Attendees

Shigenao Ishiguro
President & CEO

Seiji Osaka
Executive Vice President,
GM of Corporate Strategy HQ

Tetsuji Yamanishi
Executive Vice President,
Global Chief Compliance Officer,
GM of Finance & Accounting HQ

Noboru Saito
Senior Vice President,
CEO of Sensor Systems
Business Company

Michael Pocsatko
Senior Vice President,
GM of Corporate Marketing
& Incubation HQ

Andreas Keller
Senior Vice President,
GM of Human Resources HQ

Shigeki Sato
Senior Vice President,
GM of Technology & Intellectual Property HQ

Fumio Sashida
Corporate Officer,
CEO of Energy Solutions Business Company

Ji Bin Geng
Corporate Officer,
GM of Energy Devices Business Group of Energy Solutions Business Company

Taro Ikushima
Corporate Officer,
CEO of Electronic Components Business Company
Agenda (from 10:00 to 11:30)

● **Presentation**
  Medium-Term Plan (from FY2022 to FY2024)
  Shigenao Ishiguro, President & CEO
  Tetsuji Yamanishi, Executive Vice President

● **Q&A**
Medium-Term Plan (from FY2022 to FY2024)
Review of the Previous Medium-Term Plan

Results of our growth strategies
▼Downturn in the automotive market (to FY2021/1H)
▼Worsening tension between the U.S. and China (Chinese economy slowdown)
▼COVID-19 lockdowns (production activities suspension)
△“New Normal” (remote work and education)
  ⇒ Expanding the share of rechargeable batteries
△Expanding 5G-related demand
  ⇒ Rechargeable batteries, passive components, and sensors
△Expanding EX-related demand
  ⇒ The launch of new power cell products

Results of efforts to improve social value
E: Full-scale activities of Sustainability Promotion HQ
S: Full-scale deployment of Global HR Project
S: Reinforcement of diversity activities
G: Introduction of global common regulations (KITEI Project)
Global Changes

1. Speedy change of global market competition
   ~because of the Rise of China & the Transformation of US leadership
   • Change of geopolitical balance and national defense policy
   • Conflict of initiative in advanced technology

2. COVID-19 Pandemic

3. Change of values of sustainability
   ~ Change of requirement to companies
   • Contribute to social sustainability through business activities.
   • Environment, Energy, Society, Human rights...SDGs.

Land and Capital created wealth

Information and Data create wealth
5G, AI and RE will become the social infrastructure to uphold the evolution of industries and devices (DX/EX)

Key Innovations for the next 10 years

1. **5G**
   - Next generation communication and hardware performance enhancement enable high level of data analysis in practical level.

2. **AI**
   - Evolution and prevalence of AI make data analytics and forecasts more accurate and accelerate optimization and automation.

3. **RE**
   - As the society becomes more conscious of environment issues, demand for renewable energy will rise and energy cost will drop and the renewable energy will prevail.

Device Evolution ~ New User Experience

- Smartphone
- AR/VR Wearable
- Robot/Drone
- Autonomous Drive
- Cloud/Big Data
- xEV
- HVDC/VPP

Industrial Changes

<table>
<thead>
<tr>
<th>Mobility</th>
<th>Electricity</th>
<th>Production</th>
<th>Logistics</th>
<th>Lifestyle</th>
<th>Medical</th>
<th>Agriculture</th>
</tr>
</thead>
</table>

TDK Investors Meeting 2021
5G communication will impact on multiple industries

Applications utilizing 5G

- High-speed
- Large Capacity
- eMBB*1
- 20Gbps
- 1Gbps
- 4G
- 1ms
- 10ms
- Low Latency
- 4K/8K video Stream
- Autonomous Drive
- Remote Medication

- AR/VR
- 8K
- 4K/8K video Stream
- Smart City
- Agriculture
- Agriculture xICT
- mMTC*3
- 1million devices/km²
- Multiple Connect

Source: DTC

*1 enhanced Mobile Broadband
*2 Ultra-Reliable Low Latency Communications
*3 massive Machine Type Communications
AI will evolve from recognition accuracy, motion learning, context understanding and prevail in every industry.

