THE KAITEKI COMPANY

APTSIS 20

Presentation to Investors

November 28, 2017

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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 largely, due to numerous factors, including but not limited to the following: Group companies execute businesses in many different fields, such as information and electronics, displays, advanced moldings and composites, advanced polymers, MMA, petrochemicals, carbon products, industrial gases, pharmaceuticals, etc. 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 price revision, product liabilities, lawsuits, laws, and regulations.
## List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>MCHC</td>
<td>Mitsubishi Chemical Holdings Corporation</td>
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<tr>
<td>MCC</td>
<td>Mitsubishi Chemical Corporation</td>
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<td>MTPC</td>
<td>Mitsubishi Tanabe Pharma Corporation</td>
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<tr>
<td>LSII</td>
<td>Life Science Institute, Inc.</td>
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<td>TNSC</td>
<td>Taiyo Nippon Sanso Corporation</td>
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<tr>
<td>APIC</td>
<td>API Corporation</td>
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<tr>
<td>JPP</td>
<td>Japan Polyethylene Corporation</td>
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<tr>
<td>NKC</td>
<td>Nippon Kasei Chemical Company Limited</td>
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<tr>
<td>NSCI</td>
<td>The Nippon Synthetic Chemical Industry Co., Ltd.</td>
</tr>
<tr>
<td>QKK</td>
<td>Qualicaps Co., Ltd.</td>
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<tr>
<td>NEDO</td>
<td>New Energy and Industrial Technology Development Organization</td>
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<td>SAMAC</td>
<td>The Saudi Methacrylates Company</td>
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<td>SHARQ</td>
<td>Eastern Petrochemical Company</td>
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<tr>
<td>AI</td>
<td>Artificial intelligence</td>
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<tr>
<td>ALS</td>
<td>Amyotrophic lateral sclerosis</td>
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<td>ASU</td>
<td>Air separation unit</td>
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<tr>
<td>CF</td>
<td>Carbon fiber</td>
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<tr>
<td>CFRP</td>
<td>Carbon fiber reinforced plastic</td>
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<tr>
<td>CMP</td>
<td>Chemical mechanical polishing</td>
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<tr>
<td>EV</td>
<td>Electric vehicle</td>
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<tr>
<td>ICT</td>
<td>Information and communication technology</td>
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<tr>
<td>IoT</td>
<td>Internet of things</td>
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<tr>
<td>LCD</td>
<td>liquid crystal display</td>
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<tr>
<td>LIB</td>
<td>Lithium-ion battery</td>
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<tr>
<td>MMA</td>
<td>Methyl methacrylate</td>
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<tr>
<td>MOE</td>
<td>Management of Economics</td>
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<td>MOS</td>
<td>Management of Sustainability</td>
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<td>MOT</td>
<td>Management of Technology</td>
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<tr>
<td>OCA</td>
<td>Optical clear adhesive</td>
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<tr>
<td>OLED</td>
<td>Organic light emitting diode</td>
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<tr>
<td>PMMA</td>
<td>Polymethyl methacrylate</td>
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<tr>
<td>PO</td>
<td>Polyolefin</td>
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<tr>
<td>PP</td>
<td>Polypropylene</td>
</tr>
<tr>
<td>PPS</td>
<td>Power producer and supplier</td>
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<tr>
<td>PTA</td>
<td>Terephthalic acid</td>
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<tr>
<td>RHQs</td>
<td>Regional headquarters</td>
</tr>
<tr>
<td>SMC</td>
<td>Sheet molding compound</td>
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<tr>
<td>VLP</td>
<td>virus-like particles</td>
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</table>

**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.

**FY2017:** April 1, 2017 – March 31, 2018
1. Progress in APTSIS 20, Medium-term Management Plan
   - Operating Results and Forecasts
   - Action Plans

2. Toward Fiscal 2020
   - Intensifying Business Portfolio Management
   - Basic Policies on Growth Strategies
   - Focus Markets
   - Synergy, Growth, and Rationalization through Integration of Three Chemical Companies
   - Early Commercialization of Seeds of Next-generation Businesses
   - Digital Transformation
   - Fiscal 2020 Profit Level

3. Further Deepening KAITEKI Management
   - Strengthening Management with MOT
   - Improving ESG Evaluation by MOS

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1. Progress in APTSIS 20

Operating Results and Forecasts

Business Results with APTSIS 20 show steady improvement.

[Graph showing Net sales and Earnings over FY2011 to FY2020]

Operating income (Core operating income)
- Net sales

[Bar chart showing]

ROE (%) 4.6 2.3 3.7 6.4 4.8 15.1 15 ≥10

Mitsubishi Chemical Holdings
Operating Results and Forecasts: MOE

- Numerical targets (ROS, net income, and ROE) of *APTSIS 20* are expected to be achieved ahead of schedule.

