KAITEKI Value for Tomorrow

APTSIS 20

Presentation to Investors

December 4, 2018

Hitoshi Ochi
President & CEO
Mitsubishi Chemical Holdings Corporation
The forward-looking statements are based largely on information available as of the date hereof, and are subject to risks and uncertainties which may be beyond Company control. Actual results could differ materially, due to numerous factors, including but not limited to the following: Group companies execute businesses in many different fields, such as information, electronics and displays, advanced moldings and composites, advanced polymers, MMA, petrochemicals, carbon products, industrial gases, and pharmaceuticals, and these business results are subjected to influences of world demands, exchange rates, price and procurement volume of crude oil and naphtha, trends in market prices, speed in technology innovation, National Health Insurance drug price revision, product liabilities, lawsuits, laws, and regulations.
List of Abbreviations

MCHC: Mitsubishi Chemical Holdings Corporation
MCC: Mitsubishi Chemical Corporation
MTPC: Mitsubishi Tanabe Pharma Corporation
LSII: Life Science Institute, Inc.
TNSC: Taiyo Nippon Sanso Corporation
DEV: Diamond Edge Ventures, Inc.
MCA: Mitsubishi Chemical America, Inc.
MCE: Mitsubishi Chemical Europe GmbH
MCIS-UK: MC Ionic Solutions UK, Ltd.
MCIS-US: MC Ionic Solutions US, Inc.
UMBM: Changshu UM Battery Materials Co., Ltd.
SAMAC: The Saudi Methacrylates Company

TCFD: Task Force on Climate-related Financial Disclosures
WEF: World Economic Forum

ABS: Acrylonitrile butadiene styrene
AI: Artificial intelligence
AR: Augmented reality
ASU: Air separation unit
BMA: Butyl methacrylate
CF: Carbon fiber
CFRP: Carbon fiber reinforced plastic
CVC: Corporate venture capital
DX: Digital transformation
EAP: Employee Assistance Program
GHG: Greenhouse gas
ICT: Information and communication technology
IoT: Internet of things
LCD: Liquid crystal display
LIB: Lithium-ion battery
LLDPE: Linear low-density polyethylene
MAA: Methacrylic acid
MMA: Methyl methacrylate
MOS: Management of Sustainability
OLED: Organic light emitting diode
PBS: Polybutylene succinate
PCM: Pregreg compression molding
PHV: Plug-in hybrid vehicle
PMMA: Polymethyl methacrylate
PP: Polypropylene
PVC: Polyvinyl chloride
RHQs: Regional headquarters
SMC: Sheet molding compound
VLP: Virus-like particles
VR: Virtual reality

Note:
Product names, brand names, service names, and technology names used in this presentation material are denoted in italics and are trademarks or registered trademarks of the MCHC Group in Japan and/or overseas. Other product names, brand names, and service names may also be protected.

CIO: Chief Innovation Officer
CTO: Chief Technology Officer
CMO: Chief Marketing Officer
CDO: Chief Digital Officer

FY2017: April 1, 2017 – March 31, 2018
FY2018: April 1, 2018 – March 31, 2019
Today’s Agenda

1. Operating Results and Forecasts, Priority Management Measures in APTSIS 20

1-1. Operating Results and Forecasts
1-4. Reinforcing Business Foundation for Fundamental Industrial Materials
1-5. Generating Integration Effects and Synergy due to Establishment of the New MCC
1-6. Intensifying Marketing and Access to the Global Market
1-7. Early Commercialization of the Seeds of Next-generation Businesses

2. Review of APTSIS 20

3. Further Deepening of KAITEKI Management
Business results achieved the APTSIS 20 profit targets in FY2017

Operating results and forecasts

- Operating income (Core operating income)
- Net sales
- Net income attributable to owners of the parent

<table>
<thead>
<tr>
<th>FY2012</th>
<th>FY2013</th>
<th>FY2014</th>
<th>FY2015</th>
<th>FY2016</th>
<th>FY2017 (Forecasts)</th>
<th>FY2018 (Forecasts)</th>
<th>FY2020 (Targets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.2</td>
<td>110.5</td>
<td>165.7</td>
<td>280.0</td>
<td>307.5</td>
<td>380.5</td>
<td>368.0</td>
<td>380.0</td>
</tr>
</tbody>
</table>

ROE (%)

|       | 2.3 | 3.7 | 6.4 | 4.8 | 15.1 | 17.8 | 16.0 | 12.0 |

Mitsubishi Chemical Holdings
### Financial Index

- **Expected to achieve the numerical targets (ROS, net income, ROE) in APTSIS 20, same as the previous fiscal year**

<table>
<thead>
<tr>
<th>Financial Index (MOE)</th>
<th>FY2018 Forecasts</th>
<th>FY2020 Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core operating income</td>
<td>¥368 billion</td>
<td>¥380 billion</td>
</tr>
<tr>
<td>ROS (Core operating income)</td>
<td>9%</td>
<td>8%</td>
</tr>
<tr>
<td>Net income attributable to owners of the parent</td>
<td>¥213 billion</td>
<td>¥180 billion</td>
</tr>
<tr>
<td>ROE</td>
<td>16%</td>
<td>12%</td>
</tr>
<tr>
<td>Net D/E ratio</td>
<td>0.77 (1.2*)</td>
<td>0.8</td>
</tr>
</tbody>
</table>

* *A large-scale acquisition in the Industrial Gas segment in FY2018 is calculated based on announced value*
Shareholder Returns

- Aim to enhance shareholder value by improving corporate value
- Balance dividend policy with growth investment and financial structure improvement, and implement stable dividend payments
  (Set 30% of the medium-term profit level as a guideline for the consolidated dividend payout ratio)

(Dividend, EPS: ¥)

- Dividend (¥/share)
- DOE (%)
- EPS (¥)

Payout ratio 26.7%

Mitsubishi Chemical Holdings

**Performance Products**

- Reinforcing portfolio management
  - Accelerating portfolio reforms
  - Promoting growth strategies for focus markets

- Generating integration effects and synergy due to establishment of the new MCC

**Industrial Materials**

- Reinforcing business foundation
  - MMA, Industrial gases: Maintaining/expanding global share
  - Petrochemicals: Shifting to high-performance materials, optimizing productivity

- Intensifying marketing and access to the global market (Establishment of RHQs, etc.)