2010-2030

AI's technological evolution based on deep learning (~2030)

**Direction of AI evolution**
- **Recognition**
  - 2010: Higher accuracy in image recognition
  - 2016: 4 Billion USD
- **Motion Learning**
  - 2020: 16 Billion USD
  - Learn to move like a skilled human
- **Context Understanding**
  - 2025: 169 Billion USD
  - Understand context (Link sentences and images)
  - CAGR (2018-25): 55.6%

**Main applications**
- **Image recognition**
  - Image diagnosis
  - Advertisement
- **Multi-modal recognition**
  - Anti-crime Surveillance
  - Security Marketing
- **Robotics**
  - Auto drive Logistics Construction
  - Manufacturing
- **Interaction**
  - Nurse care Cooking cleaning
- **Symbol grounding**
  - Translation E-Commerce
- **Knowledge acquisition**
  - Education Secretary White collar

**Quantum Computing**

Source: Deloitte based on Allied Research "Global Artificial Intelligence AI Market 2018-2025" and various books and materials
Renewable Energy

Mega Trends in Energy Industry

a **Decarbonized**
- Electricity producers will focus on renewable energy
  - Paris Protocol requests elimination of CO₂ emission
  - Almost all electricity demand needs to be supplied by renewable energy.

b **Decentralized**
- Cost reduction of renewable energy
  - Due to increase of installations, economy scale will work on cost reduction of renewable energy
  - Increase of distribution cost makes renewable energy cost competitive
- Better utilization of electricity distribution

c **Digitalized**
- Resolving issues with renewable energy
  - Digital technologies will solve the instability of renewable energy generation
  - Adjust and optimize renewable energy generation as entire grid
### Key Technology Trends in 7 Strategic Markets

<table>
<thead>
<tr>
<th>Technology trends that will support evolution &amp; changes</th>
<th>7 Seas</th>
<th>How 7 Seas will evolve and change</th>
</tr>
</thead>
<tbody>
<tr>
<td>High frequency-compatible technologies to support 5G LCP, LTCC, fluororesins</td>
<td>5G Smartphone</td>
<td>More sub 6GHz smartphones/extension of current UX</td>
</tr>
<tr>
<td>Preprocessing &amp; new sensors to support smartification</td>
<td>New Mobile Device</td>
<td>Increasing use from consumer to industrial</td>
</tr>
<tr>
<td>Improving processing by optimizing uses</td>
<td>Wearable</td>
<td>Increasing use from consumer to industrial</td>
</tr>
<tr>
<td>Fusion of people &amp; machine/ HMIs that help multitasking &amp; automation</td>
<td>Robotics/Drone</td>
<td>Solved labor shortages/mechanizing simple tasks for improved productivity</td>
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<td>Better processing capabilities while using less energy</td>
<td>Data Storage</td>
<td>Shift to distributed processing &amp; storage due to latency &amp; bandwidth issues</td>
</tr>
<tr>
<td>More efficient power electronics and improved battery performance</td>
<td>Autonomous Driving</td>
<td>Increasing use of LVL2 partially autonomous vehicles</td>
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<td>Shift away from carbon to distributed &amp; digital solutions</td>
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<td>Greater use of BEVs/PHEVs particularly in China and Europe</td>
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<tr>
<td>Offshore wind power, HVDC, EMS, ESS</td>
<td>Renewable Energy</td>
<td>Expansion of distributed power sources, PV &amp; onshore wind power, reaching parity with offshore wind turbines</td>
</tr>
</tbody>
</table>

*Sensor fusion: Collectively processing data from many sensors to achieve greater recognition function than could be obtained from only 1 sensor*
Outlook 2030: millimeter wave compatible 5G smartphones will appear and diffuse, while edge AI makes smartphones intelligent, leading to greater amounts of content being consumed and increased use of clouds.

Changes to the layers of businesses involved in 5G smartphones, and functional requirements of devices/components

<table>
<thead>
<tr>
<th>Timing: Market:</th>
<th>By 2026</th>
<th>By 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>5G: 990 million smartphones (out of 1.46 billion smartphones)</td>
<td>5G: 1.43 billion smartphones (out of 1.5 billion smartphones)</td>
<td></td>
</tr>
</tbody>
</table>

### How they will evolve:

- **Millimeter wave appears, accelerating diffusion of AR and edge AI**
- **Millimeter wave smartphones diffuse, further improving UX**

#### Upper atmosphere
- **Services & apps**
  - High content volume due to AR/VR
    - High content volume becomes the norm due to real-time AR/VR
    - Acceleration of edge AI and appearance of millimeter wave

