Special Dialogue

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Sumitomo Chemical's Path to Carbon Neutrality

We welcomed Mari Yoshitaka of Mitsubishi UFJ Research and Consulting, who is a specialist on climate change issues and who has also worked on government initiatives, to a conversation with President Iwata about the Sumitomo Chemical Group's response to climate change and its path toward achieving carbon neutrality.

Initiatives to Address Climate Change and Carbon Neutrality

Iwata: The Sumitomo Chemical Group views climate change as a pressing challenge facing mankind, and we have been working on a variety of initiatives aimed at resolving this issue for many years. Recently, many countries around the world, including Japan, have made a pledge to achieve carbon neutrality by 2050. It is clear, however, that carbon neutrality will be difficult to achieve with just existing technology and that innovation will be necessary. The chemical industry is at the forefront of innovation, and we would like to take the lead in this industry in creating innovation that will lead to a solution to this issue.

Yoshitaka: Carbon neutrality by 2050 is quite a significant hurdle for the industrial sector. What sort of direction will you aim to achieve it?

Iwata: We are proceeding in two directions, broadly speaking. First, we are aiming to reduce the amount of greenhouse gasses emitted by our production activities and business activities toward zero. We are positioning this as our *obligation*. The other direction is our *contribution* to advancement toward carbon neutrality for society as a whole through our products and technologies. We will work on both our *obligation* and our *contribution*, as we move toward carbon neutrality. To this end, in February of this year, we established the Carbon Neutrality Strategy Committee and the Carbon Neutrality Cross-Functional Team, creating a system for advancing our efforts toward carbon neutrality globally.

Yoshitaka: The Task Force on Climate-Related Financial Disclosures (TCFD) calls for information disclosure from four perspectives: Governance, Strategy, Risk Management, and KPIs. We could say that your references to corporate obligation and contribution would fall under Strategy, as they are about how you view the risks facing your company, how you fulfill your responsibilities to address them, and how you grow as a company by contributing to society. In addition, ESG investors are particularly concerned about Governance. I think the fact that you have set up a global system will be rated quite highly in the respect of Governance.

Iwata: Thank you very much for your positive comments. We are going to formulate and implement a strategy which is supported by scientific technology (based on both the natural sciences and the social sciences). At the same time, we will also ensure that that strategy is characteristic of Sumitomo Chemical, which is a diversified chemical manufacturer, and that it raises an expectation that Sumitomo Chemical might be able to achieve despite the high technical hurdles. Looking back, Sumitomo Chemical got its start by producing fertilizer from the gasses emitted from the Sumitomo family's copper smelters. It means that the Company was founded with a mission rooted in both the *obligation* to overcome environmental problems and the *contribution* to agriculture by supplying fertilizer. This history has an extremely close affinity to our current efforts toward carbon neutrality, and our spirit of working toward carbon neutrality is embedded in the DNA of every employee, so to speak.

Yoshitaka: Environmental problems are no longer negative externalities, but are becoming a growth factor for companies. The very fact that Sumitomo Chemical has experience dating back to its founding in environmental initiatives raises our expectations that you might be able to achieve the goal of carbon neutrality.

Reducing Greenhouse Gas Emissions

Yoshitaka: How will you approach to the reduction of greenhouse gasses your company emits, which you frame as your *obligation*?

Iwata: In 2018, we became the world's first diversified chemical company to receive certification from the Science Based Targets (SBT) initiative for reduction targets, and we have been working since then to achieve goals set based on the 2°C target in the Paris Accords. In line with these goals, we have achieved a reduction of about 20% in our Scope 1 and Scope 2 greenhouse gas emissions, from a baseline of 9.54 million tons in 2013 to 7.42 million tons in fiscal 2020. We achieved this by improving our business portfolio, through measures such as shutting down an ethylene plant in Chiba and replacing products with particularly high CO_2 emissions. At the recent climate

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There is a story to Sumitomo Chemical's strategy. I look forward to seeing you take the lead toward carbon neutrality in the industrial sector as a whole.

