

---

# MID-TERM MANAGEMENT PLAN

May 13, 2021

**Takeshi Kawai**

**Representative Director President Chief Operating Officer**

**NGK SPARK PLUG CO., LTD.**

- 1. The vision of NGK Spark Plug**
2. Review of the previous medium-term management plan (FY2016-FY2020)
3. New medium-term management plan (FY2021-FY2024)

# The vision of NGK Spark Plug

## Management Philosophy

-Slogan-

With established trust and confidence inside and outside the company, we aim to contribute to the peoples of the world by creating and putting at their proposal **new values for the future.**

## CSR and Sustainability Charter

We contribute to **develop a sustainable society**, thereby improving our corporate value.

We build relations of trust with our stakeholders while making highly transparent decisions and actions.

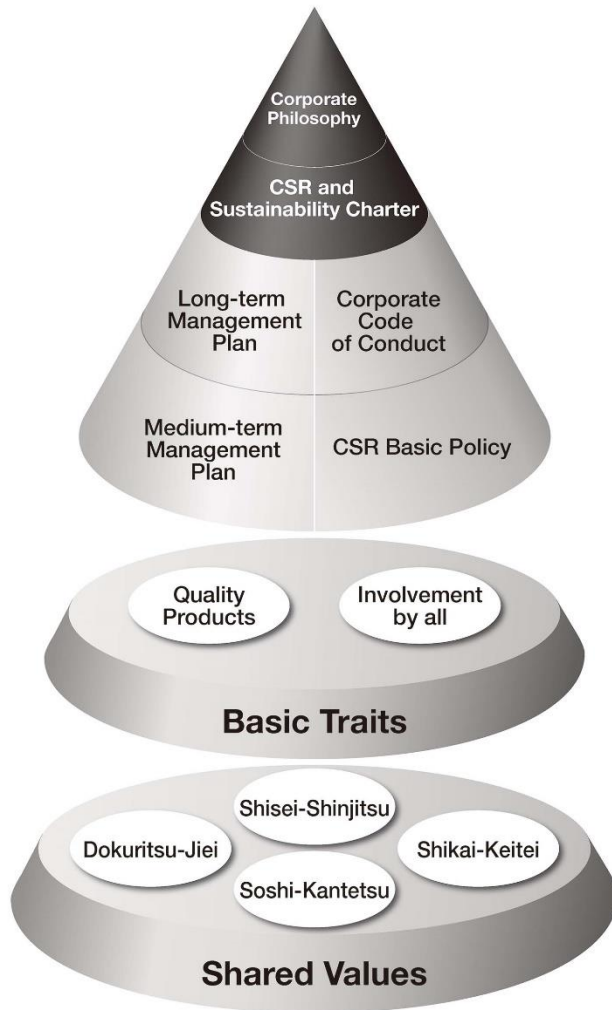
We co-create and provide new value to solving social issues.

## Long-term Management Plan




2040 VISION

**"Beyond ceramics, eXceeding imagination"**

 **Beyond ceramics,  
eXceeding imagination**



# SDGs: Major Initiatives, Goals and Outputs

|             | Item  | Contribution to SDGs  | Major Initiatives  | Goals and Outputs  |
|-------------|---|---|--|--|
| Environment | Responding to Climate Change  |          | Reduction of CO <sub>2</sub> emissions   | CO <sub>2</sub> Emissions: 30% Reduction [compared to that of 2018](2030year)  |
|             | Providing Environmentally Friendly Products   |          | Dissemination and expansion of environmentally friendly products                   | Sales ratio of precious metal plugs: not less than 50%<br>Sales ratio of wide range oxygen sensor + NOx Sensor : not less than 50% |
| Society     | Development of Technology, Products, and Businesses for Contributing to the Resolution of Social Issues |          | Development of fuel cells  | CO <sub>2</sub> Dissemination of high-efficiency distributed power supplies with a view to use free hydrogen                       |
|             |   |   | Development of unleaded piezoelectric materials                                    | Alternative promotion from lead piezoelectric materials  |
|             |   |   | Development of sensing IoT business  | Improve business efficiency through automation, optimization, and generalization   |
|             | Global Human Resource Management  |          | Promotion of employment of women, foreign nationals, and careers                   | Ratio of women, foreign nationals, and career recruits in managerial positions: 25%  |
|             |   |   | Examination of a New Personnel System  | Improved results of employee satisfaction surveys  |
| Governance  | Corporate Governance  |     | Increasing the ratio of female and foreign nationals to directors                  | Ratio of female directors and foreign nationals: not less than 30%   |
|             |   |   | Increasing the ratio of external directors   | Ratio of external directors: not less than 1/3   |
|             | Risk Management   |     | Business impact analysis (creation of risk maps) and responses                     | Disclosure of critical risk extraction process and countermeasures   |
|             | Compliance  |    | Survey of employees' awareness and continuous education                            | Implementation of compliance questionnaires and disclosure of results  |
|             | Information Security  |    | Incident response organization (CSIRT) maintenance and strengthening of the system | Strengthening activities by professional committees  |

# Sustainability promotion : Carbon neutral declaration

# CARBON NEUTRAL

CO<sub>2</sub> 0%  
by 2050

We, the NGK SPARK PLUG Group, declare  
that we will achieve virtually zero greenhouse gas emissions  
in all of the Group's businesses  
and realize a carbon-neutral, decarbonized society by 2050.

