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Basic Survey Project for Joint Implementation, etc.

Feasibility Study on Effective Use of Energy in the Cement Manufacturing Process in Thailand

NEDO Entrusted Project

Introduction

In December 1997, the 3rd Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP3) was held in Kyoto, Japan. The adopted Kyoto Protocol aims to reduce mean emissions of greenhouse gases of the developed countries, including CO_2, by at least 5% below their 1990 levels in the period 2008 to 2012. Japan sets its goal at 6% reduction.

The Kyoto Protocol also provides measures to enable flexibility in achieving the above goal: Joint Implementation (JI)*1 for sharing reductions of greenhouse effect gases among developed countries through specific international projects, and the Clean Development Mechanism (CDM)*2 which will be implemented by both developed and developing countries. Japan also aims to achieve its goal through positively utilizing these measures.

The "Basic Survey Project for Joint Implementation, etc." is a feasibility study project which NEDO (New Energy and Industrial Technology Development Organization) consigns to Japanese foundations aiming to reduce emissions of greenhouse effect gases by applying Japan's energy-saving technology and oil alternative energy technology to contribute to the sustainable economic development of a partner country. NEDO aims to identify promising projects that can be related to Japan's JI or CDM in the future through these feasibility studies.

1. Survey outline and objective

ICETT, entrusted by NEDO, has implemented the "Basic Survey Project for Joint Implementation, etc." on "Effective Use of Energy in the Cement Manufacturing Process" in 2000. One objective of the survey was to study the feasibility of reducing emissions of greenhouse gases and manufacturing costs by transferring Japan's energy-saving technology to the cement industry in Thailand, one of their highest energy-consuming industries. The other objective was to study the feasibility of its being certified as a future CDM project.

More specifically, we studied existing energy consumption at the production plants of Siam Cement Industry Corporation, the biggest cement manufacturer in Thailand. We then proposed the introduction of gas turbine generators from the view of effective use of energy, and confirmed the effects on energy saving, CO_2 emissions reduction, and profitability. The white cement plant we surveyed is located in the Khao Wong Area in the Province of Saraburi, approximately 150 km northeast of Bangkok. Many cement plants are built in this area because of the good quality limestone produced there.

Fig. 1 Location of the cement plant

Photo 1 White cement manufacturing plant

*1 A credit for emissions abatement is given to an investor from a host country as a result of a collaborative project for reducing greenhouse effect gases between developed countries. There is no change in the total emissions commitment of developed countries.

*2 A cooperate mechanism that enables a developed country to acquire the same volume of emissions as achieved through a greenhouse effect gas emissions abatement project implemented in a developing country. The developed country can add this reduction to achieving their goal, and the developing country can benefit from new investment and technology transfer.

2. Survey period and activities

Field surveys were implemented three times as follows:

1st survey	August 30 ~ September 8, 2000	Survey of the existing state of plant equipment and operations
2nd survey	November 14 ~ 23, 2000	Proposal on equipment improvement, and presentation of energy-saving amount, CO_2 reduction amount, etc.
3rd survey	February 5 ~ 10, 2001	Explanation of survey results, and further survey to supply a lack of data

A survey team was formed with the cooperation of cement manufacturing engineers, gas turbine engineers, and energy-saving engineers.

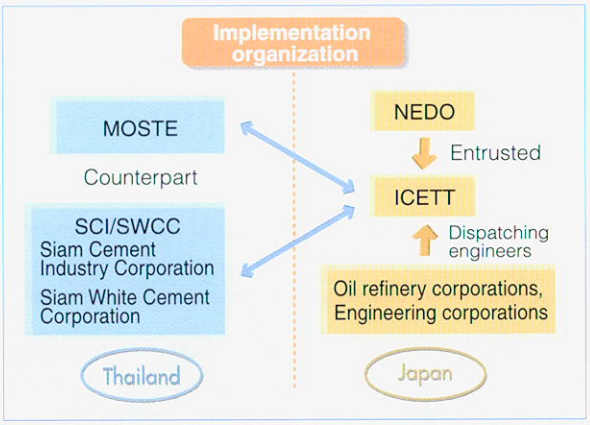


Fig. 2 FS Implementation Organization

3. Survey results

(1) Outline of proposal made

Based on the survey results, ICETT made a proposal on introducing gas turbine generators in the white cement plant and efficiently using the generated power and exhaust gas heat to save energy and improve productivity in the following ways:

1) Using generated power as an alternative to power at present purchased from outside.
2) Installing a heat exchanger to preheat air for kiln combustion to reduce consumption of kiln fuel (fuel oil).
3) Installing a preliminary incinerator for partially burning cement raw materials before burning in the kiln to reduce kiln fuel consumption.