Mari Yoshitaka
Mitsubishi UFJ Research and Consulting Co., Ltd.

MS, School for Environment and Sustainability, University of Michigan. Part-time lecturer at the Graduate School of Media and Governance, Keio University. Ph.D. (Science). After working at a number of companies, including an IT company and a US-based investment bank, and doing work at a number of institutions, such as the environmental technology department of the World Bank Group's International Finance Corporation (IFC), in 2000, she set up the clean energy finance department at Mitsubishi UFJ Morgan Stanley. Using her long years of experience in consulting on environmental finance, primarily focusing on the climate change field and developing nations, she currently provides advice for a wide range of sectors on the fields of climate change, business related to the SDGs, and ESG investment. Since May 2020, she has worked for Mitsubishi UFJ Research and Consulting Co., Ltd. She is concurrently working for MUFG Bank and Mitsubishi UFJ Morgan Stanley.

change summit, the Japanese government set a target of a 46% reduction compared to fiscal 2013 by fiscal 2030. To meet this new national target, we will reestablish our goals, in line with a target of well below 2°C, and we are now working toward reducing emissions by close to 50% compared to fiscal 2013 by fiscal 2030.

Yoshitaka: The 46% reduction by fiscal 2030 expressed by the Japanese government will certainly have a significant impact, and it might lead to a transformation in the structure of industry. In these circumstances, it is quite impressive that you are realistically able to aim for a reduction of close to 50% by fiscal 2030.

Iwata: Obviously it will not be easy, but we have built up our track record to the point that it is not an absurd number. This is quite an important point, and there are many companies that, even if they can say their goal is carbon neutrality by 2050, cannot say they will achieve a 50% reduction by 2030, because 2030 is coming right up. To achieve carbon neutrality by 2050, however, you will never make it in time if you start in 2045, for example. Accordingly, we are aiming for a reduction of close to 50% by 2030 and taking every measure as early as possible to deliver results and make steady progress. Now let me give you an overall picture of Sumitomo Chemical's greenhouse gas emissions. In the chemical industry, we apply energy to raw materials in the form of electricity or heat from steam to promote chemical reactions, converting the raw materials into products. Of our 7.42 million tons of greenhouse gas emissions, about 70% of that is energy-derived, broadly speaking, while about 30% is process-derived, generated by chemical reactions and waste processing. Currently, the steam that is the primary heat source of chemical plants is generated using fossil fuels, so we will consider electrifying all of our steam generation, presuming that we will use electricity derived entirely from renewable energy sources in the future. This will require a great deal of innovation.

Yoshitaka: I am so impressed to hear that you are heading in the direction of full electrification. Shifting to renewable energy sources is not something that can be easily done by a single chemical company on its own in Japan, so I am sure that it will be an extremely difficult decision to first proceed with electrification, assuming that the electricity will be derived from renewable sources in the future.

Iwata: If we do not presume a shift to electricity derived from renewable sources, achieving carbon neutrality in the manufacturing industry will be extremely difficult. At the same time, for the process-derived emissions, we will need to aim for zero emissions through the use of carbon negative technologies, such as carbon capture, utilization, and storage (CCUS).

Yoshitaka: The path you have laid out toward zero greenhouse gas emissions for your company is extremely easy to understand, and I think it will resonate with ESG investors.

Technology Unique to Sumitomo Chemical

Yoshitaka: The government has created the Climate Innovation Finance Strategy in order to promote investment in companies that are working on innovation aimed at significant greenhouse gas emissions reductions or a steady transition in response to climate change. To take advantage of this opportunity, it is indispensable for a company to promote specific technologies that can catch the eyes of ESG investors and bring in funds. What sorts of technologies does Sumitomo Chemical have in this regard?