- Early commercialization of the seeds of next-generation businesses (R&D, Open innovation, DX)

- Deepening KAITEKI Management, promotion of workstyle reform

**Health Care**

- Ethical pharmaceuticals:
  - Intensify the pipeline
  - Expand businesses in the U.S.

- Life science:
  - Regenerative medicine
  - Promoting healthcare and medical ICT businesses

**KAITEKI Value for Tomorrow**

Intensifying Business Portfolio Management: Accelerating Reforms (1)

**Solutions to Focus Markets**

**Mobility/Electronics/Medical/Healthcare/Environment, Energy/Packaging**

Anticipated market changes and demand trends by 2025

Selection of businesses to accelerate by 2025

Verification of market growth potential, business profitability, technology superiority, and business model

**Basic Policies**

- Implement the business portfolio reform from the viewpoint of growth potential and profitability
  - Selection and focus of growth businesses and priority allocation of resources
  - Consideration and acceleration of reconstructing businesses equivalent to total sales revenue of ¥300 billion
- Regarding subsidiaries and affiliates, in addition to streamlining through integration (reduce by 25% in the entire MCHC Group), accelerate restructuring as part of the business portfolio reform and consider reduction of 15-20 companies

**Intensifying Business Portfolio Management: Accelerating Reforms (2)**

- Executed withdrawal and transfer of businesses on a scale of ¥100 billion in sales revenue, starting in FY2017
- Reducing number of subsidiaries and affiliates by 111 by the end of FY2018

<table>
<thead>
<tr>
<th>FY2017</th>
<th>FY2018</th>
<th>FY2020 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>111</td>
<td>182</td>
</tr>
<tr>
<td>53</td>
<td>100</td>
<td>300</td>
</tr>
<tr>
<td>3,000</td>
<td></td>
<td>200</td>
</tr>
</tbody>
</table>

- Sales of withdrew or transferred businesses (Unit: ¥ billion)
- Number of reduced subsidiaries and affiliates (Unit: company)

- ABS business integration
- PMMA sheet business transfer (Europe), etc.
- Generic drug business transfer
- PMMA sheet business transfer (U.S.), etc.

Planning to re-establish businesses on a scale of ¥200 billion in sales revenue in FY2019-FY2020
### Growth Strategies for Focus Markets and Reinforcing Business Foundation for Fundamental Industrial Materials

- **Accelerating growth centering on Growth Drivers, while generating synergy with related segments**

#### Focus Markets

<table>
<thead>
<tr>
<th>1. Automobiles, aircraft (mobility)</th>
<th>2. IT, electronics, displays</th>
<th>3. Medical, food, bio products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lightweight composites</td>
<td>FPD materials</td>
<td>Food ingredients</td>
</tr>
<tr>
<td>Environment-friendly materials</td>
<td>Semiconductor-related materials</td>
<td>Pharmaceutical materials</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medical-related products</td>
</tr>
</tbody>
</table>

#### Related Segments

<table>
<thead>
<tr>
<th>Performance Product</th>
<th>Chemicals</th>
<th>Health Care</th>
</tr>
</thead>
</table>

#### Growth Drivers

- **Promoting generation of synergy in the MCHC Group by strengthening market access**
  - (Cross-sectional approach and consolidation of organization)
- **Combination, integration, providing solutions**
- **Enhancing overseas development**
- **M&A, alliance**
- **R&D, innovation**
- **Intensifying competitiveness by improving productivity and efficiency**

#### Fundamental Industrial Materials

<table>
<thead>
<tr>
<th>Industrial Films</th>
<th>Food packaging films</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemicals</td>
<td></td>
</tr>
<tr>
<td>Industrial Films</td>
<td></td>
</tr>
</tbody>
</table>

*Note: The content is presented in a logical and readable format, with a focus on the key points and visual representation.*
Growth Strategies for Focus Markets (FY2016-FY2018)

Automobiles, Aircraft (Mobility) (Sales revenue: ¥ billion)

Growth measures
- Responding to trend toward Connected, Autonomous, Shared, Electric (CASE) in the automotive industry, reinforce response to environmental issues
- Reinforcing carbon fiber and composite material business and accelerate overseas expansion
- Accelerating overseas expansion of resin compound business

Progress
- Reinforcing overseas network for carbon fiber and composite material business
- Expanding adoption of CF-SMC: Toyota Prius PHV, other
- Higher performance of PP: A new PP manufacturing facility is under construction at the Goi Plant (150kt/y)
- Acquired 2 overseas compound producers (India, Indonesia)

IT, Electronics, Displays (Sales revenue: ¥ billion)

Growth measures
- Reinforcing display-related product business: LCD, OLED materials
- Expanding semiconductor-related business: Expanding precision cleaning agent-related business, developing thermal management materials

Progress
- Optical films: A new line is under construction in China (starting operation in April 2019), OPL Film: A new line is under construction at the Kumamoto plant (starting operation in March 2020)
- Precision cleaning of semiconductor manufacturing equipment: Acquired Cleanpart Group (October 2018)
### Growth Measures: Mobility (1)

- **Reinforcing marketing and technological support for carbon fiber and composite materials used in automobiles and expand the business in Europe and the U.S.**

  - Expanding the business by leveraging achievements of CF-SMC* and PCM** in Japan and overseas
  - Making proposals to manufacturers/Tier 1 for design and development of composite materials, by establishing the composite application center in Europe and cooperating with companies involved in carbon fiber and composite materials and engineering plastics
  - Established carbon fiber recycle technology and started operation of a test facility, and studying future mass production possibilities

*CF-SMC: Carbon Fiber - Sheet Molding Compound, **PCM: Prepreg Compression Molding

