T.RAD Co., Ltd.

CSR Report 2017

Corporate Social Responsibility Report 2017

www.trad.co.jp

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T.RAD will report on its social and environmental initiatives both in this booklet and on its website along with the data. This report contains Standard Disclosures from the GRI Sustainability Reporting Guidelines. It is also published with the approval of related departments, activities committees and management.
HP : http://www.trad.co.jp/english/

Scope of report

- **Organization** T.RAD Co., Ltd. and its consolidated subsidiaries in Japan and overseas
- **Term** FY 2016 (April 2016 to March 2017)
  (Overseas: January 2016 to December 2016)
- **Fields** Social and environmental aspects
  (economic aspects)

Referenced guidelines

- GRI G4 Sustainability Reporting Guidelines
- Environmental Accounting Guidelines
  (Ministry of the Environment, 2005)

Message from the President

In 2016, the world was faced with growing uncertainty, particularly with regard to Brexit, the US presidential election and North Korea. At the same time, the risks and challenges surrounding our company became increasingly complex and changed rapidly. We are now required to keep a keen eye on these changes and respond flexibly in order to ensure our sustainable growth.

In this harsh business environment, we regard CSR activities as an essential part of our company.
This is because we believe that incorporating CSR activities in our management forms the foundation that enables sustainable corporate growth, no matter what the situation, and this belief is also reflected in our management principles.

Our Medium Term Business Plan (T.RAD-10) defines our two major strategic objectives as "being a reliable company trusted by stakeholders" and "global growth."

Firstly, in order to be trusted by our stakeholders, we understand that safety, compliance, quality, environment and managerial transparency are important issues that need to be addressed. In particular, compliance is vital to our trustworthiness. In 2016, we established the T.RAD Code of Conduct. We believe that we can build our stakeholders' trust in us and increase our corporate value when all employees observe this code of conduct. Furthermore, our company has also been providing compliance education to employees on an ongoing continued basis to allow each one of them to improve their CSR awareness, in addition to implementing mutual legal compliance audits between different sites within the company each year, which has also produced positive results.

In the area of risk management, we have begun to simulate increasingly critical scenarios in our training, in line with our business continuity plan (BCP), in response to the growing risk of the predicted Nankai Trough earthquake. In 2016, we introduced a tool to enable post-disaster communication between directors and local employees even during the night or weekends, in addition to a safety confirmation system.

President
Hiromi Kano

嘉納裕貝

With regard to "global growth," about 50% of our sales are accounted for by our overseas sites. The year 2016 also saw the establishment of our third site in China, T.RAD (CHANGSHU) R&D CENTER CO., LTD. As an R&D center developing heat exchangers for our important customers in the construction machinery- and automobile-related industries in China, the company is expected to work to capture this huge market. Our products of strategic importance, whose global sales we aim to increase, include environmentally-friendly products that can make significant contributions to enhancing fuel efficiency and reducing NOx emissions of cars, such as casingless oil coolers, EGR coolers and water-cooled intercoolers. These are priority areas for our R&D activities and market launches. The materials used in these products also meet international standards such as the RoHS directive and the REACH law, and are designed to have a minimum impact on the environment.

In this way, our company aims for sustainable growth through its CSR-oriented management strategy. One thing that I say repeatedly to our employees is that they should act in the spirit of Challenge, Change, Cooperation and Speed. Upholding this spirit, we will continue to strive in the future to achieve further growth as a global company while sharing our values with stakeholders.

Company Overview

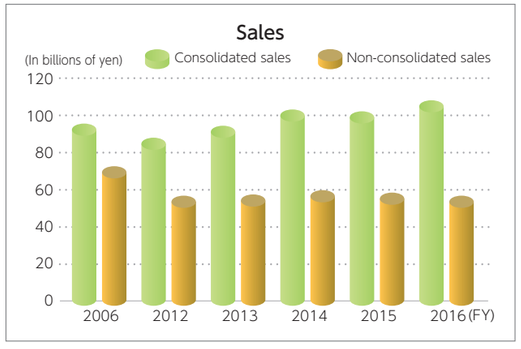
Company Name ····· T.RAD Co., Ltd.
Head Office Address ··· 3-25-3 Yoyogi, Shibuya-ku, Tokyo, Japan
Shares Listed on ····· Tokyo Stock Exchange, First Section
Number of Employees ··· Consolidated: 3,798 (Figures are current as of December 31, 2016 for overseas data and March 31, 2017 for domestic data.)
··· Non-consolidated: 1,531 (Includes employees transferred to other offices within Japan and overseas.)

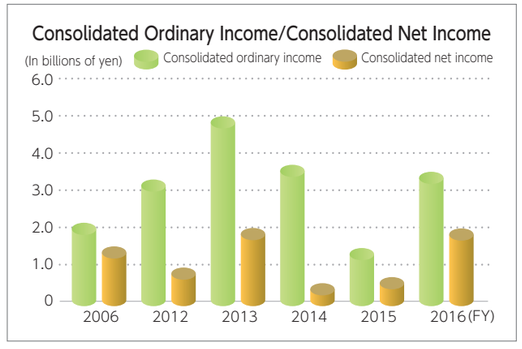
Established ····· November 11, 1936
Capital ····· 8,545,640,000 yen (as of March 31, 2017)
Business ····· Manufacture and Sale of Heat Exchangers

	Locally Hired Full-time Employees		Locally Hired Contract Employees	Transferred from Japan
	Male	Female		
Japan	79%	7%	14%	-
United States	67%	30%	1%	2%
Czech Republic	44%	23%	32%	1%
Indonesia	77%	21%	0%	2%
Russia	51%	43%	0%	6%
Thailand	43%	18%	39%	1%
Vietnam	69%	28%	0%	3%
China	71%	21%	6%	2%

Percentage of Employees Covered by Collective Bargaining Agreements ··· 71%
Are Workers Self-employed? ····· No
Significant Variations in Employment Numbers ····· None
Number of Subsidiaries ····· 15
Companies Accounted for by Equity Method ····· 3
Non-consolidated Offices ····· 7
Names and number of countries where we operate ···
Japan, United States, Czech Republic, Germany, Russia, China, Indonesia, Vietnam, Thailand, and India (10)
Important Changes ····· None
Fines for Violations ····· None

Sale of Banned Products ····· None
Financial Support from the Government, Political Contributions ··· None
Total Liabilities and Net Assets ····· 79,213 million yen
(Net Assets 42,385 million yen, Total Liabilities 36,827 million yen)
Economic Initiatives Signed/Instructed by T.RAD ····· N/A
Membership of Associations ····· None
Stakeholder Engagement ···
Shareholders general meeting, technology exchange meetings, associations, financial statements, briefing sessions to explain our purchasing policy, Central Labor-Management Round-Table Conference, "top communication" (every quarter, top executives explain business conditions to employees), etc.





*The above information was updated in May 2017. Please refer to our financial statements for the period ending March 2017 for more details.
http://www.trad.co.jp/english/manager/wp-content/uploads/2017/06/20170613022.pdf

Origin of Our Company Name

● The "T" of T.RAD refers to the following three concepts.

1. The "T" from "Toyo," in recognition of our tradition and achievements under our previous name of Toyo Radiator.
2. The "T" from "Technology," referring to our status as an advanced technology company.
3. The "T" from "Thermal exchange," which is our core technology.

The "RAD" of T.RAD was taken from the first three letters of "radiator," the word that had long been a part of our company name. "RAD" has also the meaning of "radiant" that is the root word of radiator, signifying our hope of becoming a radiant light in our chosen field by leveraging our industry-leading heat exchange system technologies and making innovative propositions.

History

1936	Toyo Radiator Manufacturing Co., Ltd. established on November 11.
1937	Kawasaki Factory (name later changed to Kawasaki Works) begins operation.
1940	Nagoya Works begins operation.
1944	Company name changed to Toyo Cooler Co., Ltd.


Large assembly/paint line at the Nagoya Works ca. 1960

1951	Company name changed to Toyo Radiator Co., Ltd.
1960	Hatano Works begins operation.
1962	Kawasaki Works operations moved to Hatano Works.
1969	Listed on the First Section of Tokyo Stock Exchange. Yokaichi Works (now Shiga Works) begins operation.
1985	Higashiura Factory in Nagoya Works begins operation.


Full view of the Hatano Works ca. 1986

1988	T.RAD North America, Inc. established in USA.
1990	Joint venture TORC Co., Ltd. established in Thailand.
1997	Joint venture TATA Toyo Radiator Ltd. established in India.
1999	T.RAD (THAILAND) Co., Ltd. established in Thailand.
2000	T.RAD North America Aluminum Div. begins operation.
2002	T.RAD (Zhongshan) Co., Ltd. established in Guangdong, China.
2004	T.RAD Czech s.r.o. established in Czech Republic.


T.RAD North America, Inc.


T.RAD (Zhongshan) Co., Ltd.

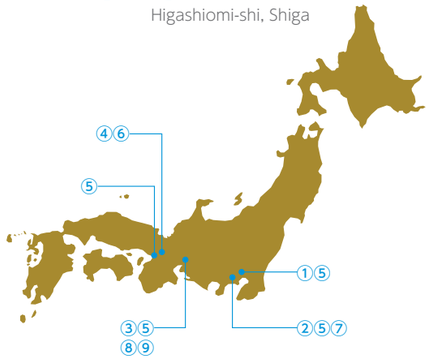
2005	Company name changed to T.RAD Co., Ltd. on April 1. Joint venture Qingdao Toyo Heat Exchanger Co., Ltd. established in Shandong, China.
2008	PT. T.RAD INDONESIA established in Indonesia. TRM LLC established in Russia.
2012	T.RAD (Changshu) Co., Ltd. established in Jiangsu, China. T.RAD (VIETNAM) CO., LTD. established in Vietnam.
2016	T.RAD North America Inc. made Tripac International Inc. a subsidiary of it.
2017	Established T.RAD (CHANGSHU) R&D CENTER CO., LTD., and T.RAD Sales Europe GmbH.

*Readers of the e-book version of this report can view the "T.RAD's Products" video here.

Companies Involved in our Environmental Management Program
(The overseas subsidiaries shown below are those that engaged in production activities in FY 2016.)

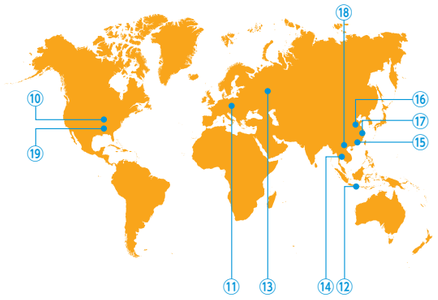
T.RAD Co., Ltd.

①Head Office	Shibuya-ku, Tokyo
②Hatano Works	Hadano-shi, Kanagawa
③Nagoya Works	Higashiura-cho, Chita-gun, Aichi
④Shiga Works	Higashiomi-shi, Shiga
⑤Sales/Marketing & Technical Division	Chiyoda-ku, Tokyo Hadano-shi, Kanagawa Nagoya-shi, Aichi Osaka-shi, Osaka
⑥Production Engineering Center	Higashiomi-shi, Shiga

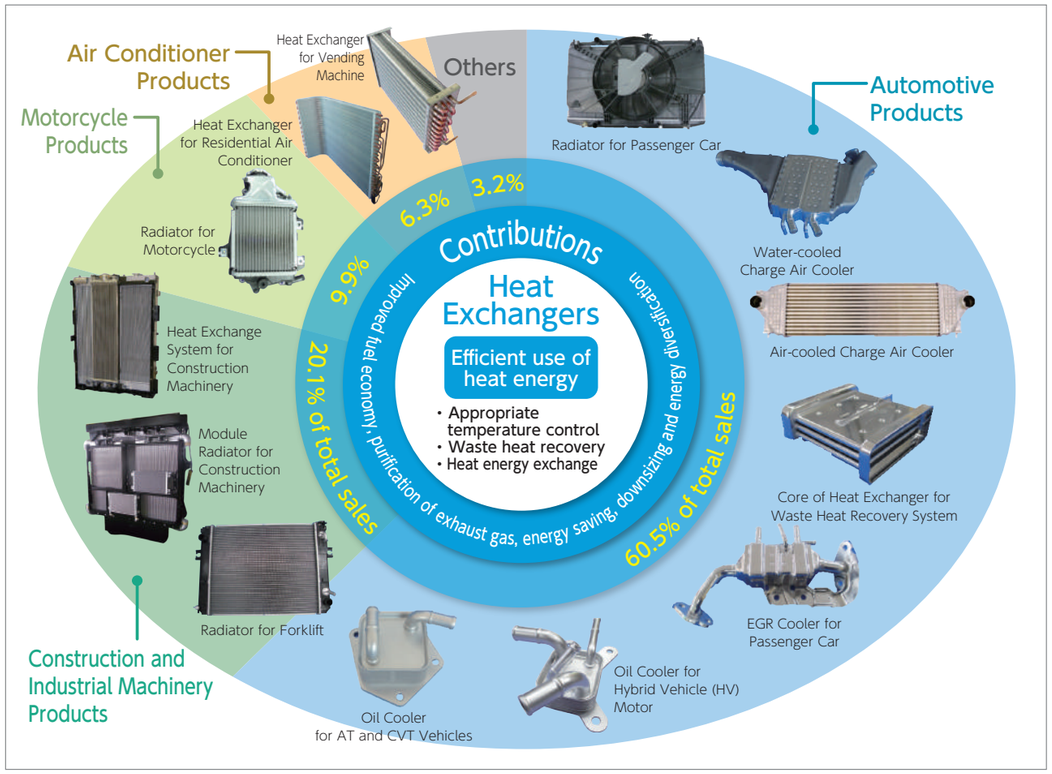


T.RAD Group Companies (Subsidiaries)

⑦Asuni Co., Ltd.	Hadano-shi, Kanagawa
⑧Towa Kosan Co., Ltd.	Nagoya-shi, Aichi
⑨Towa Unyu Co., Ltd.	Higashiura-cho, Chita-gun, Aichi
⑩T.RAD North America, Inc.	Kentucky, U.S.A.
⑪T.RAD Czech s.r.o.	Unhost, Czech Republic
⑫PT. T.RAD INDONESIA	Cikarang-Bekasi, Indonesia
⑬TRM LLC	Nizhny Novgorod, Russia
⑭T.RAD (THAILAND) Co., Ltd.	Bangpakong Chachoengsao, Thailand
⑮T.RAD (Zhongshan) Co., Ltd.	Zhongshan, Guangdong, P.R. China
⑯T.RAD (Jining) Co., Ltd.	Jining, Shandong, P.R. China
⑰T.RAD (Changshu) Co., Ltd.	Changshu, Jiangsu, P.R. China
⑱T.RAD (VIETNAM) CO., LTD.	Ha Nam Province, Vietnam
⑲Tripac International Inc.	Texas, U.S.A.



Major Products



Management

Management Principles

- Contributing to social progress by supplying superior products
- Pursuing the enduring development of the company and the happiness of customers, shareholders, employees, business partners and local communities

T.RAD's Corporate Vision

1. Reliable Company
2. A proposal-based company producing products that satisfy customers
3. A company contributing to the global environment
4. Company that supports employees' self-fulfillment

Key Impacts, Risks and Opportunities

Once a year, the President and directors analyze the risks and opportunities relating to the economy, the environment, and society and apply their conclusions to company policy.

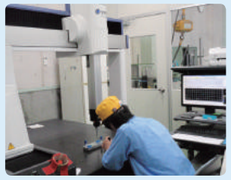
Working environment (Health and safety)

Conscious of the need to improve regional working conditions and respect human rights, we are building an environment where people can work healthily and safely.

Development of a robust society

Compliance with laws, regulations, and social norms contributes to sound corporate activities and the development of a robust society.

Technological progress and sustainable economic development



We support technological growth, resource savings, and comfortable lifestyles by supplying high performance and high quality products. We also contribute to sustainable economic development by selling attractive products worldwide.

Environmental conservation and pollution prevention

Manufacturing and product development with a low environmental burden help prevent global warming and reduce pollution risks.

Key Topics and Specific Initiatives

Once a year, management analyzes the economic, environmental, and social risks and opportunities, and identifies the high priority challenges and opportunities for stakeholders and T.RAD, while taking into consideration such factors as requests and expectations from customers and society, industry trends, and international standards.
The main themes are incorporated and developed in our business strategies and annual policy, with specific initiatives implemented through various projects and committees. The stakeholder opinions that we have received during these initiatives are also reflected in our activities.
(see pp. 10, 16, 20-22, 24, 28, 45, 46)

Medium Term Business Plan T.RAD-10 Basic Strategy (FY 2014 to FY 2017)

Ⅰ. Reliable Company

Gain the trust of all stakeholders regarding company activities.

1. Achieve targets for health and safety, compliance, quality, environment, and earnings
2. Sincere, fair, and highly transparent business activities
3. Continuous improvement through "3C + S"

*3C+S: Challenge, Change, Cooperation + Speed

Ⅱ. Global Growth

Become a company that can win in global markets.

1. Development and product strategy geared towards T.RAD-11
2. Increase global sales
3. Global personnel training and creation of an international environment

More Specific Initiatives on the Social & Environment Medium Term Plan and Projects

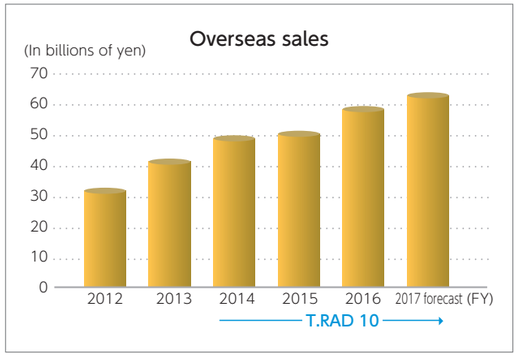
We are working on concrete initiatives in projects and committees.
Executives are taking part in projects and their progress is periodically managed in the Management Committee and other committees.

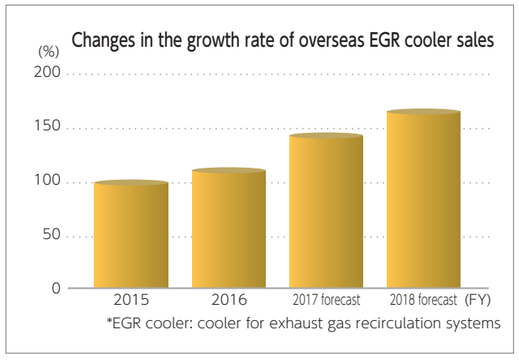
Ⅰ. Embodying a Reliable Company

	Objectives of the Medium Term Business Plan 2017	Key measures	Progress in FY 2016	Page no.
Health and safety	・Zero work accidents	・Promotion of risk assessment ・Promotion of daily activities ・Continued implementation and overseas introduction of safety training	Work accidents requiring time off work Work accident requiring 4 or more days off work 0	P.25
Compliance	・Zero compliance violations	・Improvement of compliance training ・Building of a company-wide legal compliance audit system	Violations (incomplete submissions to govt. bodies, etc.) 4 Already corrected	P.13
Quality	・80% reduction in delivery defects compared to 2012 ・Improvement of global quality management	・Preemptive measures against troubles at the design stage ・Preparation of case studies of past problems and their application to measures taken ・Strengthening of global support (training, audits. etc.)	Delivery defects fell by 17% compared to FY 2012	P.19
Environment	・CO_2 emissions 10.0% reduction compared to FY 2013 ・CO_2 emissions reduced through Environmentally Friendly Products (EFPs) by 21,400 tonnes ・EFP sales ratio of 40%	・Introduction of energy-saving furnaces and compact lines ・Increase in EFPs	5.5% reduction 19,900 tCO_2 39%	P.29-

Ⅱ. Actualization of Global Growth

We are focusing on developing products that are competitive in international markets.





FY 2017 Company-Wide Policy

Ⅰ. Reliable Company ⇒ Reform to Produce a System That Does Things Decisively

1. Health and safety
   Zero accidents
2. Compliance
   Zero violations of laws and regulations
   Strengthen the company's compliance structure
3. Quality
   Zero relapses
   Continue "First of all to stop lines" activities to ensure defect-free process completion
4. Earnings
   Cost reduction (manufacturing innovation)
   Increase indirect efficiency

Ⅱ. Global Growth ⇒ Expansion in Global Markets

1. Global strategy
   ・Deployment of a priority-based business strategy
   ・Development capable of producing profits (selection and concentration)
2. Building of a global structure
   ・Training of global personnel
   ・Strengthening of collaboration with overseas sites

Corporate Governance

Guided by one of our management principles - "Pursuing the enduring development of the company and the happiness of customers, shareholders, employees, business partners and local communities," we will strengthen and enhance our corporate governance, with the aim of fulfilling our corporate vision of becoming a "reliable company."

We have also prioritized legal and regulatory compliance as a prerequisite for corporate governance.

Corporate Governance System

As the highest decision-making body, the board of directors meet once a month, in accordance with the board's regulations, and discuss basic management policy and any legally required items, as well as other key management-related issues.

In order to separate management-monitoring function from executive functions, an executive officer system was introduced. The board of directors is given the functions of making management decisions about basic policy and of monitoring business execution.

In order to monitor business execution from an objective viewpoint, one of the six directors on the board shall be an outside director.

