

# Summary of Sustainability Briefing

November 29, 2021

Asahi Kasei Corporation

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## **Presentation**

Kobori: This is the second time we have held a Sustainability Briefing, the first being in December 2020. I would like to explain our company's initiatives over the past year.

We are implementing various measures to raise awareness of sustainability among our employees, one of which was the Sustainability Photo Contest held in the spring of 2021. We received many submissions from employees in 28 countries, and some of the best photos are used in today's presentation materials.

### **P. 4 Basic stance for sustainability**

In order to meet the expectations of our stakeholders, including future generations, and fulfill our responsibilities, our basic approach is to pursue two mutually reinforcing aspects of sustainability: "contributing to sustainable society" and "sustainable growth of corporate value." This approach will not change.

### **P. 5 Asahi Kasei Group Sustainability Policy**

We established the Asahi Kasei Group Sustainability Policy after discussion at the Board of Directors, in order to increase the common awareness of employees and accelerate actions toward sustainability. The first point is to contribute to life and living for people around the world, as stated in our Group Mission. The second is to strive for two mutually reinforcing aspects of sustainability, and the third is to pursue the optimal corporate governance while practicing the following three initiatives: "value creation through contribution to sustainable society," "responsible business activities," and "empowerment of personnel."

### **P. 6 Environmental recognition**

The importance of sustainability is increasing year by year due to COVID-19, climate change, emphasis on human rights, rising expectations from capital markets, etc. We will meet society's expectations with the two mutually reinforcing aspects of sustainability.

### **P. 8 Toward sustainable society**

In order to realize a sustainable society, we will work to solve social issues in our own ways from the perspective of ESG. In response to climate change and COVID-19, we are taking on the challenges of two themes: "active life in the new normal" and "carbon neutral sustainable world." I will explain the latter today.

### **P. 9 Two approaches to reducing GHG emissions**

To reduce GHG emissions, which are considered to be one of the factors of climate change, we will promote two initiatives: "reducing our own GHG emissions" and "contributing to reduced GHG emissions in society."

In terms of reducing our own GHG emissions, we aim to become carbon neutral by 2050 targeting Scope 1 and 2, and to reduce our GHG emissions by 30% or more by 2030 compared to FY 2013.

In terms of reducing GHG emissions in society, we will develop and expand products with

less environmental impact throughout their life cycle compared to conventional products. The global GHG emission is estimated at about 50 billion tons per year. We will contribute to reducing this amount.

#### **P. 10 Path to 2050**

We aim to become carbon neutral through new technologies and businesses in addition to efforts in established businesses.

For the existing businesses, we will divide our efforts into two time frames: one to be implemented by 2030, and the other to be after 2030 and toward 2050.

For the new technologies and businesses, alkaline water electrolysis, CO<sub>2</sub> separation and recovery, and CO<sub>2</sub> utilization will be key, and these will not only reduce our own GHG emissions, but will also greatly contribute to the reduction of GHG emissions in society as a whole.

The key words are carbon-free energy and feedstocks, carbon recycling, and collaboration with other companies and industries. Through these efforts, we will strive to become a carbon-neutral and sustainable enterprise group.

#### **P. 11 Specific measures for GHG reduction and expected effects**

By 2030, we aim to reduce GHG emissions by approximately 300 kilotons through the low-carbonization of in-house power generation, 100–200 kilotons through the non-fossil electricity purchases, and 100–200 kilotons through the control of process-derived emissions by process improvement and innovation. In addition, we will promote reduction of GHG emissions by business portfolio transformation and other measures.

Toward 2050, we will promote use of green electricity and steam through social implementation of our alkaline water electrolysis technology, etc., introduction of innovative processes, and further business portfolio transformation.

#### **P. 12 Framework to advance reduction of GHG emissions**

Four initiatives are in place to promote reduction of GHG emissions.

The first is internal carbon pricing, where CO<sub>2</sub> emissions are assumed to cost 10,000 yen per ton in the analysis of investment efficiency.

The second is calculation of carbon footprints for each product. We need to reduce emissions related to raw materials, not only Scope 1 and 2, to promote GHG reduction.

The third is launch of a company-wide project to study and promote measures to reduce emissions.

The fourth is apportioning of sustainability investment budget. Since promoting sustainability is not only a matter of fulfilling our responsibility to society, but also of increasing the competitiveness of our business, we will allocate resources for long-term investment, R&D, etc.

#### **P. 13 Proactive utilization of renewable energy**

For the next 100 years, we will actively utilize hydroelectric power generation as a green energy source, renewing and increasing the capacity of nine power plants in Miyazaki Prefecture, etc., considering green bonds as one of the measures.

