

Mitsubishi Chemical Holdings Group

Medium-Term Management Plan *APTSIS 20*

Investor Meeting

Date: December 4, 2018

The forward-looking statements made in this meeting and this document are based on information available as of the date hereof. Actual results could differ significantly from performance forecasts due to various risk factors and uncertainties.

The Mitsubishi Chemical Holdings Corporation (MCHC) Group executes businesses in extremely broad fields including information, electronics and displays, advanced moldings and composites, advanced polymers, MMA, petrochemicals, carbon products, industrial gases, and pharmaceuticals. The results of these businesses are subject to the influence of factors including, but not limited to, domestic and global demands, exchange rates, prices and volume of crude oil, naphtha, and other fuels procured, trends in market prices of manufactured goods, speed of technological innovation, drug price revisions, product liabilities, lawsuits, laws, and regulations.

In attendance on company side:

(Mitsubishi Chemical Holdings Corporation)

Representative Corporate Executive Officer,
President and Chief Executive Officer

Hitoshi Ochi

Managing Corporate Executive Officer,
Chief Financial Officer

Hidefumi Date

Managing Corporate Executive Officer

Yoshihiro Ikegawa

Representative Corporate Executive Officer,
Deputy CEO

Kenkichi Kosakai

Managing Corporate Executive Officer

Larry Meixner

Managing Corporate Executive Officer

Ken Fujiwara

(Mitsubishi Chemical Corporation)

President & CEO Masayuki Waga

(Mitsubishi Tanabe Pharma Corporation)

President & CEO Masayuki Mitsuka

(Life Science Institute, Inc.)

President & CEO Seiichi Kiso

(Taiyo Nippon Sanso Corporation)

President & CEO Yujiro Ichihara

Presentation by President and CEO Ochi

In 2018, we reached the middle of our medium-term management plan and we would like to take this opportunity to provide you with information on our businesses.

P.5 [Operating Results and Forecasts]

In 2017, we posted ¥380 billion in core operating income. The target set under the medium-term management plan was originally ¥380 billion, but we set our benchmark at ¥430 billion to achieve the initial target. Having completed structural reforms, which were the key initiatives in APTSIS15 that

covered the period between 2011 and 2015, our revenue is increasing. In addition, our extraordinary losses are shrinking. We have a stable bottom line. Although various impacts have been felt from recent economic trends, environmental issues, and the issue of over-capacity in China, among others, we have largely transformed ourselves into a company that can securely earn about ¥350 billion. We hope to maintain and improve this level.

P6 [Financial Index]

We have announced our forecasts for 2018, including ¥368 billion in core operating income, ¥213 billion in net income, and a debt-to-equity ratio of 0.77. As we announced yesterday, our debt-to-equity ratio will rise to approximately 1.2 this term, as our debts will increase by about ¥640 billion following the M&A by Taiyo Nippon Sanso Corporation. We aim to eventually reduce the ratio to around 1 by 2020.

P7 [Shareholder Returns]

Our dividend policy is the same as before in an attempt to improve shareholder value through the improvement in our corporate value. Our approach is to provide stable dividends while balancing investments for growth and financial soundness. As indicated at the time of the announcement of the second quarter financial results, dividend payments will increase to ¥40 per share at a payout ratio of 26.7%. Our EPS is also showing strong growth.

P8 [Priority Management Measures]

To go over the basics again, we must enact portfolio reforms. In addition, it is extremely important how we achieve growth in focus markets. The key points for growth are: how we reinforce and expand the business foundation in areas such as MMA and industrial gases, where we have a stable market share in the world; how we raise profitability in petrochemicals, having completed structural reforms; developing US businesses in pharmaceuticals; and regenerative medicine using Muse cells in life science. We want to achieve growth in light of the integration impact of Mitsubishi Chemical and our businesses in new areas. If a strong surge of protectionism occurs, global markets will become important. If we do not secure a position in global markets, difficulties will arise. This is also an important point. Other important issues include what kind of structures we will adopt that will work well on next-generation themes between 2025 and 2030, and how we will deepen KAITEKI management given that the

company's risks are not limited to business risks as well as the material risk that exists regarding contributing to the Earth. Human and workstyle reform in Japan is also an important issue. Today, I will focus on some of these themes.

P9 [Intensifying Business Portfolio Management: Accelerating Reforms (1)]

For portfolio management, we will focus on these six markets. We need to properly reform our portfolio, taking into account market growth potential, corporate profitability, and technological superiority. As the first step, we need to consider restructuring ¥300 billion in sales revenue. In addition, we will need to work on consolidating and streamlining affiliates and group companies.