#### Lower atmosphere
- **Networks, IoT platforms**
  - 5G (millimeter wave) appears
    - Millimeter wave appears

- **Finished products**
  - Foldables, greater longevity
    - Devices that have greater longevity
      - Increased battery capacity & lower energy consumption
    - Shift to multiple screens
      - Foldable & embedded

- **Systems**
  - 3D out cameras for high-def AR
    - Equipping with 3D sensors
      - High definition AR (out cameras)
    - Multiple lenses (wide-angle, zoom)
      - Sensor fusion
        - Better understand of context & surroundings**
    - Edge AI semiconductors
      - Higher performing and lower energy consumption edge AI semiconductors
      - More sophisticated Edge AI

- **Ground level**
  - Wireless power transmission
    - Devices that can be powered wirelessly*
      - High power receiving efficiency

#### Functional requirements of devices/components

- Higher frequencies that enable large amounts of content, multiple connections and low latency transmission
- Improved battery life (via denser batteries with more capacity, simpler charging and less energy consumption)
- Flexible/embedded devices with function enhancement of AF & OIS
- 3D sensor fusion with low-cost high performance, multiple lenses & better AF & OIS functions
- Better processing power & energy efficiency to realize edge AI

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*Grayed out since they are not expected to become a reality until 2030 or later

**Function that changes content as the surrounding environment changes (context awareness)
### Key Technology Trends in 7 Strategic Markets

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<td><strong>DX</strong></td>
<td><strong>5G Smartphone</strong></td>
<td><strong>Now – 2023</strong></td>
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<tr>
<td>Preprocessing &amp; new sensors to support smartification Sensor fusion*, 3D sensors</td>
<td></td>
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<td>More sub 6GHz smartphones/extension of current UX</td>
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<tr>
<td>Improving processing by optimizing uses Edge AI chips, photoelectric fusion</td>
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<td><strong>Better processing capabilities while using less energy</strong> High density energy, WPT, low-voltage devices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More efficient power electronics and improved battery performance All-solid-state batteries, more efficiency with higher voltage</td>
<td></td>
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<td></td>
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<tr>
<td>Shift away from carbon to distributed &amp; digital solutions Offshore wind power, HVDC, EMS, ESS</td>
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*Sensor fusion: Collectively processing data from many sensors to achieve greater recognition function than could be obtained from only 1 sensor
Outlook 2030: EVs will link up with the power grid, wireless charging will become more efficient, systems will have higher voltage, parts will be integrated, systems will be safer, and energy sources will diversify.

Changes to the layers of businesses involved in EVs, and functional requirements of devices/components

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<tr>
<th>Timing:</th>
<th>By 2026</th>
<th>By 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market:</td>
<td>Battery EVs sold: 7 million</td>
<td>Battery EVs sold: 13 million</td>
</tr>
</tbody>
</table>

How they will evolve:

- **Power grid <=> cars**
  - More large electric vehicles due to greater driving range & quicker charging
  - V2G will allow EVs energy to be used
    - Relieve electricity demand peaks
  - Bi-directional power supplies
  - Charging equipment will become 2-way
- **Systems, devices**
  - WPT reduces the # of drivers and increases unmanned vehicles
  - Wireless charging introduced to commercial-use vehicles
    - WPT for autonomous vehicles
  - Fast-charging equipment goes high voltage
    - Expansion of 900kW-grade charging equipment
- **Networks, IoT platforms**
  - Use increases as technology advances
  - Use of V2G expands in emerging nations
  - Commercialization of hydrogen energy systems*
- **Systems, devices**
  - Autonomous vehicles can be used in more areas
  - Use of autonomous vehicles over a broad area expands WPT to passenger vehicles*
  - More autonomous vehicles equipped with small DC/DC inverters
  - Post-LiBs, all-solid-state batteries
  - Autonomic vehicle systems become redundant
    - Vehicles equipped with additional power control components to improve safety
  - Next-generation batteries introduced
    - Post-LiBs, all-solid-state batteries
    - FC stacks become common*
- **Power consumption**
  - Performance of current LiBs is further improved
  - Higher voltages expand commercial-use EVs
  - Batteries & related parts for EVs become integrated**
  - Better battery performance
    - Denser energy, charging & discharging, longer battery life
  - More autonomous vehicles equipped with small DC/DC inverters
  - Post-LiBs, all-solid-state batteries
  - Autonomic vehicle systems become redundant
  - Vehicles equipped with additional power control components to improve safety
  - Next-generation batteries introduced
    - Post-LiBs, all-solid-state batteries
    - FC stacks become common*

