

Both Sporty Driving and Energy Saving in One Package

It has been passed more than 20 years since 1st-generation LEGACY. The LEGACY which has been creating the realm of uniqueness celebrated its 5th generation on the occasion of its complete remodeling in 2009. SUBARU's technology and performance are lavishly reflected not only to maintain and upgrade "SUBARU-like driving", but also to meet challenges such as global warming which are socially needed to address. We have interviewed some leading project members to hear about ecological performance built in the new LEGACY.



SUBARU Product & Portfolio Planning Dev. Project General Manager

Yasunori Kumagai

At the initial stage of its development, he was involved in mapping out the development concept and planning, promoting the whole development process. He had worked on exterior and body designs since the birth of the 1st-generation LEGACY.

SUBARU Engineering Dev. Total Vehicle Performance Integration Dept. General Manager

Naoki Shibata

Since the beginning of the development, he coordinated to give a specific shape to the vehicle performance through drawing up the target performance, planning and pushing forward required tests. He also worked on the concept with Mr. Kumagai even from the pre-project stage. He has been with LEGACY series in a variety of capacities since the 1st-generation LEGACY.

SUBARU Engineering Dev. Total Vehicle Performance Integration Dept. Manager

Kenichi Yamamoto

He joined the team to develop the performance of the new LEGACY engine and transmission. He concentrated on striking a good balance between the absolute "driving" performance which the predecessors were reputed for and environmental performance.

SUBARU Product & Portfolio Planning Dev. Manager

Noboru Kitahara

After serving as a coordinator of development and production of LEGACY's on the US side, he returned to Japan 3 years ago to join the project team of the new LEGACY development. He contributed to the product planning making good use of his experience in the US.



Car that Lets Anyone Enjoy Pleasant Drives

The 5th-generation new LEGACY which marks its 20th anniversary, took challenge to create new value, responding to what the times of economic slumps and global warming need and to voices of customers.

The 5th-generation LEGACY features 3 concepts: drivers' fun (joys of driving to drivers), passengers' fun (joys of touring to all occupants) and economic performance (for genuine pleasure). In the process of conceptualizing the 5th-generation LEGACY, we surveyed customers who still enjoy preceding LEGACY, including the 4th-generation and those who already traded for other competitive makes in face-to-face interviews, on the web and by other means. What we learnt was that they were looking for cars which not only

give them joys to drive, but also make passengers on the side or in the rear can really loosen up. We also found that some people in North America and Europe where the LEGACY occupies 70 % of the SUBARU sale, feel the LEGACY's interior too cramped to justify its purchase. The challenge we faced in the development of the new LEGACY was to give a specific shape to "pleasant interior space" which is translated from the "passengers' fun", by sensing such changing values.

Integrated 3 concepts

The 5th-generation LEGACY has inherited the uniquely appealing "fun of drives" since the 1st-generation demonstrated with such features as "turbo engine" and "symmetrical AWD". The latest LEGACY was required to be larger in body size for "pleasant interior space" and be economical while

keeping the SUBARU-like driving performance, all in one package. Fuel economy is more or less incompatible with the other two requirements and in this regard, we went through a lot of difficulties to strike a good balance.

To give an extra margin to driving, the base engine was enlarged in capacity from 2.0-liter to 2.5-liter. A next generation transmission "Lineartronic" was used for practical fuel economy while maintaining the SUBARU-like performance. The combination of these made it possible to control accelerator operations beyond necessity for pleasant driving and at the same time to reduce fuel consumption by more than 10% over its preceding 2.0-liter engine.

Fuel consumption is affected even by driver's environmental awareness. The "info-ECO lamp"^{*1} available on the FORESTER and the "Eco-gauge"^{*1} on the LEGACY since 2006 are used to



remind drivers of fuel economy whenever they are behind the wheel. The “SI-Drive”^{※2}, which enables drivers to select one of the 3 drive modes with a click of a dial, is also installed on all the latest LEGACY models^{※3}. For example, the “Intelligent mode” which allows most economy-minded operations is suitable for driving in traffic jams and on city streets.