<table>
<thead>
<tr>
<th>Financial Index (MOE)</th>
<th>FY2020 Targets</th>
<th>FY2017 Forecasts*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core operating income</td>
<td>¥380 billion</td>
<td>¥365 billion</td>
</tr>
<tr>
<td>ROS (Core operating income)</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>Net income attributable to owners of the parent</td>
<td>¥180 billion</td>
<td>¥180 billion</td>
</tr>
<tr>
<td>ROE</td>
<td>12%</td>
<td>15%</td>
</tr>
<tr>
<td>Net D/E ratio</td>
<td>0.8</td>
<td>0.98</td>
</tr>
</tbody>
</table>

* Announced on Oct. 26, 2017
Along with improving performance, the financial base is also steadily improving.

- **Ratio of equity attributable to owners of the parent (%):**
  - 2011: 24.3%
  - 2012: 24.7%
  - 2013: 25.8%
  - 2014: 22.6%
  - 2015: 22.9%
  - 2016: 24.5%
  - 2017 (Forecast): 26.2%
  - 2020 (Target): 30%

- **Net D/E ratio (times):**
  - 2011: 1.22
  - 2012: 1.15
  - 2013: 1.11
  - 2014: 1.10
  - 2015: 1.06
  - 2016: 0.98
  - 2017 (Forecast): 0.8
  - 2020 (Target): 0.8
1. Progress in APTSIS 20

Operating Results and Forecasts: Strengthening Financial Base (2)

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

**Financial structure reforms**

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction of cross-held shares</td>
<td>100</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>Working capital reduction</td>
<td>100</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>Reduction of cashes and deposits</td>
<td>100</td>
<td>150</td>
<td>220</td>
</tr>
<tr>
<td>Sales of assets</td>
<td>—</td>
<td>40</td>
<td>—</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>380</td>
<td>500+α</td>
</tr>
</tbody>
</table>

(¥ billion)

\[ \alpha \]
Operating Results and Forecasts: Shareholder Return

- Aim to enhance shareholder value by improving corporate value
- Balance dividend policy with growth investment and financial structure improvement
  - Set 30% of the medium-term profit level as a guideline for the consolidated dividend payout ratio
  - Implement a stable dividend
**Action Plans: Priority Measures for Accelerating Growth**

**Performance Products**
- Generate integration effects and synergy due to establishment of the new MCC
- Intensify portfolio management and implement growth strategies in response to changes in market trends
- Intensify marketing and access to the global market (establishment of RHQs, etc.)
- Early commercialization of the seeds of next-generation businesses (R&D, Open innovation)
- Deepening *KAITEKI* Management, promotion of health and productivity management, IoT, digital transformation

**Industrial Materials**
- MMA and industrial gas: Maintain and expand the global share
- Petrochemicals: Reinforce the business foundation with production optimization

**Health Care**
- Ethical pharmaceuticals: Intensify the pipeline and expand businesses in the U.S.
- Life science: Promote next-generation healthcare, healthcare and medical ICT businesses

**Action Plans: Priority Measures for Accelerating Growth**

*Red: Priority measures implemented up to and including fiscal 2017*  
*Blue: Priority measures to be implemented in the future*
### Action Plans: Measures by Business Domain

#### Performance Products
- **Promotion of generating synergy in the MCHC Group**
  - Conversion of NSCI to a wholly owned subsidiary
  - Conversion of NKC to a wholly owned subsidiary
  - Integration of synthetic resin emulsion businesses
- **Increasing profitability of overseas businesses**
  - Expansion of polyester film production line in the U.S.: Under construction
  - QKK: Acquisition of Piper Plastics, Inc. in the U.S.
  - Carbon Fiber
    - Expansion of production line and commencement of commercial operation in the U.S.
    - Acquisition of SGL Carbon Fibers LLC in the U.S.
    - Investment in C.P.C. SRL
- **Making new energy businesses competitive more quickly**
  - Continued improvement of profitability in battery material business
  - Electrolyte business alliance with Ube Industries, Ltd. in China (Obtained approval from Chinese authorities)

#### Industrial Materials
- **Implementing fundamental measures for unprofitable and low-profit businesses**
  - Transfer of PTA businesses in India and China
- **Increasing profitability of overseas businesses**
  - SAMAC’s MMA plant in the Middle East: Undergoing trial operation
  - Industrial gases
    - Acquisition of Air Liquide’s industrial gas business and related business assets in the U.S.
    - Acquisition of Supagas Australia
    - Constructed ASUs in the U.S.
    - Invested in a 3D printer maker
- **Realization of high-productivity corporate structure**
  - Unification of ethylene production facilities in Mizushima
  - PP production facility at the Goi Plant of JPP (capacity: 150kt/y): Under construction
  - Utility alliances at the petrochemical complex

