Summary of the Separator Business Briefing, held on March 8, 2023

Asahi Kasei Corporation

Participants

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Presentation

P. 3 Main points (summary)

Today, we have made a consequential decision regarding the separator business, which is one of our core businesses. Here is a summary of what we would like to share with you at this briefing.

In 2015, we acquired Polypore International, a U.S.-based battery separator manufacturer. Since then, we have been operating the three businesses of Hipore, our original wet-process lithium-ion battery (LIB) separator, Celgard, Polypore's dry-process LIB separator, and Daramic, also Polypore's separator for lead-acid batteries, under unified management. However, due to changes in the environmentally friendly vehicle market, Polypore's performance fell far short of the plan at the time of acquisition. On the other hand, demand for Hipore is expanding for the automotive applications, and we are going to pursue further growth centered on North America and Japan.

As the positioning of each business has become clear, the decision was made to shift from the previous unified management to the separate management of Hipore and Polypore businesses.

In accordance with this change in management policy, the asset grouping was dissolved and we performed an impairment test for Polypore independently. As a result, we decided to record an impairment loss of 185 billion yen as an extraordinary loss in FY 2022 related to the Polypore business. This amount is expected to correspond to the remaining book value of the goodwill and other intangible assets recognized at the time of the acquisition in 2015.

P. 5 Aims at time of Polypore acquisition

At the time of the acquisition of Polypore in 2015, there were various views on the future market development of environmentally friendly vehicles, such as hybrid electric vehicles (HEV), plug-in hybrids (PHEV), electric vehicles (EV) powered only by electric motors, or, as a practical solution, idling-stop systems (ISS) for internal combustion engine-powered vehicles, and there were also many technical challenges to be addressed. It was also unclear what kind of LIB would be used for automobiles, how it would differ from the LIBs for consumer electronics applications, and, in particular, what the cathode material would be, which is key to determining battery performance and cost, in consideration of restrictions on raw mineral resources. In addition, the ideal configuration of drive and power sources for environmentally friendly vehicles, as well as subsidies and tax breaks, etc. to promote environmentally friendly vehicles, had only just begun to be implemented.

Under these circumstances, the acquisition of dry-process LIB separators, which had a proven track record in automotive applications, was aimed at achieving growth in the automotive market, as well as responding to trends in the environmentally friendly vehicle market and addressing technological issues by operating businesses of wet-process and dry-process LIB separators and lead-acid battery separators under unified management. At the time, Hipore had a strong position and

track record as a top manufacturer in consumer electronics applications. Celgard was a pioneer in separators for automotive applications, used in the LIBs which became the de facto standard for the first generation EVs. Daramic was the market leader in separators for lead-acid batteries, the largest market for energy storage devices, with a market share of approximately 40%. We decided to operate these three businesses under unified management and tackle the challenges with a broader market channel and technology spectrum. In terms of accounting, the asset grouping as the separator business was also applied.

P. 6 Reference: Aims at time of Polypore acquisition

This is a page from material we used at the time of the acquisition of Polypore in 2015. It is a conceptual view of the automotive battery market. Back then, market trends were uncertain, including the respective applications of lead-acid batteries and LIBs, the separators required, and the future composition of environmentally friendly vehicles. In order to respond flexibly to such markets, with its wide range of market channels and product lines, the separator business had been operated under unified management.

P. 7 Automotive market situation after Polypore acquisition

As you know, there have been various changes in the environmentally friendly vehicle market since 2015. While China has adopted an aggressive policy to foster EVs as a key domestic industry, Europe, which had been trying to advance environmentally friendly measures centering on diesel vehicles, has shifted its focus to EVs rapidly with the so-called Dieselgate scandal. This movement was accelerated as the development of EV industry was upheld as one of the post-Covid economic stimulus measures. And in the U.S., Tesla Inc. has been successful.

As a result of such market environment and the business activities of various companies, market trends and technological issues have become clearer. EVs became the mainstay of environmentally friendly vehicles, and nickel-rich NMC (nickel-manganese-cobalt) and NCA (nickel-cobalt-aluminum) cathode materials are the mainstream for automotive LIBs, and wet-process separators with an inorganic coating are used for such batteries.

On the other hand, however, while LIBs are used for the high-voltage drive system for EVs, lead-acid batteries are used for starting the entire system, opening and closing windows, and for electrical systems such as audio systems, because of their superior cost and stability. In addition, lead-acid batteries are essential for starting engine of HEVs.