P10 [Intensifying Business Portfolio Management: Accelerating Reforms (2)]

We have sold or withdrawn from businesses worth ¥100 billion so far. We plan to sell or withdraw from businesses worth over ¥300 billion by FY2020 and are currently listing businesses to include in our restructuring plan. This will reduce our affiliates by 111 companies, and we will continue reducing them to 182. You may consider that this project is progressing as scheduled.

P11 [Growth Strategies for Focus Markets and Reinforcing Business Foundation for Fundamental Industrial Materials]

I want to talk about how we have made action plans for growth. We will show you what our growth drivers are and how we reinforce our business foundation based on them.

P12 [Growth Strategies for Focus Markets (2016-2018)]

These are the actual results and projections for our sales revenue in FY2015, FY2018, and FY2020. We also summarized the growth measures and action plans, respectively. I will provide explanations on key points. In the area of mobility, responses to CASE in the automotive industry are important. We are working on various initiatives mainly using carbon fiber and composite materials. For IT, electronics, and displays, our semiconductor business is growing with advances in displays, AI, and robotics. We are taking these actions to expand these areas.

P13 [Growth Measures: Mobility (1)]

The key issue for carbon fiber business is how we can keep providing customers with products that satisfy them. For this purpose, we need to work on designing and development. We need to have the ability to make proposals. We are dealing with this by, for instance, establishing a composite application

center in Europe. C.P.C. SRL, with which we formed an alliance last year, is fully operational and needs to consider increasing production. We are establishing carbon fiber recycling technologies and conducting laboratory tests. Going forward, we will build facilities for enlarging the scale.

P14 [Growth Measures: Mobility (2)]

As car forms change, needs for composite materials will increase. To achieve local production and local consumption, we aim to expand the size of our operations through M&As. For this purpose, we acquired compound producers in Indonesia and India this year.

P15 [Growth Measures: IT & Electronics]

In the areas of IT and electronics, we are taking actions concerning semiconductors. As semiconductor makers and equipment makers have formed alliances, those handling highly pure semiconductors are integrated with those offering precision cleaning services. We are building bases centered on Asia and Japan, while Cleanpart Group GmbH is creating its bases in Europe and the US. Combining our forces, we can create a very robust foundation.

P16 [Growth Strategies for Focus Markets (FY2016-FY2018)]

Medical, food, and bio products are very attractive areas. They include implants and nutrition. We have also acquired a medical gas-related company. In healthcare, we will strengthen business development in the US, as well as in vaccines and regenerative medicine.

P17 [Growth Measures: Medical]

For medical gases, we will add businesses targeting hospitals, which are not our strength, to Taiyo Nippon Sanso's selling, manufacturing, and development capabilities regarding medical gases for home healthcare use in order to widen the scope of our business.

P18 [Growth Measures: Healthcare (*Radicava*)]

Radicava is growing strongly and aims to post approximately ¥31.5 billion in sales this term. It has been rolled out to Europe, and its oral agent is scheduled to be launched in the US market in FY2021 to eventually increase its earnings power.

P19 [Growth Measures: Healthcare (VLP Vaccine)]

For the VLP vaccine, the phase 3 trial for adults was completed and preparations are underway for the final application. For children, preparations for trials are underway, while trials for the elderly have started. We need to start preparing for sales. Since the North Carolina plant does not have sufficient production capacity, the new Quebec plant is under construction with an investment worth approximately ¥25 billion.

P20 [Growth Measures: Healthcare (Regenerative Medicine: Muse Cells)]

We began clinical trials of Muse cells for acute myocardial infarction and cerebral infarction and have so far not encountered any major problems. We aim to start selling them in FY2021. To prepare for this, new facility is being established within the Life Innovation Center in Kanagawa Prefecture and is scheduled to start operations in January 2019.

P21 [Growth Strategies for Focus Markets (FY2016-FY2018)]

In the areas of the environment and energy, LIB materials and wastewater treatment in China have attractive prospects. We will accelerate the development of bio-plastics. We will enhance packaging, labels, and films, given various global social problems including food loss.

P22 [Growth Measures: Environment, Energy (1)]

Currently, electric vehicles account for approximately 1.4% of new cars around the world. The ratio is projected to continue increasing to 5% in 2020 and 10% in 2025. To meet this increase in demand, we will increase production of electrolytes and anode materials.

P23 [Growth Measures: Environment, Energy (2)]

The paper cups on your desks are coated with bio-plastics. Needs for these types of cups are growing in various industries, for example, restaurants. We are currently busily creating various combinations including different designs and hope to roughly triple sales in the next fiscal year. They are designed in combination with PTT MCC Biochem Company Limited in Thailand.

P24 [Growth Measures: Packaging, Labels, Films]

Needs for food packaging, labels, and films are increasing. Demand is high for high barrier containers. We will also have to cater to home-made replacement. We will launch products with new functions in this aspect. A new polyester film line in the US began operating as scheduled.

