contributing to the stable management of the association.

According to REMATEC Corporation, the company will complete debris disposal in November 2014. The company has also proposed the Ofunato Project, with a view to building a new local renewable energy system that will connect the ocean, mountains, and people as a new model business for supplying heat by using local biomass resources in the Tohoku region. It has established a council for this project, and has been studying how to proceed with its implementation. To assist in the post-disaster reconstruction of the fisheries industry, our association will cooperate with REMATEC Corporation to the best of our ability.

Shinichiro Yano Director and Factory Manager, REMATEC KYUSHU Corporation

![](_page_14_Picture_1.jpeg)

## Moving forward with the reconstruction of the Kyushu Plant —Our pledge to ensure safety—

# The plant and trust we lost in an instant

On December 2, 2013, a fire occurred at REMATEC Corporation's Kyushu Plant. I have reflected long and hard on this incident and would like to once again express my deepest apologies for the enormous inconvenience it caused local residents, the relevant administrative agencies, our customers, and many other concerned parties.

This fire almost completely burned down Building A, where important equipment for the manufacturing of RF had been installed. Fortunately, there were no casualties, but the Kyushu Plant had to suspend production completely. At the same time, the accident resulted in our losing the trust and confidence of the local community and many others who until then had long supported our business activities. I still remember like it was yesterday being at a complete loss for having committed a mistake that, as head of the plant, I could not excuse in any way.

The following day, we set up an accident response headquarters in an unaffected plant office and held a general meeting of employees to confirm the nature of the accident and to determine what our immediate response should be.

In addition, I renewed my determination to reconstruct the plant upon receiving the following instructions from Mr. Tanaka (presently chairman of REMATEC Holdings Corporation): "Since the establishment of the Kyushu Plant 25 years ago, I have devoted myself to building up a company that has the trust of the local community. We cannot give up because of this accident. By determining the causes of the fire and taking all possible measures to prevent a recurrence, I aim to build Japan's top waste recycling plant."

### Efforts to reconstruct the plant

The day after the accident, we established a team within the accident response headquarters

that was tasked with determining the fire's cause by investigating various factors, including not only the materials and equipment that were used, but also personnel skills, knowledge, and experience. The team carried out its mission while the Oita Prefectural Police and Usuki Fire Station were conducting their own on-site investigations.

At the Kyushu Plant, we manufacture Reclaimed Fuel by combining industrial waste (e.g., waste oil, sludge, and waste liquid) as a coal-alternative fuel that can be used in cement plants. Based on the results of our investigation, we developed concrete measures for realizing the safest waste recycling plant in Japan, and all of our employees have been working together to achieve this. Details of these activities are provided on pages 4 to 7 of this report.

#### **Reopening the plant**

I would like to express my heartfelt gratitude to those that attended the explanatory meeting for their understanding of our efforts in the wake of the accident and for granting us permission to build a new plant there. I will do everything in my power to meet the expectations of all those concerned.

With the cooperation of all concerned parties, REMATEC KYUSHU Corporation was able to restart operations at the plant in December 2014, just one year after operations were first suspended.

In light of the lessons learned from this accident, we will continue to carry out the measures we began undertaking in response to the accident, further contribute to society, and do our utmost to build a more stable company by having our employees work together with a strong sense of purpose and increased effort. In doing so, we hope to regain the confidence and trust of the local community, relevant administrative agencies, our customers, and our many other stakeholders.

## Occupational Safety and Health Management System

#### Health and safety principles

REMATEC Group recognizes the responsibilities and tasks required to contribute to society and to secure precise safety/ health standards for all employees through the recycling business; therefore, under the basic principles of human rights, we pursue activities that establish "Safety first" and a "Pleasant work environment".

