

Summary of Briefing on Strategy for New Business Creation, held on April 12, 2017

Asahi Kasei Corporation

Note: The forecasts and estimates mentioned in this document are dependent on a variety of assumptions and economic conditions. Plans and figures depicting the future do not imply a guarantee of actual outcomes.

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Participants

Masafumi Nakao

Representative Director and Vice-Presidential Executive Officer

Hideyuki Yamagishi

Lead Executive Officer, Senior General Manager, Corporate Research & Development

Hiroshi Shirai

Executive Officer, Senior General Manager, Chemistry & Process Laboratory, Corporate Research & Development,

Takashi Nozaki

Senior General Manager, Technology Policy Center, Corporate Research & Development

Kiyoteru Kadokura

General Manager, Investor Relations (MC)

Presentation

P4 Group's vision for FY 2025

Nakao: Our 3-year medium-term management initiative, Cs for Tomorrow 2018 (CT2018), began at the start of FY2016. Aiming to build a portfolio of high value-added businesses with high profitability, our goal is to achieve net sales of ¥3 trillion and operating income of ¥280 billion. From FY2018 to FY2025, we plan to increase net sales by ¥800 billion and operating income by ¥100 billion. While the current OP margin is approximately 8%, the planned incremental OP margin would be 12.5%. The key to achieving this figure is to build up high value-added businesses. It will depend on how we build the base during the three years under CT2018, including the R&D framework. Our basic strategy comprises pursuit of growth and profitability, acceleration of globalization, and creation of new businesses. This meeting focuses on creation of new businesses.

P5 Vision for FY 2025 by segment

In FY2015, net sales were ¥1.94 trillion and operating income was ¥165.2 billion. Our FY2025 target is net sales of ¥3 trillion and operating income of ¥280 billion. Focuses of our growth strategy are the Material, Homes, and Health Care segments. The Material segment must strengthen its earning capacity to achieve high profitability. The Homes segment needs to realize stable and continued growth. The aim for the Health Care segment is a 3 percentage point increase in the rate of segment sales to consolidated net sales. By FY2025 we want operating income of the Health Care segment to account for 25% of consolidated operating income. By expanding the businesses of this high-profitability segment, our goal is to increase the OP margin to over 9% by FY2025 from the current 8%. Each segment must pursue its responsibility to achieve growth.

P7 Asahi Kasei's sales compared to Japan's GDP

This slide illustrates the past net sales growth for Asahi Kasei and changes in Japanese real GDP. Between the 1950s and the beginning of the 2000s, our net sales increased in the fields of Fibers, Chemicals, Homes/Construction Materials, Health Care, and Electronics. The company growth coincided with Japanese economic growth. Until the end of the bubble economy in the early part of 1990s, the population of hard-working baby boomers created extra domestic demand, and the favorable export conditions in international trade contributed to economic growth. This growth however became sluggish after the bubble burst. Accordingly, business growth also slowed down across almost the entire manufacturing industry, including chemical manufacturers. While Japanese GDP grew by approximately 30% between the early 1990s and 2015, the size of the world economy more than tripled in the same period. Growth of emerging countries led world economic growth to become differentiated from Japanese economic growth. With the rise of emerging countries including China being actively involved in advanced fields, competition is now global. This is one of the points to consider in new business creation.

Growth of our company also slowed down in the first half of the 1990s. Various strategies were implemented including the selection and concentration initiative and cash flow management. After the company adopted a configuration of a holding company and core operating companies in 2003, net sales grew faster than Japanese GDP. This growth was supported by two new frameworks: one that promoted prompt decision-making that matched individual business characteristics and another one that streamlined operations to increase profit. As a result, the company improved its balance sheet dramatically and reached the level where aggressive investments including M&A were feasible.

The shift to a holding company with core operating companies had however created issues, too. From the perspective of creation of new businesses, we may have taken long-term business initiatives a little too lightly. Also, the fact that the core operating companies were independently managed caused the members of these companies to think less of taking advantage of each other's markets or integrating these markets in inter-company collaboration. These two issues primarily led us to last year's integration of the Material sector.

