

## Climate Change Interview

— Ms. Hiroko Ida, Weather Forecaster and Mr. Masayuki Aoyama, President —



The impact of climate change on corporate activities has been worsening every year. In this interview, Ms. Ida and Mr. Aoyama shared views about Nihon Parkerizing's challenges and prospects. Specific topics included the potential for CO<sub>2</sub> reduction through surface modification technologies, responses to the shift toward EVs and a decarbonized society and environmental education initiatives.

### Ms. Ida

As part of my job, I check the weather every day. Mr. Aoyama, on what occasions do you pay more attention to the weather?

### Aoyama

I care about the weather every day. Sometimes I am concerned more about the weather on weekends when I have plans to play golf. But more than anything else, I am concerned about the impact of rain and other weather phenomena on our factories. When an earthquake hit the Noto Peninsula on New Year's Day in 2024, all board members were able to connect via chat. We confirmed the impact on local factories in the affected area, issued instructions and endeavored to manage the crisis. Extreme weather has affected our worksites. Examples of this include a deterioration in cooling efficiency on summer work sites and delays in the transportation of raw materials due to heavy rains.

### Ms. Ida

Indeed. Lately, extreme weather has occurred more frequently. Environmental protection measures are increasingly necessary for a manufacturer. I am interested in what a chemical manufacturer like you will do to address climate change.

### Aoyama

Our operations are primarily divided into three businesses: chemicals, engineering and toll processing. In our chemicals business, we supply chemical products to customers who use them to apply functional surface treatments to metals on their own production lines, providing features such as corrosion resistance or slip promotion. By doing so, metals that previously lasted only five years will now last ten or even twenty years. This process achieves various properties not through paint, but with an even thinner film. While paint is as thin as a hair, approximately

tens of microns thick, our thin films achieve surface modification at thicknesses of less than one-tenth of the thickness of a hair.

### Ms. Ida

In our everyday lives, where can find surface modifications being applied?

### Aoyama

For example, they are applied to the interior and exterior surfaces of mobile phones to prevent fingerprints, as well as to the pillars in shrines and temples. Cars will rust and fall apart quickly if left untreated. Our surface treatment technology, combined with steel mills' plating techniques and paint manufacturers' expertise, prevents them from corrosion. Our surface treatment can alter the properties of metals at a depth of just a few microns. Applying surface or heat treatments to parts that become brittle due to work hardening during stamping makes the metals wear resistant, extending their service life.

### Ms. Ida

I understand that extending the lifespan of materials like metals ultimately helps reduce CO<sub>2</sub> emissions. However, doesn't the process of heat treatment and chemical manufacturing require energy?

### Aoyama

Admittedly, we cannot make products without emitting about 83 tons of CO<sub>2</sub> annually. According to our estimates, if our surface modification technologies did not exist, material manufacturing processes in Japan would emit 80 million tons of CO<sub>2</sub> annually to compensate for corrosion losses (expenses for rust and corrosion prevention) (chemical loss). Similarly, material manufacturing processes would emit an equivalent of 80 million tons of CO<sub>2</sub> to compensate for metal friction and wear losses (mechanical loss). When combined, our surface modification technology prevents the emission of 160 million tons of CO<sub>2</sub> that would otherwise be released due to metal losses.

### Ms. Ida

Providing corrosion prevention and wear resistance

technologies may enable metallic materials to last longer. Specifically, by how much can energy consumption be reduced?

### Aoyama

Our technology has achieved a calculated reduction of 31.28 million tons of CO<sub>2</sub> emissions. This figure is equivalent to the amount absorbed annually by forests covering the same area as the entire island of Kyushu. In other words, this has an impact equivalent to nearly eliminating the CO<sub>2</sub> emissions of approximately 18% of all households in Japan. This fact means we can slow the acceleration of climate change. We consider this continuity to be our mission.

### Ms. Ida

Even in a carbon-neutral society, automobiles would still be used, such as EVs and other types. New technology will be necessary there, won't it?

### Aoyama

Even as automobiles shift from internal combustion engines to motors as their drive system, the drivetrain that transmits energy to the tires remains. Furthermore, with the shift to EVs, previously inaudible sounds, such as metal creaking and other noises, have become issues, creating new demands for surface treatment. The question is how we will respond to them. We are exploring opportunities to contribute to



### Ms. Hiroko Ida

Weather forecaster, environmental educator, advisor to WWF Japan and director of Weather Caster Network

decarbonization through EVs, hydrogen and energy-related initiatives. I believe there are still markets we haven't discovered yet, such as in electronics. We may address challenges independently as the Nihon Parkerizing Group. Still, we would also like to engage in open innovation in collaboration with companies and organizations across various fields. The Nihon Parkerizing Group has also begun manufacturing and selling surgical scalpels in the medical device market. We place great emphasis on proactively engaging in proposal-based technology development and sales activities for our customers.