#### FY 2013 health and safety activities

	Item	Goal/target	Specific activities				
	Safety	Accidents resulting in worker absence: 0 Industrial accidents due to repetitive tasks: 0 Accidents not resulting in worker absenc: 3 or less	Review of procedure manual and thorough training on rules     Patrols by managers				
lant	Health	Health target achievement level: 85% or more	<ul> <li>Specification of individual health targets</li> <li>Activities to promote mental health</li> </ul>				
aka P	Disaster	Accidents due to equipment problems: 0	<ul> <li>Inspections and maintenance based on the equipment management plan</li> </ul>	• Ma • Op			
õ	prevention	Emergency response drills: 100% completion	<ul> <li>Drills for earthquakes and tsunami</li> </ul>				
	Transportation	Property damage/ minor accidents: 0 Injuries/deaths: 0	Traffic hazard prediction drills     Safety measures for operating     forklifts	• Acc (on- • Inju • Tra			
			Refer to the measures below.	• Ind (res in v			
			Risk assessments     (Reduction in no. of hazard spots)     Target frequency: 48 times     (8 times a year per dept.)	• Ass • Sor to t			
	Safety	Accidents: 0	Patrols by senior managers	<ul> <li>Nui</li> <li>Coi</li> <li>(coi</li> <li>40</li> <li>Inc and</li> </ul>			
			SS activities     Selection of model workplace and     evaluation based on check items				
r			In-house training				
yushu Pla	Health	Health target achievement level: 85% or more	Management of working environment and tasks     Discussion on automating drum yard and drum press tasks     Specification of individual health				
×			Workshops on mental health, etc.	• Wo self • Spo			
	Disaster prevention	Implementation of disaster drills	Review and improvement of the crisis management system	A lea cond An a envis the fi			
				wast			
	Transportation	Traffic accidents/ violations: 3 or less	<ul> <li>Reduction in No. In rank accidents/ property damage</li> <li>Avoidance of accidents/problems by reliable pre-operation inspections</li> <li>Use of vehicles that are in normal working order</li> </ul>	The t on-y (dow			
ant	Safety	Accidents resulting in worker absence: 0 Accidents not resulting in worker absence: 3 or less	Understanding of basic regulations and standard operating procedure Reliable management of equipment, personnel, and items Regular implementation of 4S activities	Accie Accie (cher Pla trai Equ rep troi • Cle ens boa (zo			
I SC PI	Health	Health target achievement level: 85% or more	<ul> <li>Specification and implementation of individual health targets</li> <li>Health guidance provided by industrial doctors</li> </ul>	Over			
Saka	Disaster prevention	Preparedness for earthquakes/other disasters	<ul> <li>Early firefighting drills and training on earthquakes and tsunami to ensure proper understanding of necessary responses</li> <li>Emergency drills</li> </ul>	<ul> <li>Firs Tra</li> <li>Rec che in S</li> <li>A d</li> </ul>			
	Transportation	Traffic accidents/ violations: 0	Traffic hazard prediction drills     Rollout of findings on transport safety	Traffi • Traf peri • Obs dep atte			

