

# Initiatives to Prevent Global Warming

— Tackling the greatest environmental issue through corporate innovation —

Large-scale climate change is the single greatest environmental issue of this century. At the Ajinomoto Group, we are acting to resolve global-scale environmental issues based on a fundamental attitude of offering products with high added value that do not impact the environment.

## Helping to solve the greatest environmental issue: large-scale climate change

Large-scale climate change caused by global warming is a pressing issue that is beginning to manifest genuine problems. It is an issue that impacts the sustainability of the entire planet, and directly affects the future of the Ajinomoto Group, which has an intimate involvement with ecosystem services.

We are thus advancing initiatives to prevent global warming taking two approaches. At the same time, we are searching for more ways that we can help minimize the serious consequences of climate change in the world where it has already begun.

### Mitigation

- 1 Reduce emissions of greenhouse gases caused by our own business and production activities
- 2 Contribute to the reduction of greenhouse gases by society through our businesses and products

### Adaptation

- Find ways to adapt to the impact of climate change



**We are committed to dramatically improving our environmental efficiency, as well as to meeting our targets for CO<sub>2</sub> reduction by improving our performance through technological innovation.**

### Osamu Tosaka

Member of the Board & Corporate Executive Deputy President (Management of Production Technology & Engineering), Ajinomoto Co., Inc.

### Preventing global warming through corporate innovation

We believe that we have a responsibility to continue to grow the business activities of the Ajinomoto Group relating to food and health, in order to enable the people of the world to continue to enjoy a high quality of life. Meanwhile, as seen by the issue of global warming, human activities are said to be producing twice the CO<sub>2</sub> that the planet is capable of absorbing. It is clear that the business and production activities of the Ajinomoto Group cannot continue to grow in the same way as they are, within the limited global environment capacity. Improvement is not sufficient; innovation is needed.

### Thoroughly reducing environmental impact

We have already set ourselves tough challenges in the Ajinomoto Group Zero Emissions\*, with ambitious targets for reducing CO<sub>2</sub> emissions, wastewater pollutant load, and the like in order to reduce our environmental impact to the greatest extent possible. We have achieved solid results, and we are confident that we will achieve these targets through technological innovation. As an example, we are currently reducing our CO<sub>2</sub> emissions by developing new fermentation production process techniques using biotechnology, and introducing sophisticated energy-use technologies and technologies for using biomass as fuel.

The Ajinomoto Group is also rolling out a production innovation program at

its sites worldwide. The goal of the program is to dramatically improve efficiency by revising work styles from the ground up. This program will reduce our consumption of resources, energy, time, and money, and improve the quality and quantity of production; in other words, it will dramatically improve our environmental efficiency. This program is not limited to our plants and other manufacturing divisions; we are advancing corporate innovation in all domains of corporate activity, including sales, business development, and headquarters divisions. Our approach to innovation is to improve the environmental efficiency of our corporate activities in and of themselves, and to contribute to the environment.

➔\* Please see pages 23–24, Fiscal 2006 Goals and Results, for details.

## Contributions through products and technologies

Today, there is a need for major reductions in greenhouse gas emissions at a societal level. Amidst these circumstances, reducing CO<sub>2</sub> emissions from the business and production activities of the Ajinomoto Group alone is likely to be of only limited effect. We are thus committed to contributing to the reduction of greenhouse gas emissions by society as a whole through our amino acid and food businesses, products, and technologies.

As an example, it is necessary to promote methods in the livestock industry that do not accelerate global warming. We are thus conducting validations to show that our feed-use amino acids help reduce the levels of greenhouse gases produced by the livestock industry

(see page 14).

Another factor that has been identified as a source of increased CO<sub>2</sub> emissions is lifestyle, as the public's energy consumption continues to increase. At the Ajinomoto Group, we place great value on encouraging people to switch to more environmentally friendly lifestyles as part of our food business, through our products and communication.

## Taking on Climate Change

—For vibrant lives

Unfortunately, the IPCC Fourth Assessment Report states that a certain level of climate change will in fact be unavoidable. It is predicted that lives on the planet will face more difficulties in the future. Under these circumstances, we hope to minimize the serious consequences of climate change, and that the

people around the world of this generation and the generations to come and countless life on the planet can lead vibrant and sound lives. In order to accomplish this, we believe that new knowledge and technologies are necessary.