In the U.S., which had previously distanced itself from the electrification of automobiles, the policy of establishing a supply chain for LIBs in the country, epitomized by the passage of the Inflation Reduction Act (IRA) in the summer of 2022, was also clearly indicated.

In response to these developments, the market segments that each of the three businesses is targeting in the automotive market and the direction of technological development have become clear. The market segment targeted by Hipore is EVs and PHEVs, and the technological task is to develop separators compatible with the NMC and NCA cathode LIBs used in these vehicles. Celgard will target HEVs, which require durability, as well as LIBs for energy storage systems (ESS). In addition, while I mentioned earlier that NMC and NCA cathode materials will be the mainstream for EVs, for applications such as EVs with relatively short range and ESS, some customers use lithium iron phosphate (LFP) cathodes, which are cheaper and have fewer restrictions on raw mineral resources, and such batteries are found to be a good match for dry-process separators. The direction for Daramic also became clear that it targets the applications of engine starting of HEVs and an EV auxiliary battery, in addition to the existing market for gasoline-powered vehicles.

As a result of these market trends, while demand for Hipore for automotive applications has been steadily increasing, it has been sluggish for Celgard, and Daramic has been affected by the recent high cost of raw materials, although demand is firm.

P. 8 Policy for each business moving forward

Thus, seven years after the acquisition, the market segment that we should focus on, as well as the market positioning and respective technological issues, have become clear, and we have determined that it is more efficient to operate the Hipore and Polypore businesses independently and pursue business opportunities in each.

As in the past, for Hipore, we will continue to pursue profit growth by investing resources. We aim at growth in the North American and Japanese automotive markets, and will actively consider alliances and other opportunities to further strengthen our competitiveness in the North American market. On the other hand, in the consumer market, where we see strong demand centered on high-end models, we will strive for further differentiation and higher value-added products.

In the Polypore business, Celgard aims to improve profitability and productivity, targeting not only ESS applications but also HEVs that require high output and high durability in automotive applications, while in North America, we will actively participate in the developing battery supply chain using LFP-based cathode materials, a new trend that has recently emerged. Daramic is positioned as a business that generates stable cash, and we will take a leadership role in the market for lead-acid batteries used in environmentally friendly vehicles, while strengthening its global manufacturing bases, including cost reduction, and penetration of emerging markets.

Thus, the asset grouping was dissolved and an impairment test was performed for the Polypore business, as the respective business policies of the Hipore and Polypore businesses were clarified.

P. 9 Impairment loss on Polypore

To give you an idea of the breakdown of the impairment loss, Polypore's fixed assets recognized at the time of acquisition in 2015 amounted to approximately $2.7 billion. Of this amount, about $500 million were business assets, and excluding these, about $2.2 billion were recognized as goodwill and other intangible assets, most of which was planned to be amortized over a 20-year period.

Seven years after the acquisition, we have already written off approximately $900 million, equivalent to about 40% of it, and approximately $1.3 billion is the remaining book value. An impairment test was conducted based on the estimated future cash flows of the Polypore business, and as a result, an extraordinary loss of 185 billion yen will be recorded in FY 2022 based on the latest exchange rate, which is equivalent to the residual book value of goodwill and other intangible assets.

P. 11 EV and PHEV market forecast

I will explain the business environment for LIB separators. The graph indicates the projected vehicle production volume from 2021 to 2030, showing the breakdown of EVs and PHEVs among them. The combined ratio of EVs and PHEVs to the total production of all automobiles will be approximately 30% in 2025 and almost half in 2030 worldwide.

P. 12 Automotive LIB separator market forecast

This is based on the automobile production forecast by vehicle type shown on the previous page, which is substituted for separator demand. The 2030 global demand for separators for LIBs is expected to exceed 30 billion square meters, with Japan, North America, and Europe expected to account for about half of this demand collectively.

P. 13 North American automotive LIB separator market situation

I would like to explain the current situation of the North American automotive LIB market, which Hipore will focus on in the future. As you know, there has been a growing movement in the U.S. to establish LIB supply chains within the country. Indicative of this trend is the IRA, which was passed in the summer of 2022, and which has prompted automakers and LIB manufacturers to expand their operations in North America. On the other hand, there are no mass-production plants for wet-process LIB separators in North America, and only one LIB separator manufacturer with a proven track record has announced a concrete plan to enter into the U.S. In addition, the IRA appears to exclude some countries and regions from the supply chain out of consideration for geopolitical risks, so the customers of separators are looking for suppliers, and we believe this is where our business opportunity lies.