#### Health Care
- **Establishing solid business foundation in the U.S.**
  - Launch of Radicava in the U.S.
  - Acquisition of NeuroDerm Ltd.
  - Acquisition of Stelic Institute & Co., Inc.
- **Sustainable growth and enhancing profitability**
  - Established BIKEN Co., Ltd., a JV for vaccine manufacturing
- **Realization of high-productivity corporate structure**
  - Transfer of the Fukuroi Plant of APIC
  - Transfer of generic drug business
  - Review of business structure for a recombinant human serum albumin preparation
- **Initiative to regenerative medicine**
  - Planning to start development and clinical trials of regenerative medical products using Muse cells during fiscal 2017
1. Progress in APTSIS 20

**Action Plans: Strengthening Access and Marketing to Global Markets**

- Actively investing in domestic and overseas production sites and strengthening global marketing capabilities

**Construction of new polyester film production line**

- Increased production of high-performance film products in the U.S. (capacity: 25kt/y)
  
  Operations scheduled to start in April 2018

**Expansion of carbon fiber business**

- Acquired SGL Carbon Fibers (U.S. production site) to produce lightweight materials for wind power generation blades (wings) and automobiles, etc.

- Invested in CFRP production and sales company for automotive market (C.P.C.) (44%)

- North America: Expansion and operation of carbonization line (2kt/y) [2017]

- Otake Plant (Japan): Large tow carbonization line enhancement (2.7kt/y → 3.9kt/y) [2017]

**Establishment of RHQs**

- Established RHQs in the U.S., Europe, Asia Pacific, and China

- Implemented marketing for focus markets including mobility and packaging, etc., and formulated each regional strategy

Mitsubishi Chemical Holdings
**Action Plans: MMA**

- **Building solid global supply networks**
  - Optimize regional strategies in Europe, Asia Pacific, and China due to commencement of operations at SAMAC, which has the world’s most competitiveness
  - Reconstruct the U.S. business via the MMA plant construction project using Alpha technology

- **SAMAC**
  - MMA capacity: 250kt/y; Technology: Alpha technology (raw material: ethylene)
  - PMMA capacity: 40kt/y
  - Currently undergoing trial operations, with full-scale operation slated for the beginning of 2018
  - Shipments mainly to Asia and Europe, where supply-demand balance is tight

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**Global Development of MMA Alpha Technology**

**MMA Global Market Share**

- **FY2017**: Global capacity 5,000 Kt/y, MCHC Group capacity 2,000 Kt/y, MCHC Group market share (estimate) 40%
- **FY2018**: Global capacity 4,500 Kt/y, MCHC Group capacity 1,800 Kt/y, MCHC Group market share (estimate) 35%
- **FY2019**: Global capacity 4,000 Kt/y, MCHC Group capacity 1,500 Kt/y, MCHC Group market share (estimate) 30%
- **FY2020**: Global capacity 3,500 Kt/y, MCHC Group capacity 1,200 Kt/y, MCHC Group market share (estimate) 25%
- **FY2021**: Global capacity 3,000 Kt/y, MCHC Group capacity 900 Kt/y, MCHC Group market share (estimate) 20%
- **FY2022**: Global capacity 2,500 Kt/y, MCHC Group capacity 600 Kt/y, MCHC Group market share (estimate) 15%

**US PJ (Under Feasibility Study)**

- **Europe**
- **China**
- **Southeast Asia**
- **Africa**
- **Singapore**
1. Progress in APTSIS 20

Action Plans: Industrial Gases

- Enlarge global market share through acquisition of businesses in the U.S. and Australia

**Strengthening business foundation in Japan**

- Maximization of group synergies and improvement of productivity efficiency
- Integrated management with major domestic subsidiaries through "Total TNSC"

**Enlarge market share in the U.S.**

- Acquisition of part of Air Liquide’s industrial gas business and related business assets in the U.S. (Sep. 2016)
- Expansion of business area through promotion of capital expenditures and M&A (Building ASUs and CO₂ production facilities)
- Securement of helium new source and formulation and execution of global strategies

**Enlarge market share in Asia Pacific**

- Australia: Acquisition of Supagas Australia (Dec. 2016), Building CO₂ production facilities
- Acceleration of entry into Southeast Asian and Indian markets
1. Progress in *APTSIS 20*