P8 Features of new business creation from the past cases of Asahi Kasei

The current operating income is approximately ¥160 billion per year. The foundation of this income was in fact laid between the 1970s and the 1990s. For example, in the Chemicals business, development of ion-exchange membrane, nylon intermediate cyclohexanol, polycarbonate process, and S-SBR were completed by the 1990s. In the Electronics business, development of an electronic compass started in the 2000s, and the foundation of Hipore lithium-ion secondary battery (LIB) separator was laid in the 1970s although it is attracting attention today. It was in the 1980s that development of Planova virus removal filter began in the medical devices business. Needless to say, there are materials for which technical development finished after the 1990s and are in the process of commercialization. But they are generating profits yet. Newly developed materials take significant amount of time to become profitable.

In the previous medium-term management initiative, For Tomorrow 2015, we promoted Group Synergy projects to integrate the whole group to take advantage of the business platforms. Within these projects, the Environment and Energy, Residential Living, and Health Care projects were promoted. Acquisition of ZOLL was a part of this promotion. These three projects above were launched due to the necessity to transform the business portfolio for the future. UVC LED, which is now in the business development phase, was also acquired with Crystal IS Inc. (CIS) under the same circumstance.

The corporate history so far described allows us to identify the following four characteristics in the past business creation.

First, newly developed materials take time to become profitable. Designing and developing detailed technical features from scratch requires a lot of time. Discovery of new applications of such material taking advantage of its characteristics leads to generation of a new market, which results in increased profit. Hipore is a good example.

Second, Asahi Kasei has committed strategic resources to new businesses that transform the business portfolio. The company bet its future on the petrochemicals and homes businesses and also made entry into the electronic device business. Such resource commitment included the acquisition of ZOLL and Polypore.

Third, highly profitable businesses result from the start of R&D prior to market formation ahead of other companies. This is a very important point in creation of new businesses. Although in many cases resources are used on material development after a market is identified, this is too late in terms of creation of new businesses. We must take advantage of our strengths to move forward before anyone else instead of developing materials because competitors enter a particular market. The ion-exchange membrane, battery separator, Planova, electronic compass, and magnetic sensor are our successful examples.

Fourth, broad lateral extension develops various businesses centered on the same core technology. This is the best part of material development. For example, new businesses have been generated in association with performance polymer technology, membrane/separation technology, catalyst/process technology, and compound semiconductor technology, which are Asahi Kasei's strengths.

P9 Past example of new business creation (Hipore flat-film polyolefin membrane)

The next two slides provide two examples of how materials have been commercialized. The first example is the battery separator currently attracting a lot of attention. Its development started in the 1970s. The initial objective was to develop a film for an ion-exchange membrane, not a battery separator. The developed material however did not have the right properties as a film for an ion-exchange membrane, but we still wanted to find a way to use it. Various applications were explored in the early stage. The first attempt was to use it as a separator for a lead-acid battery. Our competitor at that time was Daramic, which is now an affiliate of Polypore. Next, use of the film as a separator for a lithium primary battery was explored. Although the LIB was invented during this process, its market did not emerge until around 1995. The LIB market later grew significantly due to the demand for Windows95 PCs, laptop PCs, mobile phones, and smartphones. The market is predicted to further expand because of the LIB use in automobiles.

As describe above, if a material has good quality, it can be used not only in the initially intended way but also in other ways. Maintaining the capability to access markets is extremely important.

P10 Past example of new business creation (Magnetic sensor)

Magnetic sensor is an example of a product that attained the top market share. It detects a magnetic field and is used to control motors. Asahi Kasei used to develop an airbag. Although the company now offers Leona nylon 66 filament for airbags, it previously had been developing a whole airbag system including textile, inflator, and sensor. The company however quit airbag development in the middle. Although we had a group of very powerful patents, we realized there was no business opportunity because seat belts became mandatory in the US. The sensor remained as a magnetic sensor. The magnetic sensor technology led to the development of the electronic compass now widely used in smartphones.