Results	Status	FY 2014 challenges and targets
dents resulting in worker absence: 1 mical injury when drums till or shift) dents not resulting in worker absence: 1 ry due to damaged waste container) ar accidents: 0	×	Achieve zero accidents     Consolidate procedure manuals and on-site training     Develop improvement initiatives by encouraging ideas
th target achievement level: or more th consultations: 9 people	0	Have industrial doctors or other counselors provide guidance to individuals with medical conditions     Encourage private visits for diagnosis and health checks
ufacture Section: 100 times ration Section: 12 times	0	Develop an equipment management ledger     Conduct thorough inspections and maintenance     Implement thorough inventory management for replacement parts
rgency drills	0	Conduct evacuation drills (for earthquakes and tsunami)
dents with property damage te): 0 ies/deaths: 0 ic violations: 3		Prevent accidents by encouraging workers to pay attention to one another     Apply traffic hazard prediction effectively to prevent accidents
strial accidents: 0 Ilting in worker absence:0, not resulting orker absence:0)	0	Achieve zero accidents     Conduct risk assessments, pre-operation hazard prediction, robust employee training, etc.
essments: 38 e assessments were not possible due e fire on Dec. 2	×	<ul> <li>Conduct risk assessments for new equipment and establish a standard operating procedure</li> </ul>
ber of findings: 125 ective actions: 110 rection rate: 88.0%) fore findings ase in no. of inadequate jigs, tools, unsafe spots	×	Provide in-depth on-site guidance     Achieve a correction rate of 100% for problems identified during patrols
adequacies were frequently identified throls by senior managers. Manufacture Section modified the sm so that they could conduct 4S titles for 30 minutes every morning. ever, they failed to conduct these titles consistently.		<ul> <li>Maintain and manage the new equipment arrangement</li> <li>Clarify designated times, methods, and areas for each department's daily 4S activities and construct a system to ensure the continuity of these activities</li> <li>Have managers showcase good examples of how to clean dirty items quickly and provide thorough on-site guidance</li> </ul>
aining was conducted nearly every by effective use of video materials,		Enhance all employees' awareness and knowledge of safety     Conduct tests after training (responses to abnormal events, basic chemistry, etc.)
nation will be discussed again because nt equipment has been upgraded.		Implement measures to minimize worker exposure to organic solvents by restricting the amounts used (e.g., use of warm water and steam).
th target achievement level: 90.2% kshops on mental health (Oct.) and checking (Sept.) ts event (May: 39 participants)	0	Achieve a health target achievement level of 85% or more     Provide health management guidance to workers who handle     solvents in line with the new round-the-clock operating system
drill and comprehensive fire drill were cted.		<ul> <li>Confirm that employees understand and can carry out the steps required to respond to an abnormal event</li> <li>Plan and conduct drills (e.g., fire spreading prevention, measures against river contamination, and emergency communication with local communities)</li> <li>Plan and conduct drills to enable the in-house firefighting team to respond quickly and effectively to any accident or disaster</li> <li>Confirm that firefighting equipment functions properly</li> </ul>
tual fire posed challenges not iged in drills, including preventing from spreading and handling of water treatment equipment.	×	<ul> <li>Improve the crisis management manual</li> <li>Provide comprehensive training for responding to a major fire</li> <li>Conduct practical drills by clarifying the organizations involved and their roles</li> <li>Check the condition of stored waste and take any corrective actions necessary on the spot</li> </ul>
ents with property damage: 4 rget was not achieved despite a year- ar reduction in the no. of accidents 3 from 7 in the previous fiscal year).	×	<ul> <li>Encourage employees to commute to work in plenty of time and to drive calmy to achieve zero traffic accidents</li> <li>Instruct workers to check their vehicles before getting in and to always follow other basic rules</li> </ul>
ents resulting in worker absence:0 ents not resulting in worker absence:1 ical injury) to office training and department ing were conducted periodically, pment was inspected periodically and ir work was performed whenever ble spots were identified. r communication inside the plant was red by upgrading the old bulletin d and designating safety aisles ng).	0	<ul> <li>Providing training about procedure manuals is easier as these relate to hands-on tasks. By contrast, EMS training must be conducted step-by-step more frequently to help employees gradually understand how the system works.</li> <li>Eliminate risks associated with irregular tasks to ensure safety by first conducting risk assessments</li> </ul>
II achievement: 87%	0	Have industrial doctors provide periodic guidance so that it is possible to follow up on the health check findings and compare them to health largets
response fire training (May) ing on earthquakes and tsunami (Jan.) ipt of emergency alert message was kedduring the prefecture-wide drill held ptember for 8.8 million people in Osaka. Il was conducted in March.	0	Develop and implement a BCP
accuents/violations: 0 c hazard prediction drills were conducted dically. vvations were discussed during each rtment's morning assembly to draw tight to tracenote acfectu	0	Commune to achieve zero traffic accidents and violations

## **Environmental Management System**

REMATEC Group recognizes that the protection of environment is the most important task for the better future and the prosperity for all the human being. Therefore, we are committed to reducing of the environmental loads, energy/resources conservation to keep the environment and the recycling businesses balanced with contribution of the recycle and the construction of better and sustainable society.

-Working to conserve the global environment as an environmental leader-

The REMATEC Group has been accredited by Japan's Minister of the Environment as an Eco-First company in light of our commitment to environmental conservation initiatives (which we renewed in June 2014). In addition to submitting reports to the Ministry of the Environment, we will monitor our initiatives' progress and periodically announce their outcomes.