In addition, we are expanding the use of solar power. For example, in the manufacturing sites, MIKO srl in Italy, a subsidiary of Sage Automotive Interiors, Inc., and Asahi Kasei Jyuko Co., Ltd. in Shiga Prefecture, Japan, are actively utilizing solar power generation.

In the Homes business, we have leased the rooftops of Hebel Maison apartment buildings from their owners and installed solar power generation equipment. The environmental value from solar power generated there has been utilized in business activities within the Group. This will benefit the owners of Hebel Maison buildings, which will lead to our business growth, thus the realization of value for both the business and the environment. The environmental value from this system has been utilized at Asahi Kasei's Kawasaki Works since August 2020, and will be introduced at the Hibiya Head Office of Asahi Kasei and the Jimbocho Head Office of Asahi Kasei Homes Corp. in April 2022. This will contribute to the achievement of RE100 initiative Asahi Kasei Homes is aiming for.

#### **P. 14 Business growth with environmental contribution (expanding environmental contribution products)**

Addressing climate change, GHG reduction will become increasingly important in the future. We will promote this while achieving both environmental contribution and business growth.

Since FY 2019, we have selected environmental contribution products and calculated their contribution to reduced GHG emissions based on reviews by external LCA (life cycle assessment) experts. The GHG reduction contribution of these products was approx. 13 million tons in FY 2020, with the goal of more than doubling this amount by FY 2030.

We will also increase the sales ratio of environmental contribution products. The ratio of these products in the Group's total sales excluding Health Care is about 30% in FY 2020. We aim to increase this toward 50% in FY 2030.

#### **P. 15 Notable environmental contribution products (1)**

I will introduce some of our environmental contribution products. The first is the Li-ion battery (LIB) separators. In response to the increasing electrification of automobiles, we are expanding our production capacity for LIB separators. According to the International Energy Agency (IEA), it is essential to increase the share of electric drive vehicles in new car sales in order to achieve carbon neutrality by 2050. There are clear movements toward electrification of automobiles in the policies of various countries. We will continue to work aggressively to expand our LIB separator business, which will play a key role in achieving this goal.

Next is the ion-exchange membrane chlor-alkali process, which uses salt and water as raw materials to produce chlorine and caustic soda. Both chlorine and caustic soda are raw materials for a variety of daily commodities, and are indispensable for healthy and affluent lifestyles, which is one of the SDGs. The challenge is that the manufacturing process uses a large amount of electricity, and we are focusing on developing more efficient processes to reduce electricity consumption. In addition to improving the performance of membranes, we are also working on supporting optimal operations in our customers' plants as one of new initiatives.

#### **P. 16 Notable environmental contribution products (2)**

Hebel Haus unit homes and Hebel Maison apartment buildings are also environmental contribution products. In particular, we are focusing on ZEH (net zero energy homes), the sales ratio of which is steadily increasing. In addition to unit homes, we are also focusing on increasing the ZEH ratio in apartment buildings.

The CO<sub>2</sub> sensors are also expected to make a significant contribution to the environment. In buildings and large structures, energy used for air conditioning can be reduced by optimizing ventilation according to air quality. For this purpose, highly accurate measurement of CO<sub>2</sub> concentration is necessary. This is also true in the cabin of automobiles, especially in electric drive vehicles, where the reduction of power consumption leads to weight reduction through battery reduction, improved driving range, etc.

We will continue to expand these businesses and promote environmental contributions.

#### **P. 17 Efforts for hydrogen**

The project aiming to realize low-cost green hydrogen, which is essential for carbon neutrality, and green chemicals utilizing green hydrogen, has been selected as a Green Innovation Fund Project by the New Energy and Industrial Technology Development Organization (NEDO). In Phase 1, the project will develop larger water electrolysis equipment and a system to optimize the operation of the overall process, and in Phase 2, the demonstration of synthesizing basic chemicals using larger water electrolysis equipment will be implemented. We hope to materialize a pathway for the chemical industry to transform itself into a green and sustainable industry.

#### **P. 18 CO<sub>2</sub> utilization, separation, and recovery**

Toward carbon neutrality, CO<sub>2</sub> utilization as material, separation, and recovery are also important themes. In the area of CO<sub>2</sub> chemistry, which manufactures functional chemicals using CO<sub>2</sub> as a raw material, we have already commercialized a technology license for polycarbonate. In addition, we have started licensing technology for the manufacturing process of raw materials for LIB electrolyte. As the need for LIBs increases, low-carbonization of LIB manufacturing processes will be more important, and our technology can contribute to this. We are also developing a manufacturing

process of isocyanate, a raw material for polyurethane.