The magnetic sensor has been applied in many areas. The first application was in audio devices as a motor controller. It was then used for capstan motors in video cassette recorders which required complex motor control. Then application spread into various markets. With the emergence of Windows95, the sensor was used for CD-ROM and DVD control. It is also used to control inverter motors. In line with the energy-saving trend, the sensor is offered for home appliances as well. Furthermore, magnetic sensors were used for power windows and mobile phone open/close switches. These sensors were further developed into electronic compasses currently installed in smartphones. An electronic compass uses not only the magnetic sensor technology but also LSI technology and software technology, which was developed by Corporate Research & Development. An electronic compass is a product of the combination of technologies.

P12 R&D Organization

Since the beginning of FY2016, Asahi Kasei has operated in the three sectors of Material, Homes, and Health Care. The Material businesses are under the management of Asahi Kasei. The R&D framework for the Material business has been reorganized accordingly. Meanwhile, the Homes and Health Care sectors are operated independently in the form of core operating companies each having their own R&D organizations. On page 12 of the presentation material, the R&D organization of Asahi Kasei is the area with the blue background.

Key points of changing the organizational structure are as follows. First, future research projects for various businesses have been brought together in Corporate Research & Development. Second, collaboration between Corporate Research & Development and Corporate Production Technology has been strengthened. Once commercialization of a particular product has been decided, Corporate Production Technology is responsible for development of production process and construction of a factory to manufacture the products. The improved collaboration should help accelerate the speed of commercialization. Third, the Technology Policy Center has been assigned to development of R&D strategies for the whole group. Fourth, we have been reinforcing our CVC (corporate venture capital) activity. This will be described later. Fifth, the Healthcare R&D Center was created within the scope of the Material sector. This is to promote collaboration between the Material and Health Care sectors through materials. Finally, the heads of the Chemistry & Chemical

Process Laboratory and the Fibers & Textiles Technology Center, which engage in fundamental research under the operating holding company, concurrently serve as heads of R&D in the relevant business units. The purpose is to strengthen the collaboration between sections engaging in research for the future at the holding company and business sectors engaging in research for the present businesses. The revision of the organizational structure should achieve seamless connection of R&D between the two sides.

Furthermore, the Clean Energy Project, UVC Project, and Residential Living Project were placed under Corporate Research & Development in order to enhance collaboration between these projects and individual businesses.

P13 Main R&D bases around the world

Basic research has been conducted at the R&D sites in Japan.

In Europe and Asia, we have functions in place near customers to provide technical services. These technical centers develop products in close proximity to market demand. In Vietnam, there is a development site where product proposals are made to customers through resin molding simulation using computer aided engineering (CAE) technology.

The R&D sites in the US have two key functions. One is R&D and business development for the acquired businesses such as ZOLL and Polypore. The other one is to acquire new technology from venture companies as the seeds of our new business.

P14 Asahi Kasei Group's R&D expenses

The FY2015 R&D expenses amounted to ¥81.1 billion, accounting for approximately 4% of consolidated net sales. Nearly half of it was spent in the Material sector, and 40% was spent in the Health Care sector. Spending in the electronics business seems large due to the organizational structure at that time; R&D expenses on electronic materials was included in this segment.

Between the current business and future business, approximately 80% of the expenses were used in research for the current businesses and also reinforcement/improvement of associated businesses, and the remaining 20% was spent for research for future businesses.

P16 Changing environment surrounding R&D

Three kinds of environmental changes influence R&D and new business creation by companies.

The first is rapid growth of emerging countries. Such growth leads to generation of new companies, and these companies enter cutting-edge technology markets. In China, entrepreneurs who studied in the US return to their country and start venture businesses. Unlike previously, Chinese companies can no longer be taken lightly. We must compete against these emerging companies.