**Functional requirements of devices/components**

- Seamless linkage with the power grid
- Safer & more efficient conversion in wireless charging
- High voltage infrastructure and vehicle systems that can withstand fast charging
- Integrated parts** and redundant systems
- Diversification of vehicle energy sources

*Grayed out since they are not expected to become a reality until 2030 or later

**Batteries, DC-DC converters, and onboard chargers will become integrated

*Source: public information

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TDK Investors Meeting 2021
Value Creation Cycle
~Accelerate DX and EX in order to realize 2CX and create value for a sustainable society~

Become a highly regarded presence in the world
- Customer satisfaction
- Sustainable growth
- Healthy governance

Contribute to solving social issues and become an invaluable presence
- Digital Transformation (DX)
- Energy Transformation (EX)

Establish management systems with focus on speed
- Eco-TDK
- Digi-TDK

Get opportunities for growth by providing valuable products to society
- Digital Infrastructure
- RE Infrastructure
- Saving space & energy

2CX: Customer Experience, Consumer Experience
## Achieve Sustainable Growth

**Digital Solution**

Sensors, data storages, and electronic components supporting digital transformation

### Data storage
- HDD heads
- Industrial storages

### Transducer
- Temperature sensors
- Pressure sensors
- Hall IC
- TMR magnetic sensors
- MEMS sensors
- MEMS microphones
- Piezo actuators

### Electronic components
- 5G~High-frequency components
- RF inductors
- Noise suppression components
- Heat countermeasure components
- Anechoic chambers & EMC measurement systems

## Energy Solution

Batteries, power supplies, and electronic components supporting effective use of energy

### Energy storages
- Small / medium size rechargeable batteries

### Power supplies
- Bi-directional power supplies
- Programmable power supplies
- High quality medical / industrial power supplies
- EV power supplies (DC-DC, onboard chargers)

### Motor & generators
- Magnets for EV / wind power generations

### Electronic components
- Automotive MLCC
- High capacitance MLCC
- Power inductors
- Transformers

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**Corporate Marketing & Incubation HQ**
**Corporate venture capital**
**Global R&D center function (Japan, U.S., Europe, China)**

**Global HR system**
**Global common regulations**
**Global sustainability promotion function**
Corporate Strategy

“Value Creation 2023”

Accelerate DX and EX in order to realize 2CX and create value for a sustainable society

Commercial Value
Execute Growth Strategy
Net Sales 2,000.0 billion yen

Asset Value
Improve Asset Efficiency
OP margin Over 12%
ROE Over 14%
Capex (3 years) 750.0 billion yen

Social Value
Enhance Enterprise Value
Contribute to solving social issues

OP margin Over 12%
ROE Over 14%
Capex (3 years) 750.0 billion yen
## Management Target in Medium Term

<table>
<thead>
<tr>
<th>(Yen billions)</th>
<th>FY March 2021 Result</th>
<th>FY March 2024 Target</th>
<th>CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>1,479.0</td>
<td>2,000.0</td>
<td>11%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Segment</th>
<th>CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive Components</td>
<td>7%</td>
</tr>
<tr>
<td>Sensor Application Products</td>
<td>25%</td>
</tr>
<tr>
<td>Magnetic Application Products</td>
<td>12%</td>
</tr>
<tr>
<td>Energy Application Products</td>
<td>11%</td>
</tr>
</tbody>
</table>