The development to deal with environmental needs such as less fuel consumption and emissions is also one of the items to address with the highest priority. Taking into account costs and labor required, we optimized the vehicle as a whole by prioritizing the allocation of development resources for environment while cutting costs in other areas of the overall development process.

The development prototype vehicles were reviewed to minimize costs and wastes disposal after use and their quantity and equipment were carved down to the minimum. For instance, some prototypes have their paint primer and top coatings discontinued for cutting costs to the hilt. Including reuse of one prototype for as many tests as possible, we did our utmost effort to do the same job with half number of units as compared with the outgoing model.

DNA of LEGACY is inherited to next-generation

LEGACY series were awarded a prize of “Best Value” in “Car of the Year Japan 2009-2010” award. We were given a credit for holding the price with various performances and the added val-

※1 info-ECO lamp , ECO Gauge
A meter which indicates an economic driving condition to the driver.

※2 SI-Drive
The 3 models provided are selectable with a flick of a switch to allow drivers to run as they like or suitable for driving scenes. (Intelligent mode, Sports mode, Sports Sharp mode)

※3 ECO Gauge is employed for all overseas and domestic vehicle. SI-Drive is for domestic vehicle.

Enlarged base engine to 2.5-liter

The 2.0-liter engine was discontinued from the lineup and instead 3 types of engines: 2.5-liter NA and turbo engines better suited for larger body and higher rank and a 6-cylinder 3.6-liter NA engine (for OUTBACK only) are available. All these engines meet the level of emissions down by 75% from the “2005 Emission Standards”. In particular, the turbo engine has its structure thoroughly revamped for both powerful driving and environmental performances.



Lineartronic

The world-first chain drive CVT (Continuously Variable Transmission) was mounted on its longitudinally laid-out AWD. Although being compact, it allows a wide shift range to enhance torque transmission efficiency. Through coordinated control with the engine to keep optimal engine efficiencies, natural driving while saving energy has become a reality.



A prize of “Best Value” in “Car of the Year Japan 2009-2010” award.

ue improved. We believe that the fact that the “Best Value” was awarded to us when hybrid vehicles are paid much attention at large, demonstrates that SUBARU-like sincere and persistently honest efforts finally bore fruits. A year has passed since its debut in the market. The 5th-generation LEGACY enjoys exceptionally good response from customers for its ride comfort, interior space and fuel economy.

Without any exception, the 5th-generation LEGACY has its performance and technology enhanced year after year. Accumulation of such enhancements and succession is the history and value of the LEGACY. “Hybrid” will defy any bypassing or ignoring in the tide of the times. How to get the good points of hybrid and our unique engineering expertise united and embody a specific shape with “making cars fun to drive” in mind is the challenge we are facing. We keep going to create better vehicles which will be appreciated by customers by heeding faithfully their voices.

Preventing Global Warming with Clean Energy

Eco Technologies Company of SUBARU, making use of the engineering expertise nurtured at Aerospace Company, develops wind power generation systems. We believe that it is our mission as an automobile manufacturer to get involved in environmental protection through products, in the midst of global attention focused on the potentiality of clean energy. Here, we interviewed project members and asked on the background of product development and their thoughts and aspirations.



Eco Technologies Company
Wind Power Generation Project
Tsutomu Ono

Eco Technologies Company
Wind Power Generation Project
Project Manager
Takashi Shiraishi

Current Situation of Wind Power Generation System

Lately, natural energy business has attracted attention for its potentiality from a viewpoint of protection of resources and energy and protection of the environment. Meanwhile, while such business is viewed mostly as not economically feasible, wind power generation is said to be the only viable one.

