

Voluntary Action Plan for Preservation of the Global Environment

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Japan Construction Equipment Manufacturers Association

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1. Background

(1) General trends in preservation of the global environment

The “Global Environment Charter” was documented by Japan Federation of Economic Organizations in April 1991. The United Nations Conference on Environment and Development known as the Earth Summit of Rio de Janeiro held in June 1992. These two events were the landmarks in raising the public awareness of the global environmental issues, the importance of which was further brought home to us by the establishment of ISO 14001 (Environmental Management System) in September 1996, followed by the opening of the 3rd Conference of the Parties to the United Nations Framework Convention on Climate Change (hereinafter referred to as COP3) in December 1997.

In response to the growing concerns and activities at a global level, various industrial organizations within Japan, including the Japan Automobile Manufacturers Association, have come up with their own action plans so as to join the worldwide trend of global environment preservation, where the global warming issue has been one of the focal points.

(2) Current activities of the Japan Construction Equipment Manufacturers Association

Recognizing a need to act upon the increasingly greater public interest in the global environment, the Construction Equipment Manufacturers Association (hereinafter referred to as CEMA) started extensive studies on environmental issues led by the Production Subcommittee and the Technical Policy Subcommittee of the Technical Production Committee.

The studies conducted are as follows: the follow-up studies of fiscal 1996 relating to “Survey on exhaust gas emissions from non-regulated automobiles” conducted and reported during fiscal 1995, the compilation work of the data obtained from “Survey on noise from non-regulated automobiles” by the Environment Agency, and in fiscal 1997 the drafting of “Guidelines on preliminary evaluation at the product design stage for promoting recycling”.

In parallel to the above, the Environment Voluntary Plan Project Team was formed in fiscal 1994 under the Production Subcommittee. The Team has organized various seminars to learn of the latest efforts within the automobile industry and the outline of ISO 14001, seeking possible answers to the emerging environmental requirements.

Further, to carry out the survey work commissioned by the Manufacturing Science and Technology Center, an investigating team was sent to Europe in April 1997 for a survey on environmental load reduction policies in relation to construction machinery. The team studied specific environmental measures in force, and actual conditions and movements of other industrial sectors in Europe. The results were compiled into a report titled “Survey on Environmental Load Reduction Policies in Relation to Construction Machinery”.

(3) Steps leading to the voluntary action plan

Through the research mentioned above, CEMA has accumulated vast and diverse experience. Based on the expertise gained and full participation of the whole construction machinery community, we have worked on a multitude of issues: energy-saving policy at the production stage, development and manufacturing of construction machines which consume less energy, CFC regulatory measures, exhaust gas and noise control, shredder dust control, and industrial waste control measures.

To address the common environmental needs of the construction machinery industry from a broader perspective, a new project was devised to draw up a comprehensive voluntary action plan to be incorporated into the whole corporate practice. The “environmental harmony project team” was formed in April 1998 within the CEMA Production Committee organized by the fourteen member manufacturers.

The team conducted surveys through questionnaires and debated the results in relation to diverse environmental issues in an attempt to hammer out measures for global warming prevention. These include: energy saving and CO₂ emission control, measures for promoting recycling at all levels from product design, manufacturing, to disposal, and efforts to promote the introduction of ISO 14001 in the construction machinery industry.

2. The Basic idea of environmental harmony

As described in 1-(3), with dedication and leadership in global environment preservation, CEMA has proved to be a strategic environmental activist and will accelerate its efforts with a renewed emphasis in the following areas:

- 1) Formulation and promotion of a voluntary action plan with specific numerical goals,
- 2) Promotion of information exchange and cooperation between member manufacturers based on the shared view of the above action plan, and
- 3) Promotion of global environment preservation and further consolidation of the industrial management through the action plan.

3. Key issues in the voluntary action plan

(1) Prevention of global warming by reducing energy consumption (CO₂ emission)

The ultimate goal of the action plan is a reduction of total energy consumption involved in production. A target consumption rate is set and compliance with it will be monitored. This

target rate will be achieved by the industry through innovations in product design and development and creation of energy saving products.

Note: Cutting greenhouse gas emissions (of six gases) by 6% was agreed upon at COP3. Various official data available suggest a minimal impact on the environment from 5 gases, compared to CO₂, which was therefore singled out as the target for reduction efforts.

1) Numerical goal

The total energy consumption of the whole construction machinery industry is to be reduced by more than 10% by 2010 relative to the 1990 level. Here the energy implies all the energies concerned with construction machinery and the total production is assumed to be at the level of 1990.

[Procedures of goal setting]

- Each member manufacturer is encouraged to study the guidelines and numerical goals presented by CEMA and to formulate its own environmental management plan. Registration with CEMA is to be made at the discretion of each member.
- The numerical goal is to be applied to the energy consumed in manufacturing construction machinery. The plants and departments concerned are required to register at the CEMA secretariat.