ICETT has verified the effects of introducing the above proposals with respect to equipment investment, energy-saving, CO_2 reduction, and profitability, and also surveyed the effects, where feasible, of extending the same approach to the rest of the cement industry.

(2) Energy saving and CO_2 reduction

Calculations revealed that the annual energy saving would be about 1,200 tons (oil equivalent), commensurate with a reduction in CO_2 emissions of about 8,000 tons as shown in Table 1. Equipment investment would be about 300 million bahts (about $6.5 million). Equipment modification would increase cement production capability by 18%. If a portion of the equipment investment equivalent to this increased capability is deducted from total equipment investment, the equivalent equipment investment would be 154 million bahts (about $3.1 million), an amount recoverable in about 5 years. Accordingly, this can be recommended as an advantageous investment for Siam Cement Industry Corporation.

Table 1 Expected energy saving and CO_2 emissions reduction as a result of implementation of the project

Item	Energy-saving (toe/y)	CO_2 emissions reduction (t-CO_2/y)
Fuel oil for kiln	1,320	4,233
Purchased power	7,507	21,534
Fuel gas for gas turbin	-7,621	-17,812
Total	1,206	7,955

Energy saving of about 6% of annual fuel oil consumption of about 19,000 tons, and CO_2 emissions reduction of about 10% of the present emissions of 77,000 tons are achievable. These values may be small compared to Japanese CO_2 emissions of 1.2 billion tons. (1999). However, they are significant if it is assumed that this technology will be more widely adopted in Thailand.

(3) Funding plans and approval for the Clean Development Mechanism

The FS survey does not consist exclusively of a survey. The most important issue of this FS survey is to examine how funding for actually implementing the project can be raised and the possibility that the partner country will approve it as a CDM. If the project is approved as a CDM project, CO_2 emissions reduced through this project can be counted as a reduction achieved by Japan.

If Thai corporation cannot raise sufficient funds for upgrading their equipment, they may utilize Japanese funds (such as in the form of yen credits), which allows the project to be approved as CDM in the future. If Thai corporation raises funds on their own, there is no need to certify this project as a CDM. The specific design of CDMs was discussed at COP6 (in the Netherlands and Bonn) and COP 7 (in Morocco).

5. Future prospects

Thailand has not yet completely overcome the 1998 Asian economic crisis, so the demand for white cement is still low. Accordingly, present conditions do not allow the project to be implemented immediately. In addition, gas pipelines for supplying gas turbine fuel are not built into the plant. The project is thus also not feasible for immediate launch for reason of insufficiently developed infrastructure.

However, when the recovery of the Asian economy indicates encouraging prospects for increased white cement demand, the implementation of this project, including the building of infrastructure such as gas pipelines, which will result in increased production capacity, will look more practical. ICETT will focus on the following points and maintain contact with relevant organizations in preparation for starting up the project. When the time comes, we will liaise with supporting companies to give advice on funding, etc.

(1) Gathering information on developments within the Siam Cement Industry Corporation that might lead to startup of the project, and the CDM approval system of OEPP (Office of Environmental Policy and Planning) which is the organization in charge of CDM in Thailand. OEPP is a subunit of MOSTE (Ministry of Science, Technology and Environment).

(2) Gathering information on CDM including COP, and providing such information to Siam Cement Industry Corporation.

Training for "Fostering personnel for establishing an environmental management system in Tianjin city, China"

1. Introduction

Tianjin city, the friendship city of Yokkaichi city, is enjoying rapid economic growth, but at the same time, adverse environmental impacts, such as air pollution, are worsening faster than countermeasures can be taken for protecting the environment, and implementation of effective measures has been delayed for economic, technical, and manpower reasons. Accordingly, ICETT, entrusted by Yokkaichi city, has been providing training programs on air pollution control technology, water pollution control technology, urban pollution control technology, measures against vehicle gas emissions and measuring technology, and waste treatment and recycling technology since 1993. This year, we provided training on an environmental management system to six officers from Tianjin from October 1 to 19, 2001.

2. What is an environmental management system?

The ISO14001 environmental management system refers to an approach to working on environmental issues that can be adopted by individual organizations or companies. By implementing the system, the organization can continuously and successfully reduce its environmental impact.

ISO14001 is characterized by

1) a global standard that removes trade barriers;
2) incorporation of environmental considerations in the organization's management;
3) assurance of continual improvements for conserving the global environment;
4) a top-down system;
5) efforts spent on environmental conservation by the entire organization;
6) further improvement in information disclosure and transparency in organizational activities;
7) a system that always takes interested parties into account;
8) the basis for the LCA (Life Cycle Assessment) concept; and
9) placing importance on waste control as well as reduction of contaminants, and the promotion of resource and energy saving.

Typical environmental conservation activities by local authorities are:

1) eco office programs;
2) environmental considerations in individual activities; and
3) thorough consideration of the environment when implementing policies.