P25 [Reinforcing the Business Foundation for Fundamental Industrial Materials (FY2016 – FY2018)]

SAMAC began operations smoothly. With respect to MMA in Thailand, enhancement to MAA and BMA is also progressing smoothly. We are reinforcing our business foundation by, for instance, improving the soundness of coke furnaces, consolidating ethylene production facilities, developing high-functional polyolefin, and making large-scale investments through Taiyo Nippon Sanso.

P26 [Measures for Reinforcing Business Foundation: Industrial Gases]

Although it costs approximately ¥640 billion for Taiyo

Nippon Sanso to acquire businesses in Europe, this will help to create a business foundation. Having businesses in Europe will strengthen our special gas and medical gas businesses and enable us to roll out technologies developed in Europe to Asia. This will allow us to expand our business while generating stable revenue.

P27 [Measures for Reinforcing Business Foundation: MMA]

We have a strong position in MMA in terms of the C4 process and Alpha technology. We will build an optimal revenue basis with regard to the changing market conditions. We will try various approaches using information such as the optimization of supply chain management, pricing, and optimum operations, using AI and digital technologies.

P28 [Measures for Reinforcing Business Foundation: Carbon]

China's environmental policy and measures against excessive production facilities have had a positive impact on coke furnaces. Spreads on coke and coal have also stabilized and are moving stably despite some ups and downs. Electrode prices have come out of their worst period and are returning to a normal level. They are expected to maintain stable earnings power. Cokes themselves are operated stably. Using various technologies, we can make the coke furnace stable. We can also provide it with energy-saving impact.

P29 [Measures for Reinforcing Business Foundation: Petrochemicals]

We aim to develop slightly higher-function polyolefins. We hope to use metallocene catalyst to improve polyolefin performance during the current structural reforms.

P30 [Progress in Corporate Rationalization]

We want to continue promoting growth. I also want to explain what happened to the rationalization and growth policy of the three chemical companies that were consolidated last year. We consolidated the three companies to promote operation reforms based on Group company integration, productivity improvement, cost reduction through a review of personnel plans in corporate sections, and the use of IT. With respect to ICT, while the introduction of SAP will take more time and will not be completed before the end of the current medium-term management plan, it will achieve a rationalization impact of ¥10.4 billion by the end of FY2018, and ¥15 billion by FY2020.

P31 [Synergy and Growth]

We are working on how we expand growth areas, how we develop growth areas overseas, how we use new technologies, and how we utilize Group synergies. We are building up various areas. We have made an impact of ¥11 billion so far and aim to achieve the remaining ¥35 billion by FY2020.

common infrastructure.

P32 [Intensifying Marketing and Access to the Global Market]

Developing businesses in global markets is very important. Taiyo Nippon Sanso acquired businesses in Europe. Mitsubishi Tanabe Pharma Corporation aims to expand its business in the US. Mitsubishi Chemical intends to expand business in Europe, the US, and Asia. We plan to raise the ratio of overseas sales to 50% of total sales by FY2020. To achieve this goal, we will enhance our overseas operations while establishing technical centers and regional headquarters.

P33 [Development Based on MCHC Group Core Technologies]

New businesses are important for the 2025-2030 period as well. There are various businesses involved and we are currently considering those listed here. Scientific technologies are advancing fast. In this situation, what we have to do next may change, but we want to aggressively work on this. As we do so, it will be important to consider how we capture open innovation and ventures. How much digitalization we will pursue is also an extremely important theme. Furthermore, how we consolidate the research functions of the three chemical companies and how we enhance R&D in Mitsubishi Tanabe Pharma Corporation are important as well. In addition, we must work on reforming our human resources system to maintain motivation.

P34 [Open Innovation]

We established a subsidiary named Diamond Edge Ventures, Inc., which has corporate venture capital functions. The company is located in Silicon Valley and is working well. It is creating business opportunities in new areas and conducting research not only in the US but also in Europe.

P35 [Example of Investment in Ventures]

We recently announced that we had made an investment in DigiLens, which produces AR/VR hardware. Because this area will have huge growth, we will work with a company that possesses special technologies. We will do this with companies such as Niantic. We need to consider working with companies such as them in different sectors, and we intend to work on that. Speed is essential. We endeavor to manage them with a sense of urgency.

P36 [Digital Transformation]

Digitalization has expanded and improved reasonably well. We have 50 digital specialists consisting of 20 outside specialists and 30 internal specialists. We are about to enter a second phase. In R&D, we will introduce technologies such as materials informatics. We will also introduce process analysis and technology succession and knowledge management using AI in manufacturing. We will work on how to build business models in the business domains and transforming our culture as

P37 [Recruitment and Appointment of Personnel toward Establishment of Next-generation Businesses]

I think the key is the personnel system. In the past, we adopted seniority and lifetime employment systems. However, if we are to recruit talented personnel from outside and raise motivation from within, we must take on personnel system reforms. Members of the Emerging Technology and Business Development Office joined in MCHC, and we will trial how to change the system and then apply it elsewhere.