The second is changes in information and the surrounding environment. Previously, the amount of information we had access to depended on the size of the company or the number of business sites the company had. Now, anyone can obtain the same leading-edge information anywhere.

The third is dramatic changes in research and development frameworks. By combining AI technology and big data analysis, and various combinations of past data such as experimental data, information from patent databases, and information from reference databases, we will soon be able to predict the properties of combinations of materials without doing experiments.

Based on these three environmental changes, there are three points we must consider. First, there is a risk that what was thought to be overwhelmingly advantageous can quickly lose its advantage. Second, individual optimization has already hit its limit in terms of catching up with changes in business and technical environments. The group as a whole therefore must work together to respond to such changes. Third, we must reevaluate our accumulated competitive advantages, technologies, and business platforms, reconstruct them, and redefine competitive advantages. This is the most important point of all.

P17 Measures to cope with environmental changes related to new business development

This is an illustration of Mt. Fuji. This slide shows which new business (mountain) we should aim for and how we should create (climb) it.

At the base of the mountain, we must find out where our group's competitiveness comes from. We need first to understand objectively the core technologies, production technologies, and know-how that we have accumulated. Then, we need to take advantage of our various business platforms, materials, parts, devices, diverse market channels, and business models that are implemented in the Material, Homes, and Health Care sectors. Then, we will exert our combined strength through internal connections.

The next step is to decide how we should climb the mountain, or how to proceed with new business creation. When we create a new business to realize a 'society of clean environmental energy' and 'society of healthy/comfortable longevity with peace of mind,' it is important to actively source what we lack from outside. In today's material R&D, we do not have time to always start from fundamental research. Similar research must be underway somewhere in the world. We must locate it and collect our 'missing parts' from it or collaborate with it. To put it simply, we must not climb Mt. Fuji all the way from the base on foot; we should first drive to the halfway point. From there, we should go for the top without stopping. We will place importance on collaboration with outside parties and will actively incorporate outside seeds into our R&D activities through CVC.

P18 New business creation under the medium-term management initiative "Cs for Tomorrow 2018"

This slide rephrases our approach to new business creation illustrated on page 17 from a different perspective. Having a wide variety of technologies and diverse businesses, Asahi Kasei's strengths are a wealth of technologies, diverse human resources, and business models. We will create new businesses by taking advantage of these strengths while incorporating what we lack from outside.

P19 Example of competitive analysis of patents (membrane for electrolysis)

This slide shows the analysis result of our intellectual property competitiveness in the area of membrane for electrolysis. The chart was created with a tool called Biz Cruncher. Including membrane-related technology, Asahi Kasei has been investing its resources in competitive technology, filed many patents in the corresponding technical fields, and secured a large number of highly competent human resources and engineers.

The horizontal axis shows the 'highest scoring patent,' indicating the level of quality of the best patent of each company. A circle representing a company is plotted on the right side of the chart if it has even only one excellent patent. Competitors attempt to invalidate such excellent patents by filing other patents or otherwise try to cite them. These activities are all recorded and used in analysis to evaluate patent quality. The vertical axis shows the 'patent holder score' indicating the comprehensive strength of a company's patent portfolio. The comprehensive strength and integral value of each patent holder is obtained by summing up the competitiveness of its patents. The size of each circle symbolizes the number of patents. A large circle plotted upper right in the chart suggests that the corresponding company has powerful patents and high competitiveness in the subject business sector. Company F in the lower right has a unique and high level patent and technology in a very specific area. It is a very common pattern in venture companies.

These analysis results allow us to compare our competitiveness with that of competitors and understand how we and our potential partners can complement each other's technology.

P20 Core technologies that support Asahi Kasei Products

This slide summarizes our the strong technologies into which Asahi Kasei has so far invested its resources and also the result of competitiveness analysis of these technologies. As shown in the figure, we have various technology areas such as catalyst/process, polymers/processing, fibers, membranes/separation, compound semiconductor/LSI, homes/construction materials, and health care. The small circles at the center represent our competitive core technologies. Catalysis/inorganic synthesis technology, chemical process technology, functional polymer technology, polymerization/spinning technology, virus removal technology, and phase separation technology are

some of the examples.