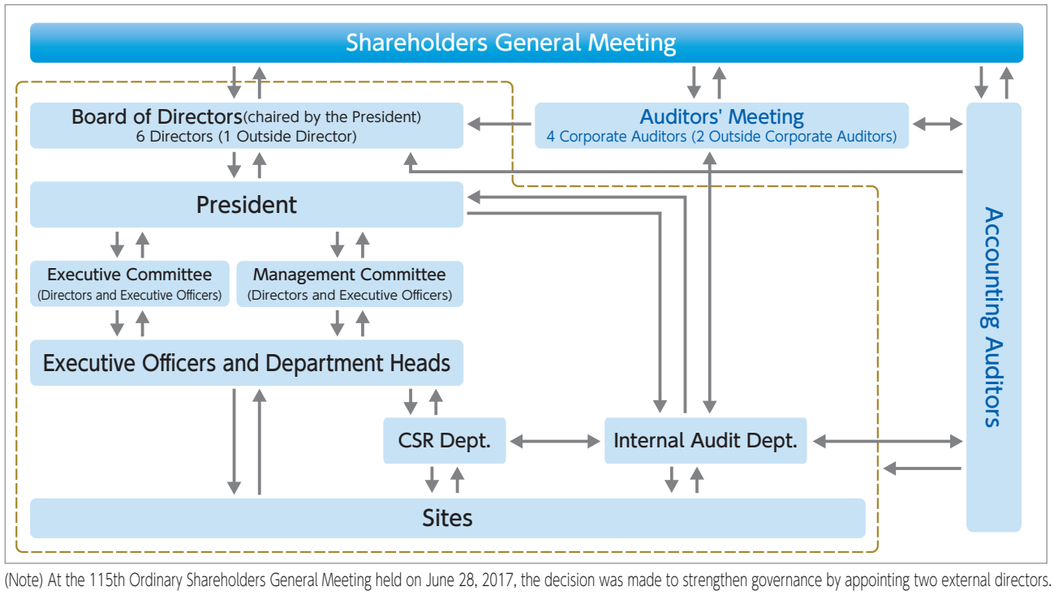
The corporate auditors also receive reports on compliance, management strategy, business risks, and the financial situation from the directors at board meetings. Also, by liaising closely with the CSR Department and the Internal Audit Department, the corporate auditors have created a system that ensures their timely receipt of information required to monitor internal controls and allows them to discuss any problems.

Furthermore, two of the four corporate auditors shall be outside corporate auditors in order to ensure independent and fair auditing.

We are also working to improve management efficiency by holding Management Committee meetings (once a month) and Executive Committee meetings (once a month), as part of a meeting structure that will implement major company-wide policies and measures and report the information required for business management, with the aim of promoting agile management decision-making (See the Corporate Governance System diagram).

We also set strategies and targets while attaching weight to the discussions at the shareholders general meeting and the Central Labor-Management Round-Table Conference, as well as taking into account the economic, environmental (see p. 31), and social (see p. 10) trends that come to light in various types of meetings under the leadership of executive officers. Executive officers are involved in the approval of performance review and brief financial reports (4 times a year) to ensure a responsible management system.

■ Corporate Governance System (as of April 1, 2017)



(Note) At the 115th Ordinary Shareholders General Meeting held on June 28, 2017, the decision was made to strengthen governance by appointing two external directors.

Internal Controls

Internal controls are intended to maintain and improve the quality of management in areas such as corporate governance and CSR activities, so could also be described as management principles in their own right. The internal control system that support corporate governance is being deployed not just in T.RAD itself, but also in our group subsidiaries and partners, in order to ensure that our actions remain legal and rational, as well as efficient.

Established independently from operating departments as the department in charge of internal controls, the Internal Audit Department verifies whether or not our operations comply with laws and internal regulations, and reports its results to the board of directors.

CSR Management

CSR Principle: Contributing to the Creation of a Sustainable Society

(Preamble)

T.RAD and its subsidiaries willingly contribute to sustainable development in harmony with society and the environment, based on our management philosophy.

T.RAD and its subsidiaries also comply with both the letter and the spirit of local and international laws and regulations, and will engage in sound business practices.

CSR Policy (Established September 2010)

1. Customers

We will work to provide safe, high quality, and environmentally friendly products to our customers.

- ●We will always strive to pursue safety, peace of mind, and satisfaction.
- ●We will strive to ensure the protection of personal information for all persons connected with our business activities.

2. Employees

We will provide fair and equitable working conditions for all our employees to help them be happy, and work to maintain and improve a working environment that is both safe and healthy.

- ●We support the self-fulfillment of our employees through work and workplaces, and through training.
- ●We will provide equal employment opportunities and not discriminate.
- ●We will respect human rights and share values through sincere dialogue and meetings.

3. Suppliers

With all our transactions based on open and fair trade, we will respect our suppliers and devote all our efforts to developing solid partnerships for our mutual development.

- ●We will respect environmental and quality standards and laws, and ask that our suppliers do the same.

4. Shareholders

We will constantly take a long-term point of view and work to ensure sound management through dialogue with the aim of improving our corporate value.

- ●We will report on our management without elaboration to ensure transparency.

5. Society

We will value our dialogue with the local community so that we can coexist with society at large.

- ●We will respect cultures, customs, history, and laws, and work on programs to respect humanity.
- ●We will take an uncompromising stance against antisocial forces and groups that threaten peace and order.
- ●Environment

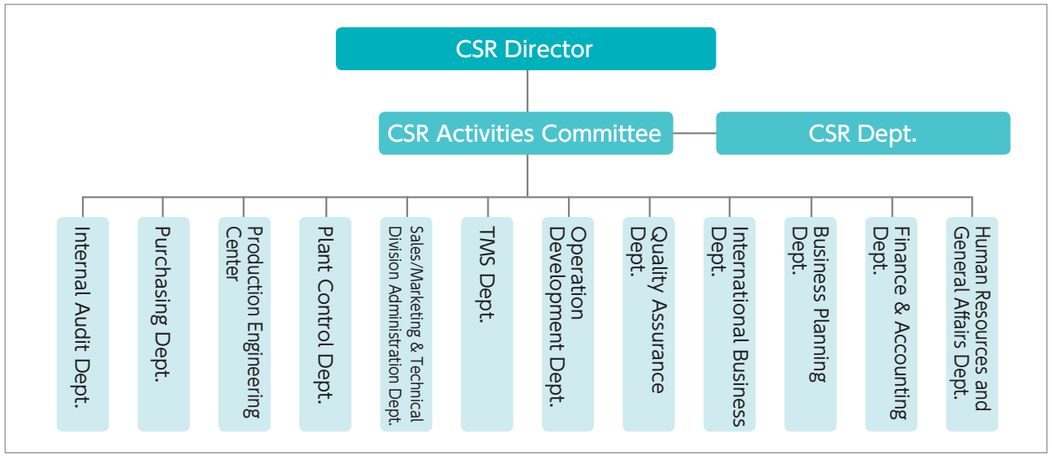
  We will work to reduce the burden on the environment through all our business activities, including products, development, production, and sales.
- ●Social contributions

  We will contribute to community growth and to creating a prosperous society both independently and with our partners.

CSR Promotion System

At T.RAD, we have been building a CSR promotion system under the supervision of the CSR Department since FY 2006. Each quarter, CSR Activities Committee members from each department are called to a committee meeting to discuss CSR problems and issues, such as those related to risk management, and the progress of compliance policy implementation in each department, so that we can deploy the policy horizontally throughout the whole company.

■ CSR Promotion System



Implementation of a CSR Awareness Survey

In FY 2016, we once again conducted a CSR awareness survey of 87 randomly selected employees in Japan and overseas. We investigated their level of understanding of CSR and any improved CSR awareness in their respective departments. We will apply the results of this survey to our CSR activities next fiscal year. The level of understanding of CSR is rising.

■ Improvement in Level of Understanding of CSR

CSR Medium Term Plan 2017 Targets and FY 2016 Results

This table shows the main social and environmental issues facing T.RAD (including risks and opportunities) and our efforts to deal with them.

Issues	Medium Term Plan		Targets for FY 2016	FY 2016 Results	Rating	Related page
	Action Items	T.RAD-10 (FY 2017) Targets				
Business Management	Construction of a global management system	Promotion of the Social and Environment Medium Term Plan 2017	90% achievement of the activities planned by the T.RAD Environmental Promotion Committee Structure	Implementation of activities as planned	○	6,7 29,30
		Understanding and strengthening of environmental management of group companies	Management of CO_2 and waste performances, promotion of improvements: 8 subsidiaries	Managed performance and presented improvement case studies to the 8 subsidiaries.	○	39-43
			Support for acquisition of ISO14001 certification by overseas subsidiaries	90% of overseas subsidiaries acquired ISO14001.	○	32
			Global unification of management of substances of concern (SOC)	Obtained evidence-based confirmation that 8 overseas subsidiaries had no SOC content.	○	38
		Taking ISO-related training in-house	① Preparation and implementation of basic ISO training for staff ② Preparation and implementation of TS standard training for supervisors	Reviewed our "Quick Guide to Environmental Laws and Regulations" and provided a differential analysis table.	○	32
	Improvement of risk management	Enhancement of risk management	Expansion of the scope of mutual legal compliance audits by adding the checking of compliance related to general affairs (notifications, etc.)	Implemented labor-related audits (4 new laws and regulations).	○	32
		Progress towards business continuity management	・Company-wide deployment of the business continuity plan and improvement of preparations for initial response activities ・Investigation of production recovery scenarios (including methods for substitution)	・Introduced a tool to ensure smooth initial response activities and conducted company-wide drills. ・Prepared manual for stopping main equipment.	○	17
		Enhancing company-wide health and safety activities	・Promotion of continuation of RA, continuation of daily activities (KYT, near-miss incident prevention activities)	・Implemented 100% as planned. ・Near-miss incident countermeasures: 97.3% including scheduled plans	△	25,26
Relationships with Employees (Human rights & labor practices)	Invigoration of human resources	Promotion of women's advancement	・Increase in women's employment rate ・Company climate reform (training for management, etc.)	・Up 3.9% in FY 2016 ・Started recruitment activities for new graduates with a female HR manager.	○	23,24
Relationships with Customers	Ensuring compliance observance	①Eradication of compliance problems	Completion of compliance-related company policy	Promoted the deployment of the policy in each department and provided follow-up support.	○	13,14
		②Enhancement and ingraining of compliance awareness	Expansion of training to all levels	Provided specialized training for supervisors.	○	13,14
Relationships with our Suppliers	Coordination with suppliers	Strengthening supplier relationships	Implementation of on-site audits of selected suppliers Target: 12 audits	Achieved annual target of 12 audits.	○	21,22
Relationship with the Local Community	Enhanced information disclosure	Social and Environmental Report that provides KPI information	・3 improvements that reflect GRI guidelines and external feedback ・Creation of pamphlets for external communication and PR	・Made the 3 improvements. ・Reported at the forum.	○	28 51,52
		Disclosure of detailed information you would find in a CSR report	In-house awareness building of CSR activities and an effective external PR response	・Implemented timely improvements to the CSR-related intranet screen.	○	13-16
	Promotion of community support activities	Promotion of community support activities by region and by site	・Domestic: Unification and horizontal dissemination of information about individual activities ・Overseas: Collection of information on overseas CSR activities and sharing of that information with the domestic office	・Shared information and disclosed it as reference information. ・Confirmed the latest information with all overseas subsidiaries and organized it with domestic information.	○	27
Biodiversity	Promotion of biodiversity initiatives	Company-wide biodiversity initiatives	Support the implementation of at least one biodiversity initiative from the medium-term plan	Supported 3 to 9 initiatives at each site.	○	44-47
Climate Change Mitigation	Reduction of energy consumption during production	CO_2 emissions: 10% reduction compared to FY 2013	7.5% reduction compared to FY 2013	-5.5%	×	39
		Reduction of consumption of energy converted into electricity per processing value: 10% reduction compared to FY 2013	7.5% reduction compared to FY 2013	-5.4%	×	39
		Development of equipment that contributes to energy savings	Development of energy-saving equipment	Completed development of energy-saving furnace.	○	39
	Reduction of CO_2 from distribution	Reduction of energy consumption per production: 6% reduction compared to FY 2011	5% reduction compared to FY 2011	-14.6%	○	39
	Development of products for mitigating climate change	Reduction of CO_2 emissions through EFP: 21,400 tCO_2	19,800 tCO_2 or more	19,856 tCO_2	○	33
		Commercialization in EV/HV fields (4 items or more)	Verification of reduction in CO_2 emissions/year achieved by heat exchanger for inverter	FY 2018: Start at 170 tCO_2/year, FY 2020: 2,210 tCO_2/year	○	33-37
			Verification of reduction in CO_2 emissions/year achieved by oil cooler for motor	FY 2013: Start at 153 tCO_2/year, FY 2020: 82,906 tCO_2/year	○	33-37
			Verification of reduction in CO_2 emissions/year achieved by waste heat recovery system	FY 2015: Start at 122 tCO_2/year, FY 2020: 2,430 tCO_2/year	○	33-37
			Verification of reduction in CO_2 emissions/year achieved by fuel gas preheater	FY 2016: Start at 84.5 tCO_2/year, FY 2020: 423 tCO_2/year	○	33-37
			Verification of reduction in CO_2 emissions/year achieved by RAD for FCV	As above	○	33-37
		Commercialization in fuel cell field (2 items or more)	Verification of reduction in CO_2 emissions/year achieved by advanced liquid/liquid heat exchanger	FY 2016: Start at 20,651 tCO_2/year, FY 2020: 170,843 tCO_2/year	○	33-37
			Verification of reduction in CO_2 emissions/year achieved by heat exchanger for stationary SOFC	FY 2016: Start at 6,884 tCO_2/year, FY 2020: 36,922 tCO_2/year	○	33-37
Environmental Pollution Prevention	Reduction of environmentally hazardous substances	Reduction in release and transfer of PRTR-specified chemicals per production	10% reduction compared to FY 2006	-81.2%	○	41
		Reduction of waste	Resource recovery rate of 98.0% or more	98.3%	○	40
		Reduction of substances of concern: To 0%	Reduction in substances containing prohibited compounds to 0%	Substances containing prohibited compounds was reduced to 0.4%.	△	38
	Prevention of air pollution	Compliance with laws (including prevention of water and soil contamination)	Continue to implement the mutual legal compliance audits	Implemented August to September, 2016.	○	32
		Reduction in release and transfer of VOCs per production	30% reduction compared to FY 2006	-75.3%	○	41
	Development of the promotion system for Design for the Environment (DfE)	Implement and disclose life cycle assessments	Agricultural machinery: 48 mm → 36 mm core	Completed LCA, observed an environmental efficiency indicator of 1.2 or more.	○	33-37
		Ratio of EFP sales: 40%	37.5% or more	39.0%	○	33
Recycling, Resource-saving	Development of products useful for recycling and saving resources	Downsizing and weight reduction of products (make high performance core series for vehicles)	Verification of environmental contribution effect by fiscal year	FY 2020 25 tCO_2	○	33-37
	Resource-saving activities	Reduction of water consumption per production	10% reduction compared to FY 2006	-32.1%	○	41

*GRI guideline: Global Reporting Initiative Sustainability Reporting Guidelines

Compliance, Risk Management, Information Security

Background & Reasons

As a company with global operations, we believe it is important for us to comply with laws and regulations and respond to the requests of our global stakeholders when conducting our business.

Key Standards
- Laws, regulations, social norms, supplier CSR policies, and T.RAD CSR policies

Engagement and Support
- Study group on customer themes, conflict minerals research

Impacts
- Sound management that complies with laws and regulations improves our corporate value and has a positive impact on stakeholder assessment of us.
- Improving the working environment and conducting fair trade overseas help enhance social norms and ethics.

Challenges
- Building an overseas compliance structure to cope with the globalization of our business is an issue.
- Building a company-wide business continuity management (BCM) structure is an issue.

Opportunities
- Being able to respond to stakeholder requests will help us enhance our competitiveness and profitability.
- Building (BCM) will enable management that is skilled at handling risks.

Management Approach
- A CSR activity meeting is held four times per year at which risk assessment results and compliance matters are discussed and policies and initiatives are developed in-house.
  A BCP Promotion Committee is also held six times per year in order to promote BCP within the company.

Evaluation
- As a result of the awareness survey conducted with employees, we were able to confirm that their level of understanding of CSR and their awareness of compliance initiatives had increased.

cf pp.11, 12

Target	Performance
1. Formulation of the T.RAD Code of Conduct ・Formulation of the T.RAD Code of Conduct that will enable our employees to embody our management principles	Completed 1. Formulation of the T.RAD Code of Conduct ・Formulation of the T.RAD Code of Conduct that will lead to the embodiment of our management principles by our employees
2. Strengthening of the company-wide compliance structure ・Building of a compliance mechanism	Completed 2. Strengthening of the company-wide compliance structure ・Performed self-checks about labor laws and regulations and conducted mutual audits between site
3. Increased awareness about regulatory compliance ・Encourage activities that increase the level of understanding of the essence of CSR/ compliance	Completed 3. Increased awareness about regulatory compliance ・Conducted training for supervisors with the aim of increasing the level of their understanding of CSR
4. Risk assessment ・Implementation of risk assessment, based on the risk catalog	Completed 4. Risk assessment ・Reported the risk assessment results to the Business Planning Dept. and offered suggestions on the development of the next fiscal year's policy
5. Maturation of business continuity plan ・Planning and implementation of new company-wide BCP drills	Completed 5. Maturation of business continuity plan ・Conducted communication drills using the safety confirmation system and a communication tool
6. Strengthening of the global security management system ・Introduction of an IT asset management tool to overseas subsidiaries	Completed 6. Strengthening of the global security management system ・Completed the introduction of an IT asset management tool to overseas subsidiaries

*Compliance training: Antimonopoly Act, Subcontract Act, Labor Standards Act, harassment issues, etc.

Promotion of Compliance Activities

Establishment of a T.RAD Code of Conduct

In FY 2016 we established the "T.RAD Code of Conduct."

We believe that implementing the T.RAD Code of Conduct will allow us to fulfill the social responsibility that it is expected of us. We will inform our employees about the code to ensure that they have an adequate understanding it. We firmly believe that this will increase the value of our company and our results and thereby gain the trust of all our stakeholders.

<T.RAD Code of Conduct> Established in December 2016

We believe that ensuring the implementation of the management principles of T.RAD fulfills our socially-expected responsibilities. In achieving the management principles, we must fully understand and place great emphasis on the T.RAD Code of Conduct as top priorities as a matter of compliance and conduct of necessary activities. By doing so, we are confident that T.RAD and its operational results will increase the corporate value and gain the trust of all stakeholders.

1. Compliance with Laws and Regulations

1) **Compliance with Laws and Spirit of the Laws**
- We will properly understand and observe the laws and regulations in Japan and those in other countries, if applicable, and will refrain from illegal conduct in society.

2) **Compliance with Competition Laws**
- In compliance with the competition laws in Japan and those in other countries, if applicable, we will not conduct any unlawful or illegal acts, such as private monopoly, the imposition of unreasonable transaction restrictions (e.g., the forming of cartels or the implementation of bid-rigging agreements . . . etc.), or the abuse of superior positions.

3) **Anticorruption**
- We will abide by the applicable laws and regulations in Japan and those in other countries, if applicable, and will make political and other donations accordingly, and strive to create transparent and fair relationships with politicians, administrators, public institutions, and organizations.
- We will not provide bribes and other unfair profits to government officials (including government officials overseas and other workers deemed to be public officials) or offer or receive entertainment, gifts, or money to or from anyone for the purposes of obtaining and maintaining unfair profits or incentives.

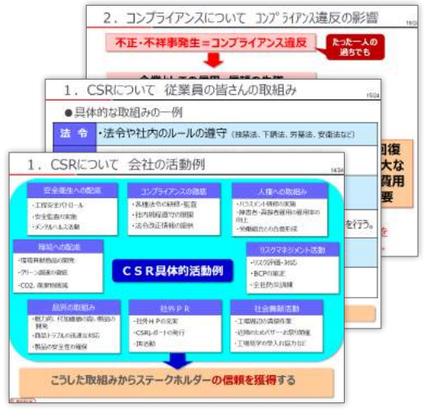
● T.RAD Code of Conduct

Implementation of various types of compliance training

We conduct various types of compliance-related training. For new employees and employees who have joined the company after a mid-career job change, we first provide basic training. Six months later, we conduct follow-up training to further deepen their understanding.

Managers from section chief level and above are trained mainly in labor management in the work place (Labor Standards Act, harassment issues, etc.). The intention is to provide them with the legal knowledge and awareness that they should have as managers. Antimonopoly Act training is continuously conducted every year in the Sales/Marketing & Technical Division.

● CSR/compliance training for supervisors



● Training content for supervisors

● CSR/compliance training for new employees

● Training content for new employees

Towards the strengthening of the regulatory compliance system

Every year each of our departments performs self-checks about laws and regulations and then mutual audits are conducted by site managers. In FY 2016, we added the Labor Standards Act and other labor-related laws and regulations to the environmental laws and regulations that we had previously checked and audited for. This helps increase the level of understanding of relevant regulatory compliance items in each department. Conducting audits also prevents the leakage of regulatory compliance items.

Main check points

- Issuing a Notice of Conditions of Employment
- Content of the Notice of Conditions of Employment
- Conclusion, notification, and publicizing of the "36 Agreement"
- Granting of annual paid leave, etc.