3. Training program

This particular training course consists of four sessions: 1) overview, 2) practical exercises, 3) environmental management at corporations, and 4) summary. Each session is detailed in the Table below.

Session	Description
1) Overview	The history of pollution control in Japan; the outline of the environmental management system (EMS); the experience of Yokkaichi City in obtaining ISO14001 certification; environmental education; and environmental monitoring systems
2) Practical exercises	Identification of environmental aspects; environmental evaluation, building the system; and preparing manuals
3) Environmental management at corporations	Case studies of manufacturing of electrical appliances, cars, and thermal power plant; development of environmental measuring instruments; and environmental accounting
4) Summary	Presentation of action plan

Photo 1: Learning about environmental monitoring instruments

In the overview session, participants learned about the experience of Yokkaichi in obtaining ISO14001 certification and their future plans, ISOP plan to extend the concept of EMS (environmental management systems) to the home, the need to study environmental issues, a case study of environmental education in civic activities, and the need to introduce environmental accounting and its methods. In the practical exercise session, which lasted three days, participants gained practical expertise in how to obtain ISO14001 certification. In the session on environmental management at corporations, participants visited corporations and studied their experiences of obtaining the ISO14001 and ISO9002 certifications, advantages gained in terms of reduced costs, pollution control technology, and the pollution control agreements at each company. In the final session, the participants made a presentation on an action plan for publicizing the advantages of ISO14001 in Tianjin city. Their action plan stated that the local government of Tianjin should take the lead in obtaining ISO14001, and then they should in turn encourage corporations to obtain ISO14001 based on their experience.

Photo 2: A visit to a coal-fired thermal power plant

A very full schedule was set up for the training course. The first half centered on lectures and practical exercises at ICETT, and the last half comprised visits to corporations in Kyoto and the Chukyo area which surrounds Nagoya city. Despite their intensive schedule, participants took part in active discussions during the lecture sessions and site tours. In particular, the participants showed great interest in the following subjects: YSO (the Yokkaichi version of EMS, for first obtaining ISO14001 at offices in Yokkaichi City Hall and extending this qualification to all public facilities in the city); the ISOP plan (the civic version of ISO, to encourage environmental management in households); environmental education; air and water quality monitoring devices; environmental accounting; dustproofing in coal storage areas in coal-fired power plants; and measures to control vehicle gas emissions. During their stay in Japan, the participants were able to experience some traditional Japanese culture through a trip to Ise Shima and Kyoto, and a Koto concert given by volunteers.

Follow-up Project to Environmental Technology Transfer to China

Background and objectives of the project

ICETT, since its foundation, has been hosting public officials and company employees from overseas countries and providing training to promote industrial technology transfer leading to global environmental conservation. As of the end of March 2001, we had provided training to 1,180 people (excluding participants to overseas seminars) from 57 countries. Of this number, the largest cohort (210 participants) came from China.

ICETT has thus recognized the need for a follow-up project in China to support ICETT alumni and collect ideas for further improving our future training programs. This project, supported by the Japan KEIRIN Association, was planned and implemented as one of our projects in 2001.

Outline of the project

Our Chinese alumni are at work at many cities over China. In this project, we surveyed officers and company employees in the four cities of Chongqing, Guiyang, Dalian, and Beijing. These four cities are also target areas for our "Training for Pollution Control Manager System", started in 2000 and entrusted by JICA. Accordingly, we made a survey forcusing on the programs implemented by our alumni and the progress they have made in applying what they learned during training, based on the action plan each participant made at the end of their course.

The survey took the form of interviews with the alumni and included information-gathering from companies and administrative organs where they work concerning local environmental information, application of training achievements and their inclusion in environmental policies. We asked the outside specialists listed below to accompany us and provide new environmental information and discuss about environmental management for China. The outside specialists provided information, in the form of seminars, on advanced environmental conservation programs at corporations, and on soil pollution, which is becoming a public issue in Japan.

Specialists	Satoshi Koyama	Environmental Specific Sub Manager, Inabe plant, Toyota Auto Body Co., Ltd.
	Yoshio Aikawa	Assistant to the General Manager, Environmental Administration Dept., Mitsubishi Materials Corporation
Survey period	July 7 ~ 19, 2001	Beijing, Chongqing and Guiyang
	July 29 ~ August 1, 2001	Dalian

Survey results

Beijing

A training alumna working at The Sino-Japan Friendship Centre for Environmental Protection* in Beijing has sent out a questionnaire to corporations in China, implemented site observation, compared observation results with those for companies that visited in Japan for training, and made a report on a pollution control manager scheme matched to conditions in China.