P21 Accumulated business platforms

Engagement in various businesses has given Asahi Kasei the ability to access a wide variety of markets. Such market access is one of the strengths of our company.

In the Material sector, we have products related to living, healthcare-related material business, automotive-related products business, and environment/energy-related material business including the battery separator business. In the Homes sector, in addition to the long-life urban homes business, we have the Construction Materials business including thermal insulation. In the Health Care sector, we have the blood purification device business and bioprocess product business. In addition, we have acquired a business platform in the US through our acquisition of ZOLL.

Each sector must take advantage of market channels in each business as well as diverse business platforms to create new businesses.

P22 New business creation through collaboration among three business sectors

The three business sectors, Material, Homes, and Health Care, have been working on new business generation by combining their strengths.

In collaboration between the Material and Homes sectors, the Technology Policy Center of Corporate Research & Development is creating various plans. The Homes and Health Care sectors are exploring future at-home patient care services.

The company is placing the highest importance on the Health Care Council. Asahi Kasei Healthcare R&D Center, Asahi Kasei Pharma, Asahi Kasei Medical, and ZOLL attend the council meeting to discuss the next mid-term plan, explore how the 2025 target should be achieved, and consider the possibility of creating a new business by using the ZOLL business platform more effectively. The meeting is held at least once every quarter to host active discussions.

P23 Aims and approach for new business creation

In last year's briefing for the new medium-term management initiative, the approach to new business creation from three different perspectives was introduced.

In the 3D matrix, the depth axis extending forward shows further expansion of Asahi Kasei's strengths. This involves expansive cultivation of new business by strengthening and making full use of business platforms and market channels in various business sectors. The vertical axis indicates fostering and acquiring core technology. We will not only strengthen in-house R&D but also actively incorporate new technology from outside parties into our R&D. The horizontal axis shows heightening of added value through developing and offering solutions.

Based on the approach I described earlier, we will create new businesses whose ultimate goals are a society of clean environmental energy and society of healthy/comfortable longevity with peace of mind.

P24 Approach for new business creation viewed by market axis and technology axis

For material manufacturers, B-to-B business accounts for a large segment of their business. In their R&D activities, they have manufactured high quality materials to meet customer requests and sold the products at low prices. Traditionally, they believed that good technology always resulted in viable business. Today's society however requires more than this. We must think of business in terms of the market and technology together.

In the chart, the horizontal axis shows the market perspectives in new business creation. Along the axis, currently existing markets are divided into four market maturity levels: mature, growth, new, and potential. The vertical axis is the technology perspective. The top half relates to the necessity of using, improving, and combining our strong technologies in creating new businesses. The bottom half is the necessity to add new technologies to the current ones when creating new businesses. The two axes together will give you a sense of the time perspective.

In Category A, most markets are growing although some are already mature. Creation of new businesses will result from strengthening of the current businesses. The key points here are the current brand strength, accessibility to market channels, cost competitiveness, and services. To give a specific example, our company launched a project last year to expand the business in the automotive

industry and set up a regional headquarters in Europe.

Category B needs a longer time span than Category A. In Category B, the approach to new business creation involves examination of the possibility to heighten added value and introduce solutions from new perspectives.

Category C aims for an entry into a new market. This category requires forward-looking marketing activities and leveraging of the technologies and business platforms that our group currently holds. While moving towards the target market, we must acquire any missing elements from outside.

Category D consists of two parts because the approach to creation of new businesses greatly differs between the B-to-C business of the Health Care and Homes sectors and the B-to-B business of the Material sector. In the Health Care and Homes sectors, we should have a large number of opportunities to propose new solutions to achieve better medical care and more comfortable living in both growth and mature markets. New high-quality solutions will be chosen by customers.