Though CEMA calls for cooperation to attain the overall goal of the construction machinery industry, the individual management policy of each member manufacturer is fully respected, whereby no specific goals, neither total nor per unit, are imposed but left to the judgment and deliberations of each one.

2) Policies and future direction

The most effective weapon to fight global warming with is a reduction of energy consumption, and this has become the primary concern of the whole industry, where continued investments are expected in development and updating of machinery such as welders, machine tools or air-conditioning equipment in particular with higher efficiency and energy saving functions. Also, a system for co-generation will be investigated as a promising area for future investment.

Besides the investments in improved facilities and equipment, more fundamental software research is underway. For instance how materials as well as the final products can be streamlined and made lighter, and how a higher efficiency can be accomplished by optimizing

the operation of the production line in place. Energy sources so far little tapped should be explored by launching serious discussions on recycling of treated water, and utilizing solar energy and recovering waste heat. Table 1 shows possible countermeasures to global warming (drafts are included).

Table 1 Measures to prevent global warming

Area		Specific action item
Production	Facility	<ul style="list-style-type: none"> - Installment of high-efficiency production systems (welders, machine tools, etc.) - Improvement of shipping and distribution facilities - Integration of machine tools and thermal treatment facilities, etc. - Minimization of unproductive operation of the facilities - Utilization of natural energy
	Energy source	<ul style="list-style-type: none"> - Introduction of co-generation systems - Fuel improvement (of less carbon content) - Recovery and effective use of waste heat - Utilization of solar energy
Work environment	Air-conditioning	<ul style="list-style-type: none"> - Installment of high-efficiency systems (thermal energy storage system, etc.) - Appropriate temperature management
	Lighting	<ul style="list-style-type: none"> - Introduction of more natural lighting - Installation of energy-saving lighting device - No idle lighting
Product	Production	<ul style="list-style-type: none"> - Reduction of weights of materials and products - Material selection by energy-saving criteria - Adoption of more energy-saving processes
	Peripheral product	<ul style="list-style-type: none"> - Electronic control of engine, improvement of cooling system (collaborative work with engine manufacturers to clear the emission control requirement) - High-efficiency power transmission system - High-efficiency hydraulic system

(2) Waste reduction and promotion of recycling

Recycling efforts should start at the design and continue through the production level so as to minimize waste and raise the rate of recycling. CEMA has laid down “Guidelines on preliminary evaluation at product design stage for promoting recycle” as a reference for manufacturers. Specific actions to be taken are listed in Table 2 below:

Table 2. Action items for waste reduction

Stage	Specific action item
Product design	<ul style="list-style-type: none">- Redesigning for a better yield rate of materials- Adoption of recyclable materials- Design concept ensuring easy decomposition and separation- Ingredient indication of synthetic resin parts- Feasibility study for implementation of LCA (the life cycle assessment)
Procurement	<ul style="list-style-type: none">- Refusal of ornamental packaging at purchase- Promotion of purchase of parts in returnable packages
Production process	<ul style="list-style-type: none">- Obligatory separation and collection- Economy in raw material by process redesigning (improvement in material intake method)- Economy in supplementary material by process improvement- Waste recycling into resources (fuel production from waste oil, etc.)
Shipping/distribution	<ul style="list-style-type: none">- Improvement of packaging and shipping- Maximum reuse of supplementary materials of shipping
Others	<ul style="list-style-type: none">- Recycling of photocopiers and other office equipment- Raising general awareness through in-house seminar

(3) Steps towards Environmental Management System

Seriously concerned with the global warming phenomena, the CEMA members have taken initiatives to reduce the adverse impact on the environment generated by their own activities. Now waste reduction and promotion of recycling are becoming common practice, while efforts

are being multiplied to gain ISO14001 certification through implementing the Environmental Management System, for which CEMA is ready to provide all possible support and information.

4. Institutional framework for support and promotion

The Environmental Harmony Project Team under the Technology and Production Committee Executive Secretariat of CEMA is leading the unified campaign to attain the numerical goal. (Refer to Figure 1 for the structure.)

For a smooth and focused steering of the project, its progress is numerically monitored and evaluated once a year. Details of successful trials and technological innovations are also exchanged and circulated, which is expected to strengthen the industry as a whole.