For CO<sub>2</sub> separation and recovery, we are developing a system that utilizes zeolites. The zeolite we have developed is suitable for CO<sub>2</sub> separation from mixed gas of methane and CO<sub>2</sub>, as well as CO<sub>2</sub> separation from exhaust gas, so we are considering demonstration trials assuming CO<sub>2</sub> separation and recovery from mixed gas derived from sewage and livestock manure.

Methane has a high global warming potential, and the need to reduce it was confirmed at the G20 Summit in October 2021. When CO<sub>2</sub> is separated from biogas and converted to high-purity methane, it becomes carbon-neutral biomethane. We expect that the opportunities for our CO<sub>2</sub> separation and recovery system will expand.

#### **P. 19 Contributing to GHG reduction in society from various perspectives**

We believe that our diverse businesses and accumulated technologies can be utilized to reduce GHG emissions, and will continue to examine the issues from various perspectives.

#### **P. 20 Efforts for a circular economy**

There is a growing awareness of circular economy. Efficient and cyclical use of resources and increased sustainability cannot be achieved by one company alone. While pursuing what we can do, we will also collaborate with other companies to promote our efforts.

#### **P. 21 Efforts for sustainable resource use**

As for the established value chains, we are working with other companies to develop recycling technologies for polystyrene and polyethylene. We are also working on the use of recycled materials and biomass feedstock as raw materials for various products. However, even with the advancement of recycling technologies, the recycling loop cannot be closed unless society properly understands and accepts it. We are trying to create a platform to promote circularization and collaborate with other companies.

As an example of the creation of a new value chain, we will also introduce a cloud-based fresh produce logistics solution. This is an initiative to transport perishable food using ordinary trucks instead of refrigerated trucks. It is being developed for commercialization as a business that contributes to a sustainable society through the 3Rs (reduce/reuse/recycle) in a broad sense, such as reusing special insulated boxes, improving truck utilization efficiency, and reducing food loss.

These efforts are being considered for development not only in Japan but also for overseas trials.

#### **P. 22 Efforts in established value chain (example of Homes)**

Here are some examples of our efforts in the Homes business. The key word for the circular economy is longevity. In our Homes business, we have consistently worked on extending the service life of homes by making the buildings themselves durable for 60 years or more and systematically conducting inspections and maintenance over a 60-year period.

Pre-owned Hebel Haus are sold under the Stock Hebel Haus brand, contributing to the distribution of safe and secure used houses. Recently, a product line that combines a universal floor plan for future sale with a guaranteed purchase service has been well received.

We are also working to reduce and recycle the waste generated at the site during new construction.

#### **P. 24 Value creation by DX**

Next, I would like to explain about DX, intellectual property, and human resources as the foundation of value creation.

With regard to DX, we have adopted the key words “connect,” “overcome,” and “co-create” leveraging digital technology. From the perspective of streamlining operations, improving quality, and speeding up analysis and development, we are working on materials informatics and carbon footprint visualization. We are also focusing on IP landscaping and blockchain technologies in terms of creating new value and leading business innovation, and on production technology innovation and internal/external co-creation from the perspective of actualizing latent value within the Group. These efforts were recognized by the Ministry of Economy, Trade and Industry and the Tokyo Stock

Exchange, and the company was selected as a “DX Stock 2021.”

#### **P. 25 Efforts for digital transformation (DX)**

The promotion of DX is still in progress, and we envision the “Digital Creation Period” from FY 2022 to promote management innovation by DX, and the “Digital Normal Period” from FY 2024, in which the creation by DX and utilization will become a prerequisite for management. We believe it is important to raise the level of all employees, in addition to training DX specialists, and have launched the Asahi Kasei DX Open Badge program, which sets five levels and provide training accordingly. We expect all employees to reach level 3 by FY 2024.

#### **P. 26 Value creation by IP**

With regard to the IP landscaping, we are conducting various initiatives to utilize it for new business creation and business strategy building. Examples include an initiative to consider the possibility of creating a new theme by matching our core technologies with emerging technologies, and a workshop to share the results of IP analysis with cross-group members for brainstorming. In addition, we have established a personnel recommendation system to search for experts within the Group based on the inventor information of patents. We have many experts with diverse technologies and knowledge. This system is designed to connect these human resources.

#### **P. 27 Strengthening human resources**

Now I explain the efforts to strengthen human resources. A company’s value is composed of financial and non-financial value. The non-financial value, including strategic mindedness, technological ability, IP skills, and organizational strength, is difficult to measure numerically, and its source is human resources. Management that enables diverse human resources to play an active role is extremely important. In order to strengthen human resources management, we introduced a new survey system in 2020 that includes measurement of work engagement. We will strive to create an environment where employees can thrive, for realization of a strong organization.