*The Sino-Japan Friendship Centre for Environmental Protection

A facility built using grant aid from the Japanese government and funding from the Chinese government in commemoration of the 10th anniversary of the Japan-China Friendship Treaty. It is a general research and management center, directly managed by the State Environmental Protection Administration. It was inaugurated on May 5, 1996. The Center carries out research and designs strategies to prevent air and water pollution, provides environmental training, etc.

Chongqing

A training alumnus who works for the Chongqing Environmental Protection Bureau has taken the initiative in determining the implementation of the "Corporate Pollution Control Manager Scheme". Trial application at three model companies started from May 2001. He pointed out the following problems in implementing trial application: limits of ordinances by local government; lack of an established qualification-acquiring system; lack of an implementation system and capability of the company itself; cost increase caused by implementing the scheme; etc. He has primarily emphasized the difficulty in gaining the understanding of corporations because the scheme is not yet legislated. Another training alumnus working in a company in Chongqing has promoted thorough 5S: Seiri (arrangement), Seiton (tidiness), Seisô (cleaning), Seiketsu (cleanliness), and Shitsuke (discipline) in his company; explained the need to reduce the quantity of waste generated during production processes at workplaces; and introduced measures to control wastewater.

Photo 1: A visit to a motorcycle plant of China Jialing Industrial Co., Ltd.

Guiyang

At Guiyang, an alumnus has reported on information he learned in Japan, including the pollution control manager system and environmental management at the Guiyang Environmental Protection Bureau and related corporations. Another alumnus working at a company in Guiyang has made an effort to set the environmental policy for his company, and is making progress in increasing the environmental consciousness of the employees.

Photo 2: Environmental policy at a cement plant in Guiyang

Dalian

Taking advantage of the fact that one of their officers participated in the course, Dalian Environmental Protection Bureau is now studying the progress made in introducing the pollution control manager scheme by the State Environmental Protection Administration of China and Chongqing City. They will further work on introducing the scheme.

Summary

(1) Several cities in China are now working on introducing a system equivalent to the pollution control manager system in Japan. Accordingly, training on the advantages of the pollution control manager system in Japan and precautions when introducing and applying the system were provided at the right time, and are being effectively utilized in their programs.

(2) The training alumni are also actively taking action to apply the environmental management technology introduced during the course.

(3) In China, the pollution control manager system needs to be proposed and approved by the Chinese government as a national scheme after trial applications have been tested at the regional level. Accordingly, the need to provide training in Japan to other cities was pointed out.

(4) Training alumni made requests to include case studies on the scheme when applied in small- and medium-sized companies as well as in large companies, and suggestions to introduce the scheme in China in the training. ICETT will include these requests in future training programs.

Research Development Project

Technological Development for Efficient Energy Use during the Melting Process for More Effective Use of Ash from Waste Incinnerators

Group d, Suehirocho Laboratory, ICETT
NKK Corp.

[Target of technical development]

Incineration ash produced by waste incineration process (ash: combustion residue, and dust: fly ash) had been subject to landfill disposal in a final disposal site, however, due to lacking capacity of the final disposal site, melting process for waste incineration ash that enables effective utilization of slag has been becoming prevalent. But with the current state of the art, molten slag is cooled by water-granulating or air-cooling technologies, thus the retained heat by molten slag is taken by cooling water and/or released to atmosphere and therefore the heat thereof is not effectively used. In addition, any technology needs energy for slag processing including crushing and rectification to use the slag effectively.

If technologies for energy saving and heat recovery are applicable to melting process which requires much energy, it seems effective to global environmental conservation and useful to further widespread use of the technologies. We focus attention on the fact that by applying an indirect cooling technology to coagulate slag on an indirect cooled metal surface, the retained heat by slag can be recovered through cooling medium and thin plate-like slag easy to crush can be produced.

In this Research Development Project, we pursued raising the efficiency of energy use in melting process for waste incineration ash by introducing a twin-roll type indirect cooling technology to the cooling process for molten slag, setting our goal of technical development on :

1) reducing and recovering energy to be consumed;

2) reducing required energy for slag processing; and

3) making the use of slag diversified and value-added to effectively use the power to be consumed by melting process.

[Detail of technical development]

As specific subjects of research and development, we carried out 1) demonstration test for a twin-roll type indirect cooling; 2) thermal conductivity theoretical analysis for recovery of the retained heat by slag; 3) slag processing test for indirect cooled slag and reference slag (water-granulated and air-cooled slag) and 4) slag characteristic test for effective use.

1. Demonstration test for an indirect cooling

An indirect cooling technology is the technology to make molten slag touch the indirectly cooled metal surface and cool. To carry out this process continuously, the twin-roll type indirect cooling equipment is available. A couple of fine copper roll of which inside surface is cooled by cooling thermal medium is placed in contact and molten slag is poured into the contact section. When rotating the rolls in reverse, slag coagulated on drum surface is rolled up continuously for cooling and solidifying.