Compliance Evaluation Sheet on Labor Relations, Laws and Regulations, and Other Requirements [Self-evaluation Use]

* 1) The person in charge at each division shall fill out the check result of each applicable condition and attach necessary evidence.
* 2) Each leader shall evaluate each applicable condition based on evidence [OK, NG, or NA if no change]
* 3) The department manager performs comprehensive evaluation based on the compliance evaluation status of the applicable laws and regulations (A corrective action must be taken for any item evaluated as NG) ⇒ Lower row

Subject: Head Office, Hatano, Kasadera, Nagoya, and Shiga

Regulation name	Requirement (compliance matter)	Clause	Applicable condition
C-3. Labor Standards Act	• Matters related to labor contract: In the case of direct employment at the Head Office or a base		
	Delivery of labor contract (notice of employment conditions) in writing	Article 15 of Act, Clause 5 of Rules	• Do you issue a labor contract in writing (or a notice of employment conditions) whenever an employee is recruited?
			• Do you create contracts in English or any other foreign languages to be understood by non-Japanese workers and distribute them to the non-Japanese workers?
	Items to be absolutely specified in the	Clause 5	• Does the labor contract (or notice of employment conditions) describe the following five **items to be**

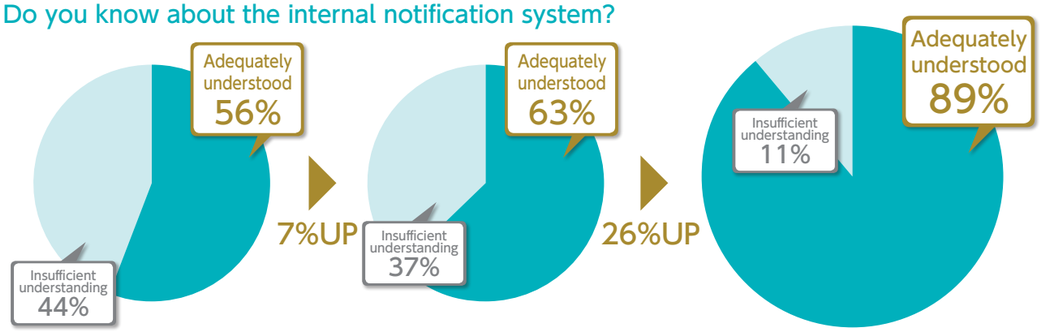
Regulatory compliance in 2016

In FY 2016, there was one missing piece of information relating to the Worker Dispatching Act. There was also one violation of the Act on Special Measures for Consumption Tax Shifting (a total of 2 cases), but both transgressions have been corrected.

Publicizing the internal reporting system

We have established an internal notification system for the early discovery and resolution of violations of our internal regulations. We have provided various methods of internal notification, such as placing a comments box in each site and allowing employees to send an email or letter to the CSR Department. Previous CSR awareness surveys revealed that this system had not been fully used within the company. As a result of publicizing the internal notification system through CSR training in 2016, a CSR awareness survey revealed that understanding has risen to 89%.

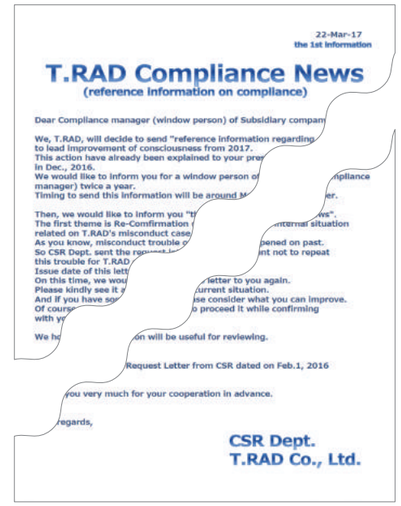
Do you know about the internal notification system?



FY 2014 (before last survey) FY 2015 (previous survey) FY 2016 (most recent survey)

Building a compliance structure for overseas subsidiaries

We are also working to build and strengthen the compliance structure of our overseas subsidiaries. In 2016, we decided on the compliance contact points for overseas subsidiaries and built a channel of communication between Japan and our overseas subsidiaries. The CSR Department also issues "Compliance News" in order to raise employee awareness of compliance, and has started to distribute it to overseas compliance contact points.


22-Mar-17
the 1st Information

T.RAD Compliance News
(reference information on compliance)

Dear Compliance manager (window person) of Subsidiary compan

We, T.RAD, will decide to send "reference information regarding
to lead improvement of consciousness from 2017.
This action have already been explained to your pre
in Dec., 2016.
We would like to inform you for a window person o
manager) twice a year.
Timing to send this information will be around M

Then, we would like to inform you "t
The first theme is Re-Comfirmation
related on T.RAD's misconduct case
As you know, misconduct trouble
So CSR Dept. sent the re
this trouble for T.RAD
Issue date of this lett
On this time, we wou
Please kindly see it
And if you have so
Of cours
with y

We h

Request Letter from CSR dated on Feb.1, 2016

you very much for your cooperation in advance.

egards,

CSR Dept.
T.RAD Co., Ltd.

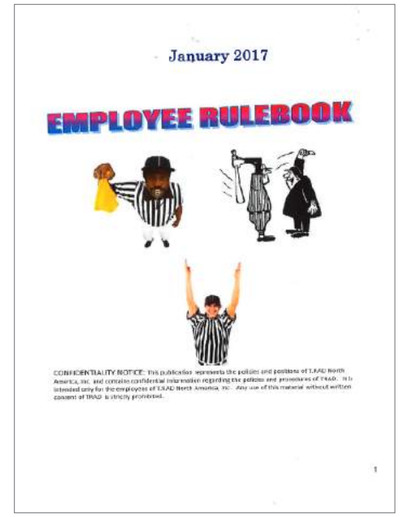
Compliance news for overseas subsidiaries

Support to overseas subsidiaries for compliance activities

In FY 2016, members of the CSR Department visited our American subsidiary (TRA), conducted interviews regarding the current status surrounding training at TRA on compliance and other related subjects, and exchanged opinions about the modalities of training.

They told TRA's HR manager about the attitude of parent company T.RAD of CSR and compliance, and shared views about the future direction of the training.

We also gave our Indonesian subsidiary (TRIN) the self-check sheet for labor-related laws and regulations that is used in Japan and supported the building of a mechanism that would allow local managers to conduct self-checks based on local laws and regulations.


January 2017

EMPLOYEE RULEBOOK

CONFIDENTIALITY NOTICE: This publication represents the policies and positions of T.RAD North America, Inc. and contains confidential information regarding the policies and procedures of T.RAD. It is intended only for the employees of T.RAD North America, Inc. Any use of this material without written consent of TRAD is strictly prohibited.

Rulebook for TRA employees

Strengthening of the global security management system

We recognize the value of all the information that we hold within the company and endeavor to ensure information security.

We have introduced an IT asset management tool in order to prevent both internal unauthorized access and external threats to the information. It solves information security problems by taking measures against internal risks (retrieving operating logs and controlling use of devices) and by detecting malware.

In FY 2016 we also started to introduce the IT asset management tool to overseas subsidiaries in order to strengthen our global information security management system that includes these subsidiaries. This allows us to achieve the same level of IT asset management as in Japan.

We plan to continue with more global initiatives in the future, such as introducing international networks and improving our email system.

Promotion of Risk Management Activities

Implementation of risk assessment

In FY 2016, we again implemented risk assessment with domestic department heads, based on the risk catalog. This allowed us to identify items that represented a high or low risk for the company.

We also created a similar risk catalog for our overseas subsidiaries and implemented risk assessment with them.

For high risk items, we will implement a risk response and pursue activities to prevent the risks from materializing.

High risk items include delivery defects, market claims, and recalls.

We inform employees of the risk assessment results using the company's intranet.

In FY 2017, we will again review and disseminate the risk catalog to enhance our risk assessment/analysis and appropriate risk response and to ensure the proper implementation of the PDCA cycle for risk management.

● Risk assessment results

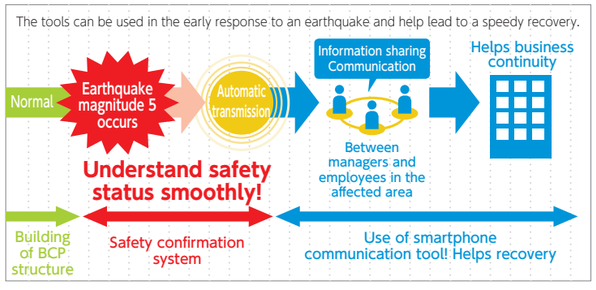
Implementation of BCP (the business continuity plan) company-wide communication drill

Once every two months, we invite concerned parties to a BCP Promotion Committee where we develop various measures. In FY 2016, we introduced a safety confirmation system and a communication tool that can be used on smartphones.

For the company-wide communication drill, it was assumed that an earthquake had occurred on a holiday. During the drill, the heads of the Human Resources and General Affairs departments in each site managed to speedily report the safety confirmation status of staff to directors and heads of other departments.

In the future, we will continue to conduct all sorts of BCP-related drills for various situations and will work to improve our ability to respond to earthquake disasters.

■ Overview of use of BCP tools



● Company-wide BCP communication drill scenario

Disaster drills at all sites

As well as BCP drills, all our work sites also conduct disaster drills twice a year.

We set up firefighting organizations and conduct drills to ensure that local staff and office staff can respond speedily in their designated roles in an emergency. With the help of the local fire services, we provide opportunities for the staff to learn where the fire hydrants are and how to discharge the water in the event of a fire.

We will continue to conduct drills to enhance disaster awareness on an ongoing basis.

● Evacuation (Sales/Marketing & Technical Division, Kasadera)

● Water discharge drill (Shiga Works)

● Simulation of rescuing injured people (Nagoya Works)

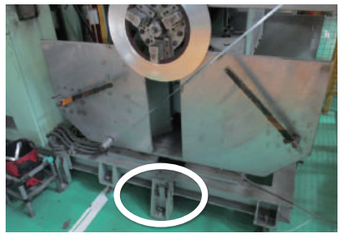
● Advice from the fire services (Nagoya Works)

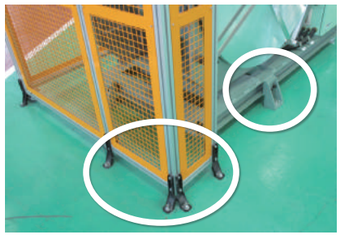
● Disaster drill at night (Hatano Works)

● Feedback from the director (Sales/Marketing & Technical Division, Kasadera)

Measures to minimize disaster damages at each works

In FY 2016, as part of our BCP activities, we completed work in all works to fasten main equipment with anchor bolts and prevent molds from falling. We also investigated the procedures for stopping important equipment such as a furnace during a disaster, and are in the process of preparing a manual for this. In terms of the procedures for stopping important equipment, we are working to make them clearer and to ensure their speedy recovery and prevention of secondary damage.





Relationship with Our Customers

Basic Quality Policy

Basic principle: Obtain the trust and satisfaction of customers by manufacturing products with priority on quality

Basic policy: In order to achieve the basic principle, we will strive to develop, design, and manufacture products in response to customer requests based on the philosophy of "Quality First" and supply products that satisfy the customers, as well as use and continuously improve our quality management system that complies with applicable standards.

Background & Reasons

As well as building a quality management system based on ISO9001 and TS16949, we are working to enhance customer satisfaction by offering "quality assurance from our customers' perspective."

Key Standards	●Customer assessment about delivery quality and process audits, and our internal quality indicators.
Engagement and Support	●Activities to make quality that meets customer needs, and active support for suppliers.

Impacts
- Affect design quality improvement activities during which high functionality and high quality are maintained.
- Affect activities done with suppliers to refine and improve incoming parts.

Challenges
- Activities to prevent recurrence to faults and their preemptive prevention by creating a database of case studies of previous faults

Opportunities
- Increase customer satisfaction by improving design quality and product quality.

Management Approach
- We share information about defects with our customers and manage it globally.

Evaluation
- We regularly conduct self-analysis, focusing on the values that we achieve in our various quality indicators and on customer assessment of our quality.

cf pp.11, 12

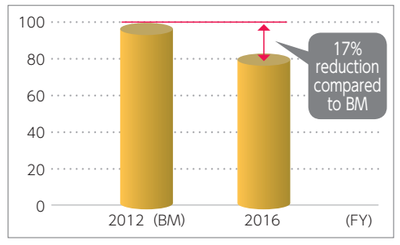
Target	Performance	
・Preemptive prevention activities, and quality improvement activities based on designs that take into account solutions for past defects.	Held evaluation meetings (design reviews, etc.).	100%
・Activities that prevent recurrence of defects in our internal processes and at suppliers.	Identified cause of defects and took corrective action (first of all to stop them).	100%
・Confirm effectiveness of preemptive prevention and recurrence prevention measures with various types of quality audits and manage quality maintenance.	Conducted quality assurance audits and took corrective and improvement actions on items revealed by audits.	100%

❶Establishment of global system for ISO9001 and TS16949

We have obtained ISO9001 at all domestic and eight overseas sites where we perform manufacturing activities, and obtained TS16949 certification at domestic and six overseas sites, and use them to maintain and improve our quality. Overseas sites: North America (1 site), Europe (2 sites), China (2 sites), and ASEAN (3 sites)

❷Eliminating "customer inconveniences"

■ Number of delivery defects (index)



❸Education, training, and globalization

In the same way that "monozukuri" (making quality goods) is said to be achieved through "hitozukuri" (making people), we believe that employee training plays a very important role in ensuring product quality.

Within the T.RAD group, we are also strengthening overseas support by training local staff overseas so that they can operate with the same mechanisms based on the same philosophy.

Quality Assurance Dept.
Keita Ohori

Employee Comments

Working on Market Quality

I'm in charge of researching and analyzing defects that have occurred in T.RAD products in the market and reporting to the people who requested the research. Based on the knowledge and experience that I have built up, I add observations to the results of this research, provide feedback to the design team and factories, and am committed to contributing to the improvement of design and production quality. I also try to follow the PDCA cycle in order to shorten lead times and to ensure that there are no omissions or leakage in our work. I strive to the utmost every day to further improve the quality of T.RAD products and to upskill myself.

Relationship with Our Shareholders

The implementation of appropriate information disclosure

We practice appropriate disclosure of management policy, financial details, and business activities to all our shareholders and investors. We exchange opinions with them through shareholders' general meetings and social gatherings for shareholders.

We also hold yearly IR briefings and financial results briefings, at which our president speaks, for all institutional investors and securities analysts.

We will continue to sincerely listen to opinions about the information that we disclose, and endeavor to build a long-term relationship of trust with our shareholders.

● Financial results briefings

About the shareholder bonus system

We provide a shareholder bonus system that is intended to thank all our shareholders for their support and also to increase the number of shareholders with medium to long term holdings by enhancing the appeal of investing in our shares. Shareholders can register at the "T.RAD Premium Yutai Club," a website exclusively for shareholders, where they can exchange points for products of their choice and make contributions to community support projects. We intend to continue to make this bonus system attractive to all our shareholders.

● The "T.RAD Premium Yutai Club" website

Insider trading regulations

We have established our internal regulations and instructed our employees not to engage in share dealing on the basis of undisclosed information about ourselves or related companies. We also strictly manage undisclosed information and rigorously ensure that third parties do not engage in improper dealings on the basis of that information.

Every fiscal year, we invite an instructor from the Tokyo Stock Exchange to provide training to new employees about the basic points of insider dealing regulations based on the latest case studies.

● Text from the seminar on insider dealing regulations

Relationship with Our Suppliers

Background & Reasons

Based on fair dealings, we will work to achieve mutual expansion with our suppliers and to collaborate with them to promote environmental conservation.

Key Standards
- EMS certification of our suppliers ... includes basic certifications (KES, Ecostage, etc.)

Engagement and Support
- Activities by the Safety and Quality subcommittee of the Toeikai suppliers association

Impacts
- Reduction of environmental burden of purchased materials and the production stage of parts used for making products

Challenges
- Training for suppliers about compliance with environmental laws and regulations

Opportunities
- Strengthening of environmental regulatory compliance in the supply chain

Management Approach
- Continued auditing of seven T.RAD certified companies
- Reporting and confirmation of improvements at the Management Subcommittee

Evaluation
- Suppliers' EMS certification acquisition rate

cf pp. 11, 12

	Target	Performance
EMS certification acquisition rate	100%	179 suppliers (including T.RAD basic certification) 100%
Hosting of workshops on environmental regulations	29 Companies	Explanation of revisions of environment-related laws and implementation of self-compliance checks 29 Companies
Initiatives to reduce disaster risk ① Disaster reduction response examined	30 companies	① Disaster reduction response examined 30 companies
Initiatives to reduce disaster risk ② Number of disaster reduction audits performed	5 companies	② Number of disaster reduction audits performed 5 companies

Held briefing sessions to explain our purchasing policy

To give our suppliers a better understanding of our company policy and procurement policy, we held briefing sessions again in FY 2016. We also award recognition to suppliers who have excelled in the fields of "Safety," "Quality," "Price," "Delivery Time," "Environment," and "Cooperativeness." We also organized social gatherings with suppliers in order to strengthen collaboration and improve communication with them.


In March 2017, we welcomed 50 suppliers to the event. This fiscal year there was no major change to the supplier chain.

Employee Comments

Component Parts Purchasing Dept., Purchasing Division
Suguru Onoda

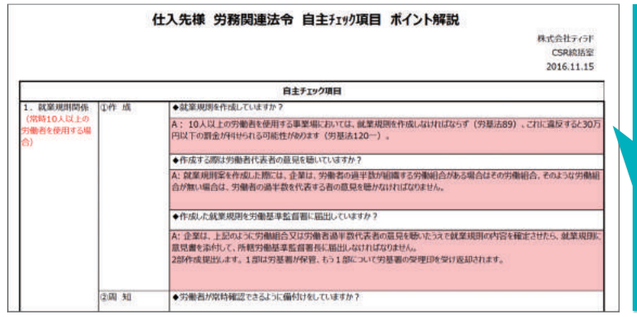
In the Purchasing Department, we strive to avoid any impact on society and our business by working with our suppliers to ensure appropriate management and preemptive prevention of any risks. As an example of a specific initiative, we visited suppliers in FY 2016 and conducted interviews about their labor management, based on a Labor Standards Act check sheet. In FY 2017, we intend to visit even more suppliers. With the cooperation of suppliers, we will continue to promote initiatives that strengthen relationships of trust.

CSR interviews with suppliers (promotion of CSR procurement)

In 2010, we issued CSR guidelines for our suppliers and sought their understanding of CSR.

In FY 2016, as well as getting our 30 main suppliers to reconfirm their understanding of the CSR guidelines, we distributed a self-check sheet for labor-related laws and regulations, and asked them to conduct a self-check.

As a result, we were able to confirm that many of the suppliers had understood their CSR. In the future, we will continue to build a win-win relationship through CSR activities with our suppliers.


仕入先様 労務関連法令 自主ﾁｪｯｸ項目 ポイント解説

株式会社ティラド
CSR統括室
2016.11.15

自主チェック項目		
1．就業規則関係（常時10人以上の労働者を使用する場合）	①作 成	◆就業規則を作成していますか？ A：10人以上の労働者を使用する事業場においては、就業規則を作成しなければならず（労基法89）、これに違反すると30万円以下の罰金が科せられる可能性があります（労基法120一）。 ◆作成する際は労働者代表者の意見を聴いていますか？ A：就業規則案を作成した際には、企業は、労働者の過半数が組織する労働組合がある場合はその労働組合、そのような労働組合が無い場合は、労働者の過半数を代表する者の意見を聴かなければなりません。 ◆作成した就業規則を労働基準監督署に届出していますか？ A：企業は、上記のように労働組合又は労働者過半数代表者の意見を聴いたうえで就業規則の内容を確定させたら、就業規則に意見書を添付して、所轄労働基準監督署に届出しなければなりません。 2部作成提出します。1部は労基署が保管、もう1部について労基署の受理印を受け返却されます。
	②周 知	◆労働者が常時確認できるように備付けをしていますか？

Main check points

- Preparation of work regulations, items in the regulations
- Listening to opinions about the work regulations and the notification and publicizing of the regulations
- Content of the Notice of Condition of Employment
- Conclusion, notification and publicizing of the "36 Agreement"

BCP disaster mitigation activities by suppliers

As part of our BCP, we also ask our suppliers to work with us by taking disaster mitigation measures against large earthquakes. They have implemented measures to prevent various types of shelves from falling. We will continue to actively promote BCP activities.

- Prevention of molds from falling

- Prevention of shelves containing metal raw materials from falling

- Prevention of gas cylinders from falling

Compliance activities for the Subcontracting Act

In our Purchasing Department, we discuss complicated projects in terms of the foundations of the Subcontracting Act and consult about them with external parties as and when required. We then present them as practical case studies in internal training. Every fiscal year, the Purchasing Department and the CSR Department also jointly audit different departments for their compliance with the Subcontracting Act on a continual basis.

Cooperating with conflict minerals surveys

If we have concerns about the use of conflict minerals (gold, tantalum, tungsten, and tin), from the Democratic Republic of the Congo or surrounding countries, that could cause social problems in terms of human rights or the environment, we take measures to avoid their use.

In FY 2016, we surveyed 142 suppliers. We will continue to request our suppliers to only buy from smelters that comply with the Conflict-Free Smelter Program (CFSP) established by the CFSI* or that are certified as not being complicit in any conflicts. We will continue to ask our suppliers to cooperate with our surveys on an ongoing basis.

*Conflict-Free Sourcing Initiative

Relationship with Our Employees

Background & Reasons

Holding up the "principle of fairness," the "fostering of a willingness to take on challenges" and the "respect for a sense of independence" as our HR ideals, T.RAD is continuously building a workplace environment where employees can maximize their potential and work energetically.

Key Standards
- Labor Standards Act, Industrial Safety and Health Act, Disabled Persons' Employment Promotion Act, customer standards, our in-house standards, etc.

Engagement and Support
- Our employees, initiative-supporting institutions/companies, association for our suppliers, customer associations, etc.