![](_page_15_Picture_6.jpeg)

Initiatives for forging a recycling-oriented society

Consistently recycle 97% or more of the industrial waste we accept from waste generators.

Advance our research into the production of fuel by recycling as many kinds of industrial waste as possible to realize a recyclingoriented society.

Carry out initiatives to forge a recycling-oriented society.

#### Initiatives for curbing global warming

Increase Reclaimed Fuel (RF) shipments to cement manufacturing plants and elsewhere by 5% compared to the current level by 2019.

Leverage our proprietary technology to recycle a wide range of industrial waste from various plants, including waste that is usually incinerated or disposed of in landfills.

Reduced use of coal and other fossil fuels at factories translates into reduced greenhouse gas emissions, which ultimately assists

efforts to realize a low-carbon society. \* One ton of RF generates the same amount of thermal energy as 0.7 tons of standard coal and curbs CO: emissions by roughly 1.65 tons.

![](_page_15_Picture_17.jpeg)

inside and outside our group

Initiatives for making effective use of waste that contaminates soil and water and reducing the

3

Focus on developing technologies to recover energy from biomass contained in waste.

EC 0

#### Develop human resources that can address society's environmental challenges by organizing our own environmental awareness initiatives, including REMATEC Future Academy.

Plan and organize guided tours of our plants to increase the public's understanding of waste recycling.

Under this program, a company publicly commits in the presence of Japan's Minister of the Environment to pursuing measures to address issues such as the following: environmental conservation (e.g., to tackle global warming), waste handling, and waste recycling. The Minister of the Environment accredits the company as an environmental leader that is

carrying out advanced, pioneering business activities to address environmental challenges.

ISO 14004 certification	Scope of certification	Date of certification	Certification No.	Scope of certification	Date of certification	Certification No.
Status	Osaka Plant, Sakai SC Plant, RTT Corporation	March 26, 1993	JMAQA-EO36	Kyushu Plant	March 26, 2000	JMAQA-E115

#### Achievements as an Eco-First company in FY 2013

Commitment	Item	Target	Achievements in FY 2013	Increase
Optimize and expand the scope of	Information disclosure	Posted on our website	Information was posted on our website as required.	0.4%
recycling	Installation of electronic manifest	-	Adoption rate: 27.7%	
Assist in the pursuit of a recycling- oriented society	Amount of RF production	100,000 t by FY 2010	Production: 103,603 t (FY 2010: 108,800 t)	Reduction
Tackle global warming	Reduction in amount of fuel used by vehicles collecting and transporting waste (specific consumption)	Minimum of 9% lower than the FY 2003 level by FY 2012	Reduction: 6.5%	<b>2.8%T</b>
	Reduction in amount of electricity used (specific consumption)	Minimum of 25% lower than the FY 2004 level by FY 2012	Reduction: 18.1%	Reduction
Prevent and address environmental pollution	Environmental conservation by implementing EMS and OSHMS	_	Measures are described on pages 27 to 33.	5.9%+