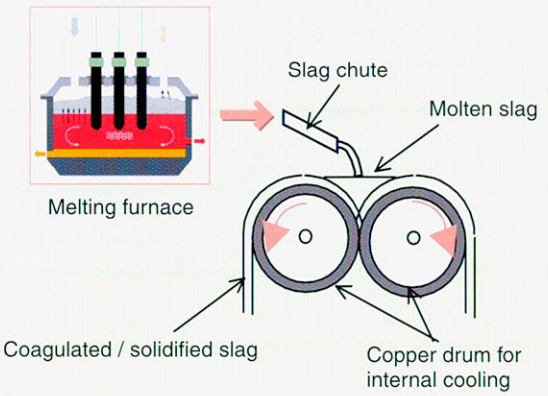


Fig. 1 Twin-roll type slag indirect cooling equipment

We manufactured a prototype of twin-roll type indirect cooling equipment of 1.5t/h and carried out demonstration test as shown in Fig. 1. Fig. 2 shows test conditions. The test result indicated that cooling heat up to 900℃ could be recovered from cooling thermal medium in the process of slag coagulation. Besides that, it became evident that the heat could be recovered as hot air from high temperature coagulated slag chip of about 600℃ if heat exchange worked.

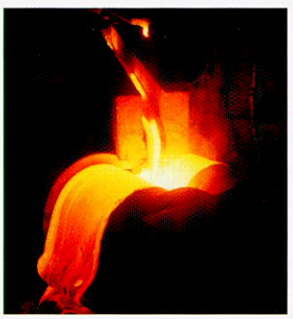


Fig. 2 Cooling test condition of indirect cooled slag

2. Heat recovery by indirect cooling technology

(1) Thermal conductivity theoretical analysis for slag coagulating section

We carried out thermal conductivity theoretical analysis for slag coagulating section. The condition of equipment was same as that of the demonstration test. Fig. 3 shows a comparison of the calculation result with experimental values. We identified thermal conductivity parameters, which indicated good agreement to temperature transition obtained in the test.

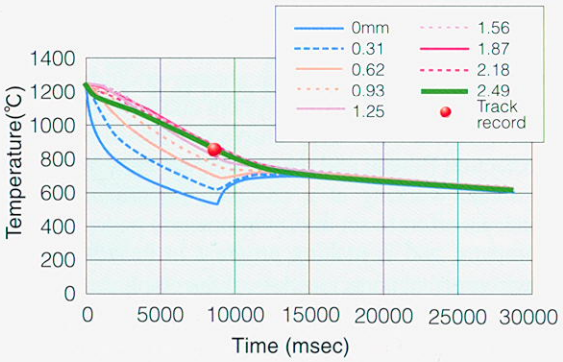


Fig. 3 Example of thermal conductivity theoretical calculation for a twin-roll slag cooling

(2) Heat recovery by slag indirect cooling

Regarding the case of using high boiling point heating medium, we calculated the recovered heat value of retained heat by slag based on the said thermal conductivity theoretical analysis. Fig. 4 shows the calculation result. It became evident from this result that in the case of slag about 3mm in thickness, about 30% of the retained heat by slag could be recovered.

Fig. 4 Calculation result of heat recovery for a twin-roll indirect cooling

(3) Heat recovery from high temperature slag chip

We carried out thermal conductivity theoretical analysis on the assumption that heat is recovered as hot air from high temperature coagulated slag chip. As shown in Fig. 5, it became evident that more than 90% of the retained heat by slag could be recovered when coagulated slag of 600℃ was treated under the condition that throughput was 1 t/h and retention time was about 1 hour.

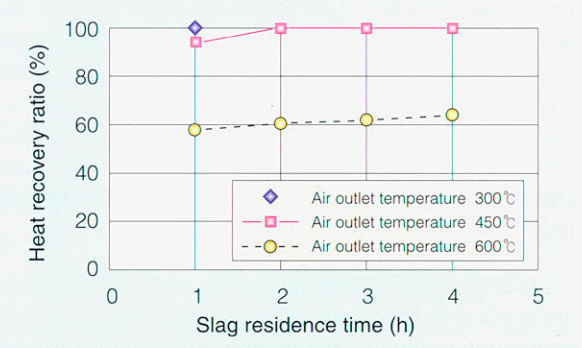


Fig. 5 Heat recovery from coagulated slag chip

3. Slag processing test

(1) Slag processing test

We carried out a slag crashing and processing test for indirect cooled slag and reference slag (water-granulated and air-cooled slag), and compared their crushing energy. With crushed particle size of 5 ~ 0mm in conformance with JIS standards concerning crushed sand for concrete within which any slag can be processed, we chose 1) a hammer crusher and 2) an impeller breaker both of which are an impulse crushing method and 3) a roll crusher and 4) a jaw crusher both of which are a compressed crushing method, and carried out the test using the commercial crusher.