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**MCC’s CF-SMC adopted by the rear door frame of the Prius PHV (Photos by Toyota Motor Corp.)**

**Roof of the Audi RS 5 Coupé using MCC’s CFRP, optional specifications (Photos by Audi)**
Stepping up efforts to establish a system of local production for local consumption by expanding the global network for the compound business

- The number of offices/production facilities will increase by about three times from 2011 until 2020
- A new production facility to manufacture PVC slush powder for automotive interiors in China (Chengdu), slated to start operation in spring 2019
- Acquired two producers of PVC compounds for automotive components, electronic cables, etc. (Indonesia, India)

28 Locations / 16 Countries

- Europe: 16
- Asia Pacific: 7
- Americas: 5

Japan: 5
Asia pacific: 7
China: 4
Europe: 8

New
Conventional
Establishing a structure to offer precision cleaning services on a global scale by acquiring Cleanpart Group GmbH

- Expanding the business by adopting advanced precision cleaning technology, which has been built up in Japan and Asia, for semiconductor manufacturing equipment makers in Europe and the U.S.

19 Locations

- Cleanpart Group
  Precision cleaning and coating services for semiconductor manufacturing equipment
  U.S. (4), Europe (5)

- MCC Group companies
  Precision cleaning
  Japan (7), Taiwan, China, Korea

Growth Strategies for Focus Markets (FY2016-FY2018)

**Medical, Food, Bio products**

(Sales revenue: ¥ billion)

- **Growth measures**
  - Expanding the implant material business
  - Expanding the nutrition-related business
  - Expanding the medical use gas business

- **Progress**
  - Acquired a U.S. high-performance engineering plastic company (Piper Plastics, Inc.)
  - Food emulsifier: Expanding sales mainly in China and other ASEAN countries
  - Respiratory-related business including home healthcare services: **Acquired IMI Co., Ltd.**

**Healthcare**

(Sales revenue: ¥ billion)

- **Growth measures**
  - Reinforcing pipelines for ethical pharmaceuticals
  - Developing the business in the U.S.
  - Commercialization of VLP vaccine
  - Commercialization of regenerative medicine

- **Progress**
  - **Expanding Radicava globally**
  - **Advancing development of influenza VLP vaccine and constructing a manufacturing facility for commercialization**
  - Developing regenerative medical products using Muse cells and promoting commercialization

Growth Measures: Medical

- Enhancing presence in the medical gas business field

Expanding into Respiratory-related Business including Home Healthcare Services

- Expanding the field and functions in both medical gas and medical equipment businesses, by acquiring the respiratory-related medical equipment sales company, IMI

**Acquisition**

For hospitals

- Gas-related equipment
- Respiratory care products
- Emergency care products
- Customer services

Home healthcare

- Home respiratory care
- Sleep care
- Infusion pump care
- Call centers

Production/Development

- Development
- Production
- Import of overseas products

[Main respiratory-related equipment]

- MONNAL T60
- VELA
- LTV2

**Growth Measures: Healthcare (Radicava)**

- Steady global expansion of infusion
- Maximize sales revenue by successively expanding to other countries, launching oral suspension (MT-1186) in the U.S. in FY2021

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**Advantage of Radicava oral suspension**

Eliminating extended treatment time for patients resulting from intravenous infusion administration and limits on number of administration sites

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Enhancing overseas development

- **Japan (Approval: June 2015)**
- **Korea (Approval: December 2015)**
- **U.S. (Approval: May 2017)**
- **Canada (Approval: October 2018)**

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**Switzerland (Application: December 2017) European (Application: May 2018)**

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**Oral suspension launch**

- FY2018: ¥31.5 billion
- FY2020
- FY2021
- FY2023

- Switzerland
- U.S.
- EU
- Oral suspension

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- **Oral suspension**
- **Infusion**
### Growth Measures: Healthcare (VLP Vaccine)

#### Reliably promoting VLP vaccine pipeline and starting construction of a manufacturing facility for commercialization

<table>
<thead>
<tr>
<th>Pipeline/Stage</th>
<th>R&amp;D</th>
<th>Non-clinical trial</th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seasonal Influenza</td>
<td>Adult</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>In preparation</td>
</tr>
<tr>
<td></td>
<td>Pediatric</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>In preparation</td>
</tr>
<tr>
<td></td>
<td>Elderly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>In progress</td>
</tr>
<tr>
<td>Pandemic Influenza</td>
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<td></td>
<td>In progress</td>
</tr>
<tr>
<td>Rota virus</td>
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<td></td>
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<td></td>
<td>In progress</td>
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<tr>
<td>Noro virus</td>
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<td></td>
<td></td>
<td></td>
<td>In progress</td>
</tr>
</tbody>
</table>

**Starting construction of a manufacturing facility for commercialization (Capex: approx. ¥25.0 billion)**

- **Location:** Quebec City, Canada
- **Purpose:** Manufacturing of commercial vaccines
- **Slated to start supply:** 2023

**New Quebec Plant (20.0 million doses)**

- **North Carolina Plant (2.5 million doses to 3.5 million doses)**

**Sales in U.S.**

- **VLP:** Virus like particle

**Growth Strategies for Focus Markets (FY2016 – FY2018)**

**R&D, innovation**
Aiming to acquire approval as quickly as possible through parallel development of applications for several indications in addition to myocardial infarction and cerebral infarction

- Started clinical trials of regenerative medical products using Muse cells for **acute myocardial infarction** and **cerebral infarction**
- Pursuing expansion of indications, and accelerate the development
- Aiming for application in FY2020 and approval in FY2021
- Established a manufacturing facility for regenerative medical products
  (Completion of construction: October 2018, Start of operation: January 2019)
- Manufacturing cells using proprietary technologies and establishing the cold chain

**Characteristics of Muse cells**
- **Proprietary technologies**
  - Cell culture technique
  - Cryopreservation technology
- Intravenous infusion of Muse cells
- Concentrating (Muse cells) into the infarction site through blood vessels
- Signaling from damaged tissue
- Tissues are repaired and functions are recovered
- Migration capability/Spontaneous differentiation capability