P39 [Financial Index]

Crude oil prices have changed since the start of APTSIS20. In addition, the US-China trade war slowly started having an impact. We need to reflect factor in the risks concerning the chemicals product market and the growth strategies of performance products, in addition to M&As in the area of industrial gases. For FY2020, I was aiming at ¥430 billion in core operating income, but we had to make a partial revision and set ¥410 billion as the must-achieve target. We aim to post ¥220 billion in net income, an ROE of 13% or more, and a net debt-to-equity ratio of 1.0 or less.

P40 [Profit Outlook in Business Segments]

This is a step-shape graph for FY2018 to FY2020. Core operating income of chemicals reflects the falling market prices of MMA and other improvements. In healthcare, there are some delays in the progress of clinical products such as the pipeline at NeuroDerm, and lower royalties anticipated for INVOKANA®. For performance products, we have incorporated organic growth as well as the synergies borne from consolidation of the three chemical companies. The figure for industrial gases factors into the recent acquisition of Praxair's European businesses. Corporate factors in rationalization have been achieved through the consolidation of the three chemical companies. With these, we want to post ¥410 billion in core operating income. Our projection for performance products remains the same as the initial plan, while we have revised our projection for chemicals upward. We also revised our projection for industrial gases upward in light of the impact of M&As, while the projection for healthcare was revised downward from the ¥100 billion target. Going forward, I want every segment to be able to exceed the ¥100 billion target.

P41 [Action Plans for Growth: Healthcare]

Given the slower-than-expected progress of the products in the pipeline at NeuroDerm Ltd., we aim to raise core operating income of the pharmaceuticals business to ¥100 billion by FY2023 through these measures.

P42 [Increase in Investment and Progress in Investment Plans]

Basically, there is no change to our resource allocation plan. The only change we have made concerns the investment and loan of Taiyo Nippon Sanso in the industrial gas business. The rest are as scheduled.

P43 [Strengthening Financial Base]

Although our net debt-to-equity ratio will increase once due to the acquisition of Praxair's European business, we aim to lower it to around 1.0 by 2020.

P44 [Increasing Capital Efficiency]

We will continue reducing operating capital and selling strategically-held shares as before per the schedule. Through these measures, we will be able to achieve a total capital efficiency increase of approximately ¥550 billion compared to the initial plan of ¥300 billion.

P46 [Status of MOS Target Achievement]

Problems that the Earth is facing are becoming more and more serious. We therefore need to further develop our KAITEKI management. We are on track in terms of MOS indices.

P47 [Workstyle Reforms]

We will actively take on our challenges concerning people through health management. We will incorporate various action plans in promoting workstyle reforms.

P49 [Revising Approach to Corporate Philosophical System]

To promote KAITEKI Management globally, we are switching the slogan to English. We will change our corporate slogan from "Good Chemistry for Tomorrow" to "KAITEKI Value for Tomorrow" and use it globally.

P50 [Proactive Participation in Initiatives]

We will actively participate in various initiatives globally including initiatives to address plastic waste.

P51 [Studying KAITEKI Vision30]

We will consider the next medium-term management plan, APTSIS25, centered on our businesses. We will further clarify what will happen by 2050 and what we are trying to do by 2030. We will compile our targets as a vision. APTSIS25 will be created addressing the problems the Earth is facing, the climate change issue, workstyle issue, initiatives on a circular economy, our approaches to these issues, and problems on the business side. We consider that this approach will also increase our corporate value.

[Questions & Answers]

Q1

The new target figure of ¥410 billion for core operating income presented on page 40 seems reasonable. By segment, performance products have increased profits fairly well over the last one to two years despite high materials prices. Where else are you going to increase profits? You plan to increase sales of carbon fiber significantly. Is this because its use in the area of mobility is in sight?

A1

As you can see on page 31, we need to accumulate profit in performance products through the synergies and growth of the three consolidated companies. We have worked on developing a growth strategy and approaches to generate profit through consolidation of the three companies. We will build things up one by one to achieve a consolidation impact of approximately ¥25 billion in the remaining two years before 2020. Carbon fiber and aqua are included in this. We will definitely do this. This is our commitment, which is why we have increased the target figure.

Q2

What specific synergy impacts will the consolidation of Mitsubishi Chemical have?