(Yen billions)
### TDK Group’s Materiality

**Medium-Term Policy**: Accelerate DX and EX in order to realize 2CX and create value for a sustainable society

<table>
<thead>
<tr>
<th>Energy transformation (EX): Contribution to energy and environmental solutions by minimizing waste heat and noise with electronic devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective use of energy and expanding use of renewable energy toward the realization of net zero CO₂ emissions in 2050</td>
</tr>
<tr>
<td>Provide products and solutions for creating clean energy to realize a zero-carbon society</td>
</tr>
<tr>
<td>Provide products and solutions for realizing an efficient energy society by storing, converting, and controlling energy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Digital transformation (DX): Promotion of the digitization of society by adding software technology to material science and process technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide products and solutions to help build resilient communication network infrastructure</td>
</tr>
<tr>
<td>Provide products and solutions for supporting robotics and mobility to promote human capability enhancement and complementation</td>
</tr>
<tr>
<td>Promote digitalization at TDK</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pursue zero-defect product quality</td>
</tr>
<tr>
<td>Reduce quality costs</td>
</tr>
<tr>
<td>Maximize customer satisfaction with product and service quality</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HR Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop human resources to lead the TDK Group</td>
</tr>
<tr>
<td>Foster greater diversity and inclusion</td>
</tr>
<tr>
<td>Improve employee engagement and job satisfaction to attract and retain skilled employees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supply Chain Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhance global procurement capabilities and mechanisms</td>
</tr>
<tr>
<td>Ensure responsible procurement</td>
</tr>
<tr>
<td>Ensure societal and environmental consideration in the supply chain</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunity &amp; Risk Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify and capture business opportunities effectively by strengthening marketing capability with full use of digital technology</td>
</tr>
<tr>
<td>Strengthen the group’s risk management capabilities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pursuing Both Delegation of Authority and Internal Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure speed and transparency in operations, based on the clearly defined roles, authorities and responsibilities of each organization</td>
</tr>
<tr>
<td>Make management systems of each group company more effective and efficient, aligned with the group’s unified policy</td>
</tr>
<tr>
<td>Implement appropriate post-merger integration (PMI) for acquired companies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Asset Efficiency Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rebuild business portfolio</td>
</tr>
<tr>
<td>Optimize facilities and manufacturing sites</td>
</tr>
</tbody>
</table>
Value Creation 2023

〜Business Strategy〜
Value Creation 2023

〜Passive Components Business Strategy〜
## Electronic Components: Launch distinctive products for strategic growth markets using proprietary elemental technologies

<table>
<thead>
<tr>
<th>Strategic Growth Market</th>
<th>Main Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>xEV</td>
<td>Resin Electrode MLCC</td>
</tr>
<tr>
<td>Autonomous Driving</td>
<td>Hybrid Polymer Capacitor</td>
</tr>
<tr>
<td>5G &amp; Post-5G M2M / V2X</td>
<td>Film Capacitor</td>
</tr>
<tr>
<td>AR/VR Wearable</td>
<td>Pattern Coil</td>
</tr>
<tr>
<td>Data Storage</td>
<td>Power Inductor</td>
</tr>
<tr>
<td>Renewable Energy</td>
<td>RF Filter</td>
</tr>
<tr>
<td>Robotics Drones</td>
<td>RF Inductor</td>
</tr>
<tr>
<td>Medical Health Care</td>
<td>Haptics</td>
</tr>
<tr>
<td></td>
<td>TVS Diode</td>
</tr>
</tbody>
</table>

### Application example of elemental technologies (thin-film coils and filters)
- Thin wire plating technology
- Low loss dielectric material
- Ferrite Substrates optimized for Thin Film Process

### Proprietary Elemental Technology
- Winding
- Lamination
- Thin Film
- Plating
- Precision Machining
- Module
- Material (Dielectric, Magnetic, Piezoelectric)
Power Inductor for Automotive Grade: Optimize products with multiple elemental technologies for growing applications (e.g., ADAS, Autonomous driving)

<table>
<thead>
<tr>
<th>Inductance (µH)</th>
<th>Low</th>
<th>0.22</th>
<th>0.47</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy storage capacity</td>
<td>42</td>
<td>47</td>
<td>100</td>
<td>220</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Market trends</th>
</tr>
</thead>
<tbody>
<tr>
<td>① ECUs for ADAS function are being installed. (e.g. Sensing Camera ECU)</td>
</tr>
<tr>
<td>② High performance processing ICs are being employed for ADAS functions. (Low Voltage and High frequency operations)</td>
</tr>
<tr>
<td>③ Increase of DC-DC converters for high voltage battery (48V~60V) for xEVs</td>
</tr>
</tbody>
</table>
Ceramic High Frequency Components
Market and Strategic Products

LTCC = Low Temperature Co-fired Ceramics

- Conductors are formed on the ceramic sheet with silver paste and fired simultaneously in multiple layers
- High Frequency Components using LTCC technology
  RF Filters, Diplexer, Coupler, Balun, Antenna …

Y2019  Y2020  Y2021  Y2022  Y2023  Y2024  Y2025  Y2026
Ceramic High Frequency Components
Market and Strategic Products

Filtering technologies and frequencies

100MHz  1GHz  10GHz  100GHz

SAW  TC-SAW  BAW  mm-Wave

4G  5G

LTCC Demand Volume for Smartphones

LTCC Antenna for mm-Wave

ANT (Low-Dk)
BPF (High-Q, Low-TCF)