The Ajinomoto Group will soon mark its 100th year of offering delicious food to the world, and pursuing the value of amino acids. Our aspiration for the next 100 years is embodied by the slogan, "Ajinomoto works for life". We will learn more about eating, living, and the amino acids that are the building blocks of life, and create new value. We will continue to search for ways in which the Ajinomoto Group can benefit global society.

## COLUMN

### Interest and information disclosure regarding large-scale climate change

As the issues of large-scale climate change materialize, institutional investors, NPOs, and researchers and other experts have begun to take interest in the impact of climate change on the performance of the Ajinomoto Group, and on the business risks and opportunities that it poses for the group. We are committed to responding appropriately to this interest, and disclosing the group's information and understanding relating to global warming

to the greatest extent possible.

One example of this is the Carbon Disclosure Project (CDP), a yearly survey relating to climate change that is sent by a federation of major financial institutions around the world to major companies worldwide. We cooperated with and responded to the fiscal 2006 survey, and agreed to the disclosure of our response.

### Overview of Response to Carbon Disclosure Project Fiscal 2007 Survey (CDP5)

Items	Summary of Response
Basic Awareness	<ul style="list-style-type: none"> <li>● We recognize that global warming and climate change are major environmental issues affecting the entire world.</li> <li>● The group's businesses are intimately linked to the global and local environments, ecosystems, and primary industries through the use of ecosystem services.</li> <li>● We recognize that the group's business domain is susceptible to impact from climate change.</li> </ul>
Risks that environmental regulations pose for corporate activities	<ul style="list-style-type: none"> <li>● There is no clear financial impact from current regulations.</li> <li>● We recognize that we would need to make sweeping changes to our business plan should extremely strict regulations (for example, severe restrictions on total CO<sub>2</sub> emissions for group operations worldwide) be adopted at some point in the future.</li> </ul>
Risks that climate change poses for corporate activities	<p>Example Risks</p> <ul style="list-style-type: none"> <li>● Procurement of raw materials (especially farm products)</li> <li>● Procurement of energy</li> <li>● Rising sea levels (e.g. land on which business sites is located)</li> <li>● Access to water resources</li> <li>● Changes to business environment (e.g. feed-use amino acids)</li> </ul>
Risks that changes in consumer behavior/demands relating to climate change pose for corporate activities	<ul style="list-style-type: none"> <li>● Our industry is not at risk of obtaining a "negative" image</li> </ul>
Opportunities for corporate activities presented by climate change	<ul style="list-style-type: none"> <li>● We have advanced biotechnologies and scientific knowledge relating to health and nutrition, and our lead in the response to risk (e.g. R&amp;D) will make us more competitive.</li> <li>● Increasing infectious diseases and other factors could increase demand for amino acids and pharmaceuticals.</li> <li>● Demand could increase in the primary industries.</li> <li>● Food businesses responding to consumers' eco-awareness could grow.</li> </ul>

\* Please see this environmental report for strategies, measures, and performance data.

**1 Reducing emissions of greenhouse gases generated in our business and production activities**  
 —Through Zero Emissions efforts

The 2005–2010 Ajinomoto Group Zero Emissions Plan identifies the reduction of CO<sub>2</sub>, CFCs, and other greenhouse gases as a key goal, and sets quantitative targets for their reduction. We are advancing a wide range of initiatives to reduce our emissions in accordance with this vision across all of our business activities, and in accordance with such factors as business-site location and size, and the characteristics of each business.

**Reducing CO<sub>2</sub> emissions through the use of carbon-neutral biomass resources**

◆ Introduction of a rice hull boiler

*Thailand*

Global warming due to CO<sub>2</sub> from fossil fuels has become a manifest issue, and carbon-neutral alternative fuels have therefore gained attention. “Carbon-neutral” is the concept that plants do not cause an overall increase in the CO<sub>2</sub> in the atmosphere, because even though they release CO<sub>2</sub> momentarily when burned, they absorb CO<sub>2</sub> via photosynthesis while they are growing.