#### Ms. Ida

Japan and the world have no choice but to strive to achieve carbon neutrality by 2050. At the same time, companies must also generate profits. With raw materials and other costs rising, it's a significant challenge to produce quality products while striving for carbon neutrality.

#### Aoyama

While some areas of the industry remain somewhat chaotic, the direction toward achieving carbon neutrality remains unchanged. We have to do it. The global trend toward resource reuse shows no signs of slowing, and our commitment remains unchanged. We have been conscious of reducing CO<sub>2</sub> emissions since around 1992, when environmental issues were being raised, particularly the problem of eutrophication in closed water systems caused by nitrogen, phosphorus and other substances. Through measures such as developing environmentally friendly products, we reduced CO<sub>2</sub> emissions per unit of sales in the chemicals business by approximately 59% over about 20 years from the peak in 2002. Hexavalent chromium for use as a corrosion inhibitor posed a problem in Tokyo in 1993. At that time, we sought to develop a hexavalent chromium-free technology because there was no alternative. Coating and costs increased tenfold, but we continued to improve and develop products that were a bit expensive but usable. These products gradually gained customers and reached the point they are at today.

#### Ms. Ida

You have expressed alignment with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). Companies have an environmental responsibility to work to reduce CO<sub>2</sub> emissions from sources such as the manufacturing of their main products.

#### Aoyama

Exactly. We align with the TCFD recommendations, and have analyzed three scenarios: less than 1.5 °C, less than 2 °C and an increase of 4 °C. I feel it is essential to address climate change and communicate this effectively. Furthermore, while setting and publishing numerical targets puts pressure on companies, it also clarifies corporate responsibility. By quantifying awareness, each employee becomes conscious of even the smallest actions in their role and contributions. Last year, we set the slogan "Challenge for Change." This transformation is bolder than just a reform. It encourages everyone to consider business efficiency. For example, we avoid unnecessary overtime and don't waste electricity, thereby cutting CO<sub>2</sub> emissions. I believe it is essential to motivate employees to propose improvements.

#### Ms. Ida

Your company engages in mangrove planting activities in addition to its business operations.

#### Aoyama

Yes. We planted 999 mangroves in Thailand. We expect they will absorb about 10 tons of CO<sub>2</sub> annually. We installed photovoltaic power generation systems in Thailand, Vietnam and South Korea. For us, preventing material corrosion is a given. Next, we will focus on reducing energy loss, improving charging efficiency, and pursuing decarbonization in a future-oriented manner. We will accelerate the development of new technologies and move forward with our target of reducing CO<sub>2</sub> emissions by 30% relative to the 2020 level by 2030, ahead of schedule.

#### Ms. Ida

By learning about your company today, I gained



a new perspective on surfaces. I also learned how surface modification reduces CO<sub>2</sub> emissions. My views on things have changed a little bit. Consumers, including myself, glance at products and buy less expensive ones. I want to be a person who, if I have learned the essence of a product and the value that lies deep within it, will pick up a product that lasts a long time, even if it is a bit expensive. Is your company increasing its opportunities to communicate with the public, for example, through classes for children about the environment, where surface modification is explained?

#### Aoyama

The Central Research Laboratories in Hiratsuka, Kanagawa, hold an open house for local elementary school students. You can clearly see the difference in how slippery or peelable a metal surface is, as well as whether it cracks when stamped. The events appear to increase children's interest in surface modification. Furthermore, our young employees take the lead in creating videos to share in-depth reports and frank employee conversations on YouTube. Bolts treated with rust-prevention treatments are used at Tokyo Skytree. The canopy shield of a helicopter relies on water-repellent surface treatments. The surfaces of hospital window coverings are coated with titanium

dioxide to prevent bacteria and stains through photocatalysis. There are many other familiar and easy-to-understand examples of surface modification that may be worth sharing in more detail.

#### Ms. Ida

Recently, we have experienced disaster-level heat, and the number of deaths from heatstroke in one summer has exceeded 1,500. We can see the greening of the ground and walls on the streets of Central Tokyo. Can surface modification make the concrete absorb heat?

#### Aoyama

Heat absorption may be difficult, but these kinds of ideas should be tried more frequently. For example, the surface of artificial turf is very smooth. If we roughened it a little bit, it might retain more water. It is also possible to control deterioration due to severe ultraviolet light by using an inhibitor, thereby extending the life. Hopefully, we will be able to work with people from many different workplaces, expand our ideas and insights and apply them to our technological development.

Thank you very much for sharing your valuable views.