P. 15 Asahi Kasei Group separator business

I will explain the policy and strategy of the separator business. In the separator business, we will aim for growth in the North American market as our main target market, centering on Hipore wet-process LIB separator. The separator business is indispensable to our goal of contributing to a sustainable society from the perspective of realizing a carbon-neutral and sustainable world, and is positioned as a business that we will continue to pursue profitable growth over the medium to long term. Currently, we are in the process of finalizing a business plan based on the premise of expanding into North America. In order to further strengthen our competitiveness in North America, we will not only consider expanding on our own, but will also consider alliances with other companies.

P. 16 Hipore growth trajectory

This chart shows the shipment volume of Hipore since 2000. The light blue area shows shipments for consumer electronics applications such as laptop computers and smartphones, and the blue area shows shipments for automotive applications. Launched in the 1980s, Hipore has achieved shipment growth of around 17% per year during the period from 2000 to 2021 as the LIB market has fully emerged. Meanwhile, to support this growth, we have invested a cumulative total of approximately 130 billion yen since 2000 in capacity expansion at the plants in Moriyama City, Shiga Prefecture and Hyuga City, Miyazaki Prefecture. The yellow line on the graph shows the cumulative amount of this investment in capacity expansion.

P. 17 Hipore automotive market strategy

Lastly, I would like to explain the outline of our strategy toward Hipore's success in the automotive market in North America and Japan in the future. We will pursue further growth by making the most of the technology, know-how, and relationships of trust we have built up with our customers over the past 40 years since the market launch of Hipore, with the following four points as core strategies.

The first is to develop products based on a high degree of coordination with customers regarding product technologies. We will develop products that meet the expectations for automotive LIB separators and provide higher value-added products.

The second is our world-leading environmentally friendly technology. Wet-process separators use methylene chloride, an environmentally hazardous substance, to extract plasticizers in the manufacturing process. Our process technology and know-how significantly reduce the emission of methylene chloride, thereby making it possible to reduce environmental impact. We have also established recycling technology for plasticizer oil, which is also used in the manufacturing process, to reduce emissions outside the plant and lower costs.

The third is the cost advantage due to our world-class high productivity, backed by 40 years of accumulated production technology. Currently, some competing manufacturers in a certain region have high cost competitiveness due to favorable competitive conditions such as aggressive subsidy policies and inexpensive labor costs. However, in North America, where conditions such as labor, utilities, and plant construction costs are equal, we believe that our high productivity gives us a competitive advantage over our competitors.

The fourth is to strengthen the supply capabilities in the North American market and actively consider alliances. In pursuit of business opportunities, we will strengthen our production capacity in the future, which is expected to require a large amount of capital and engineering resources. In order to succeed in the severe market environment, we will consider not sticking to operating on our own, and will strive to contribute the technological resources we have cultivated to the demands of society and the market for the realization of a carbon-neutral society.

Questions and Answers

- Impairment loss

Q1: Polypore's sluggish performance has been recognized for some time, but why did you decide to change the grouping and record an impairment loss at this time? In terms of the business environment, there may have been high expectations for the rise of LFP cathode material LIBs,

etc.

A1: There had been tough situation for the Polypore business, but with the direction of the automotive LIB market uncertain, we thought it would be effective to operate the separator business under unified management. However, the recent expansion of the EV market has increased demand for wet-process separators for automotive LIBs, and the positioning of each of our separators has become clearer. We have come to this conclusion as we believe that clarifying the strategy for each business and implementing it independently will accelerate management speed in pursuing the growth of Hipore. The timing of this decision was reached after much deliberation.

Q2: With the recording of this impairment loss, will the PPA-related amortization be eliminated from FY 2023 onward, resulting in an annual cost reduction effect of more than 10 billion yen?

A2: Yes, that is correct.

Q3: The extraordinary loss in the non-consolidated accounts expected to be approximately 260 billion yen. Why is this larger than the impairment loss in the consolidated accounts? Also, we believe that your company has sufficient dividend reserves even after posting a loss of approximately 260 billion yen. Is it correct to assume that this is the reason why the full-year dividend forecast was left unchanged in this announcement?

A3: In the non-consolidated balance sheet, the share value of Asahi Kasei Energy Storage Materials Inc., our wholly owned subsidiary and the holding company of Polypore, includes goodwill from the acquisition of Polypore. Unlike the consolidated balance sheet, this is not amortized. In addition, we increased its capital slightly after the acquisition. With this background, the impairment loss resulted in a loss on valuation of shares of subsidiaries and affiliates of approximately 260 billion yen. This will be recorded only on the non-consolidated balance sheet and will have no impact on consolidated results.