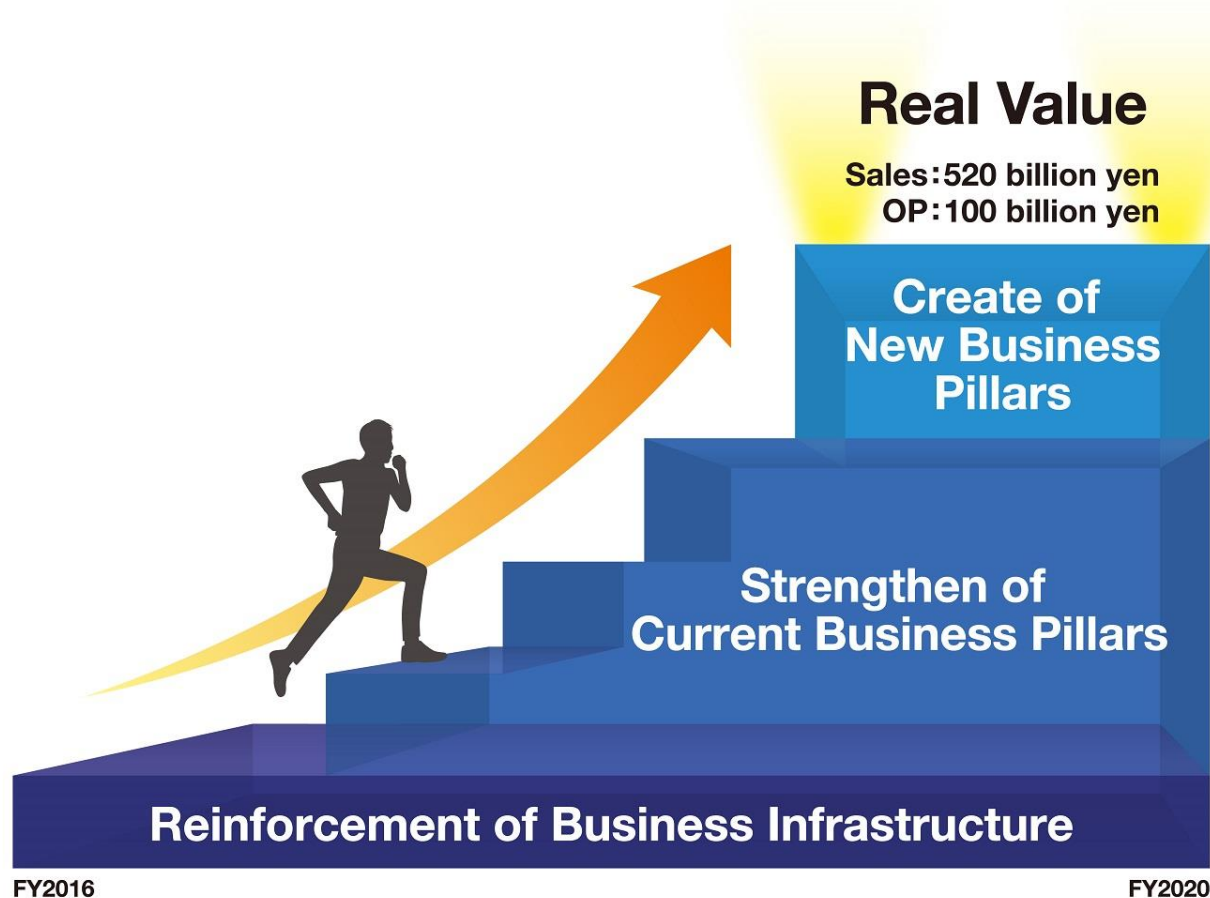


1. The vision of NGK Spark Plug
- 2. Review of the previous medium-term management plan (FY2016-FY2020)**
3. New medium-term management plan (FY2021-FY2024)

## The outline image of the 7th Mid-Term Management Plan

Slogan:

**Accelerated development of current business and new business**



## Strategic progress and task

|                         |   |
|-------------------------|---|
| <b>Revenue</b>          | <ul style="list-style-type: none"> <li>Although it was not achieved due to the delay in launching new businesses and the expansion of Covid-19, it grew to a level close to the target value due to the growth of the ceramic-related business, excluding foreign exchange..</li> </ul> |
| <b>Operating profit</b> | <ul style="list-style-type: none"> <li>As the market for ICE related business continued to make additional investments in existing businesses, the payback phase was delayed and the target value was not reached.</li> </ul>   |
| <b>New Business</b>     | <ul style="list-style-type: none"> <li>Seeding of new business has progressed, but can't show growth vision</li> </ul>  |
| <b>Management base</b>  | <ul style="list-style-type: none"> <li>The return on investment is declining. In addition, as investment in existing businesses continued to be biased, the ratio of investment in growth and new businesses could not be raised.</li> </ul>  |

### Strengthening Current Businesses

#### • Further growth of strong business

- Expanding market share in China and India
- Acquired the top share in the exhaust gas sensor market
- Business expansion of semiconductor manufacturing equipment (double sales)
- Turning the ceramic PKG business into the black

### Establishing New Business Pillars

#### • Seeding of new business has progressed, but can't show growth vision

- Business expansion through acquisition of CAIRE
- Established a subsidiary of the fuel cell business (MORIMURA SOFC TECHNOLOGY, CECYLLS)
- Define focus domains (Mobility, Environment & Energy, Medical, Communication)
- Could not draw a scenario related to commercialization, which will be the pillar of the new business

### Establishing Strong Business Infrastructures

#### • Made & promoted Nittoku Way

#### • ROIC Management is on a half way

- Introduction of RHQ organization
- Speeding up management decisions by introducing an executive officer system
- Return on investment is declining
- Ambiguity remains in the whereabouts of responsibility in the division system



## Management goals and Shareholder Returns

Although the market position and scale expansion of the automobile-related business have progressed, portfolio conversion and improvement of capital efficiency are issues.

### Target of Previous mid-term management plan

|           | FY2016 | FY2020 | Previous medium-term management plan |
|-----------|--------|--------|--------------------------------------|
| Revenue   | 3,729  | 4,275  | 5,200                                |
| OP        | 536    | 474    | 1,000                                |
| OP(Ratio) | 14%    | 11%    | Above 20%                            |
| ROIC      | 9%     | 6%     | Above 13%                            |

\*Actual rate

FOREX (yen)  
US Dollar:115yen,EURO:120yen

### Shareholder Returns

#### Dividend payout ratio

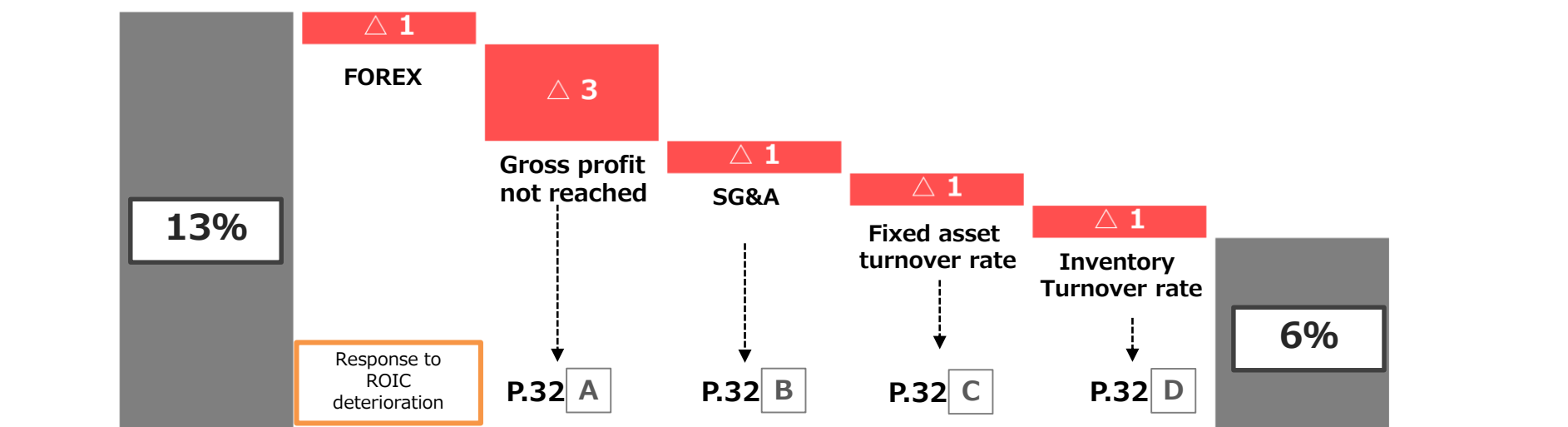
During the period of the previous medium-term management plan

- ✓ Return of payout ratio of **36%**
- ✓ Continued share buybacks with a total return ratio of **56%**

## ROIC review

Due to an increase in demand that exceeds expectations for Spark plug and sensors, we will direct growth investment to automobile-related matters and execute investment to increase production in advance.