#### FY 2013 environmental management activities

	Goal/target					FY 2014 challenges and targets
	Promote volunteer activities	***	Participation in local volunteer activities (e.g., port cleanup campaigns)	<ul> <li>Zero waste campaign: 2 participants</li> <li>Port cleanup campaign: 4 participants</li> <li>Community cleanup: 8 participants</li> </ul>	0	Encourage further participation
	Increase RF shipments (61,700 t or more annually)	🔮 🥥 😜 🍪	<ul> <li>Acceptance of industrial waste</li> <li>Stable plant operation</li> </ul>	RF shipments: 66,905 t	0	Achieve a stable supply of RF     Ensure safe operations through effective     equipment management
ka Plant	Develop procedure manuals and a standard operating procedure	👻 🔮 🚱	<ul> <li>Review and revision of procedure manuals</li> <li>Thorough training on procedure manuals</li> </ul>	Manufacture Section: 16 Operation Section: 10 Training sessions on procedures: 35	0	Review standard procedures in a strategic manner     Confirm procedures and provide robust training on them
CSdl CSdl	Amount of industrial waste accepted: 40,248 t		<ul> <li>Research on existing customers and increase in amount of waste accepted</li> <li>Addition of new customers</li> </ul>	Amount accepted: 39,852 t Achievement: 99.0%	0	<ul> <li>Increase amounts of waste accepted from existing customers</li> <li>Attract new customers</li> </ul>
	Reduce power consumption (25% lower than FY 2004)		Reduction in specific power consumption	Consumption: 10.9 kWh/t     Reduction: 36.3%	0	Conserve energy by turning off lights     Reduce power consumption by     monitoring demand
	Amount of industrial waste accepted: 40,000 t		<ul> <li>Increase in number of visits to existing customers</li> <li>Regular acceptance of waste from large waste generators and their industry partners</li> </ul>	Amount accepted: 23,905 t Achievement: 59.8% (Percentage of 26,790 t target achieved from Apr. to Nov.: 89,2%)	×	Do all in our power to regain the trust of each waste generator
	Conserve resources through stable RF supply No. of supply problems at business partners: 0	200	<ul> <li>Conducting of planned equipment inspections</li> <li>Examination of pump wear</li> </ul>	No. of supply problems: 0		<ul> <li>Achieve zero supply problems at our business partners</li> <li>Do all in our power to regain the trust of our business partners</li> </ul>
	Prevent leaks at our business		Review of the standard operating procedure     Conducting of regular inspections of storage tanks	No. of plant leaks: 1 (The leak was caused by a drum overturning while it was being transported with a forklift.)	×	<ul> <li>Prevent leaks at our business partners and the REMATEC plant</li> <li>Develop a workflow and standard operating procedure for the new plant and implement OJT</li> <li>Conduct thorough hazard prediction activities and risk assessments</li> </ul>
	partners and REMATEC plant No. of leaks: 0	<b>2 0 9</b>	<ul> <li>Conducting of risk assessments</li> </ul>	No. of leaks at our partners or the REMATEC plant: 2 (Sludge leaked from the loading platform of a transport vehicle because the condition of the sludge being loaded had not been checked adequately). (Residual liquid spilled from a hose when it was being carried to prepare for a suction operation.)	×	Prevent waste leaks during loading and transportation     Prevent accidents caused by the chemical reaction of residue inside tanks on vehicles     Confirm that vehicles are completely empty before permitting travel on roads
	Prevent the release of dirty rainwater No. of water quality problems after wastewater treatment: 0	2	<ul> <li>Replacement of the filtering sand in storage tanks</li> <li>Conducting of regular pH checks and transparency monitoring</li> </ul>	No. of water quality problems after wastewater treatment: 1 (The foam extinguishing agent used by government fire trucks during the fire at our plant entered the river through a side ditch. Although this agent is harmless, foam appeared in the river.)	×	<ul> <li>Prevent the release of contaminated rainwater</li> <li>Upgrade rainwater treatment equipment to enhance its performance</li> <li>Consolidate daily monitoring activities (round-the-clock system)</li> </ul>
	Prevent odors from affecting local communities No. of complaints about odor: 0		<ul> <li>Closing of shutters, etc., where odors are generated</li> <li>Upgrade of deodorizing equipment</li> </ul>	No, of complaints about odor: 2 (Odors were emitted when waste was being unloaded from a vehicle inside the plant.) (Odors were emitted from a suction vehicle being used to clean tanks after the plant fre.)	×	<ul> <li>Upgrade deodorizing equipment to capture odors emitted during acceptance, storage, rereatment, or other operations inside the plant</li> <li>Increase the number of local patrols to take preventive measures</li> </ul>
, Flant	Produce coagulants to aid in the reconstruction of Tohoku Coagulant shipments: 290 t		Manufacturing of coagulants by ensuring stable operation of production equipment through careful inspections	<ul> <li>No. of equipment problems: 0</li> <li>Coagulant shipments: 456 t</li> </ul>	0	Coagulant production completed in FY 2013
Sakal SU	Commit to accepting a specified amount of waste to promote recycling Amount of waste nitric acid accepted: 184 t		Recycling of nitric acid by ensuring stable operation of recycling equipment through careful inspections	<ul> <li>No. of equipment problems: 0</li> <li>Amount of waste nitric acid accepted: 194 t</li> </ul>	0	
En	vironmental challenges	Reduction in the e	environmental burden of			Energy conservation
ta	CING SOCIETY Prevention of climate change (global warming)	products and server     Reduction in the a	rices mount of waste	Prevention of soil and water contamination		Reduction in the environmental burden of transportation
6	Prevention of environmental pollution caused by chemical substances, etc.	Wider application	of new energy sources	Preservation of ecosystems and biodi	versity	
_						