As you note, we believe that retained earnings are not at a level that would impede dividend payments, and we have therefore decided to leave the dividend forecast unchanged.

• Hipore business strategy

Q4: The strategy of Hipore in the automotive market is described on page 17 of the presentation material, and you explained that under the equal competitive conditions, your cost competitiveness would be top class. Can we expect a significant cost advantage in North America, including recycling technology, etc.? Will the cost advantage and brand value of your company work to the advantage of alliances, too?

A4: We believe that our technologies for reducing emissions outside the plant, including plasticizer oil recycling, are among the best in the world. In addition, we have very advanced production technologies developed at our plants in Japan, and we are working to further enhance these in cooperation with our group-wide production technology department. Through these efforts, we believe we can achieve a high cost advantage. We are now flexibly considering alliances from a strategic perspective.

Q5: I understand that your company’s technology is very advanced, but isn’t it possible that competitors with experience in vertical start-up of mass production are more competitive? Are you confident that you would be able to achieve high productivity in the case you expand the production capacity rapidly on your own? Would the same be true if you formed an alliance with another company?

A5: We believe that we have an advantage under the same conditions. We have experience in rapid start-up of plants in Japan, and our competitive edge will be demonstrated when forming alliances, too.

Q6: There is an alliance between a Korean battery manufacturer and a wet-process LIB separator manufacturer. Where do you see your company's advantage in North America and how do you think you can differentiate yourself from the competition? Also, the grouping of the Hipore and

Polypore businesses has been dissolved, but does the fact that Polypore has a production base in North Carolina still provide an advantage in your business development in North America?

A6: We are considering alliances to strengthen our competitiveness in the North American market. Alliances can take a variety of forms, including working with competitors, customers, or completely different partners. I can't go into details, but we are currently discussing it.

In addition to the technologies to manufacture the base film that we have cultivated over our 40-year history, we also have coating technology, for which demand is increasing for automotive applications. There is a good chance for us to win in North America with our cost advantage based on the high productivity and technological and developmental strengths. Although LIB technologies are fairly well established, we recognize that it is still in the process of evolution as the market expands several times in the future. While the cost of the battery manufacturing process is being reduced, perspectives such as longer battery life and circular economy are becoming significant value propositions, and there is still much room to evolve batteries in cooperation with customers. We believe that further collaboration with our customers to create the next value will add new value to what we have already developed and will become our differentiation.

In addition, we believe that the customer network, employees, production facilities, etc. possessed by the North Carolina base will of course be an advantage in the North American strategy of Hipore.

Q7: Regarding expansion in North America, one of your competitors is already planning to build a large-scale separator production facility. Even if your company has high cost competitiveness under the same conditions due to your technological superiority, won't they have an advantage if their production scale is much larger? If your company makes an investment, will the amount be large? Is there a possibility that your company would make such investment on your own? What is the progress of the negotiations for the alliance?

A7: Regarding alliances in North America, we are deepening discussions both internally and externally and are in contact with potential partner companies. I cannot tell you any more than that, but we are steadily advancing our discussions. Alliances are not an objective, but a means to an end. We are also considering the scale of investment required for expansion in North America, including discussions with battery manufacturers. We will consider investment on a competitive scale, taking into account market prospects, customer needs, our strengths and positioning, etc. Although details of implementing the IRA are still unclear, we will update our strategy as they become clear.

Q8: The price of LIB separators has declined considerably compared to the past. With the sales price of EVs also declining, I think the entire supply chain is coming under severe cost pressure. Under these difficult circumstances, you may benefit from subsidies, etc. in North America, but what are your thoughts on ROIC? Also, when forming alliances, is it possible to negotiate prices through long-term contracts?

A8: As battery and automobile manufacturers pursue cost reductions, the cost pressure on separators is becoming very severe year by year. While there are ways to reduce manufacturing costs and lower prices, there are also cases where the use of our separators can lead to cost reductions in the overall battery manufacturing process. We will work with battery manufacturers and automakers to determine how we can reduce costs for batteries and vehicles as a whole, and where we can contribute as a separator manufacturer.

ROIC is a very important indicator. We aim to improve ROIC as a result of our efforts to reduce overall battery costs while increasing our productivity.