#### **P. 28 Group Masters Program**

We are also focusing on heightening the expertise of each employee. We appoint human resources who contribute to the creation of new businesses or the strengthening of established businesses as Group Masters to nurture them. The number of Group Masters is increasing, and I feel that the evaluation of their high-level expertise stimulates the employees around them and contributes to raising the overall level of the Group. One of the features of the program is that it includes not only R&D personnel in core technology areas, but also employees in business sector areas and core platform areas. We would like to revise the requirements and appoint more young employees to revitalize the program.

#### **P. 29 Health and Productivity Management**

We are also focusing on health and productivity management, as the health of employees is the foundation for them to thrive. In particular, in order to reduce the incidence of long-term and serious diseases, we have set KPIs for metabolic syndrome, smoking, serious lifestyle-related diseases, and absence from work due to mental health problems, and are working to promote the health of employees.

#### **P. 30 Raising internal awareness for sustainability**

In order to pursue the two aspects of sustainability that we are aiming for, it is important for our employees to understand the importance of sustainability and to be aware of it in their daily work. In order to deepen the understanding of sustainability, we conduct training and seminars, use an internal magazine, and holds various events. The photo contest mentioned at the beginning is one example. In order to further encourage employees to take action, we are considering incorporating sustainability into the evaluation system.

#### **P. 32 Closing**

We put up the term “GDP” as the key word for the realization of a sustainable society. “G”

stands for the pursuit of green, “D” for the active use of digital technologies, and “P” for people who promote them. We believe that strengthening “GDP” is the foundation for pursuing sustainability, and we will continue to promote it in the future.

### **Main Substance of Questions and Answers**

Q: What are your thoughts on technological differentiation from overseas competitors and future profit targets in the alkaline water electrolysis business?

A: The realization of a hydrogen society is a challenge common to the world. The strength of our company is that we have many elemental technologies related to alkaline water electrolysis. The technical knowledge of membranes, electrodes, electrolytic solution, and electrolyzers accumulated through the ion-exchange membrane business is being utilized. We are currently conducting demonstration trials for larger-scale production, and in addition to improving the durability and efficiency of the equipment, we need to create a system that can respond to fluctuations in the output of renewable energy and provide a stable supply of hydrogen.

We are currently considering how to proceed with the commercialization of this technology, and although we have received many inquiries from various countries, it is important to form consortiums with partners such as electric power companies that can provide stable supply of energy and hydrogen consumers. We are investing resources such as R&D and human resources to launch this business around 2025, and make it one of the growth engines of Material sector by 2030.

Q: There was a media report the other day that your company is planning to commercialize hydrogen production equipment in 2025, is that correct? The report gave the impression that the commercialization would be in the form of equipment sales, but based on your explanation, I believe that sales of components such as electrodes, membranes, and electrolytic solutions are also possible. What’s your thought about the method of commercialization?

A: The schedule for commercialization depends on the results of the demonstration trials, but we hope to realize it around 2025 through participation in the projects, etc. As I explained earlier, we would like to make this business one of the growth engines for Material by 2030, and will work on it aggressively.

As for the commercialization method, we are considering not only selling the equipment and components, but also handling the operation. We will contribute to the efficient and stable operation of the system, including maintenance proposals such as predicting the replacement time of the membranes or electrodes by analyzing the data during operation. In the demonstration trials, we are also accumulating know-how on how to respond to fluctuations in renewable energy output. In the ion-exchange membrane business, we have already developed a business model that includes operations, and we will apply this knowledge to the alkaline water electrolysis business.

Q: Japan is not very suitable for the creation of renewable energy due to natural conditions, etc. Therefore, it is important to create optimal consortiums including overseas, for both hydrogen-related business and circular economy. Are you considering any measures or incentives to encourage other companies to join your platform?

A: It is important to set forth our basic ideas about the society we are aiming for and how hydrogen can be used to achieve it, and communicate with each other through the development processes. In order to achieve total optimization of the consortium, it is necessary to openly share one another’s development status and clarify the schedule based on common goals and values. Our Group has a corporate culture that enables this. We will continue to work with partners who agree with our way of thinking.

In the area of the circular economy, we are collaborating with other companies in polyethylene and polystyrene. Aiming for total optimization, it is important to share and respect

each company's role, development status, and schedule.