- Increased management costs associated with the promotion of globalization of the automobile-related business
- Delay in creating new markets and delaying sales contribution



The previous medium-term management plan  
ROIC target

FY2020  
ROIC actual

1. The vision of NGK Spark Plug
2. Review of the previous medium-term management plan (FY2016-FY2020)
- 3. New medium-term management plan (FY2021-FY2024)**

# Overview of the medium-term management plan

## 2030 Long-Term Management Plan - NITTOKU BX

## 2040 Vision



"Existing business" and "new business" are independent and run on both wheels

## Business strategy

### ICE Business

- Maximize cash generation by maximizing return on investment and super-efficiency

### Growth Business

- Achieve business growth that exceeds the market growth rate

### New Business

- Realization of new businesses that will be the pillars of new businesses, and shortening of the business creation cycle

## Company-wide crossing

- Further strengthening earning power through ROIC management
- Promote investment in non-internal combustion business / conversion of human resources portfolio

## Priority Issues

# Management goals

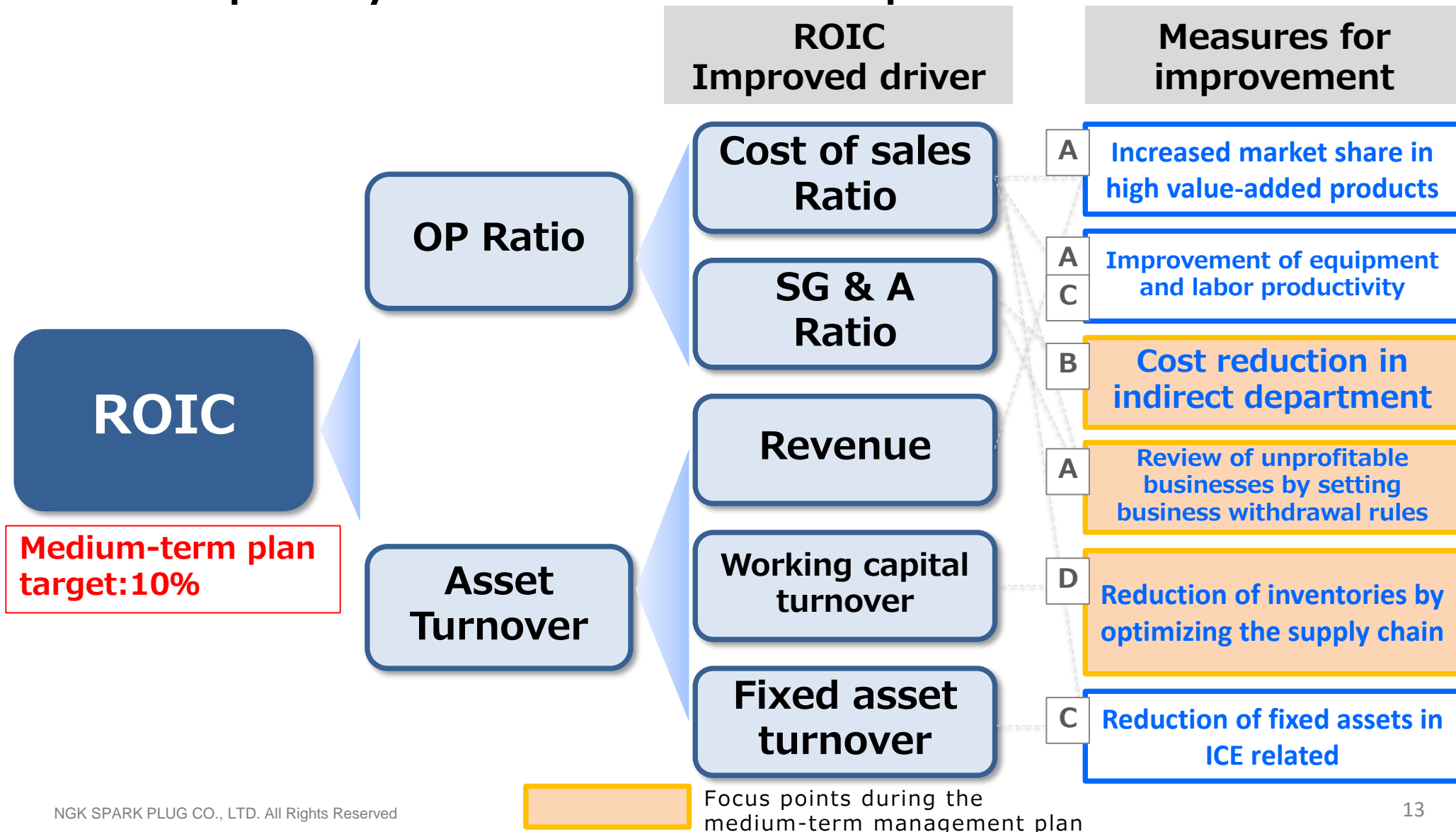
[Unit: Billion yen]

|   | FY2020  | FY2024    | ... | FY2029    |
|---|---------|-----------|-----|-----------|
| Revenue<br>[Unit: Million yen]          | 428     | 600       |     | 750       |
| Operating profit<br>[Unit: Million yen] | 47      | 100       |     |           |
| Portfolio of Revenue<br>ICE : Non-ICE   | 79%:21% | 75% : 25% |     | 60% : 40% |
| Operating profit Ratio                  | 11.1%   | 17%<br>*  |     | Above 15% |
| ROIC                                    | 5.5%    | 10%<br>*  |     | Above 10% |
| ROE                                     | 9.1%    | 13%       |     | Above 12% |

\*Calculated based on the current business plan  
(Does not include additional M & A during the medium-term management plan)