IC
MLCC Market and Strategy

- **Automotive**
  - High quality and reliability, redundant design
  - Resin electrode MLCC
  - High cap MLCC
  - 2 in 1 MLCC

- **High Reliability Zone**
  - Automotive grade
    - High quality and reliability
  - High entry barrier
    - Precise and complex firing conditions

- **Volume Zone**
  - Many suppliers
  - General MLCC

- **Medical**

- **Required quality level**
  - Low ↔ High

- **Capacitance value**
  - High ↔ Low

- **TDK’s Focal markets**

- **Base Station**
  - High quality and reliability, redundant design

- **Smartphone**

- **Consumer**

- **Industrial**
  - High quality and reliability, redundant design
  - Resin electrode MLCC
  - High cap MLCC
  - 2 in 1 MLCC

- **High Reliability Zone**
  - Automotive grade
    - High quality and reliability
  - High entry barrier
    - Precise and complex firing conditions

- **Volume Zone**
  - Many suppliers
  - General MLCC

- **Medical**

- **Required quality level**
  - Low ↔ High

- **Capacitance value**
  - High ↔ Low

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Value Creation 2023

〜Sensor Business Strategy〜
Expansion of Sensor Business

Sales by Segment

Sales by Product

Automotive  Industrial  Drone  Wearable  TWS  Smartphone

NTC  Thermistor  Pressure  Hall  TMR  6 axis  Motion  Microphone  Ultrasonic

FY2024  FY2023  FY2022  FY2021

Automotive  Industrial/H&A  ICT

Temp  Pressure  Hall  TMR  Mic  Motion
Measures for Sensor Business toward Positive Profit

**Expansion of Customer Base**

- **TMR Sensor**
  - Continuous expansion of automotive customer base
  - Expansion of consumer and industrial customer base

- **Hall Sensor**
  - Expansion of consumer customer base

- **MEMS Sensor**
  - Establishment of major position in expanded customer base (Motion Sensor)
  - Expansion of non-mobile customer base (TWS, AR/VR, Drone, Wearable, Industrial/Robotics…)
  - Expansion of automotive customer base (Navigation…)

- **Temp & Pressure Sensor**
  - Expansion of industrial customer base

**Enrichment of Product / Application**

- **TMR Sensor**
  - Continuous expansion of automotive applications
  - Launch and expansion of compass business
  - Launch of digital products

- **Hall Sensor**
  - Continuous expansion of 2D/3D sensor business
  - Development and launch of sensors for consumer applications

- **MEMS Sensor**
  - Expansion of mic business (Digital products, Noise-cancellation…)
  - Establishment of motion sensor line-up
  - Expansion of barometer business
  - Expansion of ultrasonic ToF sensor applications (IoT, Robotics…)

- **Temp & Pressure Sensor**
  - Expansion of xEV applications
Sensor Solution: Strategic Products

- High Accuracy
- High Sensitivity
- Low Power Consumption
- High Robustness

TMR Sensor
- Expertise in elemental technology of MR (Downsizing / Low power consumption)
- Subtle magnetics control (High accuracy / High sensitivity / Low noise)
- Efficient development-production cycle (First To Market)

Microphone
- Advanced design
  - ASIC (High Performance / Low power consumption)
  - MEMS (High sensitivity / High robustness)
- High-functional digital product (AAD)
- Collaboration with IC makers (First To Market)

AAD : Acoustic Activity Detect
Value Creation 2023

〜HDD Head Business Strategy〜
Head/HGA demand will increase

Data Growth is exploding in the world.

Volume of Worldwide Data Creation

HDD Heads up two times
Capacity increase four times
(Nearline HDD)

Y2014
Head/HDD : 3.26
5discs 10Heads (5TB)

Y2021
Head/HDD : 6.48
10discs 20Heads (20TB)

HDD Demand Forecast

(M HDD)

Enterprise Nearline 3.5" 2.5"
FY2018 FY2019 FY2020 FY2021 FY2022 FY2023

HGA Demand Forecast

(M Head)

Enterprise Nearline 3.5" 2.5" BOM(Head/HDD)
FY2018 FY2019 FY2020 FY2021 FY2022 FY2023

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Corporate Communications Group • May 24, 2021 • 31
We are ready for all advanced technology (New technology implementation is a chance!!)