We are considering various possibilities for alliance partners, not limited to customers. It is important to consider costs and prices not only within the alliance but also throughout the supply chain.

Q9: I understand that your company has been making various efforts to reduce your own costs, but what specific ways can separators contribute to overall battery cost reduction? For example, is there a way to increase the capacity of the cathode by further thinning?

A9: EVs will become part of the social infrastructure. Until now, each manufacturer in the supply chain has pursued cost reductions on its own, but it will be important to work in unison in the future, for example, entering each other's factories to jointly examine areas where inefficiencies can be eliminated, and where concessions can be made in order to reduce costs. We believe that there is still a lot of room for this kind of approach.

On the other hand, we will continue our efforts to reduce our own costs to improve overall yields, including recycling and quality improvement.

Q10: On page 16 of the presentation material, there is an investment in capacity expansion and shipment volume of Hipore. Shipment volume has increased in line with capacity expansion, but prices have fallen significantly during this period, so I believe ROIC has been declining. I'm concerned because investment in a business with relatively low ROIC will lead to sluggish ROIC growth of your company over the long term.

A10: As you have pointed out, ROIC is trending slightly downward due to the recent high level of investment. In order to increase ROIC in the future, it is important to create a structure that improves capital efficiency and makes the business successful, including through alliances. We will continue to study this issue and steadily implement it.

Q11: The graph on page 16 of the presentation material shows a link between the amount of investment in capacity expansion and shipment volume, but this could be said to mean that productivity per investment amount has not increased. What are your thoughts on this point? You also mentioned that you are planning to expand in North America, including through alliances, but for the next year or two, capacity expansion in Japan will probably come up first. Is the idea to prioritize Japan for the time being and export to North America if necessary?

A11: As shown in the graph, shipment volume for automotive applications has been growing significantly in recent years. There is a difference in business between consumer electronics and automotive applications, and this is one of the reasons why the efficiency of capacity expansion has not increased. For example, in FY 2022, we were affected by the fact that sales did not go as planned due to disruptions in the supply chain and other factors. As for expansion in North America, we intend to make the most of the capacity expansion in Japan, as you say.

• Polypore business strategy

Q12: What is the future business policy of Celgard and Daramic? Will you be able to continue the businesses by cutting costs, or will it be difficult without the emergence of a market such as ESS? In Europe, HEVs are expected to be used for the time being, but do you expect growth in such applications?

A12: For Celgard, our first priority is to improve productivity, which will lead to increased competitiveness. In addition to Europe, demand for dry-process separators for HEV applications is expected to grow in North America, China, Japan, etc. For ESS applications, a new market is expected to emerge in North America. We aim to build a certain position in the market by supporting our customers and capturing demand while improving productivity.

Q13: Is it correct to think that the North Carolina base will be utilized flexibly according to demand and competitiveness, and that production capacity may be expanded depending on the status of expansion of ESS applications and market for the LFP-based cathode material LIBs in North America?

A13: It depends on how far those markets are established, but if they are expected to expand steadily, we will consider focusing on them anew. To this end, as mentioned in the third point of the basic policy for Celgard on page 8, we are participating in the emerging battery supply chain in North America and are making efforts to gather information.

Q14: Is it possible to sell the Polypore business in the future? Or will it basically remain within your group?

A14: We are not considering selling the business at this time. First, we will steadily proceed with

what needs to be done. The most urgent issue is to improve the profitability of Celgard. In addition to cost reduction and productivity improvement, we aim to capture demand for new applications. As for Daramic, we will also concentrate on strengthening the business, including cost reductions.

Q15: Regarding Daramic, on page 8 of the presentation material, the basic policy to strengthen global manufacturing bases, cost reduction, etc. is described. Does this mean increasing production capacity and bases? The main application of Daramic is lead-acid batteries for gasoline-powered vehicles, which is a mature or slightly shrinking market, but are you thinking of an expansion strategy rather than a contracted equilibrium, as you have global strength?

A15: The macro trends are as you have indicated, and unlike Hipore, we do not believe that this is a business with large growth potential. Strengthening our global manufacturing bases does not mean that we will aggressively invest in expansion, but rather that we will further utilize the bases we already have through cost reductions and other measures. At the same time, we aim to generate stable cash flow by penetrating emerging markets.

Q16: Are there any technological advancements in separators for lead-acid batteries?

A16: Lead-acid batteries have been around for a long time, but recently, extending their service life has become a major issue. We are finding that separators can contribute to this, and are in the process of offering new value to our customers.