**Clinical Trials**
- Application
- Approval

**Launch**
Aiming to acquire approval as quickly as possible through parallel development of applications for several indications in addition to myocardial infarction and cerebral infarction

Muse cells, discovered by the team led by Prof. Mari Dezawa of Tohoku University in 2010, are pluripotent stem cells that exist in the human body.
Growth Strategies for Focus Markets (FY2016-FY2018)

**Environment, Energy**

- **Growth measures**
  - Expanding LIB materials business
  - Accelerating development of wastewater treatment in China and water supply treatment business in Japan
  - Developing products that reduce environmental impact

- **Progress**
  - Accelerating global expansion of electrolyte business (Europe/U.S./China)
  - Start of full-scale sales of wastewater treatment facilities for farming villages and pig farms in China
  - **Accelerating development of other applications of BioPBS**

**Packaging, Labels, Films**

- **Growth measures**
  - Barrier application: Accelerating overseas expansion of food packaging film, reinforcing development of new high-barrier performance products
  - High-performance films: Developing new products by combining the group’s technologies

- **Progress**
  - Started full-scale operation of a new polyester film line in the U.S. in 2018
  - Launch of high-barrier performance deep-formed microwavable containers
  - **DIAMION** production site is under construction in Thailand (Slated to start operation in 2020)
**Growth Measures: Environment, Energy (1)**

- **Maintaining the world’s top share in electrolyte for LIB batteries for automobiles by accelerating investment in global production sites**

  - Electrolyte: Restart of operations at the U.K. production site, 
    Plan to increase total production capacity [43kt (2017) → 85kt (2020)]
  - Anode material: Plan to expand production facilities at production sites in China [18kt (2017) → 29kt (2020)]

(Graph: Production capacity; Unit: 10kt)
**Growth Measures: Environment, Energy (2)**

- **Accelerating research and application development for biodegradable plastics and plant-derived polymers to contribute the establishment of a recycling-oriented society and achievement of SDGs**

**BioPBS**

Plant-derived and biodegradable plastics place a lower burden on the natural environment because microbial action in soil breaks them down into water and carbon dioxide.

**Accelerating Application Development**

Developing not only compost bags, mulch films for agriculture, etc., but also using composite technology, paper cups, coffee capsules, and products that deliver the characteristics necessary for gas barrier soft packaging materials.

- **Coffee capsule (Gas barrier properties)**
- **Paper cup (Heat resistance, High heat sealing properties)**
- **Packaging zipper (Repetitive sealability, formability)**
- **Heat-sealed layer of coffee bean bags (Sealing properties)**
- **Degassing valve (Durability after repeated bending, formability)**

(Degassing CO₂ generated by breathing of coffee beans)
Accelerating overseas high-performance film business and expanding applications for high gas barrier films

**Reinforcing Polyester Film Production and Sales Structure**

- New polyester film line in the U.S. started full-scale operation in July 2018, **reinforcing the supply in North America**
- Future development of multi-function products for further business expansion

**Expanding Multi-layer Film Business**

- **Constructing a new production site in Thailand** to produce “DIAMIRON,” thus expanding the food packaging business in the growing ASEAN market; **the operation is slated to start in 2020**
  - Production volume will increase by about 20% from the current capacity
- **Developing high gas barrier performance, deep-draw, nitrogen gas-sealed containers**, which can be warmed in microwave ovens, in response to increasing needs for home meal replacement and meal with family members eating separately
- Thanks to high gas barrier performance and flexibility, the shift from other raw materials is accelerating for application of infusion bag, etc.
# Reinforcing Business Foundation for Fundamental Industrial Materials (FY2016-FY2018)

**Fundamental Industrial Materials**

<table>
<thead>
<tr>
<th>Measures for reinforcing business foundation</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Expanding presence in market</td>
</tr>
<tr>
<td>- Reinforcing profitability of overseas businesses</td>
</tr>
<tr>
<td>- Realizing higher productivity and corporate strength</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemicals</strong></td>
</tr>
<tr>
<td>- <strong>Started commercial operations at SAMAC</strong></td>
</tr>
<tr>
<td>- Thailand: Capacity increase in MAA and BMA</td>
</tr>
<tr>
<td>- U.S.: Continuing study of MMA project</td>
</tr>
<tr>
<td>- Europe: PMMA sheet business transfer</td>
</tr>
<tr>
<td>- <strong>Reinforcing coke furnace to maintain conditions</strong></td>
</tr>
<tr>
<td>Unification of ethylene production facilities in Mizushima</td>
</tr>
<tr>
<td>- Utility alliances at the petrochemical complex</td>
</tr>
<tr>
<td>- <strong>Developing high-performance and high-functional polyolefin</strong></td>
</tr>
</tbody>
</table>

**Industrial gases**

- **Capital investment, large-scale investment and loans**
- Constructing an electronic material gas plant in East Asia
- Started operation of a large-scale ASU in Kurashiki City
Expanding global market share by moving into new business areas

- Acquired businesses targeting sales in Europe, through the merger of Linde AG and Praxair, Inc.
- Expecting to achieve “¥1 trillion in sales revenue,” the long-term management vision of TNSC in FY2020

Target Businesses to be Acquired

<table>
<thead>
<tr>
<th>ASUs</th>
<th>Cylinder filling plants</th>
<th>Liquide CO2 plants</th>
<th>Dry ice plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>35</td>
<td>12</td>
<td>19</td>
</tr>
</tbody>
</table>

Outlines of major assets, etc.
Establishing solid global supply networks

- SAMAC started full-scale operation (April 2018)
- Optimizing supply chain management by using digital technology
  - Improving productivity in production sites
  - Studying optimization by sharing real-time market information, each process cost information, and supply and demand in each market