## Efforts to improve profitability

### Extract priority measures for ROIC improvement



### 3.New medium-term management plan (FY2021-FY2024)

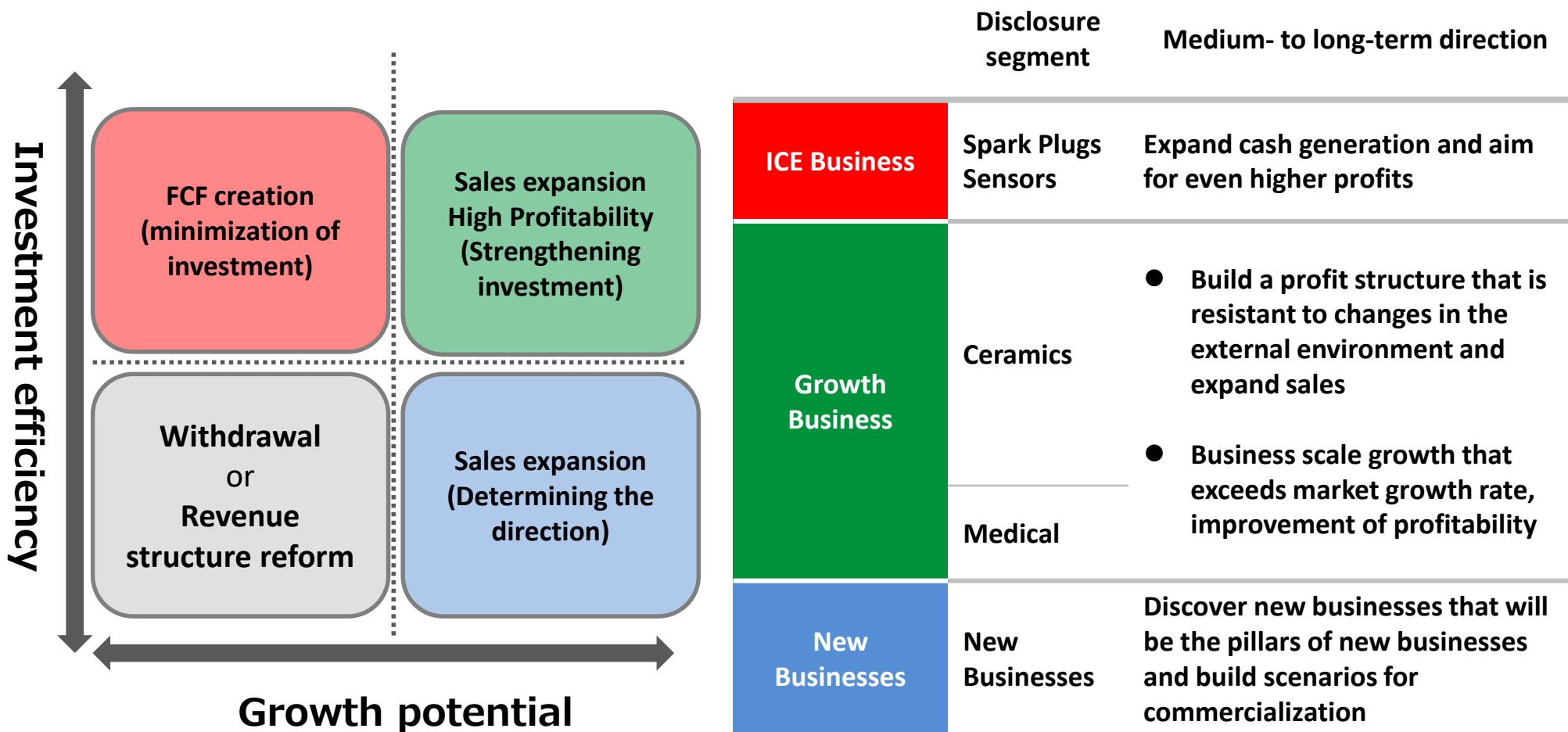
Efforts to transform the business portfolio: Introduced an in-house company system

Promote group management at “a small Headquarters Organization” and accelerate business value according to business position in the policy of **Dokuritsu-Jiei**

| Traditional organization | New organization from FY2021   | Role  |
|--------------------------|--|---|
| Corporate Domain         | <div>Corporate division</div> <div><b>Global Strategy Headquarters</b></div> | <ul style="list-style-type: none"><li>● Planning <b>company-wide strategy</b></li><li>● Strengthening <b>global governance function</b></li><li>● Promotion of portfolio conversion by <b>optimal allocation of management resources</b></li><li>● Governance of business continuity / withdrawal</li></ul> |
|                          | <div>Business support department</div> <div><b>Business company</b></div>    | <ul style="list-style-type: none"><li>● Transformation into a <b>profit center</b></li><li>● <b>Cost reduction</b> through efficiency</li><li>● <b>Advanced</b> services provided</li></ul>   |
|                          | <div>Business department</div> <div><b>Business company / split</b></div>    | <ul style="list-style-type: none"><li>● Improved <b>ability to respond to fluctuations</b> by introducing systems and mechanisms that match each market environment</li><li>● <b>Achievement of KPI / KGI</b> for each company</li></ul>  |

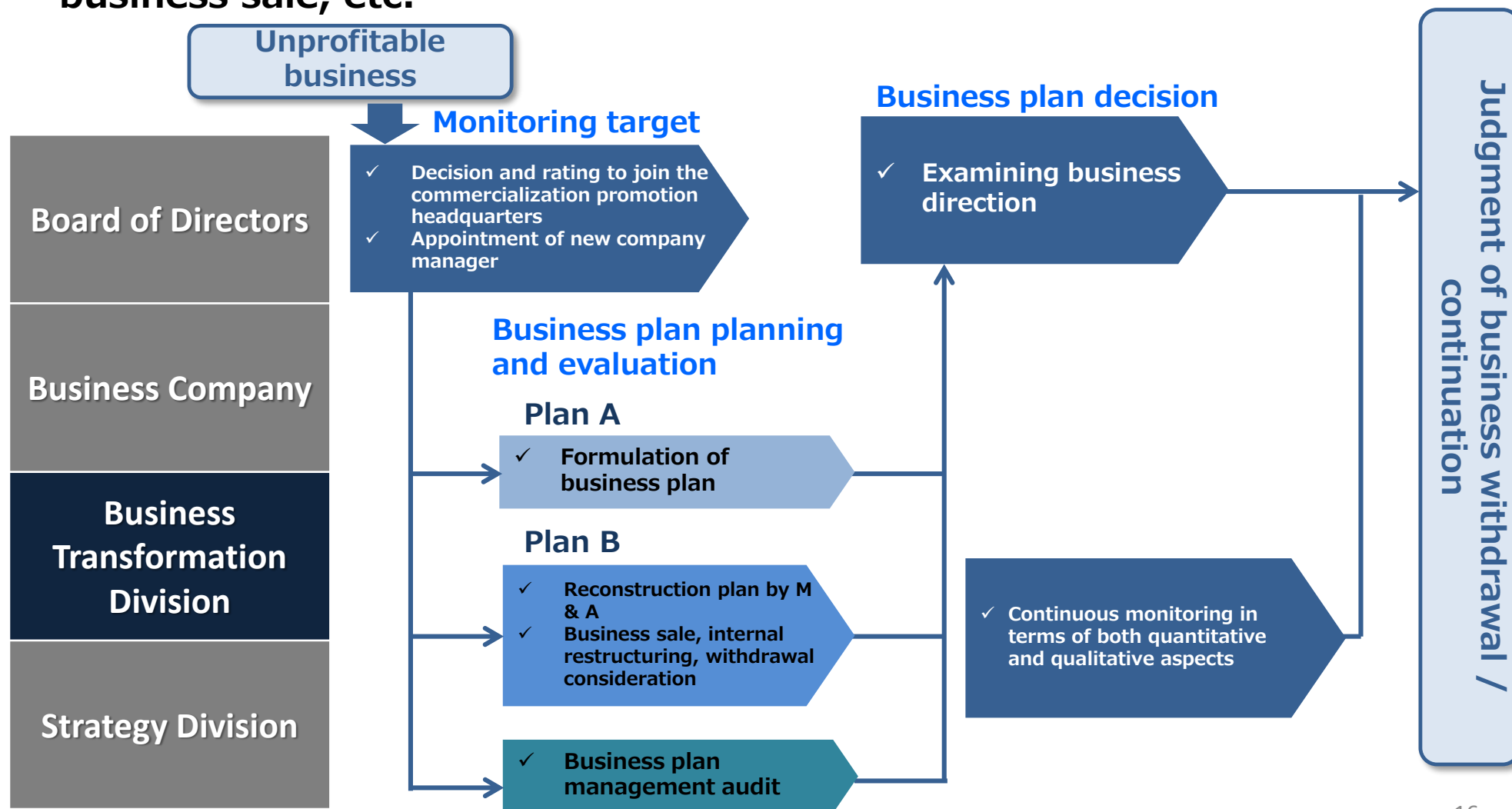
## Efforts to transform business portfolio: Business portfolio management