Impacts
- Effect on physical and mental health of employees and their job satisfaction
- Effect on stakeholders (regulatory compliance, etc.)

Challenges
- Horizontal development with overseas group companies
- Enhancement of training efficacy

Opportunities
- Contribution to local communities, strengthening of corporate competitiveness
- Enhancement of knowledge and morale of employees and concerned people

Management Approach
- Company-wide control is implemented through the regular status reporting, including overtime hours worked and paid leave taken rate and sharing of information at regular meetings, such as the Management Committee and the labor-management council.
- The Training Promotion Committee, which consists of the heads of the Production, Purchasing, and Human Resources and General Affairs Departments, discusses the objectives and training efficacy of the training plan, curriculum, and textbooks, and implements training accordingly.

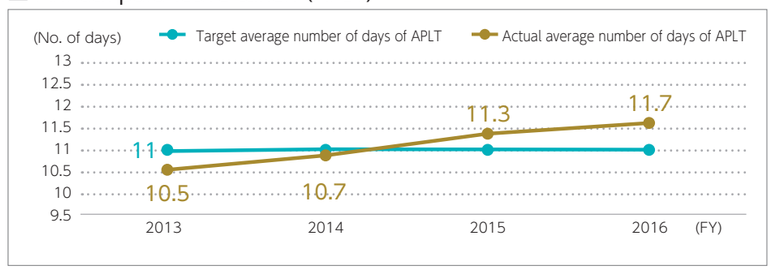
Evaluation
- Report in a top management review and be assessed by managers.

cf pp.11, 12

Target
- Average annual paid leave taken ..... 11 days
- Completion of an education system for overseas subsidiaries ..... Completed in three out of eight subsidiaries

Performance
- Average ..... 11.7 days
- Education system for subsidiaries ..... Completed in three companies

■ Annual paid leave taken (APLT)



	Average number of monthly overtime hours per worker
2013	26.9
2014	25.3
2015	24.6
2016	24.9

Initiatives for the promotion of employee health management

We have taken the following sorts of initiatives to enhance the physical and mental health of our employees.
- Set up a Health Management Office in each site. Staffed by nurses, they provide daily health care for employees.
- Our Health Management Offices work with industrial physicians to provide follow-up consultation to employees after health check.
- Started a mental health care consultation service under a contract with a company specializing in mental health care.
- The promotion of mental health, led by the company-wide mental health promotion committee.
- The implementation of a stress check system.

Promotion of diversity

T.RAD holds up its Principle of Fairness as its HR ideal. This principle states that the company "does not discriminate on the basis of age, gender, academic record, faith, or nationality, and generously treats employees who have put forth effort and produced good results in realizing the management principles and management policies." Based on this ideal, we have made efforts to promote the employment of disabled people, to hire foreigners, and to provide an environment for the employment of the elderly.

Support for various ways of working

In order to allow employees to work with a sense of purpose and fulfillment, and to be able to lead healthy and rich lives with enough time to bring up children and look after relatives, and enough private time for family, the community, and self-development, we have set up various systems, such as the Family Care Leave System, Maternal Health Management System, Childcare Leave System, Volunteer Leave System, and Half-Day Paid Leave System, and are also currently expanding these systems as we see fit.

Working with the Act on Promotion of Women's Participation and Advancement in the Workplace

On April 1st last year, the Act on Promotion of Women's Participation and Advancement in the Workplace came into force. In our action plan to promote women's advancement that was formulated and published in April, we firstly set an increase in the proportion of women being hired as our objective. However, our efforts don't end with their hiring. We are also building a mechanism to promote women's career advancement after they have joined the company. This is an initiative that aims to improve the career progress of not just women but men as well. The building of an environment that is easy to work in and that allows employees to achieve work-life balance is indispensable for employees to maximize their abilities. We have formulated and published an action plan for a work-life balance, and are also working to promote a reduction in overtime and the taking of paid leave.

Overview of the action plan
- ○ Active recruitment of female employees
- ○ Building a mechanism to promote the career advancement of employees
- ○ Reduction of working hours
- ○ Promotion of the taking of childcare leave
- ○ Development of a mechanism to support the achievement of work-life balance
- ○ Building a climate to support the achievement of work-life balance

Building an environment that is easy to work in for both women and men

Employee mental health measures

In order to promote the maintenance of the mental health of employees, we are building a support structure by making effective use of mental health committee members, Health Management Offices, and external resources.

In FY 2016, we conducted stress checks on all our employees to encourage them to notice their own stress levels and to prevent damage to their mental health. We also provided mental health training for employees to give them opportunities to learn how to deal with stress by themselves.

Personnel training initiatives

Diversity management training held

When we issued our Action Plan in FY 2016, we provided training for line managers involved in the promotion of women's advancement so that they could learn about the aims and background of the new law, the situation in T.RAD, details of our initiatives, and management methods.

They learned about the differences in the ways of thinking of men and women and the different ways of dealing with them. Solutions for everyday problems were also shared among all the participants.

Feedback from employees who received the training

- I got lots of tips about nurturing women.
- I managed to understand the meaning of diversity management.
- It is difficult to communicate with and train female subordinates.
- I want to be able to help women make the most of their abilities.
- I learned that men and women think differently, so I would like to use that knowledge in the future.

Training to improve employee skills

In order to allow employees to acquire the work skills required for "monozukuri," we have started providing periodic internal training. Additionally, by asking the workers to be trainers, those workers can also improve their own skills. We will also continue this in FY 2017.

Changes in the number of employees receiving internal training

	2012	2013	2014	2015	2016
Total number of employees who have received training*1	3,450	4,620	3,570	3,610	2,250
Number of employees who have received training	1,250	1,300	1,260	960	610
Training hours*2	8,630	11,550	8,930	9,030	5,630

*1 "Total number of employees who have received training" counts an employee who has received multiple training courses as multiple employees.
*2 "Training hours" is calculated on the basis of an average of 2.5 hours per class.

List of Achievements in FY 2016

- Development of trainers for in-house stratified training and vocational training
  - Number of new certified trainers in FY 2016 45
  - Registered trainers (total) at the end of FY 2016 594
  - Number of trainers at the end of FY 2016 219
- Number of people who have completed the Safety Administrator training
  21 (of whom 13 were suppliers)

Building a Safe Work Environment

Core principle for safety

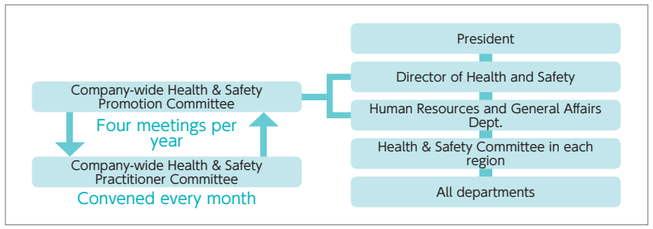
T.RAD will provide all its employees with healthy workplaces where they can work with peace of mind and achieve corporate management that aims for the happiness of employees and their families, based on our core principle of "Giving top priority to health and safety in all our activities."

Core policy for safety: T.RAD will provide "healthy workplaces where all can work with peace of mind" through all-hands health and safety activities with employees.

■ T.RAD-10 Health and Safety Targets

	Work accidents requiring time off work	Work accidents not requiring time off work	Minor injuries
Japan	0	0	0
Overseas	0	0	

■ Health and Safety Governance



Background & Reasons

We are required to provide a workplace environment where employees can work safely and with peace of mind, based on our core principle of "Giving top priority to health and safety in all our activities."

Key Standards FY 2016 Health and safety policy
- A workplace where all risk factors are eliminated and everybody can work in a confident and healthy manner
- Zero-accident workplaces where decisions are adhered to and there are no deviations or irregularities
- Safe workplaces where all have a great safety consciousness, and anybody does not perform and make others perform any unsafe action

Engagement and Support
- Meetings about safety with the Kyohokai, the Japan Auto Parts Industries Association, and customers

Impacts
- Impact on prevention of work accidents in the workplace
- Impact on prevention of job-related illnesses and on mental health

Challenges
- Improvement of management and response by the company and promoting voluntary activities by employees

Opportunities
- Reduce risk for employees and local community, pursue and maintain their happiness

Management Approach
- Implement risk assessment and equipment safety reviews, address near-miss incidents, and regularly implement KYT
- Report on and monitor the progress of the above activities and challenges that need to be addressed at the company-wide Health & Safety Practitioner Committee and that committees in each site

Evaluation
- Reported to senior executives at a top management review meeting, where an assessment is made. The assessment is made based on numerical data, such as the number of work accidents.

cf pp.11, 12

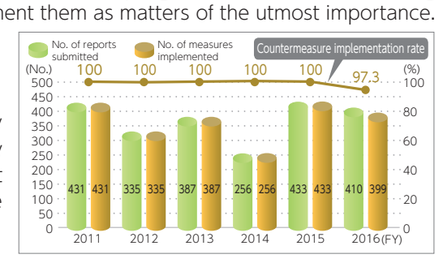
Target	・Risk management plan implementation rate	100%
	・Implementation rate of countermeasures for risks of level 3 or higher	80%
	・Implementation rate of near-miss incident countermeasures	80%
Performance	・Risk management plan implementation rate	100%
	・Implementation rate of countermeasures for risks of level 3 or higher *Being complied with in the medium to long term plan.	89.1%
	・Implementation rate of near-miss incident countermeasures	97.3%

Continuation of risk assessment

The company started risk assessment properly in FY 2010 with the objective of preventing particularly serious accidents. The implementation of plans and measures has since become fully ingrained and accidents during routine work have steadily decreased. We will continue to implement them as matters of the utmost importance.

Continuation of daily activities

Daily activities, such as near-miss incident activities, safety patrols, and danger prediction training form the core of our safety activities, along with risk assessment. In our near-miss incident activities, 410 reports were submitted, exceeding 400 for the second year running.



Implementation of equipment safety reviews

Equipment safety reviews are rigorously implemented with the objective of preventing work accidents and damage to employees' health. The reviews look not just at the installation of new equipment and accessories, but also at changes to equipment functions, safety devices, and layouts.

Risk assessment of chemicals

We have started performing these risk assessments in earnest following the coming into force of the revised Labor Standards Act. Based on the risk assessment results, we will rigorously work to prevent damage to our employees' health.

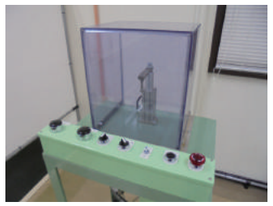
More safety simulators

We increase the number of safety simulators as and when needed, and conduct training.

❶ Wedge simulator

(1) Install the area sensors (two types because of the difference in pitch)
(2) Install various types of switches
(3) Install the motor.
The above structure allowed us to teach employees about the importance of daily inspections and operating manuals.

❷ Training about various types of switches



We use various types of switches in the production equipment, and change their shape depending on their purpose of use. We have therefore installed a new simulator to teach our employees about the safety implications of the switches.

❸ Electric shock simulator

Because electricity is invisible, getting an electric shock could develop into a serious incident. We installed an electric shock simulator in order to deepen employees' understanding of electricity.

Implementation of daily improvements

In addition to implementing measures in line with near-miss incident prevention activities, the daily application of creative and inventive improvements is indispensable to building a safe workplace. Below are some case examples of such improvements.

❶ Automatic discharge of steam drain water (used to be carried away manually)

Previously, when a certain amount of steam drain water had gathered in the top tank, we would open a hand valve and move the drain water into the lower tank. An operator would then manually carry the lower tank to a discharge ditch about 50 meters away.

Now, when a certain amount of the steam drain water has gathered in the tank, a pump automatically discharges the water to the discharge ditch. This has eliminated the operation of manually carrying the tank away when it is full of hot water.

❷ Ensuring safety in die-changing operations (at a height) (by changing the elevation part)

When changing dies, we used to have to climb up and down a vertical ladder to reach and return from the upper part of the equipment (sometimes while carrying tools).

We got rid of the ladder and put in some stairs. Now we can safely access the upper part of the equipment, even if both of our hands are occupied.

Relationship with the Local Community

T.RAD seeks the happiness of the local community through a range of activities.

■ Factory visit by local primary school children

The Shiga Works organizes a factory visit for primary school children every year in order to give local school children a learning experience.

■ Donations to flood-affected areas

We donated essentials, such as clothes, to people affected by the flooding in West Java.

■ Support activities for job-hunting by high school students

We offered internships in July to local technical high school students (from two schools). By providing the students with an opportunity to gain work experience, we are contributing to the fostering of a desirable work attitude.

■ Tree-Planting Activities

The Thai factory is engaged in tree-planting activities with employees from other companies in the development area where our factory is.

■ Community cleaning activities

Employees and their families joined local residents in participating in cleaning activities near Hoan Kiem Lake in Hanoi in Vietnam.

■ Cooperation with operations to remove illegally dumped waste from public grounds

We contribute to the beautification of Hadano City by taking part in the removal of illegally dumped waste as part of the Hadano Prevention of Illegal Dumping campaign organized by the city authorities.

■ Donations to the local primary school

We donated 125 books to the local primary school. The books that we donated were used as teaching materials to teach social skills.

■ Communication Activities with Children

Every year we participate in a Children's Day event and donate stationery and teaching materials to the local primary school.

Communication with local communities

Biodiversity seminar

Organizer: Yokohama Mirai Environment Conference (NPO)
Supported by: Kanagawa Prefecture

Government bodies, companies, and NPOs need to think about what they can do in terms of biodiversity conservation activities and sustainable development initiatives, and work together on these issues.

In this seminar, there was an exchange of opinions through lectures and panel discussions about how they can get involved in biodiversity conservation activities and what they should do to continue and expand them.

■ Content of T.RAD's lecture

Internal activities
- Social trends (needs) → Company policy/ environmental policy
- Environmental medium term plan, etc.
- Internal case studies and results about improving drainage
- Biotope lake that uses treated waste water

Public evaluation
- Acquired the environmental rating of A from the Development Bank of Japan in 2015.
- Environmental Communication Awards Received the 18th and 19th Excellence Awards.
- Use of low interest financing
- Improvement of poorly assessed items

Through the exchange of opinions at a panel discussion, we reaffirmed the importance of sharing information with NPOs, government bodies, and companies. By taking on board the requests and opinions of these concerned parties from different professions, we build a collaborative structure and intend to expand our environment activities even more.

Shonan Satokawazukuri forum

Organizer: Shonan Satokawazukuri Minnano-Kai
(Environmental conservation bodies in the Kaname River basin, etc., Hiratsuka City, Hadano City, Isehara City, Kanagawa Prefecture)
Joint organizer: Graduate School of Human Environmental Studies, Tokai University
Department of Human Development—Environment and Resources course, School of Humanities and Culture, Tokai University
Tokai University Regional Environment Network (NPO)

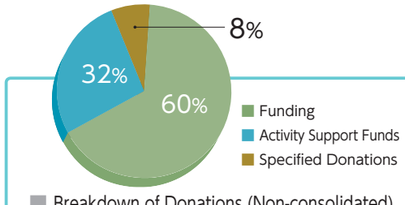
In the forum, universities, government bodies, NPOs, and companies that share the ecosystem services of the Kaname River system gave lectures and presentations about conservation and improvement activities.

T.RAD gave a presentation about its activities to improve the rivers that its factories discharge water into, based on data about the water quality of the discharged water, and explained what sort of internal activities we have conducted.

■ Content of T.RAD's lecture

Internal activities
- Specific initiatives for biodiversity
- Specific initiatives for Kuzuha River conservation
  Environmental improvements by changing the items being produced
  Reduction of water consumption
  Improvement of water quality
  Reduction in the release and transfer of chemicals
- Installation of a biotope pond that uses treated waste water

After the lecture, we conducted a survey that yielded requests for us to do more environmental activities. This has led to even more improvement activities which we will carry out in the future.



■ Breakdown of Donations (Non-consolidated)

The T.RAD Group carries out a range of support to enhance local cultural activities, festivals, and education, and to enrich sports and social welfare as our way to contribute to local community development.

T.RAD Environmental Activities

Key Topics

One of our key topics (p.6) is "environmental consideration for businesses and products." In particular, we define our vision, environmental policy, and targets by identifying the mitigation of climate change, the conservation of biodiversity, the prevention of environmental pollution, and the saving of resources as material aspects. These are also related to issues facing the international society. The "sustainable development goals (SDGs)" that are closely connected to our environmental risks, impacts, and opportunities are energy (Goal 7), climate change (Goal 13), biodiversity (Goal 15), water (Goal 6), and sustainable consumption and production patterns (Goal 12).

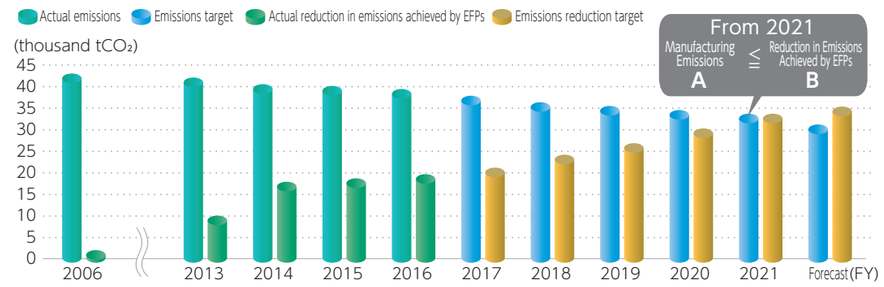
Environmental Principle

T.RAD Co., Ltd., and T.RAD group companies are aiming to be the world's top manufacturer of heat exchanger systems, and all their employees are committed to respecting our environment by taking environmental initiatives in biodiversity protection and nature conservation, leading to a happy and prosperous society.

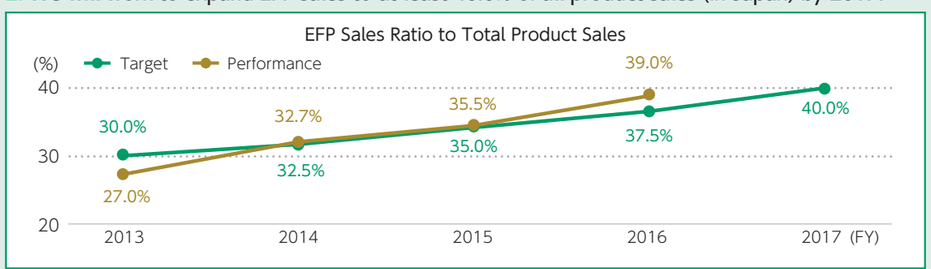
T.RAD Environmental Vision for 2021 (Japan)

1. Our aim is that from 2021, the volume of carbon dioxide (CO_2) reduced through the use of environmentally friendly products will exceed the volume of CO_2 emitted during production.

- We will reduce CO_2 emissions generated by the manufacturing process (Manufacturing Emissions). ····· A — DOWN!
- We will increase the amount of CO_2 reduced by developing, selling, and using our environmentally friendly products (EFPs) (Reduction in Emissions Achieved by EFPs). ····· B — UP!
- From FY 2021: A (Manufacturing Emissions) ≦ B (Reduction in Emissions Achieved by EFPs)



2. We will work to expand EFP sales to at least 40.0% of all product sales (in Japan) by 2017.



	Vision Targets (CSR Medium Term Plan)	Measures
Emissions	Reduction of CO_2 emissions	Introduction of energy-saving furnaces, making lines more compact, etc.
Avoided emissions	Increase in avoided emissions of CO_2 by EFPs	Commercialization and assessment of EFPs
Sales	Increase in EFPs sales ratio	Operation of registration system for product environmental efficiency indicators

See p. 30 and p. 39 for the targets and results for FY 2016. We are also considering setting a vision for our overseas subsidiaries for 2018 and beyond.

Environmental Policy (Action Plan)

T.RAD and T.RAD group companies employ a company-wide environmental management system to realize our corporate philosophy. We will ensure continual system improvement by predicting and assessing environmental impacts throughout the product life cycle, by setting objectives and targets for environmental and biodiversity conservation, and by implementing environmental activities.