# CSR Report 2014 Reporting period: April 1, 2013 – March. 31, 2014 Target organization (s): REMATEC Corporation and RTT

![](_page_15_Picture_33.jpeg)

![](_page_15_Picture_35.jpeg)

31

## **Environmental Performance Data**

Flowchart for the environmental burden of materials in FY 2013

![](_page_16_Figure_2.jpeg)

FY 2013	performance	data b	y site
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JT			Enviro	nmental	performa	ce data	a from RF pro	duction			
		Total	Osaka Plant I	Kyushu Plant	Sakai SC Plant			Total Os	saka Plant K	yushu Pla	ant
	Gasoline (kℓ)	30.6	8.9	17.1	4.7	CO (t-	2 emissions	1,261.0	417.5	370.	5
S	Light oil (kℓ)	17.2	8.6	6.1	2.5	Re	cycled material	105,251	67,405	36,698	3
5	Heating oil (kℓ)	76.5	0	0.5	76	5	RF shipments	103,603	66,905	36,698	3
	Electricity (kWh)	1,760,411	728,833	513,090	518,488	akdov	Low-grade fuel shipments	1,519	500	(	)
	Industrial water (m)	2,815	0	0	2,815	Bre	Recycled nitric acid shipments	129	0	C	)
ссе 1)+(	pted waste (t)	64,456	39,852	23,905	699	Reind	sidues and ustrial waste(t)	830	366	449	,
dus	strial waste(t)	63,109	39,852	22,558	699	F	Recycling residues	711	327	384	
	Waste oil	37,047	27,047	10,000	0	E	Empty containers	119	39	65	
	Sludge	12,952	6,256	6,696	0		Waste plastics	108	28	65	
	Waste acids	4,851	2,672	1,664	515		Metal scrap	0	0	0	
	Waste alkalis	5,099	2,924	1,991	184	eakdown	Wood waste	7	7	0	
	Soot and dust	2,069	193	1,876	0		Paper waste	2	2	0	-
	Waste plastics	752	721	31	0	l n	Debris	0	0	0	-
	Animal and plant residues	228	0	228	0		Waste textile	2	2	0	-
	Cinders	70	39	31	0		Glass waste	0	0	0	
	Scrap metal	43	0	43	0	Val	uable scrap metal (t)	1,273	817	456	
aste	oil from ships (t) ②	1,347	0	1,347	0						
aw	materials (t)	39,933	27,626	12,307	0			Total Os	saka Plant K	yushu Plant	ļ
	Recycled fuel	39,933	27,626	12,307	0	Re	cycling rate (%)	98.9	99.2	98.4	
	C heavy oil	0	0	0	0						
	Hydrated lime	0	0	0	0		Re	ecycling ra	ite form	uia	
	Heating oil	0	0	0	0		Recycling (Amount of acce		ed materials – <i>I</i>	Amount of resi	ic
i	Caustic soda	0	0	0	0		rate =	A	mount of accep	ted materials	
	Recycled hydrochloric acid	0	0	0	0		<b>%</b>	(Amount of acce containers) – Amount of accepted	epted waste – A Amount of recy wastes – Amount	mount of emp cling residues	t
	Sulfuric acid	0	0	0	0			surrount of accepted	mastos minuum	or empty cont	

## Environmental performance data from collection and transportation

Amount of light oil consumption (kl)	372.9	179.4	193.5	-

![](_page_16_Figure_7.jpeg)

![](_page_16_Figure_8.jpeg)

Recycling rate

CO <sub>2</sub> emissions (t-CO <sub>2</sub> )	978.5	470.8	507.7	-

#### Light oil consumption for collection and transportation and CO<sub>2</sub> emissions

![](_page_16_Figure_15.jpeg)

# External adviser feedback

Co-President, Japan Association of Environment and Society for the 21st Century

In light of the Kyushu Plant accident and REMATEC Corporation's restructuring in April, I have read this, the company's 15th CSR report, carefully while keeping in mind that this is the first report issued under the new president.