MMA Production Capacity

C4 process 568kt/y + ACH process 938kt/y + Alpha technology 370kt/y = Total: 1,876kt/y (Capacity base share: Approx. 40%)
1-4. Reinforcing Business Foundation for Fundamental Industrial Materials

Measures for Reinforcing Business Foundation: Carbon

- Maintaining high operating rates through reinforcing coke furnaces to maintain conditions

Reinforcing Coke Furnace to Maintain Conditions

- Large-scale partial relining under operation (hot renewal method) has been underway in a systematic manner since 2009
  → Maintaining coke furnaces in Japan’s best possible conditions, making a significant contribution to improving and stabilizing the nation’s coke supply

Enhancing Cost Competitiveness

- Increasing the ratio of low-grade coal use by introducing a briquette coal forming facility* (Operation is slated to start in 2019)
  *Coking coal pre-treatment facilities to increase coke strength by hot-mixing and pressure-forming coking coal and binders

Business Environment

- China’s environmental policy and steel overproduction/reduction of coke furnace production capacity for domestic consumption
  ⇒ tightening of demand and supply and stabilization of the market
- Tightening of demand and supply for needle coke, a key raw material, in line with tightening (price increase) of demand and supply of electrodes for use in electric furnaces in China ⇒ expecting firm market for the meantime

Price Trends: Coke, Coking Coal

Price Trends: Electrode

Mitsubishi Chemical Holdings
Improving polyolefin performance (strength, heat resistance, formability, etc.) by developing metallocene catalyst ⇒ improvement of the final product performance, expansion of the application

- General-purpose polyolefin → accelerating higher value-added products
- Furthermore, promoting development of new catalyst, which results in higher performance polyolefin

**Polyolefin High-value Added Product Ratio**

<table>
<thead>
<tr>
<th>Year</th>
<th>PE (%)</th>
<th>PP (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td></td>
<td></td>
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<tr>
<td>2018</td>
<td></td>
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<tr>
<td>2020</td>
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</tbody>
</table>

**Targets**

**PP Compound: Example of Adoption**

Door module (Automotive interior component)

**LLDPE: Example of Adoption**

Sealants for solar panels
1-5. Generating Integration Effects and Synergy due to Establishment of the New MCC

**Progress in Corporate Rationalization**

**¥10.4 billion reduction through rationalization due to integration by the end of FY2018**

**Rationalization by Integration of 3 Companies**

- **Integration of subsidiaries and affiliates**
  - Reducing MCHC Group subsidiaries and affiliates of approximately 760 companies by 25% (Target)
  - Realizing reduction of 111 subsidiaries and affiliates (incl. 65 MCC Group companies) by the end of FY2018

- **Productivity improvement, Workstyle reform**
  - Starting full-scale initiatives on improvement of productivity in FY2019
  - Contributing to improved productivity by introducing the global communication tool
  - Improving productivity by reducing actual working hours

- **Realization of corporate functions**
  - Reducing labor costs by reviewing personnel plan for corporate functions
  - Reducing controllable expenses by 20%

- **ICT • AI**
  - Contributing to productivity improvement through the use of ICT/AI in production, quality, development, business, and service
  - Introducing global core system (SAP)
  - Starting study on adoption of DX for MMA supply chain management

**¥15.0 billion**  
**FY2017-FY2018: ¥10.4 billion**
Synergy and Growth

- Increasing ¥11.0 billion in profits by the end of FY2018 through synergy and growth
- Expecting increase of ¥35.0 billion in sales revenue by the end of FY2020 through steadily implementing growth strategies for focus markets

**Synergy and Growth**

**¥35.0 billion**

FY2017-FY2018: ¥11.0 billion (Performance Products: ¥5.0 billion; Industrial Materials: ¥6.0 billion)

**Automobiles, Aircraft (Mobility)**
- Expanding sales of automotive materials for Europe
- Reinforcing response to multi-materials
- Expanding sales of electronic cable coating materials, etc. for xEVs
- Coating and UV curing resin for automobiles
- Expanding overseas compound business

**Environment, Energy**
- Studying high-performance battery materials
- Promoting disaster prevention products that are packaged according to disaster type in cooperation with government and private sectors
- Expanding share of Chinese wastewater treatment membrane market
- Expanding biodegradable polymer business

**IT, Electronics, Displays**
- Expanding sales for use in OLED displays
- Expanding semiconductor-related business
- Expanding LED-related products

**Packaging, Labels, Films**
- Overseas expansion of product groups focusing on food packaging films
- Expanding sales of existing products with improved performance achieved through development of high-performance gas barriers, etc.

**Medical, Food, Bio products**
- Reinforcing precision molding business for super engineering plastics
- Reinforcing overseas development of LACRIS lactic acid bacteria in the field of animal feed
- Expanding sales of sugar ester and other products for home meal replacement and Asia

**Fundamental Industrial Materials**
- Expanding sales of high-performance carbon black
- Expanding sales of light-weight components in the petrochemicals business
Established RHQs to support businesses growth and profit improvement in four regions of the world

- Establishing a technical center led by the RHQ in each region
- Targeting a 50% ratio of overseas consolidated sales revenue (Projection for FY2018: 43%)

(Sales revenue: ¥ trillion)

**Composition of sales revenue**

- **Japan**: 40% to 50%
- **China**: 11% to 12%
- **Asia (excl. China)**: 12% to 13%
- **North America**: 4% to 13%
- **Europe**: 8% to 13%
- **Others**: 6% to 50%

**FY2016**

- **Europe (MCE, MCHE)**: ¥3.4 trillion
- **Asia (MCAP)**: ¥3.4 trillion

**FY2020**

- **Europe (MCE, MCHE)**: ¥4.6 trillion
- **Asia (MCAP)**: ¥4.6 trillion

**Market Access**

- Europe (MCE, MCHE)
- Asia (MCAP)
- North America (MCA, MCHA)
Promoting commercialization of next-generation businesses, which reflect trends in focus markets

- Founded corporate venture capital
- Accelerating open innovation and digitalization
- Studying integration of R&D centers
- Improving motivation of R&D personnel by personnel system reform