### HDD Technology Roadmap

<table>
<thead>
<tr>
<th>Year</th>
<th>Reader</th>
<th>Writer</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>PMR</td>
<td>SMR</td>
<td>PMR/SMR</td>
</tr>
<tr>
<td>2014</td>
<td>PMR</td>
<td>SMR</td>
<td>PMR/SMR+TMR</td>
</tr>
<tr>
<td>2016</td>
<td>PMR</td>
<td>SMR</td>
<td>PMR/SMR+TMR</td>
</tr>
<tr>
<td>2018</td>
<td>PMR</td>
<td>SMR</td>
<td>PMR/SMR+TMR</td>
</tr>
<tr>
<td>2020</td>
<td>TMR</td>
<td>TAMR</td>
<td>MAMR/TAMR</td>
</tr>
<tr>
<td>2022</td>
<td>TMR</td>
<td>TAMR</td>
<td>MAMR/TAMR</td>
</tr>
<tr>
<td>2024</td>
<td>TMR</td>
<td>TAMR</td>
<td>MAMR/TAMR</td>
</tr>
</tbody>
</table>

- **MAMR**: Microwave assist magnetic Head
- **TAMR (HAMR)**: Thermal(Heat) assist magnetic Head

**TAMR (HAMR)**

- **MAMR**: Microwave assist magnetic Head
  - **TMR**: Microwave assist magnetic Head
  - **SMR**: Single magnetic Reader

- **TAMR (HAMR)**: Thermal(Heat) assist magnetic Head
  - **Laser**
  - **Write Head**
  - **Coil**
  - **Spin-torque Oscillator**
  - **Read Sensor**
  - **Media**

**TDMR**: Two Dimension magnetic Head

- **PMR**: Perpendicular Magnetic Recording
- **SMR**: Single Magnetic Recording
- **TMR**: Tunnel Magnetic Resistance

**We are here now**

- ~2004 LMR+GMR
- 2005~ PMR+TMR
- 202X~ M/TAMR+TDMR

**Actuating Tomorrow**

- **SSA**: Single Stage Actuator
- **μDSA**: micro-Dual Stage Actuator
- **μDSA**: milli-Dual Stage Actuator
- **mDSA**: milli-Dual Stage Actuator
- **TSA**: Tri Stage Actuator
Key Strategy for Growth

Succeed as the world’s only independent manufacturer in the field of magnetic head storage by supplying technologies catering to the needs in the era of large-capacity data storage

- **Retain MAMR technology leadership and make smooth transition to TAMR:**
  - Successfully ramp the MAMR 1st generation, and extend the MAMR to 2nd and 3rd generation.
  - Advance the TAMR technology and prepare for mass-production.
  - Support all customers for technological migration.

- **Optimize production capacity and operations to support future growth:**
  - Prepare the wafer and backend capacity to support new technology mix, such as TDMR, MAMR and TAMR, and demand growth in the HDD industry.
  - Achieve operation excellence by continuing to deploy automation, Smart Factory system, AI and Big Data.

- **Effectively utilize high-precision suspension technology into new fields:**
  - Launch next generation Tri-stage actuator technology to support high-capacity N/L drives.
  - Apply HDD Suspension component technologies for micro electronic components in ICT market.
Value Creation 2023

~Energy Solutions Business Strategy~
Energy Solutions for Sustainable Society

Small batteries with high safety and performance for user-friendly mobile devices and communities

Battery cell/pack for IoT devices, smartphone

BEMS/HEMS

Residential ESS

Longer-life and high-safety battery makes residential ESS and renewable energy more popular

IoT

5G/6G

Smart Factory

Smart Agriculture

Insulated bi-directional DC-DC converter

Industrial ESS

Renewable Energy

Pouch-type batteries with light-weight, high-power and flexible design to expand capability of E-mobilities

Battery pack for Electric 2-wheeler

xEV, E-Motor

DC-DC converter, onboard charger contribute to shift from fuel to renewable energy by electrification of automobile

Contribution to social foundation such as carbon-free and disaster-durable energy supplies through utilization of renewable energy by insulated bi-directional DC-DC converter and ESS

Longer-life and high-safety battery makes residential ESS and renewable energy more popular
Mid-Term LIB Market Overview and Strategy

Markets & Opportunities
- Stable growth in ICT market
- Expansion in IoT devices market
- Tap into emerging applications

Strategies
- Maintain leading position in ICT market by advanced technology and performance
- Intensify actions for stable sourcing and delivery (BCM, Supply chain etc.)