Strengthen **Business portfolio management** by setting hurdle rates for each business segment





**Established Business Transformation Division. Monitoring unprofitable businesses and judging "business revitalization" or "withdrawal or business sale, etc."**

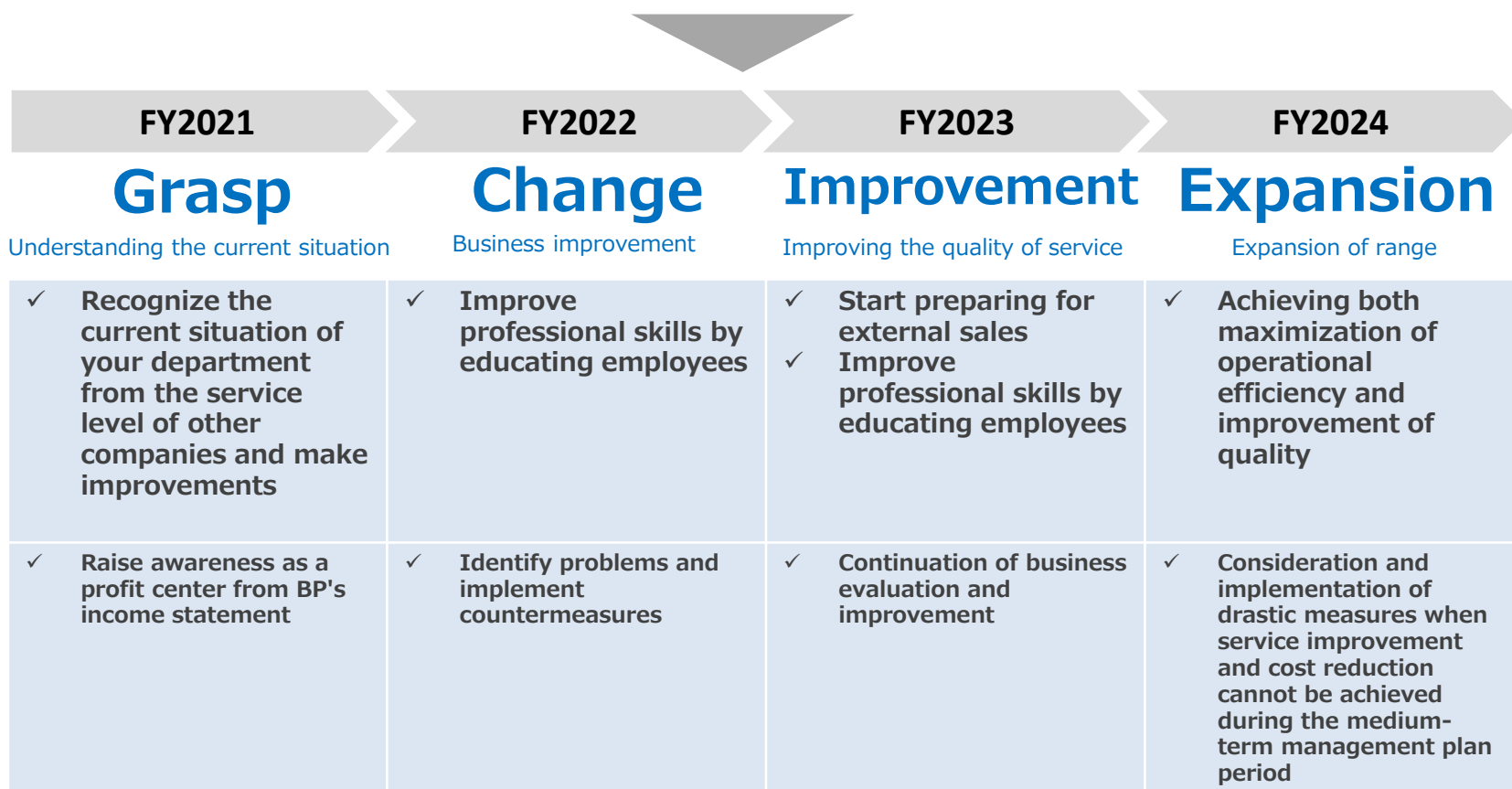


## Business Partner (BP) / Company Aims

Providing **market-competitive**, High-value-added services

## Implementation process

Procurement / Accounting / Human Resources / Labor / IT / Public Relations / General Affairs / Intellectual Property Management / Quality Control / Environmental Safety