As a result, it proved that crushing power of indirect cooled slag was almost equal to that of water-granulated slag, and was about half of that of air-cooled slag. In terms of an entire energy required for processing slag including conveyor and water conveyance, air-cooled slag and granulated slag consumed same amount of energy, while indirect cooled slag consumed only about 50%.

(2) Manufacturing test for high value-added slag

In order to review the use of high value-added slag, we compared conditions for manufacturing single-sized slag (5 ~ 2.5mm). The result of comparison indicated that the yield of single-sized slag (5 ~ 2.5mm) was 2 ~ 5% in case of granulated slag and 7% in case of air-cooled slag, while indirect cooled slag provided as high yield as 30%. Besides that, it proved that products screened by indirect cooling (2.5 ~ 0mm) could be utilized for crushed sand for concrete under JIS A 5005 and accordingly crushed products could be 100% used effectively.

4. Slag use test

(1) Characteristic of material

We carried out the characteristic test for roadbed material and found that the characteristic of indirect cooled slag was close to that of air cooled slag, and indicated distinct difference from water-granulated slag particularly in terms of unit weight, solid volume percentage, abrasion loss and CBR test, from which we verified that indirect cooled slag was very advantageous for effective use.

(2) High value-added use characteristic (water permeability of slag)

We tested water permeability of indirect cooled slag. As a result, we verified that one-sized aggregate (5.0 ~ 2.5mm) of indirect cooled slag had a coefficient of permeability of 4 ~ 8cm/s that is same level as natural stone, and thus it could be used as high value-added aggregate requiring permeability without problem.

(3) Slag characteristic test

In the above permeability characteristic test, a coefficient of permeability varied according to crushing method, but the particle distribution did not account for the range of variation. Slag shape may affect characteristic. Then we reviewed how to evaluate slag characteristic. Using a high-depth laser microscope, the shape of slag was converted to data, based on which particle area / particle height was calculated to provide frequency distribution of particle shape. As shown in Fig. 6, it was found that this method clarified particle shape of slag satisfactorily.

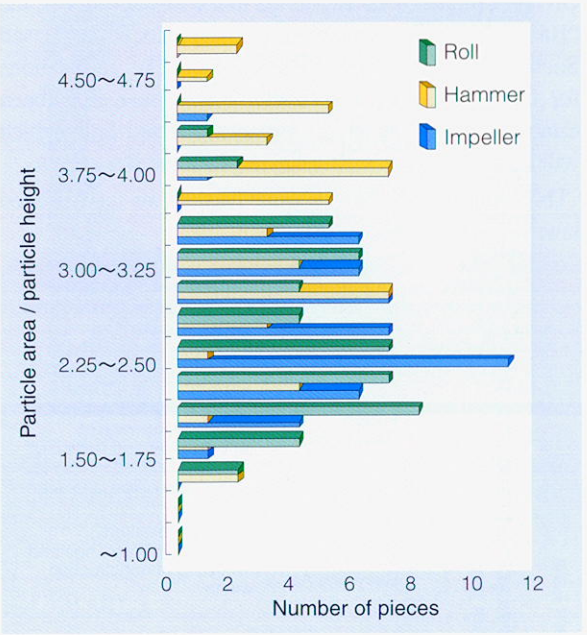


Fig. 6 Crushing method and area / particle height histogram

We compared crushed slag in this method, and as a result, we found that uniformalizing order of particle shape was 1) an impeller breaker, 2) a roll crusher and 3) a hammer crusher. 3) A hammer crusher tended to produce somewhat thin and flat particle shape. This order in shape evaluation indicated good agreement to the order of particle porosity which was the characteristic related to permeability.

Based on the above-mentioned consideration, it is verified that this slag characteristic test is applicable to the evaluation of physical characteristic caused by particular shape and therefore can be used as a measure of high value-added use.