**Components for multi-materials**

- Next-generation display materials

**Next-generation battery materials**

**Heat management materials**

**Biodegradable polymers**

**Composite materials for 3D printers**

**Regenerative medicine related materials**

**Power semiconductor materials**

**Next-generation energy**

**Environment, Energy**

- Electric vehicles
- Renewable energy
- Micro plastic issue
- Improving gas barrier performance
- Making multifunctional films
- Reducing environmental impact

**Automobiles, Aircraft (Mobility)**

- Connected, automatic operation
- Sharing, electric vehicles

**Packaging, Labels, Films**

- Preventive medicine
- Progress of regenerative medicine
- Biocompatible materials

**Medical, Food, Bio Products**

- Next-generation pharmaceutical/diagnostic pharmaceuticals

**Health Care**

- High-definition, thin, flexible
- Highly integrated, refined, heat resistant/heat dissipation

**IT, Electronics, Displays**

- Connected, automatic operation
- Sharing, electric vehicles
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**Medical, Food, Bio Products**

- Next-generation pharmaceutical/diagnostic pharmaceuticals

**Health Care**
Create new business opportunities beyond our current operating perspective, though global access to emerging technologies and new business models.

Established CVC subsidiary, Diamond Edge Ventures, Inc. (DEV) in July 2018.

Diamond Edge Ventures
2742 Sand Hill Road, Menlo Park, California (U.S.)

DEV President has 30-year experience and network in Silicon Valley, and all U.S. members were hired locally.

Close connection with international Venture Group and top management at MCHC headquarters in Tokyo.

Fast and independent decisions assured by streamlined approval process.

Corporate Venture Activity: Basic Policy
- Work closely with startups to create deep strategic partnerships, making equity investments in appropriate cases.
- Earn and maintain long-term position as trusted member of the global venture community through rapid, reliable, and steady actions.
- Provide platform to build capability for venture activity within operating companies, and nurture global mindset within MCHC Group.

Diamond Edge Ventures: Key Characteristics

DEV investment fields
Expansion for in strategic growth fields

- DX*
- Mobility
- IT, Electronics
- Sustainability, Environment
- Healthcare
- Medical, Food, Bio
- Energy
- Production Technology*

*Platform technology areas
Example of Investment in Ventures

- First investment by Diamond Edge Ventures
- Strategic investment in DigiLens Inc., world leader in AR/VR technology

### DigiLens Investment: Strategic Objectives

- Secure position as strategic supplier of advanced materials into an emerging, high-growth market
- Participate as insider in developing AR/VR ecosystem with broad impact across multiple B2B and B2C industries
- Accelerate early adoption and deployment of new computing platform to benefit MCHC current business

### MCHC Equity Investment

Breakthrough nanomaterial-based technology to build holographic waveguides enabling AR/VR hardware across multiple fields

### Ecosystem of Strategic and Institutional Investors

- Continental
- Sony
- Panasonic
- Foxconn
- Niantic
- Dolby Family Ventures
- Nautilus Venture Partners
- Adap Fund Partners
- Bold Capital Partners

Aero Auto Moto Glasses
Digital Transformation

- **Execute Digital Transformation (DX) in across broad range of fields**
- **Establish organizational structure with 50 digital specialists**
- **Focus particularly on applying to business domains, materials informatics, etc.**

### MCHC Group Structure

<table>
<thead>
<tr>
<th>Value Chain</th>
<th>R&amp;D</th>
<th>Production Facilities</th>
<th>Purchasing, Logistics</th>
<th>Sales, Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R&amp;D</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Digital Paradigms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Production</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Operational Excellence</td>
<td></td>
<td></td>
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<tr>
<td><strong>Business Domains</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>New Business Models</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Common Infrastructure</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

- Study and utilization of innovative digital technologies such as materials informatics and quantum computing
- Failure detection/prediction of facilities and processes
- Quality control and improvement using image analysis
- Skill succession and knowledge management using AI
- Automation and standardization of skilled operations

- **Data platform**
  - Establishing new common infrastructure that combines business data with manufacturing data
  - Training digital personnel and fostering a community

- **Accelerating material design**
  - Recipe
  - Direct problems
  - Inverse problems
  - Objectives characteristics

- Automated product inspection based on image information
- Creating a digital playbook and holding workshops aimed at establishment of business models
- Study and experiment with business model plan
Recruitment and Appointment of Personnel toward Establishment of Next-generation Businesses

- Utilizing highly professional personnel to successfully compete in global business

**Objectives**
- Strategic investment/partnership for global development
- Transforming to a digital native enterprise

**Approaches**
- Started recruiting and appointing expert personnel who have high-level skills and experience in fields such as IT/digital human resources and those who can lead innovation and meet drastic environmental changes in April 2017
  - Founded the Emerging Technology and Business Development Office to recruit and appoint talented personnel in Japan and from overseas (executives such as CIO/CTO, CMO, and CDO are recruited from outside)
  - Founded the M&A Office and recruited the general manager from outside

Development of an environment to secure competitiveness
Reforms in recruiting, treatment, and management of personnel to break free from conventional ideas such as year joined company, age, etc.
(Establishment of a system to ensure market value compensation for personnel)
Today’s Agenda

1. Operating Results and Forecasts, Priority Management Measures in APTSIS 20
   1-1. Operating Results and Forecasts
   1-4. Reinforcing Business Foundation for Fundamental Industrial Materials
   1-5. Generating Integration Effects and Synergy due to Establishment of the New MCC
   1-6. Intensifying Marketing and Access to the Global Market
   1-7. Early Commercialization of the Seeds of Next-generation Businesses

2. Review of APTSIS 20

3. Further Deepening of KAITEKI Management
## 2. Review of APTSIS 20

### Financial Index

- Reviewed FY2020 targets, reflecting market risks in the chemicals business, deterioration of performance in the healthcare business, growth strategies for the performance products business, and M&A in the industrial gas business
- Revised core operating income to ¥410 billion

<table>
<thead>
<tr>
<th>Financial Index (MOE)</th>
<th>FY2020 Targets Review of APTSIS 20</th>
<th>FY2020 Targets APTSIS 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core operating income</td>
<td>¥410 billion</td>
<td>¥380 billion</td>
</tr>
<tr>
<td>ROS (Core operating income)</td>
<td>9%</td>
<td>8%</td>
</tr>
<tr>
<td>Net income attributable to the owners of the parent</td>
<td>¥220 billion</td>
<td>¥180 billion</td>
</tr>
<tr>
<td>ROE</td>
<td>13%</td>
<td>12%</td>
</tr>
<tr>
<td>Net D/E ratio</td>
<td>1.0</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Projecting ¥410 billion in core operating income due to growth in the performance products business, M&A in the industrial gas business, progress of rationalization, etc. after factoring in market risks in the chemicals business.