A2

At the time of consolidation, I discussed with the Division General Managers of each Domain about how we will take on new areas and how we will grow our businesses based on new markets and new technologies. Some ideas include collaboration and participation in new overseas markets. For instance, we want to start a business for DIAMIRON™ in Thailand, or we want to sell barrier-type polyester film products overseas. We need to accelerate these actions as a growth strategy. These actions will also lead to collaboration among businesses to, for instance, develop coating agents to confer a barrier to films or to develop adhesives to improve adhesive properties. In addition, we need to consider how we will develop our businesses using new technologies and new markets. We have set aside ¥200 billion for M&As, if necessary, for this purpose. It has taken time to build these up. It won't be easy, but we want to accomplish what we set out to do.

Q3

The increasing profits generated from MMA are both a strength and concern for chemicals. If plus ¥10 billion is anticipated for carbon materials and minus ¥40 billion is forecast for commodity products, MMA price drops may be overlooked. Is this because if your company reduces the supply of MMA, it will impact the market? Can you reduce the ACH method or is it difficult to do so because acetone is cheaper? Could you please explain the supply-demand situation regarding MMA?

A3

The largest problem with MMA is supply ability. MMA recorded negative growth when China entered a

new stage after its high economic growth period. Some companies had increased their production, producing a large amount of AN. As a result, AN's byproduct, which is an ingredient in MMA, had become redundant, and this led to the production of MMA. At the time, there had been a significant over-supply compared to demand. As China moved to the new stage, MMA's earnings power declined considerably. The production of MMA is no longer promoted. While a small number of companies started using the C4 process in China, there is no strong trend pushing its use. Even if China's growth rate is 6.5%, inventories have been cleared and growth has already begun. It has become easier to maintain the balance. If growth is achieved, the balance can also be achieved. The new target we have set in this plan factors in the gradual decline in MMA prices, which are currently at a very high level. We have factored in a deterioration worth more than ¥20 billion. It is important how countermeasures are developed. Although we have so far relied on human power for, for instance, carrying out the optimum operation method when problems occurred, going forward, we will introduce new applications such as market projections using advanced technologies. We need to reduce the use of the ACH process, as it is highly inefficient and has low profitability. We need to examine what we will do with old plants that use the ACH process such as the plant in Memphis. We are steadily working on the establishment of a new plant in the US according to schedule.

Q4

Do you mean that you have improved the old plants that use the ACH process in the US through investment, but may consider giving that up depending on market conditions?

A4

We are not giving it up. Rather, it is scrap and build. While Dow Chemical is doing various things, their plants are old. They cannot make them bigger even if they wanted to. If there is anything in which we are competitive, the situation changes constantly. It will be ideal if we can reach a certain level by combining scrap-and-build and the level of growth.

Q5

Profits from performance products seem to be stagnating. Is this only because of high materials costs and the impact of various problems? Is there any internal factor that is leading to a delay in generating synergies? How are you going to accelerate the process?

A5

The most significant factor is ever-rising wages. Fixed expenses have practically risen by over ¥10 billion. We need to absorb this increase in fixed expenses. In addition, we changed how we would allocate fixed expenses when we established Mitsubishi Chemical. Performance products shoulder approximately ¥5 billion more and their growth seems to have stopped. Carbon fiber is doing

slightly worse than what we expected. Its use in cars has not grown sufficiently. I feel there is about a two-year delay compared to our plan. Carbon fiber has not yet become a revenue base. Another area is aqua. While we sell water treatment functions to water treatment businesses in China, our business selling industrial waste water treatment solutions as a unit has just started. There is a delay with this.

Q6

Can you tell us if carbon fiber will contribute to profits in 2020?

A6

There is a slight delay from the original plan. The contribution of carbon fiber to profits will be smaller than what we discussed, but I imagine the situation will be the same for our competitors. Because the price of AN, which is one of the ingredients, is rising, the AN business is generating revenue. The difference may be going there. If you ask me whether carbon fiber is growing in absolute terms, it has not yet reached that level.

Q7

What are your feelings about achieving synergies worth ¥35 billion? Is this a difficult hurdle to overcome? Is the goal in sight?

A7

Synergies are appearing steadily compared to the previous year. There are areas where we need to make efforts such as cultivating new markets and introducing new technologies. Naturally there are ups and downs, but we are committed to achieving our target. We will build on small achievements.

Q8

I expect that your company will generate a stable income of ¥100 billion from industrial gases through M&As. I think pharmaceuticals has played this role in the past. How will you position pharmaceuticals from now on given major risks such as drug price revisions and the patent cliff? Will you cater to drug development? Has there been any change in your approach?