Q: You explained that in the alkaline water electrolysis business, you will handle operations as in the ion-exchange membrane business. I agree with the point that it is important to have an ongoing business model, not just selling equipment. On page 18 of the presentation material, there is a reference to licensing of technologies for polycarbonate and for LIB electrolyte materials as CO<sub>2</sub> chemistry. For these as well, you should create a system to earn revenue on an ongoing basis according to the amount of CO<sub>2</sub> your clients could reduce by using the license, rather than only when the license is granted. I would like to hear your thoughts on this.

A: I agree with your point, and think that DX is essential for this. It is important to create a business model that utilizes data such as process operating status and CO<sub>2</sub> emissions. The "D" in "GDP," which is the foundation for value creation, is DX, and it is an important element in many ways, including business model innovation and enhanced development. We are aiming to increase the knowledge of DX among all employees through initiatives such as the Open Badge program.

In addition to selling products as a manufacturer, we are also involved in services and operations to change our business models. We believe that the barriers between industries will become lower and that collaboration with other companies and industries will become more important.

Q: On page 11 of the presentation material, you mention business portfolio transformation as one of the concrete measures to reduce GHG emissions. What is the progress of the 15 strategy reformulation businesses that were presented at the management briefing in May? Also, what is the scale of GHG emissions reduction through business portfolio transformation?

A: At this point, we cannot yet say exactly how much GHG emissions will be reduced by the business portfolio transformation. In the period up to 2030, we will strive to reduce GHG emissions by focusing on low-carbonization of in-house power generation, non-fossil electricity purchases, and process improvement and innovation.

In considering the business portfolio transformation, it is important to consider not only the GHG emissions from our manufacturing processes but also the LCA perspective. We are currently applying internal carbon pricing to investment projects above a certain scale in the analysis of investment efficiency, but we will be examining how we can contribute to carbon neutrality from an LCA perspective toward 2030.

Q: On page 12 of the presentation material, there is a reference to the apportioning sustainability investment budget as an initiative for reducing GHG emissions. Some of your competitors have proposed an investment amount of 140 billion yen or 100 billion yen by 2030, but what is the scale of your investment budget? For example, for the realization of the low-carbonization of in-house power generation described on page 11, will you need to invest more than 100 billion yen by 2030?

A: The specific amount of investment will be announced in the next medium-term management initiative starting in FY 2022, but if we look at the time frame up to 2030, investment of such a scale will likely be necessary. COVID-19 and other factors have made it clearer than ever what we should be aiming for toward 2030, and investment from a long-term perspective, including sustainability, is becoming extremely important.

The current medium-term management initiative, which ends in FY 2021, calls for a long-term investment plan of approximately 800 billion yen over three years, but we believe that the final result may be slightly higher than that.

Q: In the pie chart on page 14 of the presentation material, the sales ratio of environmental contribution products to the total sales of the Group excluding Health Care is stated to be 30%. Of this amount, I estimate that Homes will account for about 400 billion yen and Material about 100 billion yen. Is this estimate reasonable? In this view, 5–6% of the sales of Material would be environmental

contribution products. Would it be correct to assume that sales of environmental contribution products in Material would need to increase significantly in order to increase the ratio from the current 30% to 50%?

A: Your view is generally correct and the sales of environmental contribution products are around 500 billion yen currently. Although we are still considering the sales target for FY 2030, we will increase the ratio to contribute to carbon neutrality in society.

Q: On page 27 of the presentation material, there is a statement that human resources are source of non-financial value. I think it is difficult to evaluate the creation of non-financial value, but what is your approach to personnel evaluation, appointment, and human resource management?

A: For example, we have set a target of reducing GHG emissions by 30% by 2030 compared to FY 2013. We are considering including the degree of achievement of the CO<sub>2</sub> reduction target in units of plants or regions as a KPI in the evaluation.

We are also aiming to create an environment where each employee can continue to grow. As part of this effort, we would like to start appointing Group Masters not only based on their qualifications and past achievements, but also by setting medium-term missions and tasks as expectations. We believe that this kind of human resource management will lead to increased vitality and work engagement of each employee.

Q: I would like to ask you about your thoughts on measures to prevent accidents in the wake of the accident at the Hipore LIB separator plant and the semiconductor plant fire, both of which occurred in 2020.

A: I believe that safety and disaster prevention initiatives are extremely important. It is necessary for the top management to clearly formulate policies and to thoroughly implement safety assurance and prevention measures at each site in accordance with the policies. It is also essential to follow up to see if the measures are being implemented properly. We hold a Responsible Care (RC) Symposium every year for the entire Group, each core operating company, and each region to share our safety initiatives. Since becoming president, I myself have continued to communicate within the Group the “three actuals,” which is to focus on and to act in accordance with the actual place, actual thing, and actual fact. We will continue to develop our business activities based on the facts in the workplace.