On the other hand, B-to-B business of the Material sector never targets mature markets. A new technology cannot dominate an already established market and will simply be treated as a substitute for a current technology. Customers incur the replacement cost. In this case, the market does not serve as anything other than price competition. Even in a growth market, we must be well aware of our own strength to give our products uniqueness or differentiating characteristics. Only products that take advantage of our strengths and those with unique characteristics can dominate a market.

Category E plays the key role for new technology. Corporate Research & Development leads R&D activities for new markets. It will effectively and uncompromisingly invest resources into strengths of Asahi Kasei. It will also acquire early stages of technology through CVC and create businesses based on new business models.

Category F is where resources will be invested into leading-edge technology based on a long-term vision even though its market is yet to emerge in the future. It is necessary to conduct R&D with a long-term vision by effectively using not only in-house technology but also independent research institutes through collaboration with Japanese and overseas universities as well as national research and development agencies.

P25 Example of new business creation in Category C: Alkaline water electrolysis system

This slide illustrates a specific example for Category C on page 24. Category C is where we create new businesses in new markets by combining our strong technologies.

Our company has top-level ion-exchange membrane technology. With this technology, it is possible, although not easy, to convert electricity into hydrogen. The key to success is the amount of hydrogen that can be produced from a specific amount of electric power. We have already conducted extensive experiments whose data show high energy efficiency.

European countries, Germany in particular, are early adopters of technology to produce CO₂-free hydrogen from electricity, which is generated from renewable energy such as solar power or wind. We are now preparing for verification in Germany.

Application of CO₂-free hydrogen is not only for fuel cells. It can be used to produce clean energy-based fuel if it is combined with CO₂ to generate methane and methanol. Production of clean energy-based fuel for automobiles using this has already begun.

Germany has advanced gas pipelines. They are using them to distribute hydrogen as fuel. Our alkaline water electrolysis system is the case study for which we have started to explore how we can make it into a new business in the area where its market can develop the earliest.

P26 Example of new business creation in Category D: High-performance composite materials

Category D on page 24 describes B-to-B business in existing growth markets. It is the area where we must take advantage of product competitiveness and unique characteristics in order to create new businesses. The case study shown on this slide is the combination of fiber and resin technology. Polyamide (PA) 66 fiber and reinforcement glass fiber are combined into a base material. Molding PA 66 resin by injecting it into a molded base material creates a strong textile composite.

Development is almost complete, and we are targeting automotive structural parts as its future application.

Another example is cellulose. Asahi Kasei has accumulated long years of cellulose-related technical experience. The company plans to use its cellulose nanofiber nonwoven sheets to access a wide variety of markets including the structural parts market and electronic material market.

P27 Targets for high-performance composite materials

The top graph compares areas of application and characteristics of resin reinforced with carbon fiber (CF), glass fiber, and cellulose nanofiber when they are used as automotive structural parts. The horizontal axis is the stiffness-to-weight ratio and the vertical axis is the strength-to-weight ratio. To make a primary structural component, CF is far better than the other two. CF however has issues, too. The cost of using CF in components is high. Also, the manufacturing processes for CF emit a large volume of CO₂. The bottom graph compares CO₂ emissions from the manufacturing processes for various materials. CO₂ emission is one of the issues of CF.

In order to achieve a society of clean environmental energy, we plan to introduce eco-friendly structural components made with the glass fiber composite material or cellulose nanofiber composite material. These composite materials will be used for different areas of an automobile than CF and will also reduce component weight. For example, it is quite possible to use these composite materials in areas traditionally made with aluminum or steel because reinforced resin has insufficient strength. Therefore, these areas will be our target. Although there are some technical development issues including production engineering issues to address, we will work hard toward our target.