Small and Mid-size LIB global market forecast (excl. EV)

<table>
<thead>
<tr>
<th>Year</th>
<th>Small-size Batteries</th>
<th>Mid-size Batteries</th>
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<tbody>
<tr>
<td>2020</td>
<td></td>
<td></td>
</tr>
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<tr>
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- Demand expansion in ESS and E-motorcycle batteries under “de-carbonization”
- Battery demand growth in smart-factory/agriculture utilizing robot and IoT
- Secure competitive edge by leveraging small cell technologies for safety, longer life, higher power, higher ED etc.
- Enhance safety technologies in depth such as BMS
Power Supply Business

No. 1 Share in Industrial and Medical Healthcare Segment

Industrial

Medical Healthcare

Energy
For the use of renewable energy, a bi-directional converter is a key device which is suitable for efficiently charging and discharging batteries.

AC, DC Grid

EZA Series

Semiconductor Mfg. / Tester
A programmable power supply with excellent operability that is widely used in semiconductor Mfg. equipment, ICs and storage battery testers.

IC Tester

Genesys Series

Medical Healthcare
The customers in this space demand the ultimate quality and reliability of our power’s proposition in MRI, PCR tester, Patient monitor, etc.

MRI

CME Series

Source: Omdia Power Supply report, Sept 2020
**EV Power Supply**

**Contribute to xEV market expansion by “Value adding” & “Modularization”**

- **Value adding**: Enable to adapt increase of electric power demand because of multi-functionalization (for safety, improvement of comfort, etc.) and fast charging, by making current & voltage higher with our high-performance components and power supply system.
- **Modularization**: Realize weight saving by low-profiling & miniaturization utilizing original HTC-PCB and high-power density design.

**Trend of xEV power management**

- **Technology trend**: High functionality on each product
- **Functional integration • Modularization**
  - Bi-directional
  - Voltage increase (400V → 800V)
  - Modularization of DC-DC converter and on-board charger

- **Onboard charger**: for **BEV**
- **DC-DC converter**: for **BEV, PHEV**

2020 → 2030
Alliance Scheme with CATL

(1) Cross License
CATL Material to Pack for Large/Mid-LIB

(2) Joint Venture
EV・Grid ESS Large LIB

(3) Strategic Alliance
Lib for EV

Global Market (FY2025)
(Our estimation)

Biz Area (Products)

Technology

Electronic Components Power Supply

RESS, E-motorcycle
Industrial (Medium LIB)

ICT (Small LIB)

Material to Pack for Small/Mid-LIB

ATL

Material to Pack for Small/Mid-LIB

GWh
0 50 100 150 200 250 300

0 50 100 150 200 250 300

TDK Investors Meeting 2021
Value Creation 2023

~Financial Strategy~
Mid-Term Financial Strategy / Capital Allocation Policy

Make aggressive growth investment to grasp accelerating DX/EX trend and improve cash flow generating capability, which leads strong financial base to support sustainable growth

- Investment will be allocated to core biz with inclined distribution to improve cash flow
- Secure positive 3 years total free cash flow (after SH return), maintain financial discipline
- Implement stable shareholders return through growth of earnings per share

- Previous Mid-term capital allocation result
  FY19/3〜FY21/3 mid-term accumulated (b JPY)
  - Cash-IN: OP 585.5
  - Cash-OUT: CFW 900.0
  - Debt repayment 124.3
  - Shareholder return Capex 559.4
  - EBITDA ratio 81%
  - DE ratio 49% (FY21/3 end)
  - Div payout 29%
  - Energy 49%
  - Passive 20%
  - Magnetic 17%
  - Others 14%

- New Mid-term capital allocation plan
  FY22/3〜FY24/3 mid-term accumulated (b JPY)
  - Cash-IN: OP CFW 900.0
  - Cash-OUT: Shareholder return Capex 750.0
  - EBITDA ratio 65%
  - DE ratio 40% aim
  - Div payout 30% aim
  - Energy 60%
  - Passive 20%
  - Magnetic 16%
  - Others 4%

Dividend improve steadily and sustainably based on mid-term profit growth
Investment will be allocated to growth area with inclined distribution
- Rechargeable batteries
- xEV, ADAS, 5G
- HDD head, suspension/applied products

TDK Investors Meeting 2021
Corporate Motto & Principles

Corporate Motto
Contribute to culture and industry through creativity

Corporate Principles
Vision  Courage  Trust