A8

We need to constantly think about various issues. We see healthcare as a very important business. We also handle medical materials and information. When thinking about health in the future, we need to think about our approach to health and pharmaceuticals. Mitsubishi Tanabe Pharma Corporation is thinking about their approach to health and pharmaceuticals as well. We will flesh out our overall approach going forward. The industry structure will change dramatically between 2025 and 2030. We must consider how we position gases, chemicals, pharmaceuticals, and healthcare. We plan to have in-depth discussions on this. There are various options. For instance, is it a good idea to list both the parent company and subsidiaries? Hitachi has stopped doing this. There is risk in having a small number of shareholders. We need to think

carefully what business scheme we should eventually develop and what governance structure we should build. I consider the year 2025 to be a milestone. I believe our pharmaceuticals business itself can be rehabilitated. I do not believe that it is okay to leave chemicals as it is. We need to consider what kind of portfolio reforms we should implement, including various issues such as environmental issues.

Q9

I think business management with a sense of speed is important for portfolio management. Your company has had three exciting businesses in the past. Two of them are not on track at all. The third is Muse cells. I think concentrating management resources is critical to pull off these initiatives. To concentrate resources with a sense of speed, you need to understand risks. Do you have a structure to achieve this? The remaining two businesses are bulk GaN synthesis and photoelectric conversion materials. Was the failure to commercialize them attributable to a technological issue, the issue of risk, or the issue of management resources? Do you have a structure to focus your management resources in the correct manner? Can you tell me what, if anything, has changed?

A9

We invested sufficient amounts of money in bulk GaN synthesis and organic photoelectric conversion materials. We were not able to get results that were commensurate with the resources we invested. We have not given up on GaN. We are actually working on it within our pocket. It will not work under a simple format. Our approaches to technological development and resource allocation were not great. We might have overlooked the essence behind them because we were in a hurry to commercialize. We have been working steadily on Muse cells and are seeing the fruits of these efforts. The key is how we invest money and manage risks. Using outside people is also important. There are areas that cannot be covered only by people from Mitsubishi Tanabe Pharma Corporation. A weakness in our past business development projects might have been our insistence on doing everything internally. It is difficult to make changes unless we introduce ideas from the outside such as from Mr. Meixner. It is important to change our approach, as demonstrated by switching Mr. Kakimoto to the top R&D personnel level. This applies to digitalization and business models as well. However, we were not able to sufficiently use outside capabilities with a view to envisaging businesses 20 years ahead, which is probably true for KAITEKI as well. We are therefore strengthening collaboration with outside parties. It will be difficult to develop business with a sense of speed unless we make these efforts.

Q10

Is it correct that Muse cells are promising because

you will introduce resources your company is lacking from the outside and, for technologies, you have a history in Muse cells that dates back to 2010?

A10

Yes.

Q11

If we list all your focus markets, they cover 33 industry sectors on the Tokyo Stock Exchange, with practically the only sectors not included being apparel, construction, and real estate. The rest are generally relevant. Even in this situation, is the concept of "market-in" important? Is it the mindset of employees which is important?

A11

It is difficult to look at markets existing in society as single, separate markets. There is no point in looking only at car parts. We need to consider the entire concept of automobiles. If we consider the concept, we will understand how the areas that are our strengths will change. In information electronics, businesses that are operated as separate entities are weak. Sales and marketing activities that cover the entire field are important. You will find various solutions using this approach. We can define our core markets roughly, as long as we consider how we identify the areas where our strengths lie and how we will fight to remain there, as well as how we will allocate people and technologies. We are not covering every field with regard to automobiles.

Q12

Are you saying that you will enter various areas using your total capabilities, but will only compete where your strengths are?

A12

That is correct. We will not handle every battery material. We will only handle what we are good at. If you ask me whether we will handle electrolytes for solid batteries in the future, we may not. We need to consider where we can use the technologies we have. However, the seed-oriented approach will fail for sure. We need to start by considering what customers will require in the future.

Q13

On the enhancement to portfolio management mentioned on page 9, how much impact do you expect the ¥300 billion sales via business reconstructing will have on improving profits? Can you answer this question to include personnel and resource allocations? What specific actions are you planning to take, such as the sale of MMA business and withdrawal from filter tow sales, and which areas are you aiming to develop in the future?

A13

We have cut out major loss-making businesses. Our approach in considering the next stage of portfolio reforms was to stay where we could create businesses that could be integrated and grow, and to remove the rest. We said that we would look at profitability and growth potential including ROIC.

While we will exclude businesses with low profitability, if they are important for future growth, we will keep them and refurbish them. We will take various actions for the remaining ¥200 billion or so, but their impact on revenue will be small. We are thinking of about a dozen things we can do.

Q14

What is your view on industry restructuring? What do you think about the consolidation of companies rather than an alliance in the particular business that you formed with Ube Industries? Do you consider implementing horizontal restructuring of subsidiaries or vertical restructuring of midstream and downstream companies?