Priority Measures	2016 targets of the CSR Medium Term Plan	2016	cf page
Establish and enhance the environmental management system to strengthen environmentally aware management.	90% achievement of the activities planned by the Environmental Promotion Committee	90% or more	11
	CO_2 and waste management, promotion of improvements: 8 overseas subsidiaries*	3 overseas subsidiaries achieved their target	39
	Acquisition of ISO 14001 certification by overseas subsidiaries*	90%	32
	Global unification of management of environmentally hazardous substances	No SOC content	11
Work in partnership with suppliers to promote environmental conservation.	On-site audits at 12 EMS-certified suppliers	12	21
	Research into legal compliance of the suppliers	36 companies	21
Organize and develop a system that promotes environmentally friendly design and development.	Verifications of reduction in CO_2 emissions achieved by products for EV, HV, and fuel cell	2020 89,000 tCO_2	11
	37.5% or greater sales ratio of EFPs	39.0%	33
Consider our environmental impact, comply with relevant environmental laws and any other requirements, set applicable and voluntary management standards, and further reduce our environmental burden.	Mutual assessment of compliance with environment-related laws and regulations	Once a year	32
	0 violations of (environmental) laws and regulations	2 violations	32
Enhance environmental training and awareness of all personnel.	Implementation of training about revised ISO standards	4 sites	11
Actively disclose environmental information, leading to a better understanding among stakeholders.	3 improvements that reflect GRI guidelines and external feedback	Made the 3 improvements.	11
	Creation of materials for external communication and PR	2	28
Get actively involved with local communities to work on environmental and biodiversity conservation.	Implement at least one biodiversity initiative from the medium-term plan in each site	3-9 (each site)	44
Mitigate climate change by reducing greenhouse gas emissions.	CO_2 emissions: 7.5% reduction compared to FY 2013	-5.5%	39
	7.5% reduction of consumption of energy converted into electricity per processing value compared to FY 2013	-5.4%	39
	Reduction of CO_2 emissions through EFPs (19,800 tCO_2)	19,900 tCO_2	33
	5.0% reduction of energy consumption per production compared to FY 2011	-14.6%	40
Prevent environmental pollution by preventing the release of pollutants.	0% of substances containing prohibited compounds	0.4%	33
	10% reduction in release and transfer of PRTR-specified chemicals per production compared to FY 2006	-81.2%	41
	30% reduction in release and transfer of VOCs per production compared to FY 2006	-75.3%	41
Encourage recycling and resource saving through resource-use efficiency and waste reduction.	Resource recovery rate of 98.0% or more	98.3%	40
	10% reduction of water consumption per production compared to FY 2006	-32.1%	41
	Verification of reduction in CO_2 emissions achieved by lighter or downsized products	2020 25 tCO_2	11

*Underlined targets are those that relate to the environmental vision (p.29). See the CSR Medium Term Plan for more details.
*Figures are for 9 consolidated subsidiaries (of which 2 were combined as 1 overseas subsidiary).
*For 10 companies that had business operations during January-December 2016. *VOC: Volatile Organic Compounds

Concrete Measures and Process

The measures for achieving the environmental vision 2021 (p.29) and the CSR Medium Term Plan (p.11) are decided on and their progress is monitored at the Environmental Promotion Committee Structure. Their implementation is led by the committee members, and supported by the organizations below it and stakeholders.

Environmental Promotion Committee Structure

Environmental Committee
Chairman: President
Hiromi Kano
Hosted by: TMS Dept.

- One meeting per year
  - Discussing and determining the Environmental Policy and CSR Medium Term Plan
  - Reviewing the fiscal year performance results and approving the targets and plans for the next fiscal year.

Management Subcommittee
Chairperson: Executive Officer responsible for the Environment
Kazuhiro Watanabe

- Four meetings per year
  - Defining strategies for employee education programs, community support projects, and environmental publications.
  - Discussing the biodiversity activities, including green procurement.
  - Evaluating and ensuring progress in the global implementation of EMS.

Product Subcommittee
Chairperson: Executive Officer in Charge of Engineering
Kimiaki Nakano

- Four meetings per year
  - Examining and reviewing progress of the development of environmentally friendly products.
  - Discussing environmental indices and environmental conservation related to product development.

Production Subcommittee
Chairperson: Director responsible for Production (Energy Management Control Officer)
Toru Yamazaki
Energy Management Planning Promoter: TMS Dept.

- Four meetings per year
  - Reviewing measures to reduce the environmental burden from production and coordinating with the department in charge.
  - Evaluating progress in environmental regulatory compliance, energy and resource saving practices, and improvement of logistics and procurement.

*The members of each subcommittee consist of representatives from the related departments.

Example 1: Company-wide deployment of biodiversity initiative (Japan) (cf p.44)

	2014	2015-2016	2017
Target	At least one high priority activity	At least one activity from the Plan in each site	Compliance of 6 items with the Act
Performance	Performed 1-4 activities in each site	3-4 activities in each site (2015), 3-9 activities	n/a

Management Subcommittee: ・Decides policy — 4 times a year ・Manages progress

Each site in Japan:
- ・Changed copy paper in 3 sites and conservation
- ・Implemented the Medium Term Plan in 6 sites. Plan to increase purchases of items that comply with the Act on Promoting Green Procurement in 2017.

Example 2: Reduce CO_2 by EFPs (target related to Environmental Vision for 2021) (Japan) (cf p.33)

	2014	2015	2016	2017
Target	12,800 tCO_2	15,700 tCO_2	19,800 tCO_2	21,400 tCO_2
Performance	17,600 tCO_2	18,500 tCO_2	19,900 tCO_2	n/a

Product Subcommittee: ・Commercializes and evaluates EFPs (Products for EVs, HVs*, and fuel cells) — 4 times a year ・Manages progress ・Sharing of external trends and information about customer needs

Design Department, etc.:
- ・Decided detailed plans ・Trained on LCA* and "product environmental efficiency indicators"
- ・Verified CO_2 amounts for relevant products (Fuel gas preheaters, etc.) ・Continued assessment of design drawings (Certification of EFPs)
- ・Verified CO_2 amounts for relevant products ・Continued assessment of design drawings — Plan

*EV, HV: electric vehicle, hybrid vehicle *LCA: life cycle assessment

Example 3: Reduce CO_2 (target related to Environmental Vision for 2021) (Japan) (cf p.39)

	2013	2014	2015	2016	2017
Target	Base year data	-2.5%	-5%	-7.5%	-10%
Performance		-2.0%	-3.5%	-5.5%	n/a

Production Subcommittee: ・Decides the measures (Introduction of energy-saving furnaces, making lines more compact) — 4 times a year ・Manages progress ・Shares new technology and information about laws and regulations

Each region (Energy-saving committees, Production Dept., etc.):
- ・Decided detailed plans
- ・Introduced energy-saving furnaces ・Integrated lines ・Measures to prevent air leakage ・Update energy-saving amp in testing machines ・Change to LED lighting, etc.
- ・Introduced energy-saving furnaces ・Removed old furnaces in production line maintenance ・Updated to high-efficiency transformers ・Plan to review cooling tower operation, etc.

Under the long term plan, we are changing the furnaces in the factories that use a lot of energy to energy-saving furnaces.

Environmental Regulatory Compliance

Environmental Regulatory Compliance and Accident/Complaint Results for FY 2016 (Unit: No. of Incidents)

	Head Office	Hatano Works	Nagoya Works	Shiga Works	Kasadera Area
Violation of Laws and Regulations	0	1	1	0	0
Fines or Lawsuits	0	0	0	0	0
Accidents	0	0	0	0	0
Complaints	0	0	0	0	0
Spills	0	0	0	0	0

Hatano: Received an Instruction for Corrective Action from the Labor Standards Inspection Office about the failure to report local exhaust ventilation (Ordinance on Prevention of Lead Poisoning). We submitted our Corrective Action Plan in March 2017.

Nagoya: Filed a Sequence of Events and Improvement Plan, which was accepted (April 2017), because we had not submitted a change report in relation to the Factory Location Act.

Environmental Management System

T.RAD strives to continuously improve its environmental management system in order to enhance its environmental performance. In Japan, we acquired ISO 14001 company-wide certification in 2011, and our domestic subsidiaries have also acquired Green Management and KES* certification. Overseas subsidiaries with production sites have also obtained ISO 14001 certification.

*KES: Kyoto Environmental Management System Standard

Status of acquisition of ISO 14001 certification by overseas sites	
T.RAD North America, Inc. (United States)	October 2001
T.RAD (Zhongshan) Co., Ltd. (China)	February 2005
T.RAD Czech s.r.o. (Czech Republic)	May 2007
T.RAD (THAILAND) Co., Ltd. (Thailand)	December 2007
PT. T.RAD INDONESIA (Indonesia)	August 2010
TRM LLC (Russia)	August 2014
T.RAD (Jining) Co., Ltd. (China)	January 2015
T.RAD (VIETNAM) CO., LTD. (Vietnam)	January 2015
T.RAD (Changshu) Co., Ltd. (China)	November 2015

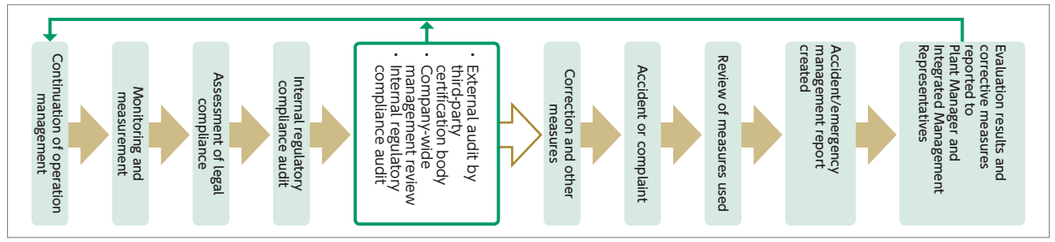
Environmental Risk Management

The internal and external audits inspect our environmental regulatory compliance performance and our operation of the Environmental Management System. T.RAD has strengthened its management of environmental and other types of risks, particularly by improving its internal audits through the use of our check sheets.

①Internal regulatory compliance audit…Regional management divisions mutually audit on regulatory compliance to objectively evaluate whether or not appropriate risk management is practiced.

②Company-wide integrated management review…The management team comprehensively evaluates company-wide management problems and execution appropriateness.

T.RAD Risk Management System Chart



Re-verification of compliance assessment

Checks by ISO secretariats

①Implemented self-inspection before mutual compliance audits

In FY 2015, we started to implement general inspections at each site, in addition to the normal controls, before conducting the mutual compliance audit. The number of issues picked up by the mutual compliance audit was 0 in FY 2016. We will continue to promote a speedy response by identifying issues using general inspections.

②Added labor-related elements to the mutual compliance audit

In FY 2016, we added label-related items to those covered by the mutual compliance audit.

While we have only covered a portion of the laws and regulations at this point, we plan to gradually add more while monitoring the result of the audits.

Development of Environmentally Friendly Product (EFP)

Background & Reasons

Design for resource efficiency and the development of products with a low environmental burden are indispensable activities for a sustainable society and important roles of a company. The appropriate control of the risks of environmentally hazardous substances contained in our products is also required by statutory provisions and stakeholders.

Key Standards

- RoHS Directive, ELV Directive, REACH Regulation, etc.
- Customer standards
- Our in-house standards
- Our environmental vision and medium term plan
- Product environmental efficiency indicator

Relevant Sustainable Development Goals

Engagement and Support

- Japan Auto Parts Industries Association
- Joint Article Management Promotion-consortium (JAMP), etc.

Impacts

- Product's impact on the environment during its life cycle (climate change, etc.)
- Impact on stakeholders (compliance with law, dealing with customers, etc.)

Opportunities

- Opportunities for technological improvement, risk management, and market expansion

Challenges

- Further strengthening of Design for the Environment (DfE) and the control system

Management Approach

Product subcommittees set targets and manage progress. They cooperate with the design, sales, and purchasing departments; share research, training, and data; and calculate figures for the sale and CO_2 savings of environmentally friendly products.

Evaluation

We confirm product environmental efficiency indicators (PEEI) through evaluation of the design drawings. It is also evaluated by managers and external assessors through committees and IR reports. Once every six months we conduct a satisfaction survey with our major customers and adapt our policies accordingly.

Certification criteria for environmentally friendly products (EFPs)

① Products that achieve substantial CO_2 savings during their use compared to existing products

② Products whose PEEI, calculated based on life cycle assessments, is greater by 1.2 or more points than those of existing products

cf pp.11, 12

Target		Performance	
・EFP sales ratio	37.5% or more	・EFP sales ratio	39.0%
・Cumulative reduction in emissions through EFPs	19,800 tCO_2	・Emissions reduced	Approx. 19,900 tCO_2
・Reduction in substances containing prohibited compounds	to 0%	・Proportion of substances containing prohibited compounds	0.4%

How to Understand Product Environmental Efficiency Indicators (PEEI)

Environmentally Friendly Products should meet both of the following criteria.

1 Easy to use, high performance, low cost products (product value)

2 Products with a low environmental burden in terms of climate change, resource depletion, and environmentally hazardous substances.

Eco-efficiency is the quantification of how high the product value is and how low its environmental burden is. The product environmental efficiency indicator is obtained by dividing the eco-efficiency of the new products by that of existing products. The calculations are based on the guidelines of the Japan Auto Parts Industries Association.

1. Calculated based on LCA.

Eco-efficiency = Product Value ↑ Rises (Ease of use, high performance, low cost) / Environmental Burden ↓ Falls (Climate Change, Resource depletion, Environmentally hazardous substances)

2. Eco-efficiency of new products compared with existing products

Eco-efficiency of new products / Eco-efficiency of existing products = Product Environmental Efficiency Indicator

The higher the value,
①the better the performance
②and the more considerate the EFP is of the environment.

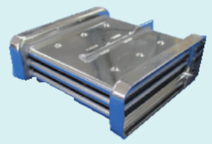
Examples of Environmentally Friendly Products

Automotive Parts

Radiator for hybrid vehicle (HV)

EGR cooler

Oil cooler for HV motor



Core of heat exchanger for waste heat recovery system

Reduction in emissions achieved by EFPs approx. **10,100** tCO_2/yr

This corresponds to the amount of CO_2 absorbed by about **1,148,000** cedar trees

Construction Machinery Parts

Radiator for auxiliary equipment

Oil cooler for motor

EGR cooler

Charge air cooler

Reduction in emissions achieved by EFPs approx. **1,100** tCO_2/yr

About **125,000** cedar trees

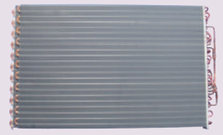
Motorcycle Parts

Radiator for motorcycle

Reduction in emissions achieved by EFPs approx. **730** tCO_2/yr

About **83,000** cedar trees

Air Conditioner Parts

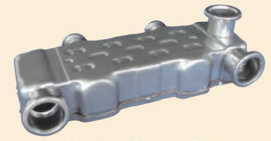


Heat exchanger for residential air conditioner

Reduction in emissions achieved by EFPs approx. **2,930** tCO_2/yr

About **333,000** cedar trees

Stationary Device Parts



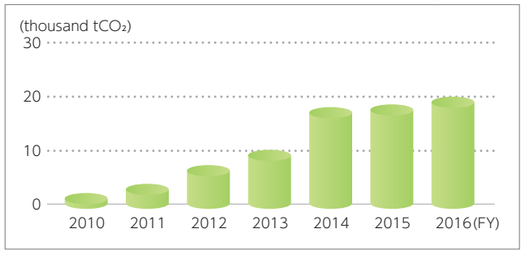
Heat exchanger for fuel cell

Reduction in emissions achieved by EFPs approx. **3,980** tCO_2/yr

About **452,000** cedar trees

*Calculated based on the amount of carbon dioxide absorbed by a 40-year-old planted cedar tree during one year (8.8 kg of CO_2/year).
Source:"How much carbon dioxide does a forest absorb?" Forestry Agency.
http://www.rinya.maff.go.jp/j/sin_riyou/ondanka/20141113_topics2_2.html
One hectare of 40-year-old planted cedar trees absorbs about 8.8 tonnes of carbon dioxide per year. It is assumed that there are 1,000 trees in one hectare.

Cumulative reduction in CO_2 emissions through EFPs*1



EFP sales ratio*2

*1: The reduction of CO_2 emissions through use of EFPs is a cumulative 5-year value. (Taking into account the years of usage of the product in which the EFP is installed.)
A different calculation method is defined according to each product category.
Example 1: The difference in CO_2 between a base vehicle and a vehicle in which the EFP is installed × (weight of the EFP/vehicle weight) × annual distance driven × number of vehicles
Example 2: The difference in CO_2 between a base product and a product in which the EFP is installed × system contribution ratio × (utilization rate) × number of hours used per year × number of products

*2: This is the ratio of sales of EFPs compared to all our products.

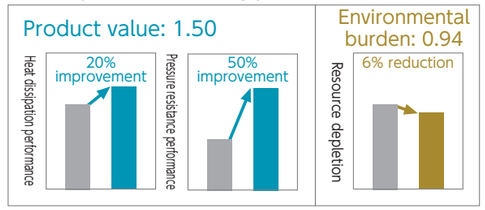
Examples of Environmentally Friendly Products

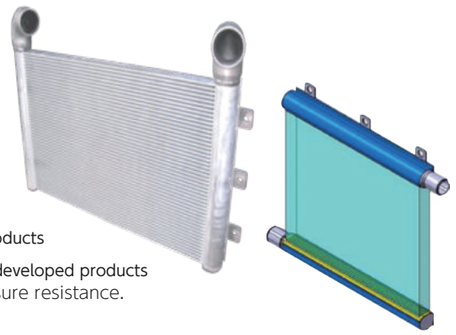
Charge air cooler for construction machinery

Mass-produced product　Ratio to total EFPs sales 7%

Environmental efficiency indicators of typical products **1.60**

■ Compared to existing products:





■ Existing products
■ Newly developed products

Contributing to exhaust gas purification through improvement of pressure resistance.
Reducing weight by optimization of the shape of parts.

■ Product characteristics

Contributing to exhaust gas purification by cooling heated air by supercharger and lowering engine combustion temperature. Downsizing system by improved pressure resistance and performance.

■ Installed in

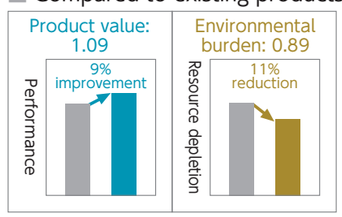
・Hydraulic excavators
・Wheel loaders
・Other construction machinery

Casing-less oil cooler

Mass-produced product　Ratio to total EFPs sales 13%

Environmental efficiency indicators of typical products **1.22**

■ Compared to existing products:



Mission oil (ATF) cooler/warmer

■ Existing products
■ Newly developed products

Reducing the amount of aluminum material use by doing away with fins on the water side and designing dimples.

■ Product characteristics

Improving fuel economy especially for a cold start by quickly heating ATF (Automatic Transmission Fluid) and reducing friction just after an engine start.

■ Installed in

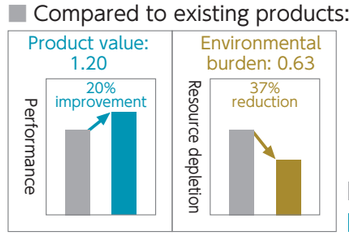
・AT vehicles (automatic transmission) and CVT vehicles (continuously variable transmission).

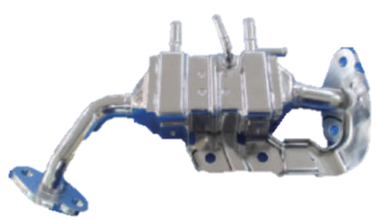
EGR cooler

Mass-produced product　Ratio to total EFPs sales 24%

Environmental efficiency indicators of typical products **1.90**

■ Compared to existing products:





■ Existing products
■ Newly developed products

Improving performance drastically and downsizing by improvement of fins on the gas side. Contributing to reduction in the amount of stainless steel use.

■ Product characteristics

Reducing NOx and improving fuel economy by recirculating some of high-temperature exhaust gas from an engine.

■ Installed in

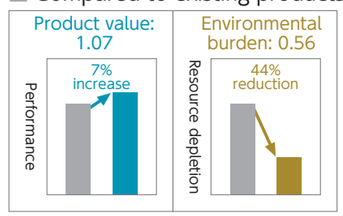
・Gasoline engine
・Diesel engine

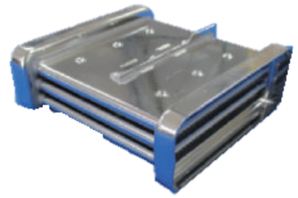
Core of heat exchanger for waste heat recovery system

Mass-produced product　Ratio to total EFPs sales 10%

Environmental efficiency indicators of typical products **1.34**

■ Compared to existing products:





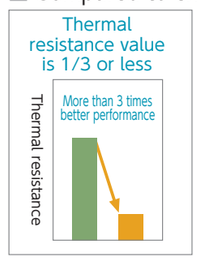
■ Existing products
■ Newly developed products

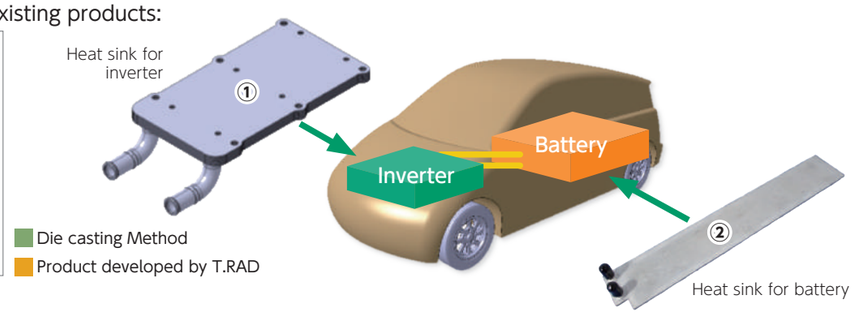
■ Product characteristics

Achieving higher performance than the current model and drastically thinner & lightweight shape by new high performance fins. Improving fuel economy and heating efficiency in the winter. Satisfying severe mounting requirements in a height direction by flat shape.

Heat sink for EV and HV

■ Compared to existing products:





■ Die casting Method
■ Product developed by T.RAD

■ Product characteristics ①

Enabling downsizing of semiconductors (power module) by high cooling performance. Contributing to reduction of the overall cost of inverter.

■ Product characteristics ②

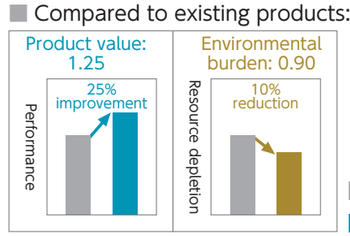
Contributing to higher efficiency and longer life by adjusting battery cells to appropriate temperature. Enabling downsizing of the battery module compared to the previous air cooling method that requires space between battery cells.