Wind power generation started in the 19th century in Europe. Geographically endowed with vast land and plentiful winds, Europe has led the world's wind power generation. At present, as Japan imports 80% of its wind generators, we have been anxious to enter such market that heavily relies on imported generators as a do-

mestic manufacturer. However, there are difficulties involved to do so because of inherent climatic conditions. Japan, being a country where plain fields are limited with lots of hills and mountains, also is one of countries most frequently hit by heavy lightning strikes. These adverse conditions thus posed unavoidable challenges to face with to enter the wind power generation business.

Applying Existing Technology to New Business

Originally, it started as a small group activity by young members to develop new products. After many trial developments, they came up with a wind power generation system for commercialization. A project kicked off with a

few members accumulated fundamental technical expertise through study meetings and joint researches with a university.

It takes highly sophisticated electronic control technology to run wind power facilities. To say nothing of generators and blade angles, electronic control technology is required for a remote monitoring system to measure electricity and force of wind because of their unmanned operations. Such technology could basically be dealt with by applying aircraft technology. In addition to blade manufacturing technique and fluid dynamics, such expertise as electronic control and electrical generation necessary for wind power generation was readily available in our aircraft technology.

A system operating rate of 95% is



**2MW-class Power Generator
Rated Output SUBARU80/2.0**

The 2MW-class large-scale wind power generation system produces electricity as the rotor which measures 80 meters in diameter with three blades rotates.

*The left photo shows the parts of large scale generator, Nasser.

required for a large-scale wind power generation. Keeping such high ratio means it cannot be stopped for more than 1.5 days a month. For this reason, we are now in the process of preparing a system which can determine proper replacement timing of oil and components for preventative maintenance with highly sophisticated failure diagnostic functions. Such engineering expertise has been stepped up year by year, dictating constant technological innovations to us.

Developing Reliable Products for Next Steps

We currently deliver products mainly to the domestic market. There were many hurdles to be cleared to venture into a new business. To overcome

major technical difficulties, for example, we studied the effect of complicated terrains on wind conditions for forecasting by fluid calculation and conducted fatigue strength analysis. As a result, we came to learn the advantage of the downwind method with the rotor positioned behind the tower for higher output as wind hits the blades from the front. The climate inherent to Japan was also focused on in the product development. We are one of the few manufacturer who used a design method to prevent the propeller from cracking or its tip from being blown off when struck by a strong lightning. As a new field, wind power generation on the ocean is being contemplated. Developing products which expend minimum ocean resources out of consideration to the impact on the marine life is our target. The wind power generation business is one of trump cards against global warming. We will carry on with the business of large-scale wind power generation system to provide natural energy in a sustainable manner.

As a transportation equipment manufacturer, we have to fulfill our responsibilities for environmental issues such as reduce exhaust gas or improve fuel economy. The development of a large-scale wind power generation system has a new potential to help us fulfill our responsibilities as a maker. A day may come when our electric vehicles are run with the electricity produced with our large-scale wind power generation system. We will commit ourselves to being a manufacturer who steps forward by discharging our responsibilities to coexist with nature and environment.



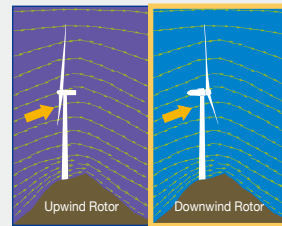
Eco Technologies Company
Wind Power Generation Project Project General Manager
Hidetoshi Muramatsu

A measure to solve global energy and environmental problems is to highly utilize regenerative energy. We at SUBARU intend to contribute to the society and the environment by offering not only products that use energy, but also those that generates energy. One of the approaches along this line is the "wind power generation". We will strive to create a society which is friendly to the environment and sustainable through widespread use of the SUBARU downwind wind mill.

