

Chapter 4

We take care of the global environment

The oil products that the Cosmo Oil Group delivers to its customers represent an invaluable source of energy that is essential to modern lifestyles. The fact is, however, that the use of oil impacts the global environment in no small measure. To deal with this, the Cosmo Oil Group works on various fronts, striving to produce and deliver environmentally friendly oil products, while also focusing on renewable energy, the protection of biodiversity and other activities designed to preserve the planet's irreplaceable natural environment for future generations.

Japan Petroleum Institute Award

The Cosmo Oil Group won the Fiscal 2011 Japan Petroleum Institute Award for Technological Progress in the petroleum, natural



Shigezuki Funada of Cosmo Oil's Research & Development Center accepts the award

gas, or petrochemical industries. By developing a fermentation process that utilizes a photosynthesis bacterium, the Group has realized more cost-effective, mass production of ALA. The Group also discovered ALA's beneficial effects on plant growth and salt tolerance. The award recognized this entire set of achievements.



Greening Our Neighborhoods

Shingo Tsubouchi
ALA Products Division¹
Cosmo Seiya Agriculture Co., Ltd.



“After the earthquake and nuclear accident last year, an increasing number of people in Japan seem to be growing their own vegetables in gardens and on balconies in order to secure a safe food supply in case of emergencies. The cultivation of bitter melon and morning glory to create ‘green curtains’ for windows is also on the rise, due to increased awareness of energy saving methods.

Although home gardening is familiar and easy to start, people often give up on their gardens before too long because of insufficient sunlight due to the orientation of the home or other environmental conditions that are not suitable for growing plants. The Penta Garden liquid fertilizer series containing ALA (5-aminolevulinic acid) developed by Cosmo Oil helps to enhance the photosynthetic capacity of plants and has

been well received. Since it works to promote the absorption of nutrients at the root, it enables the cultivation of healthy plants. It is even effective in indoor gardens or on balconies with less sunlight, where cultivation was not possible before.

ALA is a natural amino acid found in plants and animals and can be made with a natural fermentation process using photosynthesis bacteria, such as those contained in soy sauce.

Although more and more consumers are aware of global environmental issues, the population of gardeners is decreasing along with urbanization and an aging society. This could mean the loss of very familiar greenery in neighborhoods. Since indoor or balcony gardening is easy to start even for beginners, we aim to maximize the number of long-term gardeners using Cosmo Oil's ALA products.”

1. Current position: Sales Department, Cosmo Oil Co., Ltd.

Cosmo Oil continues to promote neighborhood greening while contributing to environmental preservation on a global scale.

Saving Energy in Refineries

Every stage of the Cosmo Oil Group's operations, from extracting crude oil to shipping it, to refining it and then storing products, generates CO₂ emissions, but approximately 60% are generated by refining. The Group is working to reduce this figure and conserve energy, both by introducing high-efficiency equipment and improving operational performance.

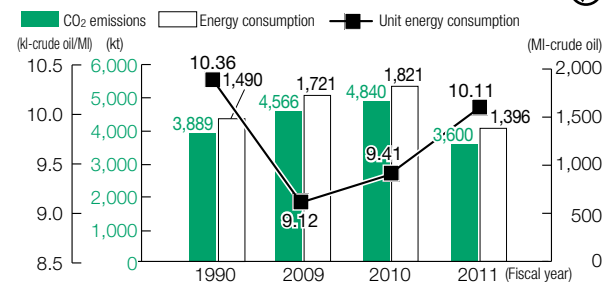
As part of equipment and performance efforts to reduce CO₂ emissions in fiscal 2011, the Group improved pump efficiency using plastic coatings, while also reducing the amount of steam used, and revising operation conditions. The Third Consolidated Medium-Term Environmental Plan set a refinery CO₂ reduction target of 21,900 tonnes (crude oil equivalent of 8,430 kiloliters) for fiscal 2011. By the end of the year, the refineries had reduced CO₂ emissions by 37,900 tonnes (crude oil equivalent of 14,490 kiloliters), exceeding the goal.

In fiscal 2011, the Chiba Refinery halted production for an extended period of time. Consequently, the refinery's total CO₂ emissions fell along with its energy consumption, causing the unit energy consumption to deteriorate.

Leveraging creative ideas that only an energy company can come up with, the Cosmo Oil Group will steadily execute

new energy-saving initiatives while maintaining existing improvement efforts.

Energy Consumption and CO₂ Emissions at Four Refineries



Notes:

- Unit energy consumption indicates total energy consumption divided by the total crude oil equivalent processed, taking into account the complexity of refining technology. The unit used is kiloliters of crude oil equivalent/megaliters (kl-crude oil/M). Total energy consumption is calculated by converting heat, electricity, and other energy use into the megaliters of crude oil equivalent (MI-crude oil). The unit used for CO₂ emissions is kilotonnes (kt).
- Beginning with fiscal 2006 results, the method of calculating CO₂ was revised as stipulated by Japan's Act on Promotion of Global Warming Countermeasures.
- CO₂ emissions for each fiscal year have been calculated using the CO₂ emission factor for electricity for the previous fiscal year.
- In addition to the figures shown in the graph, N₂O released from the catalyst regeneration tower amounted to 14 kilotonnes of CO₂ equivalent in fiscal 2011.

Energy Measures and CSR/Environmental Management

A pioneer in environmental economics, Kazuhiro Ueda is a professor at the Graduate School of Kyoto University and is also a trustee of the Cosmo Oil Eco Card Fund.¹ Keizo Morikawa asked him about how the Cosmo Oil Group should promote CSR and environmental management.

Morikawa: Cosmo Oil emphasizes harmony and symbiosis among society, humankind and the environment, and pursues management based on both business performance and CSR. This effort began with the Cosmo Oil Eco Card Fund.

Ueda: The Eco Card Fund is a great initiative. However, it is necessary to further clarify the significance of these activities. I think it is important to consider CSR and management in an integrated way.

Morikawa: You mean incorporating CSR into the business itself?

Ueda: Exactly. It is important for the main business to have CSR significance.

Morikawa: In order to ensure our business activities as an energy company help to build a more sustainable world, it is necessary to combine diverse energy sources and pursue symbiosis with the environment.

Ueda: While carefully using non-renewable resources such as oil, you now need to put more effort into renewable energy

Interviewer

Keizo Morikawa

Executive Vice President, Cosmo Oil Co., Ltd.
Chairman, Cosmo Oil Eco Card Fund
(As of March 2012)



sources, and make a smooth transition. That is the general direction you should be heading.

Morikawa: Speaking about renewable energy, Cosmo Oil made a full-scale entry into the wind power business by welcoming EcoPower Co., Ltd., as a subsidiary in March 2010.

Ueda: I have to say that Japan is still lagging behind in the renewable energy field, but by implementing two major mechanism changes, progress can be expected. One is balanced development for regional economies, and the other is development of new production technology infrastructure.

Morikawa: Certainly we can expect a lot from the development of technology for renewable energy.

Ueda: If Cosmo Oil employees come together to work on environmental protection, they will be able to develop awareness as global citizens. I have a lot of optimism for the future.

Note: This conversation took place in March 2012. Keizo Morikawa became President of Cosmo Oil in June 2012.

1. Please refer to Cosmo Eco Card Fund on page 16 for details.