Heat exchanger for residential fuel cell

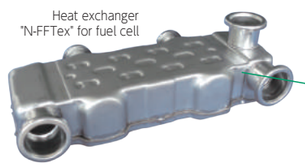
Mass-produced product

Environmental efficiency indicators of typical products **1.39**

■ Compared to existing products:



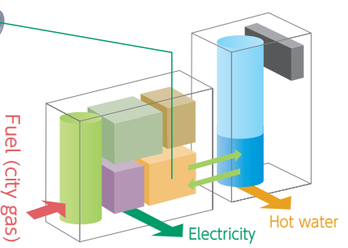
Heat exchanger "N-FFTex" for fuel cell



■ Existing products
■ Newly developed products

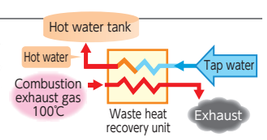
Reducing weight by optimization of the shape of parts.

Diagram of inside the "ENE-FARM" system
* New Energy Foundation
Based on the "The Happy Home Project: Home Fuel Cell Systems" ('09 version).



■ Product characteristics

Heating tap water by recovering waste heat from a fuel cell. Contributing drastically to ENE-FARM's 50% heat recovery (Lower Heating Value).



■ Installed in

・2016 model of residential fuel cell "ENE-FARM"

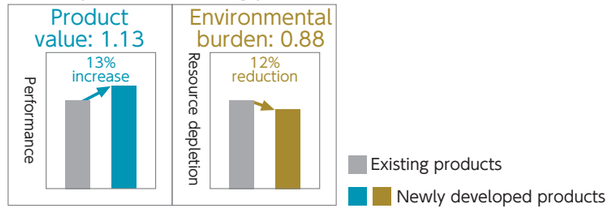
New type high performance charge air cooler (CAC)

Mass-produced product　Ratio to total EFPs sales **9%**

Environmental efficiency indicators of typical products **1.31**

Water-cooled CAC

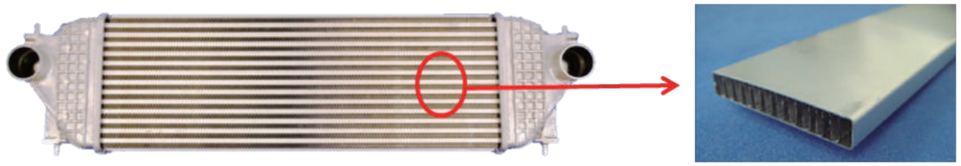
■ Compared to existing products:



■ Product characteristics

Achieving low pressure loss, compactness, and lightweight by adopting high performance fins, dimples on the water side, and highly densified core.

Air-cooled CAC



■ Product characteristics

Adopting a rectangular tube that suits a front-mounted CAC with a wide core.
Expanding the pass of charge air by rectangular tube.
① Reduction of pressure loss of charge air.
② Improvement of performance by increasing the number of inner fin waves.
③ Reduction in the number of tubes and in weight by increasing the tube size.

Employee Comments

H. E. Development Dept.
Masashi Ogawa

Development of a charge air cooler in response to demand

One of the trends in engine development by domestic and overseas car manufacturers is a downsized turbo engine. This is a system that uses a turbo charger to compensate for the loss in power caused by reducing engine displacement. The smaller engine displacement improves fuel economy and environmental performance, but it also reduces engine power. This is a system that compensates for that with a turbo charger. If hot compressed air from a turbo charger is fed straight into the engine, its power will fall and fuel economy will deteriorate. It therefore needs to be cooled with a charge air cooler (CAC).

A CAC can cool by using water or air. There are also various types depending on where in the car it is mounted. There are various engines and cars being developed by car manufacturers, and we develop products in order to meet that wide-ranging demand.

Through our development of products that will support the development of these engines and cars, we will continue to work hard to become a manufacturer that makes even bigger contributions to the environment.

Chemicals Management

T.RAD ensures strict control of chemical substances at every step from design and parts procurement to manufacturing and shipping.
We also ensure appropriate control over our suppliers, based on our own Green Procurement Guidelines.

Pollution Prevention Management Regulations
- Listing of relevant laws and regulations
- Identification of persons in charge
- Identification of control methods (checks, measurements, records, responses to authorities, treatment, information management, etc.)

Control Procedures for Environmentally Hazardous Substances
- Identification of company-wide standardized control methods

Identification Procedures for Substances of Concern (SOC)
- Definition of SOC control standard values*
- Identification of verification method SOC control

Engineering Standards

Control Standard Values for Environmentally Hazardous Substances (Threshold)

*Details of the controlled substances and standard values specified in the Procedures
- List of controlled substances, banned substances, and monitored substances
- Identification of the SOC control standard values (threshold)

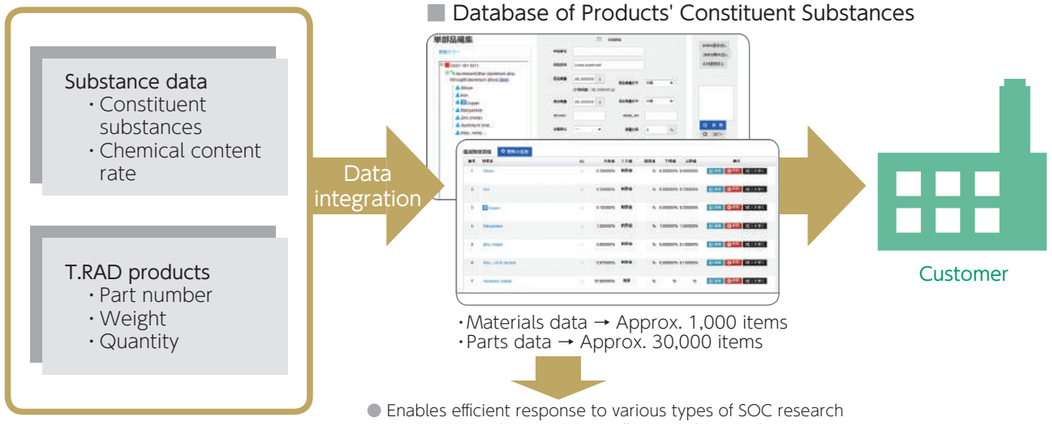
T.RAD is promoting the improvement of control systems and the switch to safe materials in order to promptly meet the statutory provisions of all countries and the regulations of our trading partners. We are thereby working to reduce or eliminate environmentally hazardous substances used in products.

Statutory Provisions	Substances for Reduction or Elimination	Switchover Schedule		
		FY 2016	to FY 2017	FY 2017 and later
Substances banned by T.RAD	● RoHS Directive (including the revised RoHS), ELV directive ● REACH Regulation Any additional substances requiring permits ● Substances that are banned by subsequent revisions of laws or regulations	● For automobile/electronics industries: already done (save for certain exceptions) Reduction/elimination in the process of being complied with		● 0% in FY 2017 (Will also not use banned substances added after FY 2017)
Autonomous	● REACH Regulation Any further SVHCs (Substances of Very High Concern) ● Chemicals that need to be reported or monitored ● Other chemicals added in laws or regulations	Supported as needed		

● Details of banned and monitored substances controlled by T.RAD can be viewed at "Environmentally Hazardous Substance Control Standards" under Supplier Contacts on our website.
http://www.trad.co.jp/english/supplier/green.html

T.RAD has built, and now operates, a system that can be used more efficiently for each operation by storing information about SOCs (substances of concern) in a database.

■ Database of Products' Constituent Substances



● Enables efficient response to various types of SOC research (IMDS/JAMA sheets, etc., certification of non-inclusion, etc.)

Reduction of Environmental Burden of Business Activities

We are reducing the environmental burden of our business activities in order to tackle one of our key topics (p.6), an "environmental consideration for businesses and products."

Material Aspects and Environmental Performance

*Scope: The three works in Japan, Sales/Marketing & Technical Division, and the Production Engineering Center

	Base year	Base year data	2014	2015	2016	Target	Performance	Achieved
Climate Change Mitigation (Energy)								
Consumption of Energy Converted into Electricity (CECE) per processing value (MWh/ million JPY*1)	2013	3.31	3.19	3.33	3.13	-7.5%	-5.4%	×
CO_2 emissions (thousand tCO_2) (Total of scope 1 and scope 2)	2013	42	41	40	40	-7.5%	-5.5%	×
Energy consumption per production (Crude oil equivalent kL/million JPY) (Distribution)	2011	0.025	0.021	0.021	0.022	-5.0%	-14.6%	○
Resource-saving								
Waste per production (excluding steel scrap) (kg/million JPY)	2013	59.1	58.7	58.6	56.6	-3.0%	-4.3%	○
Waste recovery rate (%)		n/a	98.5	98.4	98.3	98.0 or more		○
Water consumption per production (m^3/million JPY)	2006	6.3	4.9	4.4	4.3	-10.0%	-32.1%	○
Environmental Pollution Prevention (Chemicals)								
Release and transfer of PRTR-specified chemicals*2 per production (kg/million JPY)	2006	3.1	1.0	0.8	0.6	-10.0%	-81.2%	○
Release and transfer of VOCs*3 per production (kg/million JPY)	2006	2.3	0.9	0.7	0.6	-30.0%	-75.3%	○
Biodiversity								
					Started in 2011. Activities performed at 3 sites 2013-2014. Performed at 6 sites from 2015.			
					2016 target: Implement plans at all sites. At least one plan in each site. Result: Implemented 3-9 plans, such as tree planting and green purchasing.			○

*1: In 2016, the denominator was changed from production to processing value.
*2: For chemicals with reduction targets. PRTR: Pollutant Release and Transfer Register
*3: VOCs (Volatile Organic Compounds) *See pp. 29 and 30 for product-related environmental values. See p.47 for other data.

Climate Change Mitigation (Reduction of Energy and CO_2)

Relevant Sustainable Development Goals (SDGs):

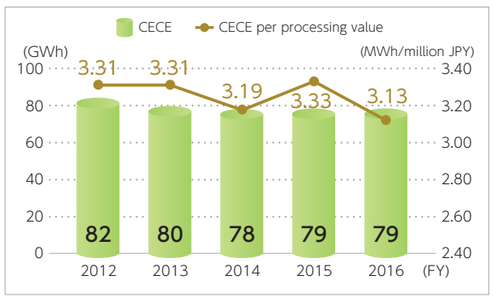
Energy and CO_2 from Business Activities

We have set numerical targets for consumption of energy converted into electricity (CECE) in Japan and for CO_2 indicators overseas, and assess the target achievements monthly. The FY 2016, CECE per processing value in Japan fell 5.4% compared to 2013, against a target of a 7.5% reduction.

6%

Reduction of CO_2 emissions compared to FY 2013 (Scope 1 + 2, Japan)

■ Changes in CECE and CECE per processing value (Japan)



■ CO_2 emissions per processing value (Overseas)

(tCO_2/million JPY)

	2016
United States	1.6
Czech Republic	4.5
China (Changshu)	2.2
Indonesia	4.5
Russia	3.0
Thailand	2.1
Vietnam	1.0
China (Zhongshan)	1.0

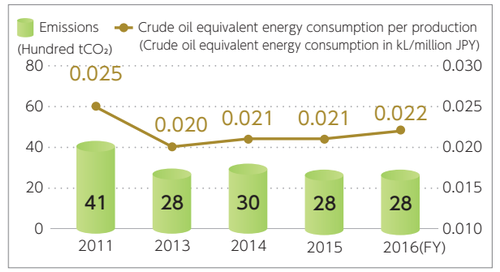
Energy consumption (GJ) was approx. 770,543 GJ, a 1.7% reduction compared to FY 2013 (p.47).

*In 2016, the denominator was changed from production to processing value (Japan and overseas). "Overseas" covers 9 overseas subsidiaries. Of which one company is included in figures for China (Changshu).
*High per processing value in the Czech Republic was caused by the installation and trials of a new line. In Indonesia, it was caused by a new furnace and taking production in-house.
*Electricity emission factor (Unit: tCO_2/MWh) United States 0.516, Czech Republic 0.490, China (Changshu) 0.686, Indonesia 0.755, Russia 0.437, Thailand 0.522, Vietnam 0.429, China (Zhongshan) 0.437. Other fuel emission factors: Gasoline 2.27 tCO_2/kL, kerosene 2.52 tCO_2/kL, light oil 2.68 tCO_2/kL, LPG 2.98 tCO_2/tonne, city gas 1.88 tCO_2/1,000m^3

Energy and CO_2 from Distribution Activities

The FY 2016 target for energy consumption per production was a reduction of 5.0% from FY 2011. This was achieved with an actual reduction of 14.6%. We hold a Distribution Subcommittee meeting four times a year in which distributors and the departments involved in product shipping work together to reduce the energy used during distribution. In 2016, we improved the delivery routes. Our distributors also conducted eco-driving training and conducted improvement activities, such as fitting reformers to their trucks.

■ CO_2 emissions and crude oil-based energy consumption per production cost



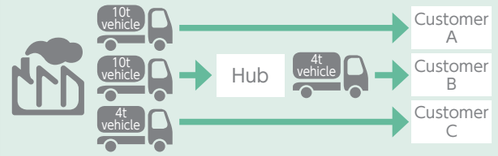
Distribution Improvement Case Study

Reduction of 19.6 tCO_2/year

We reduced CO_2 emissions by changing the delivery route, changing the vehicles used, and adjusting the load.

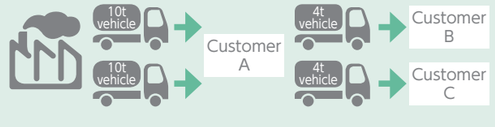
Before improvement (1 month)

4t vehicle: 94 (GJ) x 0.0187 (tC/GJ) x (44/12) = 6.4 (tCO_2)
10t vehicle: 66 (GJ) x 0.0187 (tC/GJ) x (44/12) = 4.5 (tCO_2)



After improvement (1 month)

4t vehicle: 15 (GJ) x 0.0187 (tC/GJ) x (44/12) = 1.0 (tCO_2)
10t vehicle: 73 (GJ) x 0.0187 (tC/GJ) x (44/12) = 5.0 (tCO_2)



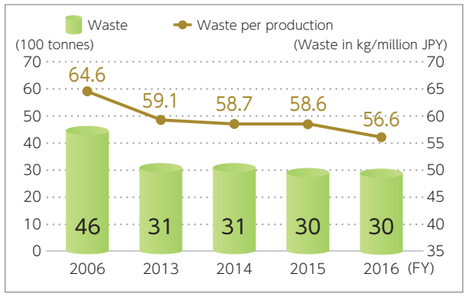
1 month's effect: 10.9 (tCO_2) - 6.0 (tCO_2) = 4.9 (tCO_2) FY 2017 effect (4 months): 4.9 (tCO_2) x 4 months) =19.6 (tCO_2)

Resource Saving (Reduction of Waste and Decrease of the Burden on Water Resources)

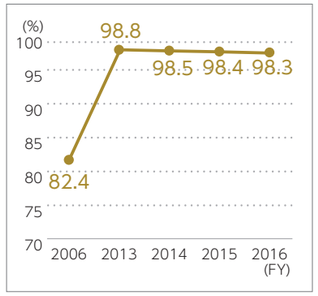
Relevant SDGs:

T.RAD is working on the reduction and recovery of waste. Our waste per production (excluding steel scrap) in FY 2016 posted a 4.3% reduction compared to FY 2013, against a target of a 3.0% reduction for the same period. Our resource recovery rate was 98.3% against a target of 98.0%. The waste generated (excluding steel scrap) was 5.2% less than in FY 2013.

■ Changes in waste and waste per production (excluding steel scrap) (Japan)



■ Resource Recovery Rate (Japan)



98%

Resource recovery rate (Japan)

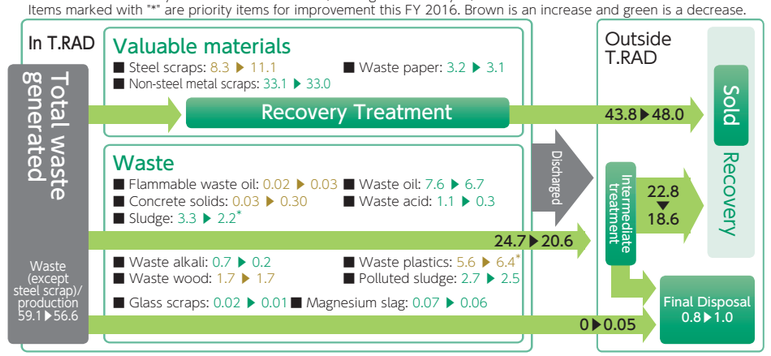
■ Waste per sales (Overseas)

(kg/million JPY)

	2016
United States	100
Czech Republic	111
China (Changshu)	45
Indonesia	122
Russia	102
Thailand	98
Vietnam	139
China (Zhongshan)	73

■ Waste flow (Japan)

Results from the base year FY 2013 to FY 2016 (Unit: kg/millions of yen)
Items marked with "*" are priority items for improvement this FY 2016. Brown is an increase and green is a decrease.

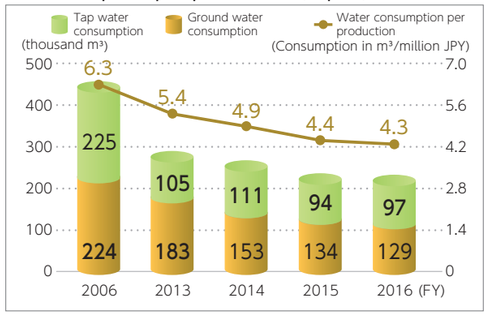


**"Overseas" covers 9 overseas subsidiaries. Of which one company is included in figures for China (Changshu).
*High per sales in Indonesia was caused by increase following taking production in-house. In Vietnam, it was caused by an increase in waste from more packaging and increased production. Per sales was low in China (Changshu) because of increased sales.

The FY 2016 target for water consumption per production of our Japanese works was a reduction of 10.0% compared to FY 2006. This target was easily met, as we achieved a reduction of 32.1%. Water consumption fell by 49.7% compared to FY 2006. In particular, the water used for industrial purposes in the Shiga Works was reused without being released.

Example: FY 2016 Shiga Works
Breakdown of water consumption
- Total amount of water withdrawal: Approx. 62,000 m³ (For domestic use and additional industrial use)
- Total amount of water reused (for industrial use): Approx. 89,000 m³

■ Changes in water consumption and water consumption per production (Japan)



*Breakdown: Refer to GRI Standard 303-1 (G4-EN8)

50%
Reduction in water consumption compared to FY 2006 (Japan)

Environmental Pollution Prevention (Reduction of Chemicals in Production)

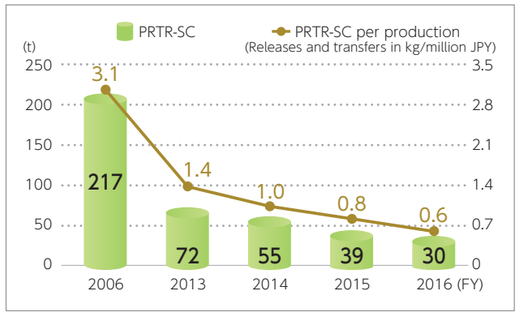
Relevant SDGs:

Reduction of PRTR-Specified Chemicals

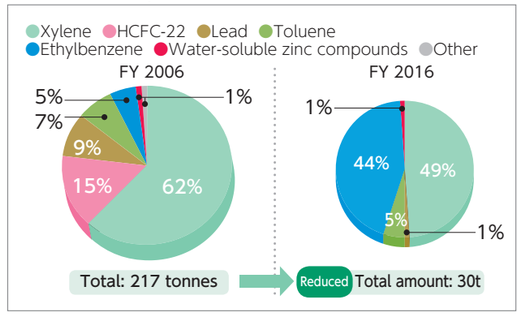
Of the chemicals specified in PRTR, the following seven required release and transfer volume notifications by T.RAD in 2016.
① Ethylbenzene ② Xylene ③ Chromium and trivalent chromium compounds
④ 1,2,4-trimethylbenzene ⑤ Toluene ⑥ Lead ⑦ Nickel
These are joined by water-soluble zinc compounds, dichloromethane, 1,1-dichloro-1-fluoroethane (HCFC-141b), benzene, and chlorodifluoromethane (HCFC-22) for a total of 12 substances for reduction, for which T.RAD has set targets and is strengthening control. Release and transfer of PRTR-specified chemicals per production has been greatly improved in FY 2016, with an 81.2% reduction compared to our target of a 10.0% reduction from FY 2006.
*We also monitor normal hexane, styrene, and others.

86%
Reduction of 12 controlled chemicals compared to FY 2006 (Japan)

■ Changes in release and transfer of PRTR-specified chemicals (PRTR-SC) and PRTR-SC per production (Japan)



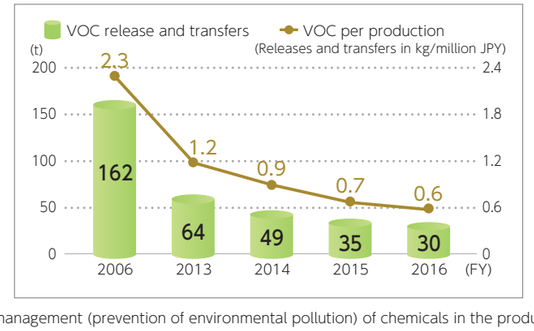
■ Release and transfer of PRTR-specified chemicals by chemical (Japan)



Reduction in Volatile Organic Compounds (VOC)

Ethylbenzene, xylene, toluene, 1,2,4-trimethylbenzene, and benzene are set as VOC reduction targets in particular. We gather data on them to understand how the improvements are working. The release and transfer of VOCs per production fell by 75.3% in FY 2016 compared to FY 2006, easily achieving the target of a 30.0% reduction.