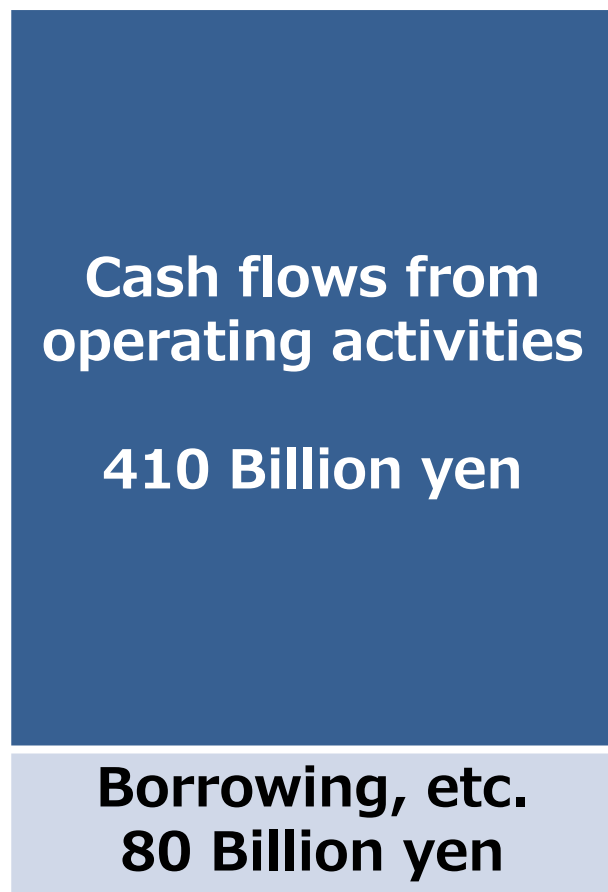


# Cash flow planning

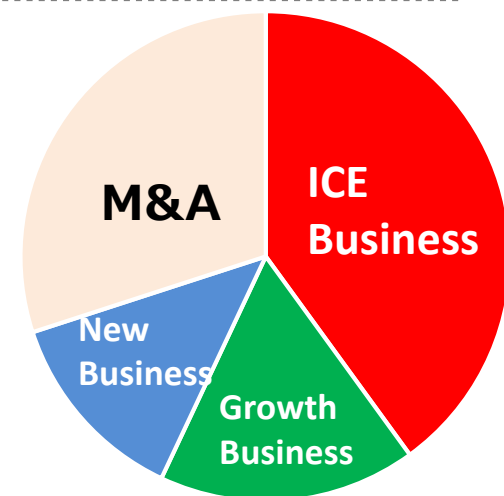
**Cash generated in the ICE Business will be used for Growth and New Businesses to transform the business portfolio.**

[Unit: Billion yen]

## Cash In



## Cash Out



} **Further growth investment**

# Shareholder return policy

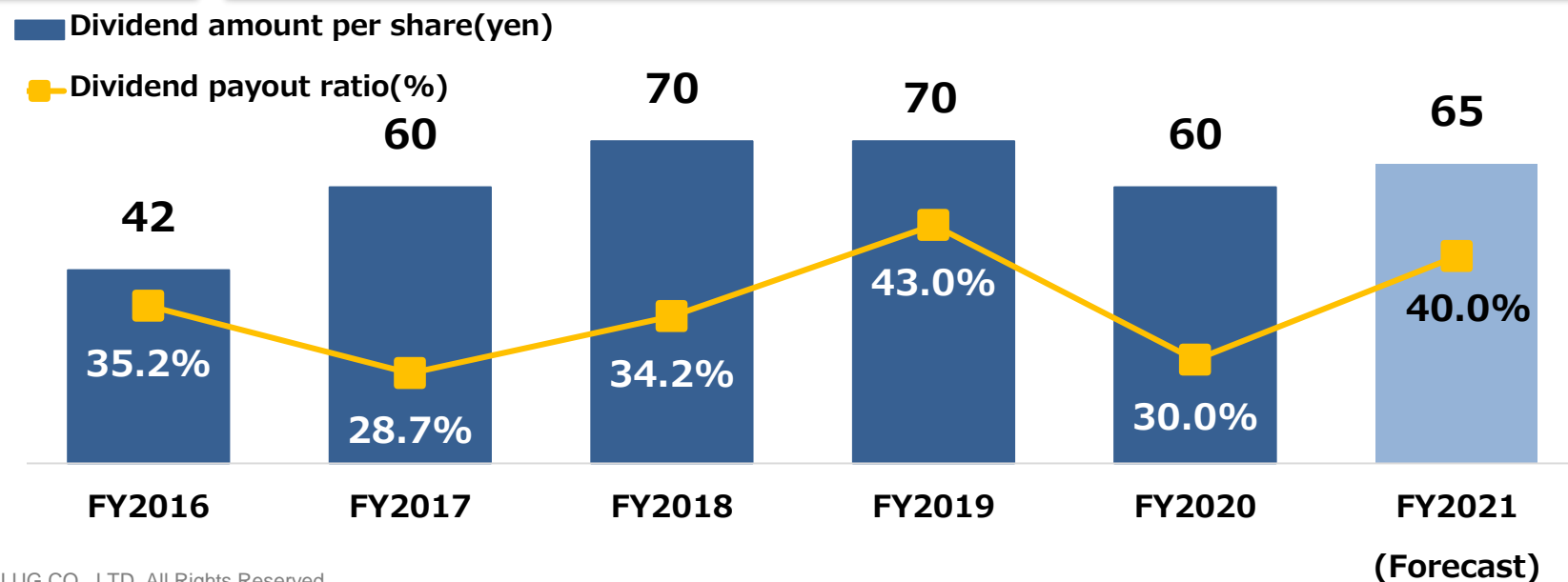
## Policy in the New medium-term management plan

### Basic policy

- Consider the optimal balance between the execution of growth investment for the future and the soundness of capital, and strive to enhance shareholder returns based on dividends.
- Considering the acquisition of treasury stock in view of the appropriate capital level in the medium term

### Dividend policy

- Performance-linked type
- Dividend amount determined with a payout ratio of **40%**