**Characteristics of SUBARU80/2.0
Wind Power Generation System**

[Adoption of downwind rotor]

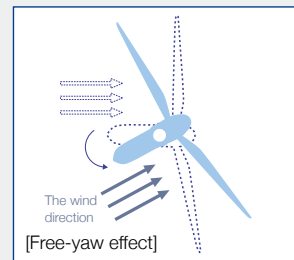
The downwind method is the type of downwind rotor to absorb wind power efficiently with wind off topographical configurations. In general, the rotor is directed upwind, but SUBARU adopted the downwind rotor method in order to make the Wind Turbine System suitable for the Japan's topographical configurations like mountains and hills.



A Wind Turbine Suitable for Japanese topographical configurations

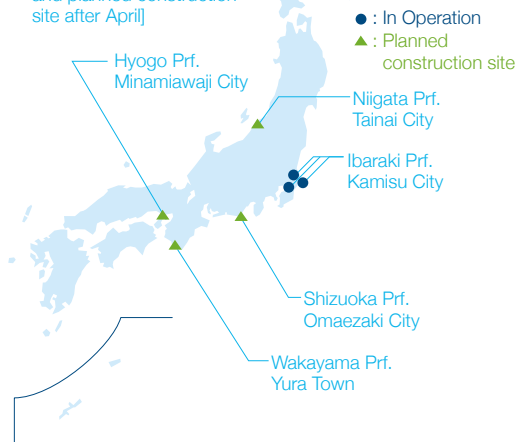
[Free-yaw effect]

A downwind turbine has the free-yaw effect which works to direct the rotor downwind naturally like a case of weathercock. When hit by storms, it can pass off wind naturally, and safety is assured.



**SUBARU80/2.0
Wind Power Generation
System**

[Actual status by March 2010 and planned construction site after April]





Feature Article 3

Acquisition of Eco-Action 21 certification
 ~Dealerships in Action~

Environmental Activities Change Pattern of Behavior



President Mr. Kodaira (Right) receives certification form by the Chamber of Commerce Executive Director, Mr. Koseki (Left)

March 18, 2010 TOCHIGI SUBARU,INC. acquired “Eco-Action 21^{※1}” as a part of environmental activity. With the rising environmental consciousness among customers, we have entered the era when engagement with the environment at offices and service shops is called for while ecological vehicles are gaining popularity. Here, we interviewed 6 people who were deeply involved in acquiring the Eco-Action 21 certification.

* Information on certification acquisition at other dealerships is provided in page 62.

With Acquisition as Starter, Environmental and Sales Activities to be Accelerated

For TOCHIGI SUBARU,INC. that handles automobiles, grappling with environmental issues, we believe, is an important responsibility. We decided to get this Eco-Action 21 certification not only with a view to cut expenses, but also as a part of environmental activities each employee had to take part in. Once decided, at regular meetings where chiefs of outlets and those in charge at departments, how to proceed and numerical target of each outlet, roles of each department and others were

discussed. What were concluded at these meetings was cascaded to each outlet for infiltration.

Acquisition of the Eco-Action 21 certification is not the goal, but rather the point we should start from. What is at stake is how much we can accomplish before audits which come one year or two years after. To make ourselves deserve the certification, we will set various activities in place and work out a system to get a PDCA circle rolled by all of us. In addition, from a standpoint of local contribution, we will get ourselves involved positively in cleaning campaigns by local communities.

Above all, we believe that selling environmental-friendly vehicles is the best con-



tribution we can make as a sales company of automobiles. While counting on some positive impact of the Eco-Action 21 certification, we will take act more proactively to appeal to customers.

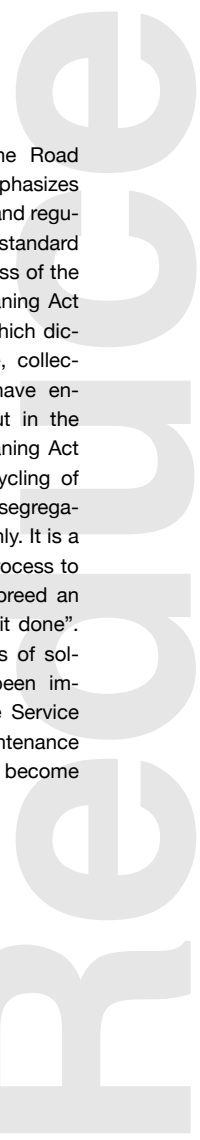


Executive Vice President
 Sadao Tani



General Administration Dept.
 General Affairs Sec.
 Manager
 Shigemi Shibazaki

※1 Eco-Action 21
 The environment management systems mapped out by the Ministry of the Environment based on ISO 140001.