**Action Plans: Strengthening Petrochemical Businesses Foundation**

- **Enhancement of cost competitiveness and shift to high-performance products:**
  Respond to shale gas or other resource-derived cheap PO and polymers

  - Enhancement of cost competitiveness
    - Unification of naphtha cracker in Mizushima
      Completion of 1.5 unit operation system in Japan
    - Execute utility alliances at petrochemical complexes
      Overall optimization via electric power liberalization system
      (new power PPS company)

  - Shift to high-performance and high-quality products
    - Construct PP production facility at the Goi Plant of JPP
      (scheduled to begin operation in 2019)
    - Shift to higher quality and efficiency through conversion of production method
      (liquid phase method → gas phase method)
    - Production capacity: 150kt/y

**Mizushima Plant, MCC**

**Goi Plant, JPP**
Action Plans: Ethical Pharmaceuticals – Business Development in the U.S. (1)

- Target ¥80 billion in sales revenue in the U.S. by 2020, by expanding Radicava and launching ND0612 to the market

Radicava

Treatment option for ALS (Radicut in Japan)
1st drug for ALS approved by the FDA in 20 years
(Approval: May 2017, Launch: August 8, 2017)

Expected to be the 1st step in new ALS treatment, which will offer new hope for patients with ALS

- Build a sales operation of some 50 members
- Already given to 1,000 ALS patients

ALS: Amyotrophic lateral sclerosis

- ALS is an intractable neurological disease that deforms and degenerates motor neurons, inducing muscle atrophy/weakness.
- 5,000 to 6,000 people* are diagnosed with ALS in the U.S. annually. *Source: ALS Association Website
**Action Plans: Ethical Pharmaceuticals – Business Development in the U.S. (2)**

- Strengthening the neurological disorder area pipeline by acquiring NeuroDerm

**ND0612**

World’s first product of liquid Levodopa and Carbidopa (LD/CD) Enables continuous 24-hour LD/CD administration

Promoting development, aiming to launch in 2020

**Pipeline**

<table>
<thead>
<tr>
<th>Product</th>
<th>Generic name</th>
<th>Indication</th>
<th>Stage*</th>
</tr>
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<tbody>
<tr>
<td>ND0612</td>
<td>Levodopa/Carbidopa subcutaneous infusion pump/patch</td>
<td>Parkinson’s Disease (Moderate to severe)</td>
<td>P2</td>
</tr>
<tr>
<td>ND0701</td>
<td>Apomorphine subcutaneous infusion pump</td>
<td>Parkinson’s Disease (Severe)</td>
<td>P1</td>
</tr>
<tr>
<td>ND0801</td>
<td>Nicotine and Opipramol transdermal patch</td>
<td>Cognitive impairment associated with central nervous system diseases</td>
<td>P2</td>
</tr>
</tbody>
</table>

*As of Nov. 1, 2017*
1. Progress in *APTSIS 20*

**Action Plans: Investment Plan**

- Increase investment and loans by **¥200 billion** [¥1.5 trillion → ¥1.7 trillion] (Performance Products)
- Increase R&D investment by **¥25 billion** over 3 years (Performance Products, Health Care)

### Performance Products

- New markets: High-performance films, Food ingredients, Advanced polymers
- New technologies: High-performance engineering plastics, Carbon fiber and composite materials, Performance chemicals
  - New production line for polyester films
  - C.P.C.

### Industrial Materials

- Overseas development: Industrial gases, MMA
  - Strengthening businesses in the U.S. and Australia
- Development in North America: Ethical pharmaceuticals (specialty areas)
  - NeuroDerm
- New markets: Healthcare and medical ICT

### Health Care

- Priority Businesses for Investment
- Action Plans:
  - Investment Plan
  - Resource Allocation Plan

#### Resource Allocation Plan

- **Investment and Loans**
  - FY2016-FY2017
  - FY2016-FY2020
- **Capital Expenditures**
  - FY2016-FY2017
  - FY2016-FY2020
- **R&D Expenses**
  - FY2016-FY2017
  - FY2016-FY2020

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**Mitsubishi Chemical Holdings**
Agenda

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2. Toward Fiscal 2020

**Toward Fiscal 2020**

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- Early commercialization of the seeds of next-generation businesses (R&D, Open innovation)
- Deepening *KAITEKI* Management, promotion of health and productivity management, IoT, digital transformation

Red: Priority measures implemented up to and including fiscal 2017  Blue: Priority measures to be implemented in the future
Intensifying Business Portfolio Management (1)

- Positioning each operating company and subsidiary based on the indices by business domain
- Optimizing the business portfolio and resource allocations with regular monitoring

**Actions**
- Conduct PDCA cycles with regular monitoring
- Plan resource allocation
- Evaluate business portfolio (incl. downsizing, withdrawal and sale)