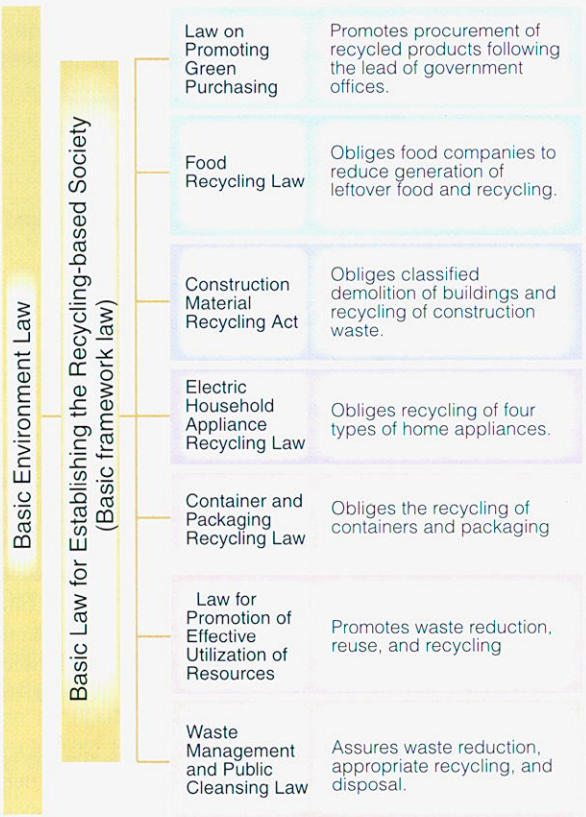
5. Conclusion

This research became an important step to further develop the equipment for indirect cooling technology

Environmental Topics in Japan (2)

To tackle recently apparent environmental problems and maintain a sustainable and recycling-based society, the central government, local governments, corporations, and citizens must all play a non-partisan role in implementing Green programs. As explained in the last newsletter, the "Basic Law for Establishing the Recycling-based Society" was approved in May 2000. The foundations for building a recycling-based society have now been established. Below is an outline of related laws which will be stipulated or revised in line with the Basic Law.

The relationship between the Basic Law and related laws are as follows.



Law on Promoting Green Purchasing

Acceptance of recycled products on the market as well as conscientious classification of waste is essential for promoting recycling. The law aims to establish demand for recycled products by specifying the initiative of public offices in promoting the purchase of environmentally friendly articles at public offices. (New law)

Food Recycling Law

Leftover food generated by the food industry in Japan, including food processing companies, restaurants, and fast food shops, comes close to 10 million tons annually. The law aims to recycle these leftovers into fertilizer and animal fodder. Recycling into products other than fertilizer and fodder is an ongoing task now being examined.

Food waste from households also totals about 10 million tons annually. At present, this type of food waste is not recycled at all and is mostly burned. (New law)

Construction Material Recycling Act

Construction waste is the biggest source of illegal dumping. The new law obliges building materials to be classified when taking down buildings, and wood, asphalt, and concrete are separated from other forms of construction waste for recycling. The law aims to reduce industrial waste. (New law)

Electric Household Appliance Recycling Law

Plastics and metals are separated from waste television sets, washing machines, air conditioners, and refrigerators for resource recovery. The law obliges home appliance manufacturers to collect and recycle waste home appliances. The recycling costs are borne by the consumer. (Existing law)

Container and Packaging Recycling Law

Consumers classify five types of waste generated at home for disposal. These five types are glass containers, PET bottles, paper containers and packaging, plastic containers and packaging, and expanded polystyrene trays. The local government collects classified waste, and a contractor is engaged to collect and recycle it. The local government bears rather large burden. (Existing law)

Law for Promotion of Effective Utilization of Resources

The law reinforces and defines the basic concept behind the individual recycling law, which is waste reduction by recycling and lengthening product service life, measures for reusing components collected from products, and recycling of products by manufacturers. (Revised)

Waste Management and Public Cleansing Law

The history of this law, originally stipulated in 1971, is long, and it has been revised several times. Due to increased illegal dumping, the public is showing rapidly diminishing belief in the effectiveness of this law. Many local governments have problems with incinerators and landfill disposal sites. In addition, the final disposal sites for industrial waste will soon be full. In response to this state of affairs, the law has been revised again to secure a system that ensures appropriate treatment and to strengthen regulations that will ensure appropriate treatment. (Revised)

The above laws are stipulated for developing a recycling-based society. How these laws will be effectively applied is not yet known. New laws and revised laws define increased producer responsibility*1, but there is also a view that the economic responsibility of producers should be broadened. The recycling law which specifies that consumers must bear the cost of recycling is leading to increased illegal dumping. A deposit system*2 for limiting throwaway products, increasing the collection rate, and promoting recycling should perhaps be imposed more vigorously. It is clearly desirable that a basic law and related laws should be established. However, to achieve the intended effects, revisions should be made if problems are found in any of the laws.

*1 The principle that the producer has the responsibility not just for product performance, but for any environmental impact from production to disposal of their products.