Reviewing Approaches for Further Progress

TOCHIGI SUBARU,INC. has been taken a part of the environmental activities for a long time. They clean up their maintenance service shop every morning and pay full of attention when they handle solvents and gasoline based on the Fire Service Act and Water Quality Pollution Control Act.

We once thought that obtaining the Eco-Action 21 certification would require observing various laws and regulations stip-

ulated by the government much more closely than before. It turned out, however, infiltration of the need for the certification into the minds of employees went more smoothly than we anticipated since we only had to add a few new approaches to the base we already had and observing strict laws was nothing new for us in doing business.

The new approaches gave us a good opportunity to review our behavioral patterns.

We have been working with the Road Trucking Vehicle Act which emphasizes safety and compliance with laws and regulations of vehicles as a guiding standard and now the level of consciousness of the Wastes Disposal and Public Cleaning Act as well as the Fire Service Act which dictate proper segregation, storage, collection and disposal of garbage have enhanced. The segregation set out in the Wastes Disposal and Public Cleaning Act is mainly aimed to promote recycling of wastes. If some one ignore such segregation, the law is to exist in name only. It is a wonderful thing to see that the process to get the certification has helped breed an awareness of "it takes all to get it done".

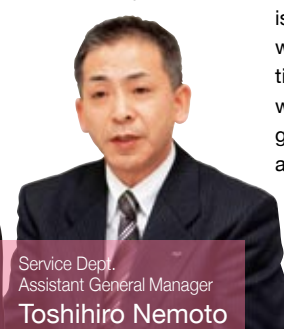
Storage and control methods of solvents and gasoline have been improved by learning the Fire Service Act. We feel that our maintenance service shops will also become cleaner than ever before.



Service Dept.
Engineering Sec.
Manager
Katsuhisa Nakata



Senior Director
Masao Itou



Service Dept.
Assistant General Manager
Toshihiro Nemoto

Result from the Record and Challenge

We have been tackling for some time past with saving energy, for instance, by grasping figures of consumption of electricity and gasoline for comparison with those for the prior year.

Since setting out to grapple with obtaining the Eco-Action 21 certification, such figures have been documented. The record made us surprised to see energy consumption clearly going down.

The report compiled in January and February this year, as compared with the one

made before the activities to acquire the certification started, indicates larger reduction. This is the result of the accumulation of small but dedicated efforts of employees to minimize consumption by taking such actions as turning off lights and computers whenever possible. Since there still remains much room for improvement, we will step up our efforts to better the environment in the future.



General Administration Dept.
Accounting Sec.
Manager
Kazuyoshi Oohashi

Voice

To spread the importance of the activities, I created posters which show how to separate waste, and put on the office and near garbage cans. It makes easy to understand for everyone.

I feel this is not enough, so furthermore I would like to spread environmental activity in various ways.



General Administration Dept.
General Affairs Sec.
Eri Kasuya



Comments from the Chamber of Commerce and Industry

There was no problem whatsoever at the review since all the people had worked together as one team for the certification. From this point on, we would expect them to evaluate the process they went through and result,



Utsunomiya Chamber of Commerce
Administration Officer
Eco-Action 21 Regional Office Tochigi
Executive Director
Hideaki Koseki

What we found different from others at TOCHIGI SUBARU,INC. was their bottom-up approach. We think that their effort to create an atmosphere "Let's get it done together!" led to getting all employees involved as a matter of course. I wish them to keep going with such a wonderful sense of unity.