**Indices**
- Growth potential (Sales growth rate)
  - ≥4%/y
  - (Projected global economic growth rate: 3.5%*)
- Profitability (ROS)
  - Performance Products ≥8%
  - Industrial Materials ≥5%
  - Health Care ≥14%
- Capital efficiency (ROIC)
  - Performance Products ≥8%
  - Industrial Materials ≥5%
  - Health Care ≥8%**

*IMP outlook 2016-2020 average
**Calculated excluding dash and deposits
Intensifying Business Portfolio Management (2)

**Solutions to Focus Markets**
Mobility/Electronics/Medical/Packaging/Environment, Energy/Healthcare

**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 affiliated companies, in addition to streamlining through integration, accelerate restructuring as part of the business portfolio reform and consider reduction of 15-20 companies
2. Toward Fiscal 2020

Basic Policies on Growth Strategies

MCHC Group Philosophy and Vision

**Good Chemistry for Tomorrow**
Creating better relationships among people, society, and our planet.

Realizing **KAITEKI**

Mega Trends

- Worsening climate change, pollution and insufficiency of water resources
- Increasing global and ageing population
- Advancing globalization, expansion of regional economic zones, and development of emerging countries' economies
- Digitalization, modularization, ICT introduction
- Increasing medical costs, regenerative medicine and personalized medicine

Environmental and societal issues that the MCHC Group must address

- Efficient use of resources and energy
- Climate change (CO2 reductions)
- Securing clean water resources
- Food and agricultural problems
- Health maintenance and disease treatment
- Smart society

Focus Markets

1. Automobiles, Aircraft (Mobility)
   - Business scale
   - ¥300 billion (FY2015)
   - ¥310 billion (FY2017)
   - ¥420 billion (FY2020)

2. IT, Electronics, Displays
   - Business scale
   - ¥220 billion (FY2015)
   - ¥230 billion (FY2017)
   - ¥300 billion (FY2020)

3. Medical, Food, Bio Products
   - Business scale
   - ¥80 billion (FY2015)
   - ¥85 billion (FY2017)
   - ¥150 billion (FY2020)

4. Healthcare
   - (Pharmaceuticals, Healthcare solutions)
   - Business scale:
   - ¥540 billion (FY2015)
   - ¥550 billion (FY2017)
   - ¥650 billion (FY2020)

5. Environment, Energy
   - Business scale
   - ¥135 billion (FY2015)
   - ¥150 billion (FY2017)
   - ¥240 billion (FY2020)

6. Packaging, Labels, Films
   - Business scale
   - ¥165 billion (FY2015)
   - ¥175 billion (FY2017)
   - ¥230 billion (FY2020)
# Focus Markets (1)

## Automobile, Aircraft (Mobility)

### Lightweight
- Strengthening the Europe and U.S. business of CF-SMC, which has already been used in domestic mass production cars
  - Japan: Expansion of production facilities and diversification of products
  - Europe: Establish mass production structure of few thousand tons/year scale
  - North America: Consider the possibility of local production
- Enhancing the production capacity of PP compounds in North America and Asia (15%)

### Electrification
- Sales expansion of resin for electric wire coating material for EVs
- Sales expansion of materials that handle noise and vibration problems peculiar to EVs
  - Glass fiber mat composite material
  - Extra fine acrylic nonwoven fabric

### Environmental applications
- Sales expansion of bio-based engineering plastic DURABIO used in internal/external components and transparent panels

## Environment, Energy

### LIB materials
- Electrolyte: Enhancement of world quadrupole production system
  (Restart of production in the U.K., capacity increase in Japan and the U.S., sales expansion by JV in China)

### Water treatment
- Waste water treatment facilities: Targeting China’s wastewater treatment market for farmers’ villages and pig farming
- Full-scale operations at the JV for water quality analysis in Myanmar (FY2018)

### Separation/purification
- Mass production of new separating agents for peptides such as insulin and nucleic acid drugs (FY2018)

### Agri solutions
- Collaboration in deployment of plant factory with China Internet e-commerce company (FY2017)

### Infrastructure
- Enhancing the provision of solutions by packaging disaster prevention/disaster mitigation products (FY2018)
## Focus Markets (2)