P28 Example of new business creation in Category E: UVC LED

As an example of Category E of page 24, which is development of new technology in a new market, this slide describes UVC LED. In January 2012, Asahi Kasei acquired CIS that had aluminum nitride (AlN) single crystal growth technology. Sales of the CIS UVC LED have now begun in the business development phase. Marketing activities are actively implemented in various areas including European countries with the focus on the US. Also, UVC LED will be used in products in the Chinese market.

UVC LED can be used for many purposes including medical care, analysis, water sterilization, and food sterilization. Our approach to UVC LED is different from competitors. UV LED has attracted a lot of attention and many companies have entered into the market. What differentiates our UVC LED from others is the single-crystal AlN substrate. Asahi Kasei is probably the only company that has the technology to mass-produce it.

When acquiring CIS, Asahi Kasei was already seeing the future technological potential and possibilities of AlN. The graph at the bottom left of the slide shows the relationship between UV wavelength on the horizontal axis and the DNA absorption spectrum on the vertical axis. UV is absorbed more by DNA to inactivate the DNA near its absorption peak. This means, around this peak, the bactericidal capability of UV is the highest. When using the AlN substrate, the DNA absorption is distinctively high at around 250 nm within its range of emission wavelength. Most competitors use a sapphire substrate. Since sapphire substrate so far is used in a white LED for lighting, its optimal emission wavelength is in a longer wavelength range than UV. We have conducted various tests with sapphire substrates, but a lot of difficult problems must be overcome before they can emit light below 280 nm or 270 nm in the optimum wavelength range for disinfection. One of the features of our UVC LED is that it emits light in the wavelength range that has the most powerful bactericidal effect.

From Asahi Kasei's perspective, LED is not the only application of the AlN substrate. Compared to a gallium nitride substrate, the AlN substrate has lower pressure resistance and on-resistance. This means that the AlN substrate has desirable properties for use in electronic devices. AlN has the same or better properties than diamond. Since our company has the technology to mass-produce its single crystals, various institutes are offering us joint development opportunities.

P29 CVC Function: Bringing in sprouts in Categories C and E

The chart shows the function of CVC. The horizontal axis on the chart is a market timeline and the vertical axis is a technology timeline. The top right corner of the chart means a new market and new technical development. The area indicated by the word "Low" means that the commercialization naturally has a low success rate.

In order to accelerate commercialization while reducing the failure risk, our company has increased CVC Office activities. The CVC Office was launched in 2008. Its base was relocated to the US in 2011. The number of personnel has also increased.

What the CVC Office does is not simple venture company search. The most important aspect of it is to use the human resources that the company developed and their good judgment to identify venture companies with genuine excellence in the high-risk area. As with the case of the CIS acquisition, good judgment is most important and should be utilized.

P30 CVC Office: Bringing in sprouts in Categories C and E

The CVC Office operates in two locations. One is in Menlo Park, California, a part of Silicon Valley. The Menlo Park operation is in charge of the area of clean technology. The other one is in Chelmsford, Massachusetts, working in the health care field. Its office is at ZOLL's location near Boston. From these two locations we make investments into venture capital firms and search for venture company information. The size of the fund is approximately ¥5 billion for three years total.

P32 ZOLL products in the "Chain of Survival"

This section discusses the solution business using IT in relation to creating added value from new perspectives in existing markets as described in Category B on page 24. Many may have thought, immediately after the ZOLL acquisition, that Asahi Kasei bought an incompatible business. From a different angle, however, this means that ZOLL had a completely different business model that Asahi Kasei did not have.

ZOLL has two characteristics. One of the characteristics of ZOLL is that it has been offering total solutions for patients with a risk of sudden cardiac arrest. ZOLL's products provide powerful support for patients in all phases of the Chain of Survival. LifeVest wearable defibrillator is a device that automatically performs defibrillation when a ventricular fibrillation occurs while a patient wearing it while going about their daily lives. ZOLL also offers RescueNet (data management suite for fire and emergency medical services) that works with emergency medical services and also defibrillators to be used by physicians after patients are taken to a hospital. There is also a body temperature management system designed to avoid brain damage caused by a high temperature in a patient in serious condition. The Chain of Survival is a concept advocated by the American Heart Association, and ZOLL offers solutions that cover the entire chain. This is ZOLL's business model.