Utsunomiya Chamber of Commerce
Administration Officer
Eco-Action 21 Regional Office Tochigi
Tadatashi Kurogo

■ **Background and Meaning of Integrated Certification**

SUBARU Aiming for Unified Management, Consistency and Streamlining of Environmental Activities

We have so far acquired the ISO 14001 certification at 5 sites to stage their own activities. There had been an idea to get integrated certification for some time before. The economic crisis in the fall of 2008 set a stage for through review of all business activities including the EMS. Taking this as a good occasion, we initiated a movement toward integrated certification for more efficient and reasonable EMS. Members of the promotion offices brainstormed some creative ideas and intensively discussed them, which successfully led to setting up a new EMS in place expeditiously in a short period of time. We were given high marks for the system by the examining authority as evidenced in its statement saying that SUBARU had been making effective use of the integrated EMS on an ongoing basis.

■ **Taking Part in Acquiring Integrated Certification For Operation-based Approaches to Environment**

In the Gunma district, they went through the examination for integrated certification including ISO 9001. Once ISO 14001 certifications get integrated into one company-wide, we can equalize intensity levels of involvement and save management man-hour. Since the Gunma district has a large work force of more than 8,000 people, we had difficulties to get all personnel thoroughly informed of all sorts of things including changes of procedure documents and examining institution.

There were voices asking for environmental activities closely associated with their operations. Such voices will also be focused on under the integrated system in the future.



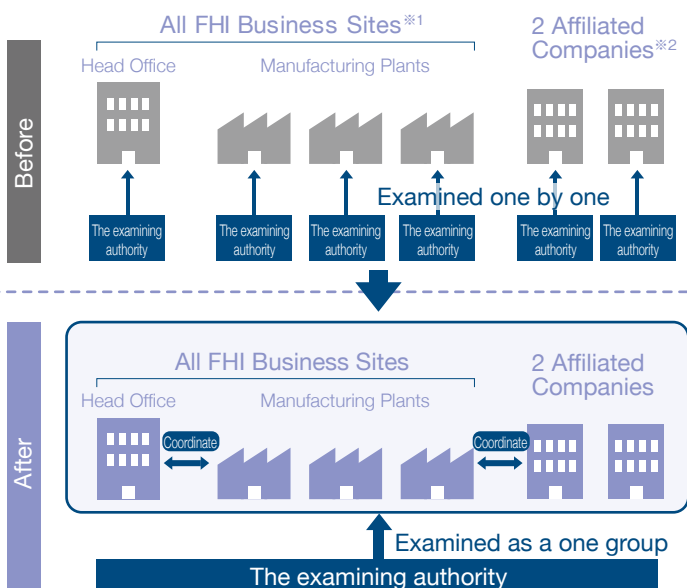
Gunma Manufacturing Division
General Administration Dept.
Environment Sec.
Masahide Takahashi

Feature Article 4

Establishing Reasonable Environmental Management System through Integrated Certification

Acquired ISO14001 Corporate as the First Car Manufacturer.

Fuji Heavy Industries Ltd. labored to get integrated ISO 14001 certification for more streamlined promotion of Environmental Management System (EMS hereafter) already authenticated at 5 business sites: Head Office and in Gunma, Tokyo, Utsunomiya and Saitama. We introduce the promotion office members who were deeply involved in integrated ISO14001 certification.



The EMS integration promotion office members

*1 All FHI business sites
Head Office, Gunma Manufacturing Division, Tokyo Office (Automobile business unit), Utsunomiya Manufacturing Division, Handa Plant, Handa West Plant (Aerospace Company, Eco Technologies Company), Saitama Manufacturing Division (Industrial Products Company)

*2 2 Affiliated Companies
Yusoki Kougyo K.K. (President & CEO : Mr. Haruyoshi Saigoku Head Office: Aichi Prf. Handa City)
F.A.S Inc. (President & CEO : Mr. Yukio Kimura Head Office: Tochigi Prf. Utsunomiya City)

Improving Education of Employees to Facilitate their Involvements

On the occasion of the integration, we reviewed the education of employees also from a company-wide perspective. The curriculum will be streamlined in FY2010 to raise the awareness level of employees. Regardless of which business sites employees are transferred to, it is expected that they will be able to direct their consciousness to EMS and environmental activities all the more under the integrated system.