A14

I think it is fine to think about them, including M&A. When doing so, we need to keep growing our supply chain. Carbon fiber needs to be combined with processing technologies. It means that we need to form an alliance with a company downstream. We need certain areas when we develop products. We may be lacking channels or technologies. There could be various cases. We need to incorporate these areas or form alliances. In relation to portfolio reforms, I think it is fine for us to refrain from “acquiring” companies like we did in the past. It is fine to form an alliance and have separate areas. The mindset of Japan’s chemicals industry seems to be rather complex. Even overseas, quite in-depth discussions are conducted before engaging in M&A. It is not a simple matter of buying or selling. An alliance that is formed well works better. We will do large-scale M&A if there is a chance, but I think it may be difficult.

Q15

Can you explain your strategy for the carbon business on page 28? It seems you position it as a cash cow, but I have seen media reports about your potential capacity increase for needle cokes in India and China. Can you explain your strategy on these issues?

A15

The carbon business is a limited world. We need to consider the positioning of cokes furnaces. Another key point is how we position the carbon business when we do not have steel making capabilities. We also need to consider what we will do with COG in the future together with power companies. While it is a big cash cow, we are thinking about various directions for the business.

If we put carbon in one category, it is a cash cow. In addition, it is a business with large cash flow. While the compounding of raw coal requires know-how and technology, they do not only belong to people. If a 0.1 or 0.2 improvement is made to the original unit, yield, first run rate, and so on through the use of AI or digital transformation technologies, its impact will be great due to the large cash flow. We will introduce AI to the steady efforts currently being made centered on the Sakaide Plant. In addition, we may

take chances and look for materials for electrodes and so on overseas, as they will grow in the future.

Q16

On shareholder returns on page 7, despite the increase in the debt-to-equity ratio in relation to Taiyo Nippon Sanso, will the payout ratio remain unchanged at 30% in the medium-term? Are you going to do something more under the next medium-term management plan?

A16

I think our financial fundamentals are not yet strong enough. I want to strengthen them. Having said that, shareholders will not be happy if they do not receive stable dividends. I therefore aim to maintain the payout ratio at 30% as the benchmark, but I also want to return our profits while paying the stable dividends.

In May, we bought back our treasury shares worth ¥20 billion. This was because our dividends did not match the increased revenue we had in the previous year and the year before last. I do not rule this out for the future, and may conduct a share buyback under special circumstances.

Q17

Could you explain the assumptions on which you projected the market price of MMA in FY2020 and the background to such assumptions. I believe that SAMAC has recently been operating stably. Could you confirm its background and whether it can continue doing so?

A17

With respect to the MMA market, you can either look at it from a historical viewpoint or from the viewpoint of our position. We are carefully watching the market. I want to make sure that we do not keep riding on a wave like we did in the past. SAMAC follows a long track record in Singapore. It is very easy to operate. While the C4 process is easy to operate, the life span of the catalyst is short and it may slightly lack flexibility. The AN process uses acid, which causes problems everywhere and it is a concern. Regarding the geographical problems of Saudi Arabia, we are dealing with sand and other issues. The key point though is the issue of people. There is a large difference between people in Jbeli, Saudi Arabia and people in the western part of the country. In other words, SAMAC has someone who has worked in top management in Singapore. This person is English and has good communication skills. This helps SAMAC to operate stably.

Q18

You spoke about considering expanding facilities in North America before the end of this fiscal year. Can you tell us what you are considering?

A18

As the next facility expansion for MMA following SAMAC, we are looking at North America. We aim to complete the expansion by as early as 2021 or 2022. Although we are slightly behind where we want to be,

our discussions are progressing nearly on schedule.

Q19

I think the current operating ratio of the carbon business is about 80 to 90%. As prices are rising, are you considering procuring a little more tar and raising the operating ratio?

A19

If we are able to get tar, we want to increase production. But it is not easy to obtain tar when we consider quality. We are thinking of procuring it from overseas.

Q20

On increasing capital efficiency described on page 44, it seems that you actively sold strategically-held shares and assets in 2016 and 2017 but slowed these activities in 2018. It does not appear that you will make much progress in the remaining two years. Is it correct to say that you have done everything you could? Can you please tell us the scope you still have for increasing capital efficiency and improving asset allocation?

A20

We are continuing our efforts. Although our activities have slowed down this year, we are still actively working on them given the revisions made to the Corporate Governance Code and changes in social trends. We are continuing with annual checks at the Board of Directors as well. Basically, we are positively working on them. We will work on areas that we can actively take on.

Q21

Can you tell us your outlook for the domestic polyolefin market and its impact on your business results? I think the price difference in Japan and overseas has reversed as prices fall in Asia. If this price level normalizes, what do you think about the potential inflow of products to Japan? Do you think such an inflow will be limited because the quality of wrapping films will differ depending on what materials you use? If such an inflow occurs, what is your view on its impact on your business results?