FY2018 Results (announced on Nov. 1, 2018)

* A large-scale acquisition in the Industrial Gas segment in FY2018 is calculated based on announced value.
Maximizing sales revenue of ethical pharmaceuticals, mainly in the U.S. market, and reinforcing profits in Japan by FY2020; further developing global markets after FY2021

Aiming at earlier launch of regenerative medical products in the life science business

### Action plans up to FY2020

**Ethical pharmaceuticals**
- Expanding *Radicava* launch regions
- Influenza VLP vaccine launch
- Vadadustat launch
- Reforming operational productivity (vs. FY2015: ¥30 billion reduction)

**Life science**
- Commercialization of regenerative medical products
- Reinforcing sales of capsules

### Action plans from FY2021

**Ethical pharmaceuticals**
- Significantly expanding the following products in the U.S. and Europe
  - *Radicava* (incl. oral suspension)
  - Influenza VLP vaccine
  - ND0612 (Parkinson’s treatment agent)
- Maintaining ¥300.0 billion in sales revenue in Japan
  - Vadadustat (renal anemia)
  - Fasinumab (osteoarthritis)
  - Pentavalent vaccine
  - Valbenazine (tardive dyskinesia)
  - *Canaglu* (diabetic nephropathy)

**Life science**
- Expanding indications of regenerative medicine
- Expanding pharmaceutical manufacturing equipment
- Launching new capsule products
**Increase in Investment and Progress in Investment Plans**

- Investment and loans in FY2018 increased from ¥0.7 trillion to ¥1.3 trillion due to large-scale acquisition in the industrial gas business.

### Performance Products
- New markets: High-performance films, Food ingredients, Advanced polymers
- New technologies: Information, Electronics and display, High-performance engineering plastics
- ⇒ Acquisition of Cleanpart Group GmbH, Expansion of OPL Film production facility

### Industrial Materials
- Overseas development: Industrial gases, MMA
- Development in North America: Ethical pharmaceuticals, VLP vaccine
- ⇒ Acquisition of Praxair (Europe business)

### Health Care
- New markets: Regenerative medicine
- Resource Allocation Plan

#### Resource Allocation Plan

<table>
<thead>
<tr>
<th>Performance Products</th>
<th>Chemicals</th>
<th>Industrial gases</th>
<th>Health Care</th>
<th>Others</th>
</tr>
</thead>
</table>

### Graphs

- **Investment and Loans**
  - FY2016-FY2018: Performance Products 800 billion, Chemicals 600 billion, Industrial gases 600 billion, Health Care 200 billion, Others 200 billion
  - FY2016-FY2020: Performance Products 1,200 billion, Chemicals 1,200 billion, Industrial gases 1,000 billion, Health Care 800 billion, Others 800 billion

- **Capital Expenditure**
  - FY2016-FY2018: Performance Products 400 billion, Chemicals 400 billion, Industrial gases 600 billion, Health Care 200 billion, Others 200 billion
  - FY2016-FY2020: Performance Products 1,000 billion, Chemicals 800 billion, Industrial gases 800 billion, Health Care 600 billion, Others 600 billion

- **R&D Expenses**
  - FY2016-FY2018: Performance Products 100 billion, Chemicals 100 billion, Industrial gases 100 billion, Health Care 200 billion, Others 200 billion
  - FY2016-FY2020: Performance Products 400 billion, Chemicals 400 billion, Industrial gases 400 billion, Health Care 200 billion, Others 200 billion
Improving financial base toward FY2020, though financial index will deteriorate temporarily as a result of increased borrowings for acquisition of Paraxair’s European business.
Increasing Capital Efficiency

Higher cash-generating capability due mainly to improved performance and asset reduction

Financial Structure Reforms

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction of cross-held shares</td>
<td>100</td>
<td>100</td>
<td>100+α</td>
</tr>
<tr>
<td>Working capital reduction</td>
<td>100</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>Reduction of cashes and deposits</td>
<td>100</td>
<td>160</td>
<td>220</td>
</tr>
<tr>
<td>Sales of assets</td>
<td>—</td>
<td>50</td>
<td>80+α</td>
</tr>
<tr>
<td>Improvement of profits and others</td>
<td>—</td>
<td>80</td>
<td>80+α</td>
</tr>
<tr>
<td>Total of capital efficiency and others</td>
<td>300</td>
<td>450</td>
<td>500+α</td>
</tr>
</tbody>
</table>

APTSIS 20

(¥ billion)
Today’s Agenda

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3. Further Deepening of KAITEKI Management
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**Status of MOS Target Achievement**