*2 A system to add a certain amount of money (deposit) on sales price, and return it to a consumer when a product (container) is returned. At present, a deposit system is established nationwide for glass bottles such as beer bottles and soft drink bottles.

by Saki Mukumoto, awarded the Director General's Prize of Ministry of Environment at the 2nd National Environmental Poster Contest, Japan

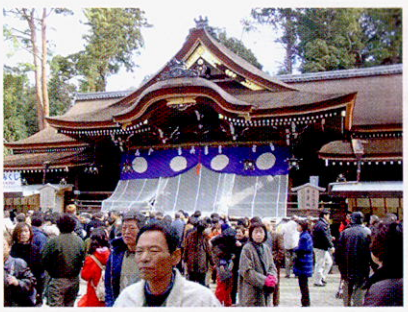
The Seasons of Japan

Oshogatsu, the New Year holiday

The New Year holiday is the biggest winter event in Japan, and it marks the beginning of the year. Technically, the New Year holiday lasts from January 1st to 7th. However, since the holidays of most public offices and private companies start from the end of the previous year to the third day of January, the holiday atmosphere lasts until January 3rd.

Japanese generally celebrate the beginning of New Year quietly with their family at home, merrily with their relatives back in their hometown, or cozily at a hot spring. The number of people celebrating New Year abroad increases every year.

There are many events during the New Year holiday.



Hatsumode

The Japanese seldom worship at temples and shrines, but the New Year holiday is special. Most people go to a nearby temple or shrine to pray for health and good luck in the coming year, which is called *hatsumode*. *Nengajo*, the New Year greeting post card is also an important part of the New Year holiday. People write greetings with a brush, or print graphics depicting the animal of the year, or print a family photo with a message. Nowadays, professional-looking cards can easily be made with personal computers. It is something like a once-a-year post card on recent conditions from those who do not usually write letters. To receive a stack of New Year cards is one of the most enjoyable events of the New Year holiday. The biggest event for children would be *otoshidama*. Children are mostly interested in how much gift money they will receive from their parents and relatives.

Osechiryôri

Cooking for the New Year holiday is always *osechiryôri* and *zôni*. *Osechiryôri* is a special type of food for celebrating New Year. Many different types of cold dishes are arranged in stacked lacquer boxes. The original idea was to provide food which can keep for several days, to give the women of the household a complete rest from domestic chores during the first three days of the New Year. These days, some people purchase deluxe *osechiryôri* at supermarkets and department stores. *Zôni* is soup containing rice cakes, vegetables, and meat in a fermented soybean paste- or soy sauce-based stock. You can find different types of traditional *zôni* in the different regions of Japan and different families.

ICETT Topics

Toward the ISO14001 certification

In Japan, over 7,000 organizations have already obtained ISO14001, the environmental management certification. ICETT is now also working on ISO 14001. To obtain the certification, ICETT has established the following environmental policy, and Executive Director Kura and all the ICETT staff are making great efforts to implement the environmental management system since its introduction on September 1st, 2001. We are also asking the overseas participants staying at the accommodation to cooperate in classifying waste, energy saving, etc.

ICETT Environmental Policy

1) ICETT will positively carry out training, survey, research and information disseination activities for conserving environments in developing countries and the global environment as a whole, thereby contributing to the international community.
2) ICETT will work for "effective use of resources and energy" and "promotion of reduction, reuse and recycling," to help reduce environmental load and prevent environmental pollution.
3) ICETT will abide by laws, regulations and ordinances related to the environment.
4) To achieve this Environmental Policy, ICETT will set environmental objectives and targets, which will be reviewed periodically to ensure continual improvement.
5) ICETT will make effective use of information technology (IT) to communicate Environmental Policy and environmental objectives and targets to the parties concerned. This information will also be made public through ICETT's homepage, to define its commitment to conserving the environment.

Photo : Waste classification

Training in Japan

The 2002 Training Program (Tentative)

April 2002 - March 2003

Course Title	Duration	Number of Participants	Sponsored by	Countries that participants selected from
Technology for G.H.G.s Emission Mitigation	June~July, 2002	9	JICA	Asia, Near and Middle East Africa, Central and South America, and South Pacific Region
Environmental Management Technology in Petrochemical Industries	June~ August, 2002	9	JICA	Asia, Near and Middle East Africa, Central and South America, and East Europe
Water Environment Management	June~July, 2002	14	Japan Cooperation Center for the Middle East	Bahrain, Iran, Kuwait, Oman, Qatar, Saudiarabia, UAE
Training Program of Environmental Cooperation Program for Asia	September~ October, 2002	10	Mie Prefecture	Malaysia
Regional Environmental Monitoring for the Arab Republic of Egypt	September~ November, 2002	6	JICA	Egypt
Training for the Establishment of the Recycling-based Society for Tianjin, the People's Republic of China	October, 2002	6	Yokkaichi City	Tianjin, China
Pollution Control Manager System for the People's Republic of China	November~ December, 2002	8	JICA	China
Training for the Support of Environmental Conservation in Henan Province	November, 2002	2	Mie Prefecture	Henan Province, China
Regional Environmental Administration for Jordan	Jan~Feb, 2003	7	JICA	Jordan

ICETT

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