At the Ajinomoto Group, we have been moving toward clean energy for some time, including replacing crude oil with natural gas as the fuel used in our plants. In recent years, however, we have begun studying the use of biomass fuels derived from agricultural products as an alternative to fossil fuels at our plants in South America, Southeast Asia, and other regions.

One example is our plant at Ajinomoto Co., (Thailand) Ltd. There, the introduction of a boiler that uses rice hulls is scheduled. Thailand is the world’s sixth-largest producer of rice, and the plant is located where it is easy to procure rice hulls. Since this biomass boiler does not use fossil fuels, the CO<sub>2</sub> emitted by the plant will be reduced to half the level currently emitted using crude oil, which, it is believed, will contribute to the prevention of global warming.

We are moving forward with the use



Rice hulls used as fuel

of biomass fuels in accordance with such factors as the agricultural environment of each country or region.

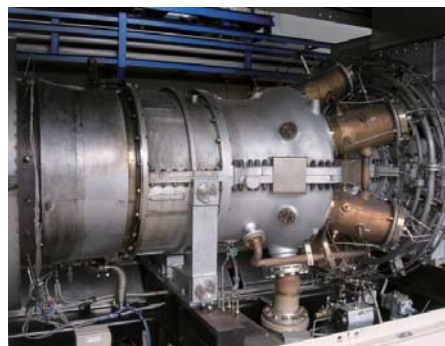
**Reduction in CO<sub>2</sub> emissions through introduction of energy-efficient equipment**

◆ Introduction of cogeneration equipment

*Indonesia*

Our core plant in Indonesia, which produces *AJI-NO-MOTO® umami* seasoning, flavor seasonings, and other products, has introduced a cogeneration system (combined system) that improves energy efficiency by recovering waste heat. This cogeneration system began operation in April 2007. We expect this new system to reduce the plant’s CO<sub>2</sub> emissions over conventional equipment by about 20%.

The CO<sub>2</sub> emissions of the Ajinomoto Group in fiscal 2006 were about 2,340,000 tons, of which about a tenth were from this Indonesian plant. Preventing a rise in CO<sub>2</sub> emissions in Indonesia and the rest of Southeast Asia, where business growth is expected, is an important issue of the Ajinomoto Group. We remain committed to designing and installing environmentally-friendly equipment, while taking into account a wide range of parameters including plant location and product types.



Gas turbine power generator (7,000 kW class)

This combined system has high heat efficiency. It consists of a natural gas-fired gas-turbine power generator with a 7,000 kW-class gas turbine; a waste-heat recovery boiler; and a steam turbine power generator. The total system output (12,000 kW of electric power and 55 tons of steam per hour) is supplied to the plant production equipment. The total operational efficiency is over 90% and the CO<sub>2</sub> emissions of the plant as a whole are about 20% lower than with the old system (fueled by both crude oil and natural gas). Additionally, a low-NO<sub>x</sub> burner is used, minimizing the levels of NO<sub>x</sub> that are generated.



Waste-heat recovery boiler



Steam turbine power generator

## 2 Contributing to the reduction of greenhouse gases by society —Through our products

We are committed to harnessing the technologies and expertise of the Ajinomoto Group to develop and popularize products and technologies that can help reduce the levels of greenhouse gases produced by society outside the group.

### Reducing levels of greenhouse gases generated by the agricultural livestock industry with feed-use amino acids

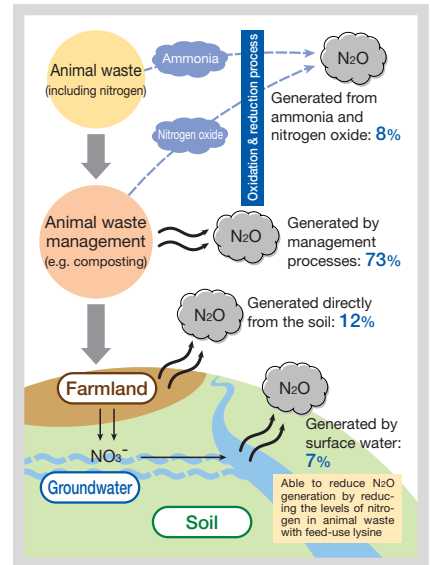
Feed-use amino acids are valuable to the environment in a number of ways. We have learned that feed-use amino acids have several benefits: they economize on natural proteins and enable the effective use of farmland; they reduce groundwater and soil pollution by reducing the amount of nitrogen in animal waste\*; and they reduce some of the greenhouse gases with the greatest warming effect as well.