Iwata: First, we have the products and technologies that have been designated as Sumika Sustainable Solutions*, and among them there are several that contribute to mitigating or adapting to climate change. Some examples of products that contribute to reducing greenhouse gas emissions include methionine, an animal feed additive that can reduce the amount of nitrogen in livestock waste, and separators for lithium-ion secondary batteries, which are used in electric vehicles. The number of the products and technologies designated as Sumika Sustainable Solutions has reached 57, and the total annual sales of these solutions now amount to around 500 billion yen. While we are making a contribution through these products and technologies, we

* Sumitomo Chemical Group products and technologies that contribute to response to climate change, reduction of environmental impact, and effective use of resources.

are working on the development of a number of new technologies. We are focusing on carbon cycle technologies by capitalizing on our expertise as a chemical company, and in particular, we place a high priority on chemical recycling, which is sometimes called the ultimate form of recycling. We are working together with a variety of companies, universities, and public bodies to develop these technologies. For example, we are collaborating with SEKISUI CHEMICAL on technology to manufacture ethylene from municipal waste, with the Muroran Institute of Technology on technology to manufacture olefins from plastic waste, and with Shimane University on technology to synthesize methanol from plastic waste and other sources.

Yoshitaka: In addition to climate change, ESG investors are particularly concerned about biodiversity. Chemical recycling enables us to recycle plastics and other waste in a closed loop and prevent them from being disposed of elsewhere, so it can reduce our impact on the natural world, and thereby contribute to biodiversity as well as climate change.

Iwata: Chemical recycling is an area where we can leverage our technology. We would like to accelerate research and development in this field going forward. I touched on CCUS technology earlier, which consists of both technology to selectively capture CO_2 and technology to convert CO_2 into chemical products. In the first area, we are currently developing a low energy, high efficiency CO_2 separation technology using functional membranes, and in the second area, we are working on the development of methanol synthesis technology with Shimane University as I mentioned earlier. We are also engaged in a joint project to develop technology that can replace the fuel for naphtha cracking with ammonia. Finally, direct air capture (DAC) has received a lot of attention as the ultimate carbon negative technology, but the massive energy and cost requirements are an issue. This is why we focus on plants, and we are currently developing EcoDAC, a set of technologies that utilize the ecosystem. As an example of EcoDAC, there is a technology that increases the amount of CO_2 absorbed by plants by applying a type of fungus to the soil to activate plants. If we could use this to increase the amount of CO_2 absorbed by existing plants by 10%, we would be able to contribute to reducing CO_2 by massive amounts, more efficiently than reforestation. This is an area where we can fully capitalize on insights from our crop protection products and fertilizers. We are currently in the experimental phase with this technology, and scientific data collection is currently underway at an American university.

Yoshitaka: That's very interesting. From the perspective of focusing on plants, the CDP also views forest-related information disclosure as an important issue, perhaps we could say even as important as biodiversity, so I absolutely hope you will work on this as a pioneering business. You have clear stories for all of the technologies I have heard about from you to this point, and they are also all connected to your value chain. One of the points ESG investors focus most on is whether top management can present a strategic narrative about their company. You have a clear story for your strategy, and I hope you present it in a way that makes its appeal easy to understand.

Expectations of Sumitomo Chemical

Yoshitaka: Hearing about Sumitomo Chemical's response to climate change and your strategy for carbon neutrality has raised my expectations quite high. I have gotten the impression that achieving carbon neutrality by 2050 is not just words, it is something that I can envision in reality. While there are some companies whose mindsets do not really change, I would hope that Sumitomo Chemical not only takes the lead in the chemical industry, but becomes a leading presence in the industrial sector as a whole.

Iwata: Carbon neutrality is not something that will ever be achieved just by aiming for it. We will continue to show steady progress toward carbon neutrality by 2050, based on a strategy that is supported by science and is characteristic of Sumitomo Chemical. Thank you for speaking with me today.

Our *obligation* to reduce our own greenhouse gas emissions toward zero, and our *contribution* to carbon neutrality for society as a whole. We are working on these challenges by utilizing technologies that are unique to Sumitomo Chemical as a diversified chemical manufacturer.

Keiichi Iwata