### IT, Electronics, Displays

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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</table>
| Displays                              | - Strengthening LCD components  
  Examination of expansion of new OPL film line (for large-sized TVs)  
  Expanding Chinese production facilities for high-performance coating polyester film  
  - OLED components: Sales expansion of bank materials  
  - OLED flexible components: Strengthening development and commercialization of cover film, OCA film, etc.  
  - Printed ink materials for OLED: Sales expansion of ink materials |
| Semiconductor materials (Gas, and others) | - Strengthening sales structure in East Asia and China (Industrial Gases)  
  - Strengthening sales synergy of other semiconductor materials (Performance Products) |
| Cleaning agent, cleaning services     | - Sales expansion of cleaning agents after CMP and precision cleaning services, etc.                                                          |
| Thermal management materials          | - Strengthening development of high-thermal conductivity materials: commercialization of new heat release materials                           |
## Focus Markets (3)

### Medical, Food, Bio Products

| Implant materials, Infusion bags | Business expansion of implant materials: Accelerating deployment of precision molding of super engineering plastics and near net shape molding  
|                                | Infusion bags: Realizing high-performance products by development of multilayer technology and high barrier materials, etc. (compatibility of barrier properties and flexibility) |
| Capsules                        | Strengthening business development in emerging countries  
|                                | Production enhancement of plant-based capsules in Japan and the U.S. |
| Sugar ester formulation         | Sales expansion in China and Hong Kong  
|                                | New product development in China/ASEAN countries |
| Lactic acid bacteria LACRIS    | Full-fledged development of LACRIS in the field of animal feed (to be implemented in 2018)  
|                                | Development novel intestinal flora-related materials |

### Packaging, Labels, Films

| Barrier application             | Accelerating development in Asia: Local production of food packaging film DIAMIRON (FY2020)  
|                                | Development in Europe and the U.S.: Accelerating deployment of domestic product group using existing production sites in Europe and the U.S. |
| High-performance films          | Increase in customer demand: Enhancing production capacity of TECHBARRIER and products of J-Film Corporation  
|                                | Polyester film production site in the U.S.: Enhance business by operating the expanded line |
## Health Care

### Ethical pharmaceuticals
- U.S. business development: Expanding *Radicava* and launch of ND0612 lead to achievement of sales revenue of ¥80 billion
- Maximizing pipeline value: Creation of 10 candidates that advance to late-stage development
- Strengthening IKUYAKU (drug fostering and evolution) and marketing: Achieve domestic sales revenue of ¥300 billion by continuous focus on autoimmune disorder, diabetes and renal disease, etc.
- Vaccine business:
  - Acceleration of development of novel vaccines such as plant-derived VLP vaccines
  - Productivity improvement by establishing a vaccine manufacturing JV, BIKEN Co., Ltd.

### Regenerative medicine
- Development of regenerative medical products using Muse cells

### Healthcare, medical ICT
- Start of businesses concerning diagnostic support system using AI
- Expansion of health support business

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Refer to the next page for details.
Focus Markets (4-2)

Development of Regenerative Medical Products Using Muse Cells

- Start clinical trials for the first indication: acute myocardial infarction (by the end of fiscal 2017)
- Aim for application in fiscal 2020 and approval in fiscal 2021
- Pursue expansion of indications, and accelerate the development
- Construct a manufacturing facility for regenerative medical products

First indication
Acute myocardial infarction

2017 2018 2019 2020 2021 2025

Clinical Trials
Application Approval
Launch

Accelerate R&D and develop the following products at an early stage

Specialty of Muse cells

Muse cells are novel pluripotent stem cells firstly demonstrated by Dr. Mari Dezawa (Professor and Chairman, Division of Stem Cell Biology and Histology, Tohoku University Graduate School of Medicine).

Intravenous infusion of Muse cells

Migrates in damaged heart through blood vessel

Signaling from damaged tissue

Accumulate in damaged tissue and replenish damaged cells by spontaneous differentiation

Tissue and Function are restored.
Synergy, Growth, Rationalization through Integration of Three Chemical Companies

- Improve earnings of ¥44 billion through synergy and growth and rationalization of three chemical companies

### Synergy, Growth

- Total ¥35 billion of which ¥2 billion will be in FY2017

### Automobiles, Aircraft (Mobility)
- ¥14 billion

### Environment, Energy
- ¥7 billion

### IT, Electronics, Displays
- ¥3 billion

### Packaging, Labels, Films
- ¥3 billion

### Medical, Food, Bio Products
- ¥2 billion

### Fundamental Industrial Materials
- ¥4 billion

### Rationalization by integration of three chemical companies

- Total ¥15 billion of which ¥4 billion will be in FY2017

#### Integration of affiliated companies
- Reducing MCHC Group affiliated companies of approximately 760 companies by 25% (Target)
- Reducing by 25% of approximately 400 MCC Group affiliated companies (Target)
- ¥2 billion

#### Productivity improvement, Work style reforms
- Implementation of efforts to improve productivity as UP!20
- Improve productivity by reducing actual working hours
- ¥2 billion