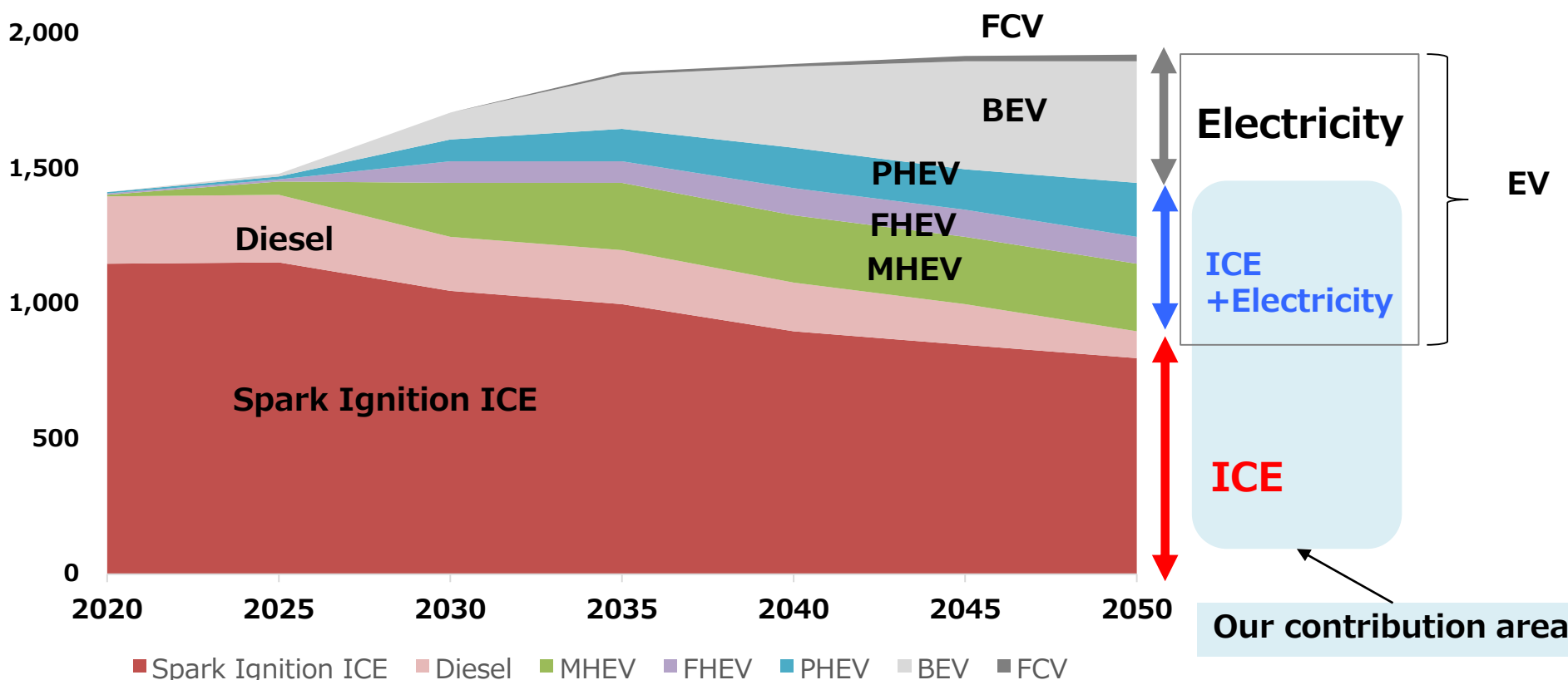
## Business Strategy: ICE Business

### ICE demand forecast

Gasoline / diesel vehicle (ICE) peaks faster, HEVs increase in the medium term, and ZEVs (zero emission vehicles) increase in the long term

2,500

### Global 4W vehicle ownership



## Business Strategy: ICE Business



### Mobility

#### Social value

Responsible for supplying parts for internal combustion engines as a supplier, and continue to **contribute to CO2 reduction with Well to Wheel**

#### Business value

**Maximize cash generation** by maximizing return on investment and super-efficiency

### Environmental awareness

#### External Environment

- Transformation of consumer behavior in the after-covid 19 era
- Increasing importance to climate change response
- Rapid progress toward a carbon-free society

#### Market Needs

- Decarbonization of energy sources
- Increased improvement in fuel efficiency due to increase in HV and PHV

#### Our Position

- Top global share in spark plugs and exhaust gas sensors

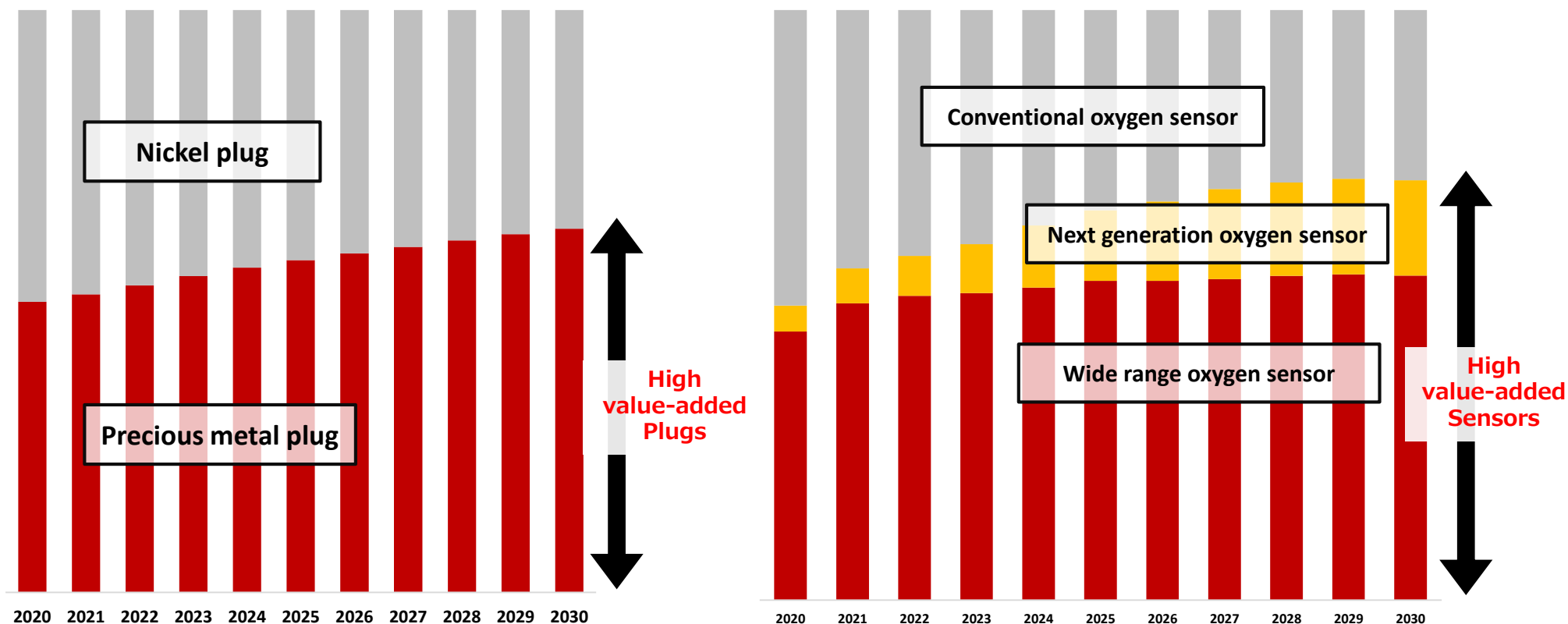
#### Value Provided

- Speedy response to market demand by concentrated investment in products that are directly linked to fuel efficiency and exhaust gas regulations
- Ceramic material technology

## Business Strategy: ICE Business

The ratio of high-value-added products that respond to CO2 reduction continues to increase because of increased demand and increased market share due to heightened fuel efficiency regulations and exhaust gas regulations.

### Quantity trends for high value products



## Business Strategy: **ICE Business**

### KGI

Operating profit  
Ratio

CAGR + 1 %

Free Cash Flow

1.5 times (compared to FY2020)

### Priority Issues

1. Increased market share in high value-added products

2. Control investment by improving productivity

3. Improving capital efficiency by reducing inventory

Priority measures in ROIC tree

**ICE Business Inventories**  
**40% reduction**  
(Compared to FY2020 )



## Business Strategy: **SPE Business**

### Communication



### Social value/Business value

**Aim to become a top supplier in the semiconductor manufacturing equipment field by differentiating with our own technology and meeting cutting-edge needs**

### Environmental awareness

### Memory market

### Logic market

### External Environment

Increase in demand for semiconductors due to an increase in 5G smartphones, work styles in “the New normal era”, and changes in lifestyle

### Market Needs

High-rise 3D NAND memory  
→ Fine and deep hole processing technology  
→ High power plasma

Thinning by **multi-patterning**

### Our Position

Possession of **ceramic sheet lamination technology**  
(3rd among major manufacturers)