Environmental pollution from nitrogen emissions and effluent does not stop at soil and groundwater pollution: oxidation-reduction also converts some of the nitrogen into nitrous oxide (N<sub>2</sub>O), which is released into the atmosphere. Along with methane, N<sub>2</sub>O is one of the major greenhouse gases, following behind CO<sub>2</sub>. By volume, N<sub>2</sub>O has about 300 times the warming effect of CO<sub>2</sub>.

Using low-protein animal feed supplemented with amino acids is known to reduce the amount of nitrogen in pig and

poultry waste by about 30% compared to feed in common use. It is consequently believed that this can reduce the generation of N<sub>2</sub>O due to the oxidation-reduction of animal waste nitrogen by about 30%. By our calculations, this could reduce the volume of greenhouse gases generated by pigs and poultry in Japan by 1 million tons CO<sub>2</sub>-equivalent. This is double the approximately 500,000 tons of CO<sub>2</sub> emitted by Ajinomoto Group sites in Japan, and signifies that reductions in N<sub>2</sub>O from the utilization of feed-use amino acids could fully offset the greenhouse gases generated by the group's business activities. Additionally, a million tons of feed-use amino acids are used each year worldwide, about 100 times the amount used in Japan, meaning that feed-use amino acids can contribute to the global environment.

We continue to verify the effectiveness of feed-use amino acids at reducing greenhouse gases. We are increasing our knowledge of the role of feed-use amino acids in sustainable agriculture and a sustainable food supply, while at



(Note) Proportions of emissions are calculated assuming standard management practices in Japan.

the same time actively disclosing information on the level of contribution that feed-use amino acids make to the environment to all our stakeholders, and especially to members of the livestock industry.



Feed-use lysine

➔\* See Ajinomoto Group Environmental Report 2006, pages 27–28, for more information about contributions to economizing on natural proteins, effective use of farmland, and reducing groundwater and soil pollution through the reduction of nitrogen in animal waste.

## Other initiatives to prevent global warming

See also page 45, Initiatives to Reduce Greenhouse Gas Emissions.

### Measures by the Ajinomoto Group to reduce CO<sub>2</sub> emissions

#### Sales departments

- Switching over the sales vehicle pool to eco cars

#### Logistics departments

- ➔ See pages 51–52, Logistics-related Efforts
- Promoting modal shift
- Improving pallet load efficiency
- Eco driving with digital tachographs

#### Product development departments

- ➔ See pages 41–44, Environmentally-friendly Containers and Packaging
- Revising product containers and packaging materials

#### Environmentally-friendly buildings

- We are incorporating environmental friendliness into building construction, including energy efficiency and long lifetime

#### R&D

- ➔ See pages 37–40, Environmental Research and Technology Development
- LC-CO<sub>2</sub> assessment of containers and packaging
- LC-CO<sub>2</sub> of food: Publication of our food-related material CO<sub>2</sub> emission coefficient database

pages 21–22, Feature 3

#### Initiatives in the office

- We are carrying out programs to reduce trash and electricity usage
- We have implemented a “Cool Biz” (no ties and open collars) dress code

#### Production departments

- ➔ See pages 45–46, Initiatives to Reduce Greenhouse Gas Emissions
- Conserving energy by making production processes more efficient
- Switching to clean energy
- Removal of CFCs from freezers
- Recycling waste cooking oil as boiler fuel

#### Communication

- ➔ See pages 19–20, Feature 3
- Approaches to consumer and supplier

#### Team Minus 6% Project

- ➔ See pages 35–36, Activities to Raise Environmental Awareness
- Joining the national Team Minus 6% movement being advanced by the government to prevent global warming, and advancing such programs as Mission *Uchimizu* and My Bag Campaigns.