#### Rationalization of corporate functions
- Review of personnel plan of corporate functions, reduction of controllable expenses by 20%
- ¥3 billion

#### AI/IoT
- Contributing to productivity improvement through the use of ICT/AI, including new sensors and analysis technology at production, quality, development, business and service locations
- ¥4 billion
Early Commercialization of Seeds of Next-generation Businesses (1)

- Promote commercialization of next-generation businesses, which reflect trends in focus markets
- Accelerate technology innovation through open innovation, which is necessary for new businesses

**Automobiles, Aircraft (Mobility)**
- Components for multi-materials
- Next-generation battery materials
- Next-generation sensor materials

**Environment, Energy**
- Reduction of environmental impact
  - LCA (recycle technology)
  - Renewable energy
  - New biodegradable polymers
- Power semiconductor materials

**IT, Electronics, Displays**
- Next-generation display materials
- Functional barrier films (Medical, Food)
- Organic sensing films

**Medical, Food, Bio Products**
- Regenerative medicine related materials
- Next-generation pharmaceuticals/diagnostic pharmaceuticals
- Strengthening Preventive medicine (Microbiome)
- Medical systems using ICT/AI

**Packaging, Labels, Films**
- Composite materials for 3D printers (Medical application, etc.)
- New biodegradable polymers

**Core Technologies**
Early Commercialization of Seeds of Next-generation Businesses (2)

- Established Emerging Technology & Business Development Office (ETBDO) under domain of CIO*, aiming to promote open innovation
  - Contribute to expanding MCHC Group business portfolio in 10-20 year timeframe and strengthening our global presence
  - The organization is planned to include approximately 50 members by the end of fiscal 2017.

| Emerging Technology Group | Expand global innovation network, aiming to exploit emerging technologies and business models from outside MCHC Group
| | Establish presence in the U.S. and start cooperation and investment with accelerators, incubators, and VC funds, etc., in order to strengthen ties with innovative venture businesses |
| Future Market Group | Conduct market research focused on creating business models linked deeply to future potential customers |
| Healthcare Business Development Group | Survey the needs of the medical fields to create new business models in the Health Care Business Domain |
| Digital Transformation Group | Create new value through the use of AI and IoT
| | Develop and nurture “digital native” organizations and human resources |

*Chief Innovation Officer

Refer to the next page for details
Digital Transformation

- Launch a MCHC Group-wide dedicated organization
- Promote digital projects that move toward solution of business issues (more than 10 issues in the first step)
- Reform MCHC Group businesses and culture with digital technology and philosophy

Current MCHC Group Digital Projects

**Production Technology**
- Production planning and demand forecasting
- Facility abnormality detection and prediction
- Quality control and improvement
- Collaboration between human and robot

**R&D**
- Digital R&D and application of AI to product development
- Technology inheritance and knowledge management via AI

**Foundation**
- IoT platform (big data network)
- Common infrastructure foundation and method maintenance (sharing analysis processing)
- Digital human resources development
- Internal networking

Creation of New Value

Digital native organization/human resource development over a broad range of fields
Further accelerate growth with an eye on ¥430 billion in core operating income for fiscal 2020.
1. Progress in APTSIS 20, Medium-term Management Plan
   - Operating Results and Forecasts
   - Action Plans

2. Toward Fiscal 2020
   - Intensifying Business Portfolio Management
   - Basic Policies on Growth Strategies
   - Focus Markets
   - Synergy, Growth, and Rationalization through Integration of Three Chemical Companies
   - Early Commercialization of Seeds of Next-generation Businesses
   - Digital Transformation
   - Fiscal 2020 Profit Level

3. Further Deepening KAITEKI Management
   - Strengthening Management with MOT
   - Improving ESG Evaluation by MOS
### Strengthening Management with MOT

#### New dimension of MOT Axis: Innovation and acceleration of commercialization by indices and progress management

<table>
<thead>
<tr>
<th>Sector</th>
<th>Indices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R&amp;D Indices</strong></td>
<td>- No. of new seed settings</td>
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<tr>
<td></td>
<td>- Success rate of moving up to next stage</td>
</tr>
<tr>
<td></td>
<td>- Speed of moving up to next stage</td>
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<tr>
<td></td>
<td>- Investment efficiency of successful seeds</td>
</tr>
<tr>
<td><strong>IP Indices</strong></td>
<td>- Innovative productivity</td>
</tr>
<tr>
<td></td>
<td>- Overseas application rate</td>
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<td></td>
<td>- Patent profitability</td>
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<tr>
<td></td>
<td>- Practical application rate of open innovation</td>
</tr>
<tr>
<td><strong>Market Indices</strong></td>
<td>- Total no. of new products and new services launched</td>
</tr>
<tr>
<td></td>
<td>- New product and new service contributions to profits</td>
</tr>
<tr>
<td></td>
<td>- New product and new service contributions to sales</td>
</tr>
</tbody>
</table>