P33 LifeVest solution business

The second characteristic of ZOLL is that it provides IoT-based solution services. For example, LifeVest automatically executes the resuscitation process when a patient has a cardiac arrest. The patient's electrocardiogram can be monitored, especially data before and after the cardiac arrest. ZOLL also has a 24/7 call center.

P34 Examples of solutions business being advanced and developed

Close observation of our company business results in discovery of a diverse solutions business. For example, under Corporate Production Technology, there is a plant design company called Asahi Kasei Engineering Corporation. Its plant maintenance service known as a diagnosis service has been rated highly. The company offers solutions for achieving stable operation of plant and equipment.

The company also offers an electric power system analysis service. When it provides the service in the Nobeoka area, the company uses power purchased from Kyushu Electric and also power generated in-house. The purchased power is at 60 Hz and power generated in-house is at 50 Hz. The company skillfully uses these two systems. It has a solution for showing the recovery process for a shut-down system and also a solution for achieving the most efficient automatic

recovery without compromising the operation rate. Examination of these solutions from a different perspective will provide us an opportunity to provide new services.

In the stable supply solution for hydrogen from water electrolysis, we should be able to provide a high-value added solution because, needless to say, we will create its system too. In the case of UVC LED, too, we believe we can offer it as a high-value added solution by taking advantage of the water treatment, modularization, and medical care businesses.

P35 Enhancing business activity utilizing IoT, AI, Big Data

Asahi Kasei is promoting coordinated utilization of advanced IT in two frameworks. The first is the area surrounded by red lines: manufacturing and production technology innovation. The second is the area surrounded by blue lines: acceleration of development/creation of high value-added businesses.

It is mainly led by Corporate Production Technology and Corporate IT Management in charge of managing the core IT. As for manufacturing and production technology innovation, the Manufacturing Technology Center is also involved. For acceleration of R&D utilizing IT, Corporate Research & Development is involved. For creation of high value-added businesses, Asahi Kasei Microdevices joins.

Through collaboration among these organizations, we plan to use IT for operations, production technology innovation, supply chain innovation, risk management, and work standardization within the framework on the left—manufacturing and production technology innovation.

In the right-hand framework, in addition to the use of material informatics, the use of AI and Big Data help us plan R&D strategies by analyzing data on the competitiveness of our company and competitors.

P37 Essence of new business creation under “Cs for Tomorrow 2018”

At this briefing so far, the essence of new business creation has been explained using themes with a long-term vision. In order to transform the business portfolio by business expansion and new business creation for the future, we must create new markets and develop them on our own.

First, business producing hydrogen by water electrolysis is an example of creation and development of a new market. Also, in the CO₂ chemistry business, which is our strong area, we can produce various basic chemicals using CO₂. Creation of disinfection markets using the UVC LED is another possibility. New sensors, and infrared sensors in particular, are sensitive to wavelengths of 4 μm to 7 μm, covering wavelengths at which gases absorb infrared. As a result, CO₂, CO, NO_x, formaldehyde, and all methane-related gases can be detected. We believe sensors can have a wide range of application. For example, we can create the next new business using various environmental gas sensors.

Second, as explained earlier, we must leverage our diverse core technologies and business platforms, as well as our ability to discern.

Third, we must create high value added business by combining different cultures. Traditionally, Asahi Kasei had a strong Japanese culture. It has however changed quite a lot after the acquisition of ZOLL, Polypore, and CIS. As we and the acquired companies learn to understand each other's culture, we were able to re-define the strength of each organization. Asahi Kasei has long had the capability to develop components. We are good at creating various applications for each material. We carefully build technology from the ground up to produce high quality components. Meanwhile, ZOLL has an excellent ability to create business by determining targets based on established technology. The key to the successful future is to continue to evolve by combining the strengths of the group companies.