■ Changes in release and transfer of VOCs and VOCs per production (Japan)



82%
Reduction in VOCs compared to FY 2006 (Japan)

*See p.38 for information about the management (prevention of environmental pollution) of chemicals in the products.

Improvement Case Studies

Improved air leakages
Reduction of approx. 70 tCO_2/yr (Japan)

We reduced the electricity consumption of our compressors by repairing air leaks in our factories.
Before improvement: 1,912 kWh/day, after improvement 1,527 kWh/day
Effect: Approx. 140 MWh/year x 0.500 tCO_2/MWh = approx. 70 tCO_2
(The photo below shows an example.)

Tear in hose

Hose replaced

Air leak from the joint

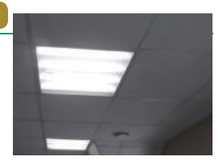
Part replaced

Withdrew old furnaces and introduced energy-saving furnaces
Reduction of approx. 49 tCO_2/yr (Japan)

We changed the furnaces used in production to compact energy-saving furnaces. This made the production process more compact and reduced CO_2.
Before improvement: 100,000 kWh/month, after improvement 92,000 kWh/month, effect: 8 MWh/month x 12 months x 0.509 tCO_2/MWh = approx. 49 tCO_2/year

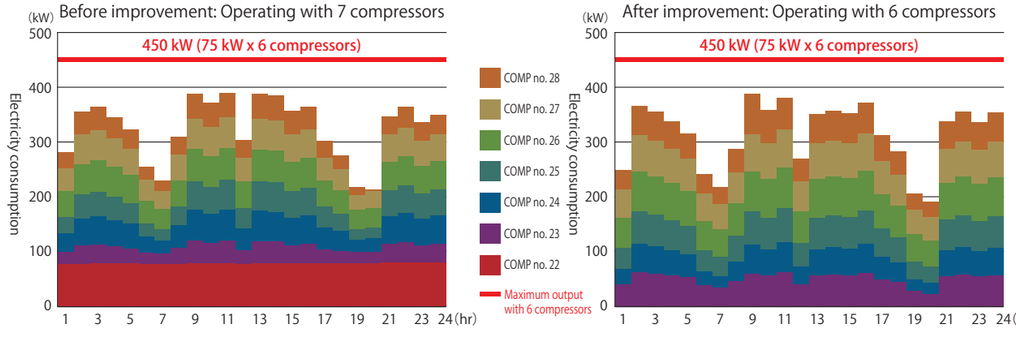
Changed to LED lighting and energy-saving lighting
Reduction of approx. 81 tCO_2/yr (consolidated)

- Changed to LED lighting:
  Before improvement: 36.173 MWh x 0.500 tCO_2/MWh + 89.041 MWh x 0.486 tCO_2/MWh +133.517 x 0.509 tCO_2/MWh +1.143 x 0.437 tCO_2/MWh
  After improvement: 9.477 MWh x 0.500 tCO_2/MWh + 38.764 MWh x 0.486 tCO_2/MWh + 54.964 MWh x 0.509 tCO_2/MWh + 0.572 MWh x 0.437 tCO_2/MWh
  Effect: 78 tCO_2
- Changed 11 lights to energy-saving lighting:
  Effect: 0.00025 MW x 11 lights x 9h/day x 252 days x 0.437 tCO_2/MWh = approx. 3 tCO_2


LED lighting in the Russian office

Appropriate operation and stopping
Reduction of approx. 85 tCO_2/yr (Japan)

- Reorganization of transformers:
  We stopped operation of two small load transformers and consolidated them into one large capacity transformer.
  Before improvement: 14,784 kWh/year, after improvement: 7,911 kWh/year, effect: 6.873 MWh/year x 0.500 tCO_2/MWh = approx. 3 tCO_2
- Optimal operation of compressors:
  ①We reduced the supply pressure of the low-pressure compressor. We also reviewed the operation settings of the inverters and dampers, and stopped the operation of two compressors. Before improvement: 5,287 kWh/week, after improvement: 4,477 kWh/week, effect: 0.81 MWh/week x 48.8 weeks x 0.500 tCO_2/MWh = approx. 20 tCO_2
  ②During the seven non-summer months, we stopped the operation of one compressor because of the lower load. We decided to use a 6-compressor operation because the electricity consumption from using a 7-compressor operation would never exceed the maximum output of 6 compressors of 450 kW (75 kW x 6) (left graph below).
  Before improvement: 43,621 kWh/week, after improvement: 41,230 kWh/week,
  effect: 2.391 MWh/week x 4 weeks/month x 7 months x 0.486 tCO_2/MWh = approx. 33 tCO_2/year



③On holidays, the six inverter compressors were operating at a low load, so we stopped the operation of three of them. We automatically stopped the operation during holidays for 34 hours using a calendar timer.
Effect: 0.018 MWh x 34h x 4 weeks/month x 12 months x 0.486 tCO_2/MWh = approx. 14 tCO_2/year

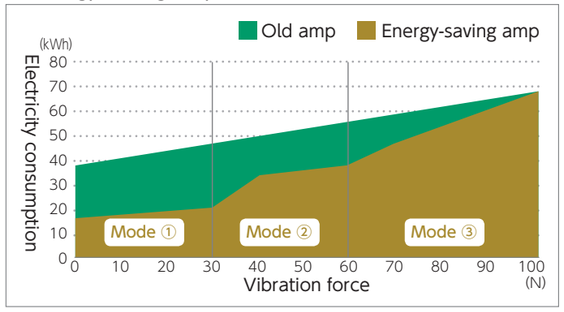
- Stopping operation of blade servers and relocating them:
  We reduced electricity consumption by stopping the operation of one blade server and relocating 12 servers from the computer room to a data center.
  Before improvement: 16,500 kWh, after improvement: 0 kWh, effect: 16.5 MWh x 0.486 tCO_2/MWh = 8.0 tCO_2
- Appropriate operation for the flow of water:
  Due to changes in the production process, the amount of water treated at the water treatment plant was reduced. In response to the reduced water flow, we changed the pump to a small type, fully opened the flow adjustment valve, and used inverter control.
  Before improvement: 11 kW, after improvement: 2.9 kW, effect: 0.0081 MWh x 7 hrs/day x 244 days x 0.500 tCO_2/MWh = approx. 7 tCO_2

Upgrade to energy-saving equipment

Reduction of approx. 42 tCO_2/yr (Japan)

- **Upgraded the fridge in the employee cafeteria to an energy-saving fridge:**
  ①Before improvement: 2.567 MWh/year, after improvement: 0.937 MWh/year, effect: 1.63 MWh x 0.500 tCO_2/MWh = approx. 0.8 tCO_2
  ②Before improvement: 1.980 MWh/year, after improvement: 0.55 MWh/year, effect: 1.43 MWh x 0.486 tCO_2/MWh = approx. 0.7 tCO_2
- **Upgrading of vending machines:**
  In accordance to the number of products sold, we reviewed the number of installed vending machines and upgraded machines that had been manufactured five years ago.
  Effect: (effect of removing one machine 0.835 MWh + effect of upgrading five machines 8.029 MWh) x 0.486 tCO_2/MWh = approx. 4 tCO_2
- **Upgrading to energy-saving transformers:**
  Effect: before improvement: 21.958 MWh/year, after improvement: 12.117 MWh/year,
  effect: 9.841 MWh x 0.486 tCO_2/MWh = approx. 5 tCO_2
- **Upgrading to energy-saving amp:** We upgraded the amp on the electrodynamic vibration testing machine to an energy-saving amp (automatically selects the mode depending on the test conditions).
  Before improvement: 305.454 MWh/year, after improvement: 240.037 MWh/year,
  effect: 65.417 MWh x 0.486 tCO_2/MWh =approx. 32 tCO_2

Energy-saving amp Eco modes



Reduction of waste

Approx. 39,230 kg/year reduced (consolidated)

- **Return of pallets:**
  We return the pallets used by suppliers for their deliveries so that they can reuse them.
  Effect: 450 kg for wooden pallets, 770 kg for returning other companies' pallets
- **Reduction of waste flax by introducing jet dispensers:** Effect: 1,130 kg
- **Reduction of scrap:** Effect: approx. 33,200 kg
- **Improvement of packaging materials:**
  We changed the packaging for parts from paper to polyester (right), and reused packaging materials by returning them to suppliers.
  Effect: approx. 3,680 kg

Employee Comments

Production Department, Nagoya Works
Kenji Kato

The electricity consumption of the compressors accounts for 14% of the entire Nagoya Works. We fitted electricity meters to all compressors so that we could ascertain the load of each machine. This allowed us to stop one compressor and control the number of machines in operation when load is low during holidays, in an effort to optimize the number of compressors in operation and save energy. We also created a graph daily out of the electricity data measurements so that we could visualize and monitor status such as the load of each compressor.

Work Safety Administrator, Russia
Utekhina Tatyana

Since 2014 we are certified according to ISO 14001: 2004. We constantly aim at reducing our negative impact on the environment. Since 2014, we have been replacing lamps in the production hall with energy-saving ones. This allowed us to significantly reduce our energy consumption. Since 2016, we have begun to replace the lights in our office with LED lights.

Initiatives for Biodiversity

Background & Reasons

Our business operation relies on the benefits of biodiversity. To ensure sustainable business activities, it is extremely important to reduce our environmental burden and promote conservation.

Relevant Sustainable Development Goals

Key Standards
- Convention on Biological Diversity
- Sustainable Development Goals
- The Corporate Ecosystem Evaluation
- Basic Act on Biodiversity
- Environmental Policy
- Guidelines for Private Sector Engagement in Biodiversity

Engagement and Support
- Shonan Satokawazukuri Minnano-Kai
- Environmental Partnership Organizing CLUB
- Shiga Central Forestry Union

Biodiversity is said to be one of the challenges facing the world today. The Sustainable Development Goals (SDGs)* include a goal about biodiversity (Goal 15). The following explains our involvement with biodiversity by taking sustainable forest management as an example.

*the United Nations. (2015). Transforming our world: the 2030 Agenda for Sustainable Development.

Impacts

Timber and other wood fiber

- The risk of contributing to forest loss by buying and using paper procured from forests that have not been managed appropriately.
- The risk of a shortage of timber that provides the raw material for paper, leading to a drastic rise in the price of paper, which would affect business activities.

Opportunities

- We contribute to the prevention of forest loss by using paper procured from managed forests and highly recycled paper.
- Through forest conservation and by creating a promenade that makes effective use of wood chips derived from forest thinning, we promote sustainable forest management and provide a place for people to rest and relax.

Examples of activities
- Reduction in paper use
- Green procurement
- Tree planting
- Conservation of trees
- Created a promenade using wood chips derived from forest thinning in the woods.

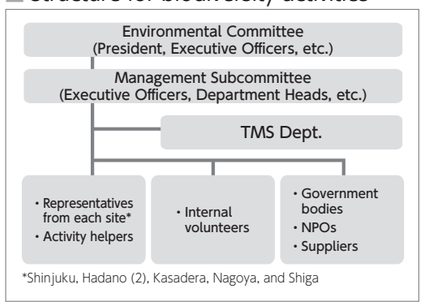
Challenges
- Ascertain the green procurement status of office supplies and equipment, and switch to products that comply with APGP*.
- Quantification of the effects of initiatives in each region and the connection between our products and biodiversity.

Management Approach
- Set goals in the CSR Medium Term Plan, the medium-term biodiversity plan, and departmental policies. Every month, we check the progress of activities with department heads and managers in each region, and share information about solving problems. We also report to executives every month.

Evaluation
- In external forums and other places, we reported our activities, received feedback from our stakeholders, and rated our activities.
- Executives assessed the activities at the Management Subcommittee and the Environmental Committee. We also attach importance to the opinions of employees who have seen the activities or read our internal reports.

*Act on Promoting Green Procurement

Structure for biodiversity activities



*Shinjuku, Hadano (2), Kasadera, Nagoya, and Shiga

cf pp.11, 12

■ 2016 target: Implement plans at all sites ------ At least one plan in each site.
Performance: ------ 3-9 in each site

■ Examples of the performance at each site (see pp. 45 and 46 for more details):

120 plants	9%	538 kg
Number of sweet viburnums planted	Reduction in photocopying paper per person (no. of sheets used/ person)	Amount of used work clothes recycled

■ FY 2017 target: Company-wide compliance of 6 new items with the APGP

Evaluation and the Medium Term Plan

In 6 sites, we perform a "Corporate Ecosystem Evaluation" and conduct activities on ecosystem services with high dependence and impact on biodiversity.

Ecosystem service	Dependence	Impact	2011 - 2014	2015	2016	2017
Timber/wood fibers	High	High	Switched photocopying paper	Ascertained green procurement at each site and made changes accordingly	21% company-wide ascertainment, 25% green purchasing, reduced paper use	Company-wide compliance of 6 items
Freshwater	High	High	Installed biotope pond, checked water safety, sponsored, cleaned river		Researched organisms in the biotope pond, took part in forums, etc.	Continuing to check safety and other activities
Air quality/climate regulation	High	High	Energy-saving, switching off lights activities →		Switching off lights, installing green curtains →	
Genetic resources, pollination, etc.	-	High	Planted indigenous species, planted trees, conservation →		Created Green Recreation Promenade	Conserving animals and plants
Waste treatment	-	High		Improving methods for recycling used work-clothes and other items →		

*Biodiversity Medium-Term Plan (excerpts)

Dependence, Impact and Examples of Initiatives

Freshwater

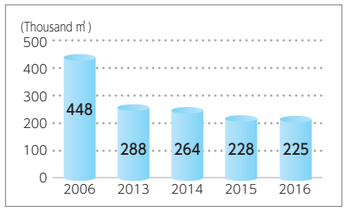
Risks/Impacts Restriction of use of water due to depletion of water resource; risk of contaminating the water quality of the rivers into which water is released.

Opportunities Conservation; contribution to the community; legal compliance

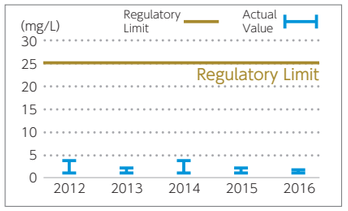
- ✔ Sites comparatively close to protected regions: (Aichi Prefecture) Sales/Marketing & Technical Division (Fujimae-higata), Shiga Works (Lake Biwa)
- ✔ Sites that discharge into rivers: Hatano Works (waste water treatment plant into the Kaname River), Nagoya Works (septic tanks into Ise Bay)
- ✔ Water withdrawal sources (3) for main works/sites: Tanzawa water system (Kanagawa Prefecture), Kiso River water system (Aichi Prefecture), Echi River (Shiga Prefecture)

- Set targets for and reduced water consumption (p. 40). Reused water within the company.
- Managed the water quality risk through water quality inspections and compliance audits.
- Improved washing processes and used detergents with a low environmental burden.
- Before discharging treated water into rivers, checked its impact on organisms in the biotope pond that used water from a waste water treatment plant.

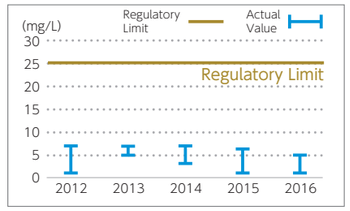
■ Changes in water consumption (Japan)



■ Changes in Biochemical Oxygen Demand (BOD) (Hatano)



■ Changes in Chemical Oxygen Demand (COD) (Hatano)



*The values for BOD and COD are the result of water quality inspections at Hatano Works. Shown as the gap between the minimum and maximum values. Values below 1 mg/L are indicated as 1.

- Conserved indigenous organisms in the biotope pond and a water tank (examples of the number of species being grown: stone moroko (approx. 35), semisulcospira libertina (approx. 200), dragonfly naiad (approx. 80))
- Collected, with local residents, trash from the river that we discharge water into. Sponsored the conservation body for the Kaname River water system, Shonan Satokawazukuri Minnano-Kai (http://www.satokawa.com/). Exchanged opinions with personnel at Kanagawa Prefecture's Planning and Coordination Division. We received opinions about "the importance of corporate participation" and "calling on other companies (to action)."
- Introduced our initiatives at the "2017 Shonan Satokawazukuri Forum". Exchanged opinions with local residents (p.28).

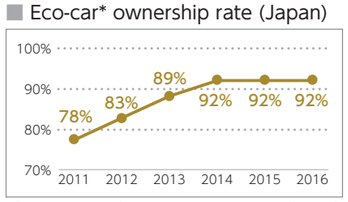
Collaboration: Hadano City Hall and the Kanagawa Prefectural Fisheries Technology Center Freshwater Experiment Station (killifish)

Climate regulation, air quality regulation

Risks/Impacts Impact on rising temperatures caused by CO_2 emissions; risk of increases in the cost of using energy; risk of increased costs in responding to tighter laws and regulations

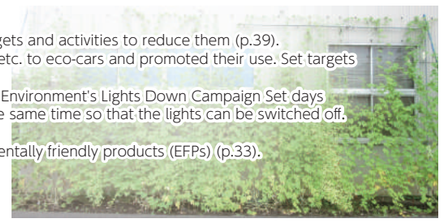
Opportunities Enhancement of the added value in the EFPs and expansion of their market; improvement of operating techniques for energy saving and its technology transfer to overseas; switch to energy-saving equipment.

■ Eco-car* ownership rate (Japan)



*Company cars, long-term contract rental cars, forklifts, etc.

- Energy consumption and CO_2 targets and activities to reduce them (p.39).
- Switched company cars, forklifts, etc. to eco-cars and promoted their use. Set targets and managed them.
- Participated in the Ministry of the Environment's Lights Down Campaign Set days when everyone leaves work at the same time so that the lights can be switched off.
- Installed green curtains (right).
- Promoted the design of environmentally friendly products (EFPs) (p.33).



Waste treatment, fibers, and other general things

Risks/Impacts The risk of damaging the circulation of resources by using and discarding items with a high environmental burden. The risk of tarnishing our own reputation by dealing with inappropriate contractors.

Opportunities To contribute to the circulation of resources by switching to methods of reuse that result in an even lower environmental burden; and by using environmentally friendly producers and contractors.

- Green purchasing (purchasing of products that comply with the "decision criteria" in the basic policy for the promotion of the procurement of eco-friendly goods and services.). Currently investigating whether 274 items that are purchased company-wide comply or not. In order to raise our compliance rate, we have also set target values and are currently switching to compliant goods.
- Continued to reuse packaging materials of parts. Recycled waste plastics (3,435 kg for new efforts in 2016)
- Changed the method for recycling work-clothes (switched from using a base course material to using old clothes/materials), continued to recycle (538 kg).
- Reduced photocopying paper per person (no. of sheets/person) by 9%.

Pollination, genetic resources, and pest regulation

Risks/Impacts Limitation of animal and plant habitat, pollination limitation, limitation of predator's feeding on pests, impact on agriculture, all due to land use.

Opportunities Recovery of nature; conservation of plants and animals; promotion of pollination by bees; creation of rest areas by increasing greenery

✔ Total number of species on the red list for prefectures in which we have sites

	Tokyo	Kanagawa Prefecture	Aichi Prefecture
Critically Endangered IA	627	270	104
Endangered IB	456	171	201
Vulnerable II	980	291	206
Near Threatened	718	226	121

	Shiga Prefecture
Critically endangered	168
Endangered	147
Rare	401
Requiring attention	245

*Source:Tokyo: Red Data Book Tokyo http://tokyo-rdb.jp/index.php; Kanagawa Prefecture: Kanagawa Red Data Book 2006 Web version http://conservation.jp/tanzawa/rdb/rdblists/about_rank; Aichi Prefecture: Overview of the third red list "Red List Aichi 2015" http://www.pref.aichi.jp/kankyo/sizen-ka/shizen/yasei/redlist/gaiyou.pdf; Shiga Prefecture: "Wildlife that should be valued in Shiga Prefecture (Shiga Prefecture Red Data Book) 2010 edition" http://www.pref.shiga.lg.jp/d/shizenkankyo/kyoseijourei.html, retrieved May 2017.

- Restoration of nature affected by land use (Examples of new planting in 2016 and continuously conserved animals and plants)

Hatano Works (Kanagawa) Ashitaba (a. 8), Japanese pepper (b. for butterflies, 3), sasanqua camellia (3), pulsatilla cernua (conserved), dianthus superbus (4), lythrum anceps (c. conserved), hyacinth orchid (d. conserved as a Kanagawa Prefecture endangered species IB), Japanese iris (conserved), threeleaf arrowhead (conserved), killifish (conserved), etc.

Nagoya Works (Aichi) Buddhist pine (e. 18)

Shiga Works (Shiga) Japanese maple (f. 5), rhododendron subg. hymenanthes (g), Japanese red pine, sweet viburnum (h. 120 as a protective wall), etc.

Collaboration: Hadano City Hall, the Shijuhasse Gawa Shizen Mura NPO and the Shiga Central Forestry Union

- Created a Green Recreation Promenade in the middle of a Japanese red pine forest within the premises of the Shiga Works. Used wood chips made out of lumber remnants for the path. We hope that employees and local people will be close to and enjoy the nature that we are conserving. The President and Plant Manager also celebrated its completion.

Shiga Central Forestry Union
Head of the Hino Site
Sumitaka Tonoike

Opinion of a cooperator

The Japanese red pine forest growing naturally inside the Shiga Works is not only rare, but also a valuable greenery barely left from the pre-war days, as no other cultivation has taken place there. As many of these old unplanted trees are dying away due to the damage caused by pine wood nematode, finding a way to preserve them has become a major challenge. Although we have been protecting them by using nematicides since 2007, some of them are dying because of abnormal weather of recent years and diseases. We therefore would like to focus on growing seedling pines. To get many of the employees interested in Japanese red pines and greenery due to the promenade that was created in the natural forest, the Shiga Central Forestry Union intends to continue carrying out its 50-year forest management project.