As the Message from the President indicates, the Kyushu Plant accident was a major test for REMATEC. However, the thorough description of the accident that this report provides demonstrates the company's strong commitment to avoiding a recurrence. The details provided include photographs of the accident site and descriptions of not only the direct and indirect causes, but also strict new safety measures (equivalent to those of a chemical plant). These measures, which go further than conventional responses to accidents, have been adopted in light of the company's sincere remorse. A company's true value is tested by the crises and difficulties it faces. I hope that REMATEC will remember that its true value lies not only in its response in the aftermath of the accident but also in its sincere efforts going forward, and that it will therefore ensure that its countermeasures are implemented.

This report also highlights that the company aims to contribute to resolving social issues in the environmental field through the company's resource recycling and renewable energy businesses. This demonstrates a positive attitude toward accurately and quickly responding to the needs of the time and society by leveraging the lessons that REMATEC has learned from past experience and its technical capabilities.

However, although I understood the descriptions of the individual businesses, the report does not give

a clear overall picture of the individual companies as a group. I was left wondering:

![](_page_17_Picture_7.jpeg)

What exactly is the group as a whole trying to achieve by consolidating the power of its individual companies? How does the group's corporate philosophy compare with those of the individual group companies? What are the relationships between the group companies?

Furthermore, since REMATEC Corporation has been converted into a holding company and the missions and responsibilities of the group's individual companies have now been defined, I hope that the environmental performance data will be improved by, for example, presenting data on each company's business activities as well as for the group as a whole. This would help clarify the significance and advantages of the restructuring, even for activities intended to reduce environmental burdens.

The company has found itself in quickly changing circumstances since the Great East Japan Earthquake. Based on the Message from the President, however, I expect all REMATEC employees to keep the fundamentals of ensuring safety and the corporate philosophy firmly in mind even after the transition to a group company. I also expect the group to value the diverse employees and capabilities they have acquired, and to steadily move into a new era by continuing to take on new challenges in helping to develop a sustainable society with all of their employees working together under their young new president, Mr. Tanaka.

#### Response to External Adviser Feedback

Masatoshi Tanaka Chairman of the Board, REMATEC Holdings Corporation

This year marks REMATEC's 40th anniversary, and this is the 15th edition of our environmental report, which we initially issued in 2000 as an industry first with the aim of helping our stakeholders to better understand our waste recycling business. During the intervening years, we have developed technologies to respond to society's changing needs by transitioning from a waste disposal business into a recycling business. We have developed the world's first recycling technology using subcritical water, proposed a technology for restoring sites filled with illegally dumped waste, and accumulated a great deal of knowhow and experience. It was a great honor to have been able to contribute to the disposal of disaster waste following the Great East Japan Earthquake by making use of this know-how and experience through company-wide efforts. These efforts also helped us to realize the importance of developing businesses rooted in local communities.

Restructuring our company was a significant decision for me. I consider

![](_page_17_Picture_15.jpeg)

our group's mission to be as follows: the group companies will continue to operate businesses rooted in their respective local communities (thereby making a positive contribution to these communities), while the holding company collects information from the group companies and shares it throughout the group to continue our efforts to build a sustainable society by quickly deploying personnel, technologies, know-how, and experience across the group.

I believe that the younger generation will build safe, trustworthy companies by developing human resources who can quickly respond to changes in society flexibly and strengthening the organization through friendly competition among our group companies.

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http://www.rematec.co.ip

http://www.rematec.co.in/rematec

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![](_page_17_Figure_49.jpeg)

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