Gunma Manufacturing Division
General Administration Dept.
Environment Sec.
Kazuki Sorimachi

Environmental Policy and Targets Clarified Company-wide

The environmental activities tended by 4 organizations reflecting their respective cultures were unified under the SUBARU brand, which resulted in orienting their activities in the same direction. A one-page rule using A3-sized sheet of paper was brought in for any documentation. Now with the company-wide policy and targets clearly identified, we think, we have succeeded in setting up a system which allows us to think and act on our own.



Utsunomiya Manufacturing Division
General Administration Dept.
General Affairs Sec.
Youichi Tanaka

Change of Mindset Indispensable for Meaningful Activities

I was assigned to handle ISO 14001-related issues from March in addition to my duties associated with ISO 9001. The predecessor told me that he began to see what we should do now and in future. His comment, I think, implies that it boils down to how to proceed from this point on to change the mindset or awareness of each employee for meaningful activities under the integrated EMS.



Saitama Manufacturing Division
General Administration Dept.
General Affairs Sec.
Kazuhiro Kobayashi

Integrated Certification

Integration of EMS and QMS for Efficiency Enhancement

The examination of Tokyo Office went very smoothly since the same institution served as examiner as it did for individual certifications before. Also, we could manage to integrate in a timely manner EMS and QMS (Quality Management System), which had been an issue since the acquisition of certification. Further integration of EMS and QMS will be pursued so that we could appreciate substantive enhancement of efficiency.



Tokyo Office
General Administration Dept.
Environmental Affairs
Promotion Office
Hiroshi Sasahara

Customer-oriented Environmental Activities

Exchanging information with promotion offices of manufacturing sites was quite productive. I feel that our company-wide approaches provided an opportunity to make our people more aware of customers. Tokyo Office will orient its approach with that of Gunma Manufacturing Division which belongs to the same automotive business unit for a more streamlined management system.



Tokyo Office
General Administration Dept.
Environmental Affairs
Promotion Office
Yoshifumi Aizaki

Raising Environment Awareness at Head Office Away from Manufacturing Plants

Interpretation of the word "environment" is different from person to person. What came to my attention through working for the integration was the high level of awareness toward the environment among members of the promotion offices. The level of awareness of people at the head office still stays low as compared with those at plants since they are less exposed to plant operations. I take it my role to make them at the head office realize the importance of unified approaches together with the people at work sites.



General Administration Dept.
Environmental Affairs
Promotion Office
Noboru Hayasegawa

Future Issue and Outlook

System to Help Employees Engaged

The main issue in future is to draw out tangible results out of the integrated certification. This requires commonization of working mechanisms and improvement of education, internal auditing and manuals. While contributing to the business management from a perspective of environmental management as the promotion office, we will step up the level of our capacities through series of discussions to make the management system easy for employees to get engaged.



Corporate Planning Dept.
Tsukasa Shinohara

Promotion for Enhanced Efficiency and Spread in Steps

The company-wide integration of EMS has allowed us to upgrade our operations to shift from local to total optimization, making it possible to share all types of information. This means that any risk is not an issue of one particular business unit any more, but rather is deemed as the one to be addressed by the whole group. In other words, global warming and emission trading must also be coped by all of us, taking it as our own responsibilities. We will press ahead for further efficient and streamlined operations by boosting the integration to a higher level while working to get domestic group companies and overseas business units integrated as well.



CSR-Environmental Affairs
Promotion Office Manager (at that time)
Tatsuya Suzuki