Environmental Data and Material

FY 2016 Overall Environmental Burden of Business Activities

- Term: April 2016 to March 2017
- Scope: The three works in Japan, Sales/Marketing & Technical Division, and the Production Engineering Center

Input

Energy 770,543GJ (2,432) (non-consolidated)

			(GJ)
●Volatile gasoline	5kL	(-1)	161
●Kerosene	103kL	(5)	3,784
●Diesel	2kL	(-0.2)	81
●LPG	114t	(-365)	5,812
●City gas	2,293,000m³	(225)	103,178
●LNG	0t	(0)	0
●Electricity	67,743MWh	(1,136)	657,527

Total 28,075t (-998)

● Chemicals*1	136t	(-44)
●Raw materials	27,923t	(-956)
Metals	24,407t	(-1,213)
Plastics	3,516t	(257)
●Containers, packaging materials	16t	(2)

Water 225,540m³ (-3,075)

●Surface water	0m³	(0)
●Underground water	128,616m³	(-5,837)
●Tap water	96,924m³	(2,762)

Manufacturing

Production Plant
Press
Welding
Machining
Brazing
Coating
Assembly

Recyclable materials
3,505t
(-27)
Resource recovery rate
98.3%

Distribution

Output

Greenhouse Gases 39,603tCO₂ (-846)

●CO_2	39,603tCO₂	(-846)
Scope1	5,829tCO₂	(-563)
Scope2	33,774tCO₂	(-283)

Gases Emitted into Atmosphere

●SOx	0m³	(-1)
●NOx	1,184m³	(-384)
●Particulate matter	0.39t	(-0.11)
●HCFC-22*2	0.004t	(0.004)
●HCFC-225cb*2	0.021t	(0.021)
Hazardous air pollutants*3	1,277 tonnes of dichlorobenzene equivalent	
Photochemical oxidants*3	26 tonnes of ethylene equivalent	

Chemicals*1 32t (-11)

●Toluene and xylene	16t	(-4)
●Lead and lead compounds	0.3t	(-3)
●Other	15t	(-4)

Discharge to Water System

●Treated water	110,546m³	(-1,033)
●BOD	0.12t	(-0.09)
●COD	0.38t	(-0.13)
●Nitrogen	0.66t	(-0.08)
●Phosphorus	0.05t	(-0.01)

Waste

●Waste	3,565t	(-23)
●Final disposal	57t	(4)

CO_2 Emissions from Distribution

●CO_2	2,839tCO₂	(-6)

Figures in parentheses are the increases or reductions from the previous fiscal year. *1: Also includes chemicals other than the 12 substances that have been targeted for reduction.
*2: HCFC-22 and HCFC-225cb are substances that deplete the ozone layer. *3: Calculated from the volumes of chemicals and SOx, NOx, based on "JEPIX Simple Calculation Sheet2_2."
Energy: Consumption x calorific value; CO_2: Electricity consumption x CO_2 emissions factor; Other fuels: Consumption of other fuels x calorific value x carbon emissions factor x 44/12.
Source for calorific value: Act on the Rational Use of Energy.
Volatile gasoline: 34.6 GJ/kL; kerosene: 36.7 GJ/kL; diesel: 37.7 GJ/kL; LPG: 50.8 GJ/t; daytime electricity purchased: 9.97 GJ/MWh; nighttime electricity purchased: 9.28 GJ/MWh.
Calorific value of city gas (the three works in Japan, Sales/Marketing & Technical Division, and the Production Engineering Center): Hatano Gas, Toho Gas, and Osaka Gas, 45 GJ/1,000 m³.
Source for emissions factors: Appendix 1, Ministerial Ordinance on Calculation of Greenhouse Gas Emissions Arising from the Business Activities of Specified Emitters.
Gasoline: 0.0183 tC/GJ; kerosene: 0.0185 tC/GJ; diesel: 0.0187 tC/GJ; LPG: 0.0161tC/GJ; city gas (Shiga Works and Production Engineering Center): 0.0136 tC/GJ.
Other sources for city gas (Hatano Works, Sales/Marketing & Technical Division (Hadano), Nagoya Works and Sales/Marketing & Technical Division (Kasadera)): Hatano Gas, Toho Gas, 0.0139 tC/GJ.
Electricity: the GHG Emissions Accounting, Reporting, and Disclosure System, 2016. Emissions factors for each utility for FY 2015. Available at:
http://ghg-santeikohyo.env.go.jp/calc, retrieved June 2017.
Hatano Works and Sales/Marketing & Technical Division (Hadano): Tokyo Electric Power Company, 0.500 tCO₂/MWh;
Nagoya Works and Sales/Marketing & Technical Division (Kasadera): Chubu Electric Power, 0.486 tCO₂/MWh; Shiga Works and Production Engineering Center: Kansai Electric Power, 0.509 tCO₂/MWh.

Environmental Accounting

- Target Period: April 1, 2016 to March 31, 2017 (FY 2016)
- Scope: Head Office, Three Domestic Works (Hatano, Nagoya, and Shiga), Sales/Marketing & Technical Division (hereinafter referred to collectively as "SMTD"), Production Engineering Center (hereinafter referred to as "PEC")
- Calculation Method: Calculation items are in accordance with the Environmental Accounting Guidelines 2005 issued by the Ministry of the Environment. Business trip expenses are excluded from the calculations.

Environmental Conservation Costs (Scope: Head Office, Three Domestic Works, SMTD and PEC. Unit: ¥1,000)

Category		Key Activities	Investment	Costs
(1) Business Area Costs				
Breakdown	(1)-1 Pollution Prevention Costs	Improvements, checks and inspections of pollution prevention equipment	2,220	82,107
Breakdown	(1)-2 Global Environmental Conservation Costs	Installing LED lights, update energy-saving furnace and equipment	218,533	95,352
Breakdown	(1)-3 Resource Circulation Costs	Waste disposal costs	0	75,042
(2) Upstream/Downstream Costs		Redesigning of skids for loading efficiency, etc.	0	0
(3) Administration Costs		Review costs, costs for creating reports, education, greenification, etc.	865	27,106
(4) R&D Costs		R&D costs of EFPs, equipment investment, etc.*	0	151,676
(5) Community Activity Costs		Donations to environmental conservation bodies, etc.	0	30
(6) Environmental Remediation Costs		-	0	0
Total			221,618	431,313

*"Cost" includes depreciation costs. Applies to equipment acquired in 2013 and later. The high cost for research and development is due to large number of specific research goals.

Environment Conservation Benefit (Scope: three domestic works, SMTD, PEC.)

Environmental Conservation Benefit Categories	Environmental Performance Indicators (Units)	FY 2015	FY 2016	Environmental Conservation Benefits
Environmental Conservation Benefit Related to Resources Input into Business Activities	Total energy input volume (GJ)	768,111	770,543	-2,432
	Energy input volume by type: Electricity (MWh)	66,608	67,743	-1,135
	Kerosene (kL)	98	103	-5
	Gasoline (kL)	6	5	1
	City gas (1,000m³)	2,067	2,293	-225
	LPG (t)	479	114	365
	Water consumption (m³)	228,615	225,540	3,075
Environmental Conservation Benefit Related to Waste or Environmental Burden Originating from Business Activities	CO_2 emissions (tCO₂)	40,449	39,603	846
	CO_2 emissions per processing value (tCO₂/million JPY)	0.784	0.752	0.032
	Release and transfer of PRTR-specified chemicals (tonnes)*	42	32	11
	Waste (tonnes)	3,588	3,565	23
	Final disposal (tonnes)	54	57	-4
Other Environmental Conservation Benefits	Noise (dB) (maximum value)	70	71	-1
	Vibration (dB) (maximum value)	52	46	6

*Also includes chemicals other than the 12 substances that have been targeted for reduction. For details, see pp. 47, 49, and 50. "Conservation Benefits" shows the results of calculations that include values below the decimal point.

Economic Benefits Associated with Environmental Conservation Activities (Scope: Head Office, Three Domestic Works, SMTD, and PEC. Unit: ¥1,000)

Details of Benefit		Amount
Revenue	Revenue from the sale of recycled waste products and used products	223,438
Cost Reductions	Reductions in energy costs through energy saving	22,378
	Reductions in waste disposal costs through resource saving or recycling	886
Total		246,702

FY 2016 Environmental Performance Data

Works Name			Hatano Works	Nagoya Works	Shiga Works	Sales/Marketing & Technical Division (Kasadera)
Address			937 Soya, Hadano-shi, Kanagawa, Japan	1-7 Fujie Aza Orido, Higashiura-cho, Chita-gun, Aichi, Japan	297 Gochicho, Higashiomi-shi, Shiga, Japan	4-14 Shioya-cho, Minami-ku, Nagoya-shi, Aichi, Japan
Major Products			Radiators, Oil coolers, Air coolers, EGR coolers, Core assy for waste heat recovery systems	Radiators, Air coolers, Heater cores	Radiators, Oil coolers, Air coolers, EGR coolers, Fin coil heat exchangers	Trial phase products
Photograph of the Works						
General Environmental Data						
Input	Energy Consumption (GJ)		229,966	163,869	285,419	91,289
	Water (Intake) (m³)		128,860	11,698	62,126	22,856
	Chemicals Handled (t)*		102	0.5	32	1
Output	Greenhouse Gases	CO_2: Scope1,2 (tCO_2)	11,819	8,284	14,892	4,607
		CO_2 from distribution (tCO_2)	1,623	572	644	-
	Atmosphere	Particulate matter (t)	0.07	0.02	<0.3	-
		NOx (m³)	19	377	788	-
		SOx (m³)	-	Cannot calculate due to measurement value being ND	Cannot calculate due to measurement value being ND	-
	Water	Volume released (m³)	79,275	8,774	10,502	11,996
		Discharged to:	Rivers (Kaname River)	Rivers	Sewers	Sewers
	Water Quality	BOD (t)	0.07	0.05	-	-
		COD (t)	0.3	0.1	-	-
		Nitrogen emissions (t)	0.3	0.4	-	-
		Phosphorous emissions (t)	0.02	0.03	-	-
		Release and transfer of chemicals (t)*	29	0.5	0.8	1
		Total volume of waste (t)	1,163	803	1,564	35
		Final disposal of waste (t)	13	7	38	0

Treated Water

Indicator	Regulatory Limit	Performance		Regulatory Limit	Performance		Regulatory Limit	Performance		Regulatory Limit	Performance	
		Minimum	Maximum		Minimum	Maximum		Minimum	Maximum		Minimum	Maximum
Density of hydrogen ions (pH)	5.8 - 8.6pH	7.2	8.1	5.8 - 8.6pH	6.9	7.3	6.0 - 8.5pH			5.0 - 9.0pH	6.4	7.4
Mass of suspended matter (SS)	70mg/L or less	Less than 2.0	3.5	30mg/L or less	Less than 1.0	3.0	Less than 20mg/L			600mg/L or less	Less than 0.5	24.0
Biochemical oxygen demand (BOD)	25mg/L or less	Less than 1.0	1.5	30mg/L or less	1.1	6.5	Less than 20mg/L			600mg/L or less	2.4	37.0
Mineral oils	-	-	-	-	-	-	-			0.5mg/L or less		Less than 0.5
Animal and vegetable oils	-	-	-	-	-	-	-			30mg/L or less	-	Less than 0.5
Chemical oxygen demand (COD)	25mg/L or less	Less than 1.0	5.0	30mg/L or less	4.1	15.0	Less than 20mg/L			25mg/L or less	-	-
Normal hexane extract content	5mg/L or less	Less than 1.0	Less than 1.0	5mg/L or less	-	-	-			5mg/L or less	-	-
Nitrogen content (T-N)	Less than 100mg/L	3.9	5.3	Less than 120mg/L	3.2	40.0	Less than 20mg/L			-	-	-
Phosphorus content (T-P)	Less than 16mg/L	0.07	0.4	Less than 16mg/L	0.9	3.5	Less than 5mg/L			-	-	-
Lead and lead compounds	0.1mg/L or less	Less than 0.01	0.03	-	-	-	-	-	-	-	-	-
Copper and copper compounds	1mg/L or less	Less than 0.05	Less than 0.05	-	-	-	-	-	-	-	-	-
Zinc and zinc compounds	1mg/L or less	Less than 0.05	Less than 0.05	-	-	-	-	-	-	-	-	-
Soluble manganese content	1mg/L or less	Less than 0.02	0.02	-	-	-	-	-	-	-	-	-
Iron and iron compounds (soluble)	1mg/L or less	Less than 0.05	0.37	-	-	-	-	-	-	-	-	-

Ceased use of integrated water treatment tanks in July 2008.

Atmosphere

Indicator			Regulatory Limit	Performance		Regulatory Limit	Performance		Regulatory Limit	Performance		Regulatory Limit	Performance	
				Minimum	Maximum		Minimum	Maximum		Minimum	Maximum		Minimum	Maximum
Painting Booth	Benzene	(ppm)	10ppm	-	-	-	-	-	-	-	-	-	-	-
	Toluene	(ppm)	100ppm	0.2	0.6	-	-	-	-	-	-	-	-	-
	Xylene	(ppm)	150ppm	4	7	-	-	-	-	-	-	-	-	-
Boiler	Particulate matter	(g/h)	-	Excluded from the law since FY 2011, because of the move to LNG and the reduction in combustion capacity		-	-	-	-	-	-	-	-	-
	SOx	(m³N/h)	-			-	-	-	-	-	-	-	-	-
	SOx density	(ppm)	-			-	-	-	-	-	-	-	-	-
	NOx	(m³N/h)	-			-	-	-	-	-	-	-	-	-
	NOx density	(ppm)	-			-	-	-	-	-	-	-	-	-
Furnace	Dust density	(g/m³N)	0.2g/m³N or less	0.002	0.007	0.2g/m³N	Less than 0.002	Less than 0.002	0.2g/m³N	ND	Less than 0.025	0.1g/m³N	Less than 0.002	Less than 0.007
	SOx emissions density	(ppm)	5ppm or less	n/a	n/a	0.252m³N/h	Less than 0.002	Less than 0.009	1.75 (K value)	Less than 0.02	Less than 0.3	Less than 0.212m³N/h	Less than 0.002	Less than 0.008
	NOx density	(ppm)	200ppm or less	2	2	180v/vppm	Less than 25	50	180-230ppm	Less than 5	Less than 10	180v/vppm	Less than 40	50
	Concentration of fluorine compounds	(mg/m³N)	2.5mg/m³N	1.7	2.0	10mgF/m³N	Less than 0.8	1.1	(3mgF/m³N)	Less than 1.0	Less than 1.0	Less than 10mgF/m³N	Less than 0.8	-

PRTR

Indicator	Volume Handled (kg)	Performance (kg)		Volume Handled (kg)	Performance (kg)		Volume Handled (kg)	Performance (kg)		Volume Handled (kg)	Performance (kg)	
		Emissions	Volume Transferred		Emissions	Volume Transferred		Emissions	Volume Transferred		Emissions	Volume Transferred
Water soluble zinc compound	323	4	251	0	0	0	0	0	0	0	0	0
Ethylbenzene	13,017	12,878	139	1	0.1	0	263	212	25	0.3	0.3	0
Xylene	14,536	14,208	139	1	0.1	0	1,298	269	32	0.5	0.5	0
dichloromethane	0.6	0	0	0	0	0	0	0	0	0	0	0
Chromium and trivalent chromium compounds	9,146	2	0	0	0	0	9,710	0	0	0	0	0
Chlorodifluoromethane	0	0	0	0	0	0	0	0	0	0	0	0
1,1-dichloro-1-fluoroethane	0	0	0	0	0	0	0	0	0	0	0	0
Toluene	1,394	1,255	139	5	0.2	0	491	205	75	0.5	0.5	0
Lead and lead compounds	44,619	1	319	0	0	0	0	0	0	0	0	0
Nickel	15,770	2	0	0	0	0	19,420	0	0	0	0	0
Benzene (Gasoline)	0	0	0	0	0	0	14	0	0	0	0	0
1,2,4-trimethylbenzene	2,787	1	0	0	0	0	1,165	5	0	0	0	0

*The value inside the ( ) is the reference value. *The figures for volumes handled, volumes released, and volumes transferred also include chemicals other than the 12 substances targeted for reduction (cf p. 41).
*ND means that it cannot be detected because it is a small value.

External Evaluation

In April 2016, we received a quality award from Toyota's Hirose factory. The "Honor Quality Award" recognized our achievement of zero defects on delivery for the last 4 consecutive years, including FY 2016.

In June 2016, we received a certificate of commendation from Daikin's Yodogawa factory (Oil Hydraulics Division). We were rewarded for our "achievement of zero defects in our deliveries of drawn-cup oil coolers to the Oil Hydraulics Division for 6 years."

We received a 2016 Excellent Quality Award from TMCAP (Toyota Motor (Changshu) Auto Parts).

In March 2017, we received an Outstanding Quality Control Award from Hino Motors.

In November 2016, we received a certificate of commendation for our cleaning of Higashiura town near the Nagoya Works as part of the "2016 Higashiura Town Public Facilities Adoption Program."

Obtained the highest environmental rating of A from the DBJ (Development Bank of Japan)

The highest rating for "Companies with excellent advanced environmental initiatives"

After undergoing an environmental rating assessment by the DBJ in 2015, T.RAD obtained the highest possible rating and was given a preferential lending rate. The rating is awarded on the basis of an assessment of the company's environmental management, and a preferential interest rate is applied in accordance with this assessment. The assessment criteria are tightened every year to reflect the latest international trends. The fact that we have been getting the same "excellent advanced environmental initiative" assessment since 2012 shows that our environmental management has been continuously improving.

The DBJ website provides a list of Leading Recipients of Financing Based on Environmental Ratings. T.RAD appears on this list. http://www.dbj.jp/en/

Global Reporting Initiative (GRI) Content Index Sustainability Reporting Guidelines (G4)

Source: The GRI website: https://www.globalreporting.org/Pages/default.aspx

This report contains Standard Disclosures from the GRI Sustainability Reporting Guidelines. For General Standard Disclosures, we have selected and referred to the Core items.

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Third Party Comments Afterword

Third Party Review of our CSR Report 2017

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Following the official coming into force of the "Sustainable Development Goals (SDGs)" of the UN on January 1, 2016, this was a year in which many civic societies, private companies, and local authorities questioned what sustainability is and what they can do at grounds. I'm sure a lot of people heard the word "SDGs" used. In this report, the President Mr. Kano commits to the CSR not as a separate issue unrelated to the business, but as the foundation for the company's sustainable growth (p. 2 of this document).

The SDGs are 17 goals and 169 targets for 2030 that were specifically listed in the "2030 Agenda for Sustainable Development" that was adopted at the UN summit in September 2015. In this report, the relationship with the SDGs is marked passim (pp. 39, 44). As with the SDGs, the report has also been designed in a way that the progress with the overall targets of the company, which can be easily understood for the readers. The comparison between 2017 objectives and results achieved in 2016 on p. 11-12 is particularly easy to understand. The environment is also linked to other SDG issues at the global level, including peace and the alleviation of poverty, so there are many other sections in this report where the relationship with SDGs could have been signaled.

It is to be positively noted that the T.RAD has substantially expanded the coverage biodiversity by devoting three pages to it (pp. 44-46). The topic of "addressing topics related to biodiversity" was suggested in last year's Third Party Comments, as well. It is implemented in terms of communication with local communities, the company is conducting community-based activities in collaboration with NPOs and universities (p. 28). It is also recognized that, in response to my request that the company deepen its activities to prevent global warming while preserving the accuracy of the information disclosure and the clarity of its comprehensive vision, the reduction of greenhouse gas emissions has been expressed in an easy-to-understand manner in terms of the equivalent number of cedar trees it would take to account for amount of the carbon dioxide absorbed, with the calculation method shown in the footnotes.

As a result, T.RAD has achieved many of its 2016 targets in fields like biodiversity. However, challenges remain for its initiatives to prevent global warming that, by the company's own account, failed to meet its 2016 targets. I refer, in particular, to its CO_2 emissions and energy consumption per monetary unit. Although a certain amount of fluctuation is unavoidable, I would ask that discussions be held on how targets can be achieved in the long run and creative actions be taken to put the conclusions into practice, regarding CSR as an area to be included in the management of business. Appropriately enough, climate change, which was one of the challenges left unsolved by Millennium Development Goals (MDGs), the predecessors of SDGs, has been highlighted as a big threat. It will take more than one year to work out how T.RAD, as a company, can contribute to the SDGs, so I look forward to reading its reports next year and beyond.

Afterword

We appreciate your taking the time to read the T.RAD CSR Report 2017. This report contains the Standard Disclosures from the GRI Sustainability Reporting Guidelines (G4). We have also expanded our descriptions of information security, our suppliers, the relationship between Sustainable Development Goals (SDGs) and material aspects of the environment, and our engagement with biodiversity.

This report has been published with the approval of the president, executive officers, and each subcommittee (p. 31). Some descriptions of ongoing standards and systems are the same as in the previous report (e.g., "How to Understand Product Environmental Efficiency Indicators" on p. 33). In the future, we hope to further improve this report and make it easier to read based on advice from third parties. We welcome your valuable feedback and comments regarding this report.

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[Editor in Chief] Kazuhiro Watanabe, TMS Dept., T.RAD Co., Ltd.
[Date of Issue] August 2017 [Date of Previous Issue] August 2016 [Date of Next Issue] August 2018 [Reporting Cycle] Yearly
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