### Progress of MOS Indices in FY2017: 108% achievement

#### MOS Indices

- **C Indices**
- **H Indices**
- **S Indices**

#### FY2017 Results vs. FY2020 Targets

<table>
<thead>
<tr>
<th>MOS Indices</th>
<th>FY2017 Results</th>
<th>FY2020 Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction of GHG emission (domestic reduction of scope 1, 2) [S-1-1]</td>
<td>- Compared to FY2015 CO2 reduction: 10.2%</td>
<td>Considering a new long-term target, including review of boundaries</td>
</tr>
<tr>
<td></td>
<td>- Compared to FY2013 CO2 reduction: 18.7%</td>
<td></td>
</tr>
<tr>
<td>Contribution to GHG reduction by products and services [S-3-1]</td>
<td>78 million tons of CO2 reduction</td>
<td>150 million tons of CO2</td>
</tr>
<tr>
<td>Resource saving and conversion to renewable materials [S-2-2]</td>
<td>Reduction of 2,194 tons when converted to heavy oil</td>
<td>12,000 tons</td>
</tr>
<tr>
<td>Promotion of the use of renewable energy [S-2-3]</td>
<td>Promoting utilization of 52.6 Mw</td>
<td>50 Mw</td>
</tr>
<tr>
<td>Contribution to solving water resource problems [S-3-2]</td>
<td>3.34 hundreds of millions of tons reuse of water supply</td>
<td>Total 1.7 billion tons</td>
</tr>
</tbody>
</table>
3. Further Deepening of KAITEKI Management

Workstyle Reform

Promoting strategic investment in “people,” the source of value creation (KAITEKI Health and Productivity Management)

Health Support, Workstyle Reform, Diversity Promotion

- Improving job satisfaction with key words—enthusiasm, trust, growth
- Improving work environments
- Setting KPI Activeness Index, Health life Index, Workstyle Index
- Utilizing health support system i² Healthcare
- Developing global human resources, etc.

Measures for Health Support

- Distribution and use of wearable devices
  - Sleep/exercise/eating habit awareness raising
  - Encouragement of self-management by combining results of health checkup
- Effective EAP service and mental health care
- Subsidy to use walking point system and external fitness club, etc.

Measures for Workstyle Reform And Diversity Promotion

- Expansion/enhancement of telework system
- Introduction of satellite offices
- Establishment of concentration work zones
- Advancement of communication base
- Establishment of global human resources database
- Enhancement of training systems, etc.
3. Further Deepening of KAITEKI Management

**Increased External Assessment**

- Continually earned third-party corporate credibility with progressive ESG activities
- Selected for Dow Jones Sustainability World Index for 2 consecutive years

**Dow Jones Sustainability Indices**

**FTSE4Good Index**

**CDP-Climate Change**

**RobecoSAM Sustainability Award**
- Bronze Class

**Morningstar Socially Responsible Investment Index**

**NIKKEI Smart Work Management Survey**

**FTSE Blossom Japan Index**

**MSCI Japan ESG Select Leaders Index**

**MSCI Japan Empowering Women Index**

**S&P/JPX Carbon Efficient Index**

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1. As of November 2018
2. The inclusion of Mitsubishi Chemical Holdings Corporation in any MSCI Index, and the use of MSCI logos, trademarks, service marks or index names herein, do not constitute a sponsorship, endorsement or promotion of Mitsubishi Chemical Holdings Corporation by MSCI or any its affiliates. The MSCI Indexes are the exclusive property of MSCI. MSCI and the MSCI index names and logos are trademarks or service marks of MSCI or its affiliates.
The sustainable well-being for people, society and our planet Earth

Group Philosophy

<table>
<thead>
<tr>
<th>Mission</th>
<th>We create innovative solutions globally based on our core values of Sustainability, Health and Comfort, striving for the well-being of people, society and our planet Earth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision</td>
<td>Realizing KAITEKI</td>
</tr>
<tr>
<td>Value</td>
<td>Sustainability, Health, Comfort</td>
</tr>
</tbody>
</table>

Corporate Slogan
KAITEKI Value for Tomorrow
3. Further Deepening of KAITEKI Management

Proactive Participation in Initiatives

- Announcing globalization of KAITEKI value toward further improvement of corporate value

Toward establishment of a sustainable society, playing a leadership role and participating in major initiatives that lead to improvement of corporate value

- Participation in the WEF*1 Fourth Industrial Revolution Center (July)
- Participation in Japan Initiative For Marine Environment (JaIME) as an organizer (September)
- Support of TCFD*2 recommendations (October)
- Participation in Ministry of Economics’ Clean Ocean Material Alliance as an Executive Committee member (November)
- Participation in an international alliance (November)

*1 World Economic Forum  *2 Task Force on Climate-related Financial Disclosures

### Forecast of Plastics Volume Growth

<table>
<thead>
<tr>
<th>Year</th>
<th>Plastic Production (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>311</td>
</tr>
<tr>
<td>2050</td>
<td>1,124</td>
</tr>
</tbody>
</table>

### Recycling Flow of Plastics in Japan (2016)

- Flow of recycled resin
- Reclaimed products to be recycled to the next year
- Flow of residue

Sustainability vision, which will be the framework of the next medium-term management plan targeting FY2030, is being formulated.

KAITEKI Vision 30

<Innovation & Solutions>

- Addressing climate changes and improving resource/energy efficiency
  - Reducing GHG emissions
  - Reducing in production activities
  - Reducing environmental impact through the value chain
  - Contributing to effective utilization of water, etc.

- Fulfilling “job satisfaction,” improving creativity and productivity
  - Composition and competency of employees, ideals for the personnel system are under discussion

- Promoting optimal circular economy
  - Promoting reuse/reduce/recycle
  - Implementing DX, etc.

Looking Ahead to Solutions

Reflecting to the Next Medium-term Management Plan

Waves of Drastic Changes toward 2050

- [Globalization]
  Irreversible trend toward globalization
- [Introduction of AI/IoT]
  Transcending barriers of time differences/national borders/languages
  Fusion of real and cyber
- [Socialization]
  Decentralization/Networking
  The era of always “connecting”

Environmental/Social Issues

- Accelerating climate changes
- Pollution, shortage of water resources
- Marine plastic pollution
- Increasing population and advancement of population aging
- Globalization and widening disparity
- Expansion of regional economic zones
- Increasing medical expenses

The Earth

People

Society

Ideal Sustainable Society

- Optimized circular society
- Sustainable well-being

Backcasting approach

KAITEKI Value for Tomorrow