A21

We do not expect that the momentary reverse in prices will become a normal state. Market prices of both polyethylene and polypropylene are fluctuating at present. The price of olefin, which is a monomer, is also moving. We need to look at spreads. Currently, polyethylene has a slightly worse spread than polypropylene. With polyolefin, the issue of quality arises. Imported products already have a fairly large share in areas where they can be used. Japanese makers are surviving in areas that have difficult specifications. At the same time, it is true that the market for high-value-added products is expanding overseas. Going forward, we need to start overseas sales of high-value-added products manufactured in Japan. We want to consider "improving polyolefin performance (e.g. strength, heat resistance, moldability) through the

development of a metallocene catalyst, and then improving performance and increasing the scope of use of final products" not only in domestic markets but also in overseas markets. In terms of the impact on profits/losses, market fluctuations are having a negative impact. In particular, we are currently going through a difficult period. Markets are moving very poorly; for instance, as soon as we raise prices in response to increasing naphtha prices, the naphtha prices decline. While it depends on our negotiations with customers, how we transfer the production cost that has risen over a few months will have an impact on immediate business results.

Q22

As various bits of information float around due to the US-China trade war, can you tell us your approach to investment in each country? What is the size of investment you plan to make in the US and in China under the current medium-term management plan? How much and in which country are you going to make investments in the future?

A22

APTSIS originally set the amount of investment at ¥500 billion but increased it to ¥1.3 trillion due to the M&A conducted by Taiyo Nippon Sanso and the expansion of performance products. We basically do not establish investment criteria by region. We make investment decisions based on the profitability of the relevant business and whether it is part of the program listed in our growth strategy. While the US-China trade war exists, our investments in the US are mostly finished such as investment in polyester films. Going forward, we will carefully examine each project when making decisions. We do not adopt an approach of uniformly reducing or controlling investment in the US.

There is no need for us to change locations in response to the issue of tariffs or policies. We will make investments based on thinking about growth in the region. In other words, if we are going to invest in Thailand, it means that Thailand is growing. We do not adopt the approach of parts makers in manufacturing parts in one place to lower costs. We make investments based on an idea similar to "local production, local consumption."

Q23

Overseas makers are making comments from the viewpoint of digital commerce. Dow Chemical is conducting their marketing activities from the viewpoint of having over 200,000 unique users in the US and 70,000 in Japan. Evonik has made a comment about applying the B2C business model to B2B business. Can you tell us what you eventually aim to achieve through your digital-related investments?

A23

We need to work on digital commerce and digital marketing. In the past, we often used manpower for marketing products. We are running a trial to see how certain products will move when using digital

marketing. We need to cooperate with customers on e-commerce. Japanese society is falling behind significantly. Our digital team is thinking about various solutions to deal with these trends. About 15 years ago, we worked on e-commerce. However, it was limited to B2B business and never reached B2C business and small customers. This was because both sides did not have the appropriate hardware and software. To promote digital commerce and marketing, we need to develop common software, and so on. We want to get involved in how we address the areas where Japan is falling behind.

I think it is possible to create something like this for B2B business. It will save extra cost. We used it when we were handling materials and were connected by pipes. We can do this for other transportation means as well. The major problem is the mindset of the entire country.

We are working on several digital marketing projects. We began trials from around two years ago.

Q24

I have questions about biodegradable plastics and biomass plastics on page 23. You said that you wanted to triple sales next fiscal year. If your sales triple, it seems you would be in a phase where you need to consider your next investment. In this situation, how far will you go with your own assets? Will you use a patent in the form of an alliance? Can you tell us your strategy about this? In Europe, chemicals makers own recycling facilities or work with them through alliances under the concept of a circular economy. What is your company's view on this issue?

A24

Sales of biodegradable PBS in this term are lower than the initial projection. At the same time, it is true that we have received many inquiries and requests for quotes, including large and small transactions, as the issue of microplastics has been highlighted by the media over the last six months, mainly in Europe. If we can conclude one or two large deals next fiscal year, it is not beyond the realm of possibility to triple our sales. If that happens, the next investment will be in sight. Currently, we are manufacturing PBS in a JV together with PTT Global Chemical of Thailand. We will have to consult with them as well. Meanwhile, we are also talking with various chemical makers around the world using our bio-related patents. I want to consider PBS or bioplastics that slightly differ from PBS in these networks. At present, PBS is at a stage where it is produced from oil and has biodegradability. The next stage will be biodegradable, plant-based PBS. The ultimate goal is to recycle it. Some of our group companies are engaging in the recycling business. We are also working on recycling carbon fiber products. For recycling plastics, we will work on it as a business, and also on technology development.

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