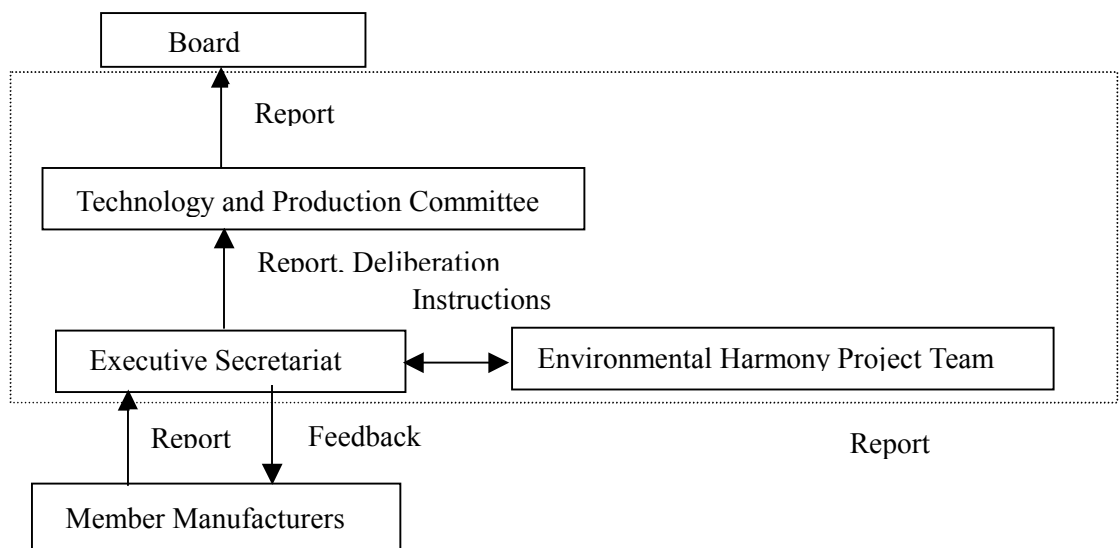


Figure 1. CEMA institutional framework for promotion

5. Concluding remarks

CEMA, with resolve and enthusiasm, executes what the self-imposed voluntary action plan dictates. CEMA will expand the agenda as necessary if there is any challenge to achieving the goal.

Another task of CEMA is to win the necessary administrative and institutional support for the initiative to take off and develop to its fullest extent and for the maximum benefit.

Introduction to the Japan Construction Equipment Manufacturers Association

(1) Outline

The Japan Construction Equipment Manufacturers Association (CEMA) was established in 1990, after being separated from the Japan Society of Industrial Machinery Manufacturers Association. Our missions are to promote sound growth of the construction machinery industry and to serve the country by contributing to national economic development and the welfare of the people. To this end we plan and act over a full range of the industrial spectrum, specifically from reinforcement of the management system to commerce and statistical research, from dissemination of the research results to promotion of fair trade, etc.

Major products of the member manufacturers, highly diverse in function and size, are categorized into two groups; the machine itself, such as excavators, wheel loaders, bulldozers, cranes, road machinery, and attachments, such as breakers.

A systematic framework allows unhindered progress of CEMA activities orchestrated by the Board. Under committees and subcommittees conduct lateral coordination and research groups by machine type, respectively.

Presently (as of November 1998) the number of regular members is 88 and that of supporting members 29.

The grand sum of the machinery shipped by the members is 1,811.1 billion yen, 1,226.4 billion yen for domestic use and 584.7 billion yen for overseas market.

(2) Energy consumption by the construction machinery industry

Manufacturing of construction machinery, starting from the parts purchased and the processed materials provided by suppliers, is mostly assembling those components into a product. The process involves notably less energy consumption, that is, less burden on the environment compared to more basic industries engaged in refinement of the raw materials.

To get updated on the energy consumption of the members a survey was conducted immediately before the drafting of this voluntary action plan. Based on the results of the questionnaires collected, the total industry-wide energy consumption is estimated at 196,000 kl/year in crude oil, which accounts for about 0.055 % of the total national energy consumption of 358,810,000 kl/year. The breakdown by energy source is: 70% by electricity, 20% by fuel, and 10% by gas.

Factors fed into the numerical goal

In finalizing specific figures of energy consumption cut, we referred to various data collected under the banner of global warming prevention.

(1) Results of COP3

At the COP3 held in December last year in Kyoto, Japan agreed to reduce the greenhouse gas emissions of CO₂ and others by 6% relative to the 1990 level by the period of 2008 to 2012. To attain this goal our own goal had to be set at the lowest at 6% as well.

(2) Results of the questionnaires

According to the results of the survey on energy-saving among the members, the combined consumption by the top thirteen energy-based manufacturers accounts for approximately 96% of the total of the construction machinery industry. The projected consumption for 2010 by the same thirteen represents a cut of about 10% as compared to the 1990 level.

(3) Harmony with other industries

The other industrial associations under the Japan Federation of Economic Organizations have announced their voluntary action plans so as to abide by the COP3 agreement. It seems that on the average a 10% cut of energy consumption or of CO₂ emission is the goal envisioned among them.

(4) Others

In global warming phenomena six gases are listed as the culprits. They are CO₂, methane, nitrous oxide, and three kinds of alternative chlorofluorocarbons (HFC, PFC, and SF₆), among which CO₂ is to be blamed for 92% of the total emission, while 5% is attributed to methane and nitrous oxide combined, and 3% to alternative chlorofluorocarbons. As the emission of methane and nitrous oxide is largely due to agricultural activities, we narrowed down on CO₂ as a reduction target under the energy-saving campaign.