Commercialize the seeds of next-generation businesses:
Create road maps to enable thorough progress management
## Improving ESG Evaluation by MOS: Environment

### 141% achievement of fiscal 2016 targets, 31% progress toward fiscal 2020 targets

<table>
<thead>
<tr>
<th>Related SDGs</th>
<th>Item</th>
<th>Results in FY2016</th>
<th>Targets of FY2020</th>
<th>Progress rate</th>
</tr>
</thead>
</table>
| Climate change                | Reduction of GHG emission (domestic reduction of scope 1, 2) [5-1-1] | ● Compared to FY2015 1,611 thousand tons of CO2 reduction (10%)  
                                  |                                                                     | ● Compared to FY2013 2,563 thousand tons of CO2 reduction (19%)  | Achieved domestic reduction targets (initially estimated emissions: 13,400 thousand tons of CO2)  
                                  |                                                                     | Consideration of new target                                                   | --            |
|                               | Contribution to GHG reduction by products and services [5-3-1]      | Contribution to 46 million tons of CO2 reduction                                  | 150 million tons of CO2                  | 31%           |
| Resources and energy          | Resource saving and conversion to renewable materials [5-2-2]      | Reduction of 1,965 tons when converted to heavy oil                               | 12,000 tons                             | 16%           |
|                               | Promotion of the use of renewable energy [5-2-3]                    | Promoting utilization of 42 Mw                                                   | 50Mw                                     | 84%           |
| Water                         | Response to water risk                                              | ● Creation of a risk map of production sites, including overseas  
                                  |                                                                     | ● Investigation of 3 high risk areas and confirmation of response  
                                  |                                                                     | →Certified CDP-Water A list (2017)                                           | --            |
|                               | Contribution to solving water resource problems [5-3-2]             | 156 million tons reuse of water supply                                            | Total 1.7 billion tons                  | 9%            |
3. Further Deepening KAITEKI Management

Improving ESG Evaluation by MOS: Society (1)

Promote KAITEKI health and productivity management as key to sustainable growth

- Improvement of productivity and creativity
- Improvement of workplace health and organizational activity
- Improvement of health consciousness and satisfaction

- Management leadership
- Health support
- Work style reforms
- Utilization of ICT/IoT

Make a declaration on the promotion of health and productivity management
Full-fledged start

Improve productivity and creativity with healthy, fulfilled employees and a high degree of organizational activities as KPIs
## Improving ESG Evaluation by MOS: Society (2)

**Build win-win relations between the company and employees through promotion of KAITEKI health and productivity management to increase corporate value**

<table>
<thead>
<tr>
<th>Targets</th>
<th>Categories</th>
<th>Examples of Measures</th>
</tr>
</thead>
</table>
| ● Improvement of health consciousness and satisfaction | Management leadership | ● Launch health and productivity management promotion projects  
● Establish a CHO* in each operating company  
● Formulate the promotion plan by 2020  
● Promote PDCA through the setup and utilization of KPIs |
| | Health support | ● Use of wearable devices (WD)  
● Health point system  
● Events for prevention of lifestyle diseases  
● Distribute health white paper  
● KAITEKI exercise |
| | Work style reforms | ● Health survey and reforms  
● Meeting style reforms  
● Workstyle and business practice reforms  
● Expand skill development programs |
| | Utilization of ICT/IoT | ● Promote effective/efficient health and productivity management by integrating data on WD, health checkup, workstyle, etc. |

*Chief Health Officer

Set KIPs during fiscal 2017 and start monitoring

Mitsubishi Chemical Holdings
3. Further Deepening KAITEKI Management

Improving ESG Evaluation by MOS: Governance (ESG External Assessment)

Deepening business portfolio management by strengthening governance structure

Further clarification of role and function between MCHC and operating companies

- **Start of new management and execution structure**
  - Changes in the composition of the Board of Directors
  - Expansion of the Corporate Strategy Division
  - New establishment of the Corporate Executive Officers Committee (improving management agility and ensuring objectivity and transparency)

- **Improvement of the effectiveness of the Board of Directors**
  - Vitalization of discussions involving outside directors

Continually earned third-party corporate credibility in fiscal 2016 and fiscal 2017 with progressive ESG activities

- Obtained the highest rank in the Development Bank of Japan’s environmental rankings and also received a special commendation
- Selected as a world member for the first time (The only Japanese company in the Materials category)