### Value Provided

High plasma resistant material  
(High withstand voltage)

- Uniformity of in-plane temperature
- Particle reduction
- Wide range of temperature  
(low temperature / high temperature)

## Business Strategy: **SPE Business**

### KGI

Revenue

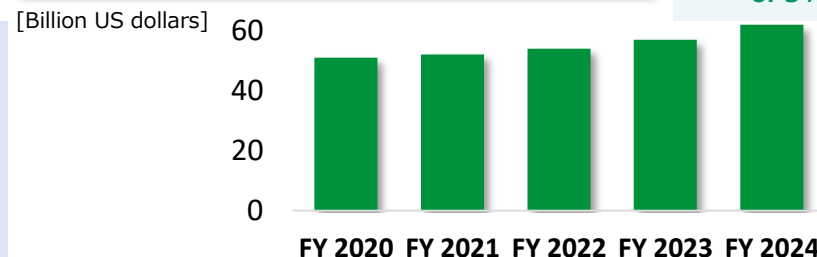
**35 Billion yen**

ROIC

**17%**

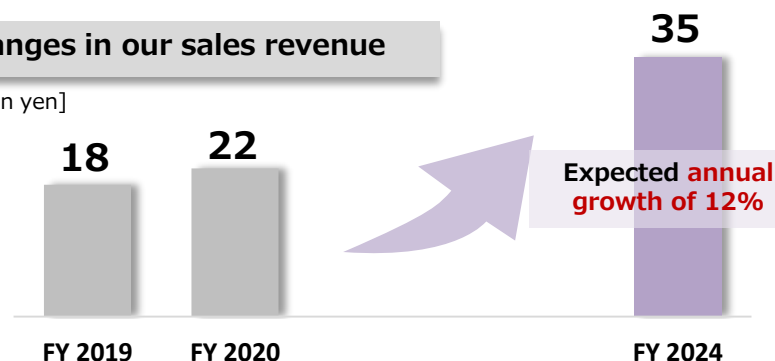
Outlook for semiconductor manufacturing equipment market

Expected  
annual growth  
of 5%



Changes in our sales revenue

[Unit: Billion yen]



### Priority Issues

**Differentiation with unique technology that meets customer requirements**

**Building a production system that is resistant to market fluctuations**

Inventory optimization, equipment utilization rate improvement, labor productivity improvement, etc.

Main indicators

Revenue CAGR  
**Above 12%**

Improving labor productivity  
**Above 30%**  
(compared to FY2020)

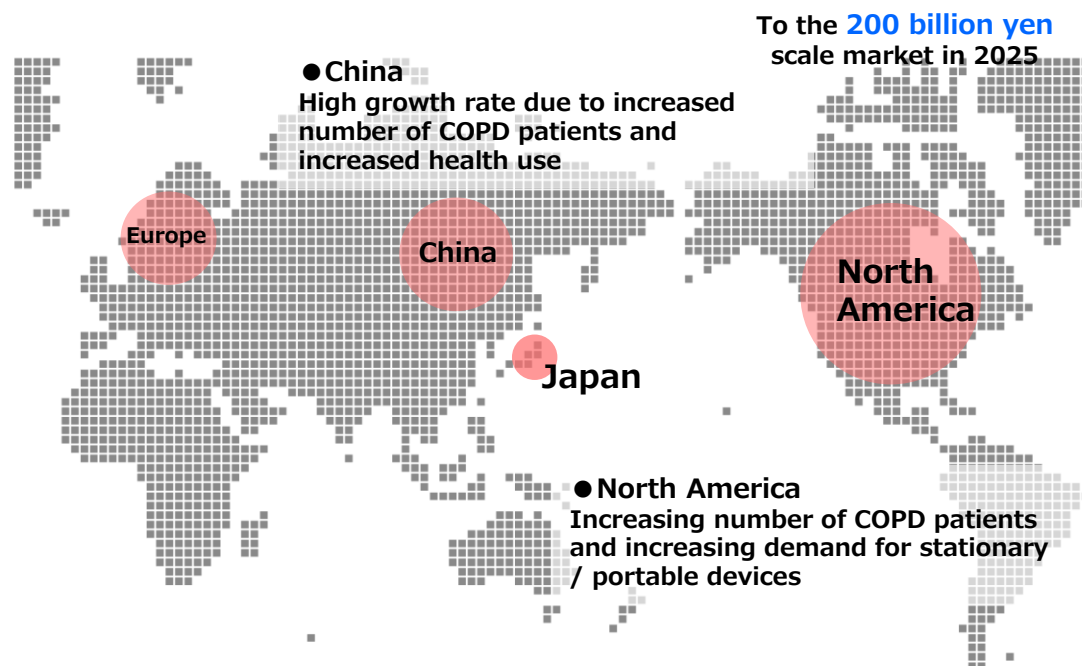
## Business Strategy: **Medical(respiratory-related business)**



### Social value/Business value

Aiming for business growth by expanding product groups and expanding sales areas and channels in order to contribute to improving the QOL of patients globally

### Growing need for oxygen therapy



### Main oxygen concentrator lineup

Stationary type

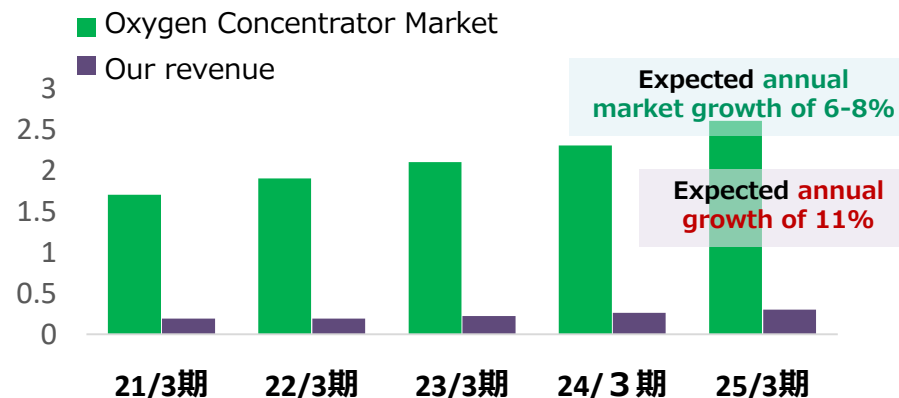
Portable type

Transportable type

Liquid oxygen



### Market growth and sales growth of our company



## Business Strategy: **Medical(respiratory-related business)**

### Environmental awareness

#### External Environment

Global increase in COPD patients, especially in China, where smoking prevalence is high

#### Market Needs

Required products differ depending on the market (region)

#### Our Position

4th among major manufacturers

#### Value Provided

Not only oxygen therapy by strengthening the development system with CAIRE, but also new product development in the respiratory field

### KGI

Revenue

**30 Billion yen**

Operating profit  
Ratio

**18%**

### Priority Issues

Development of new products for oxygen concentrators

Diversification of sales channels and sales regions

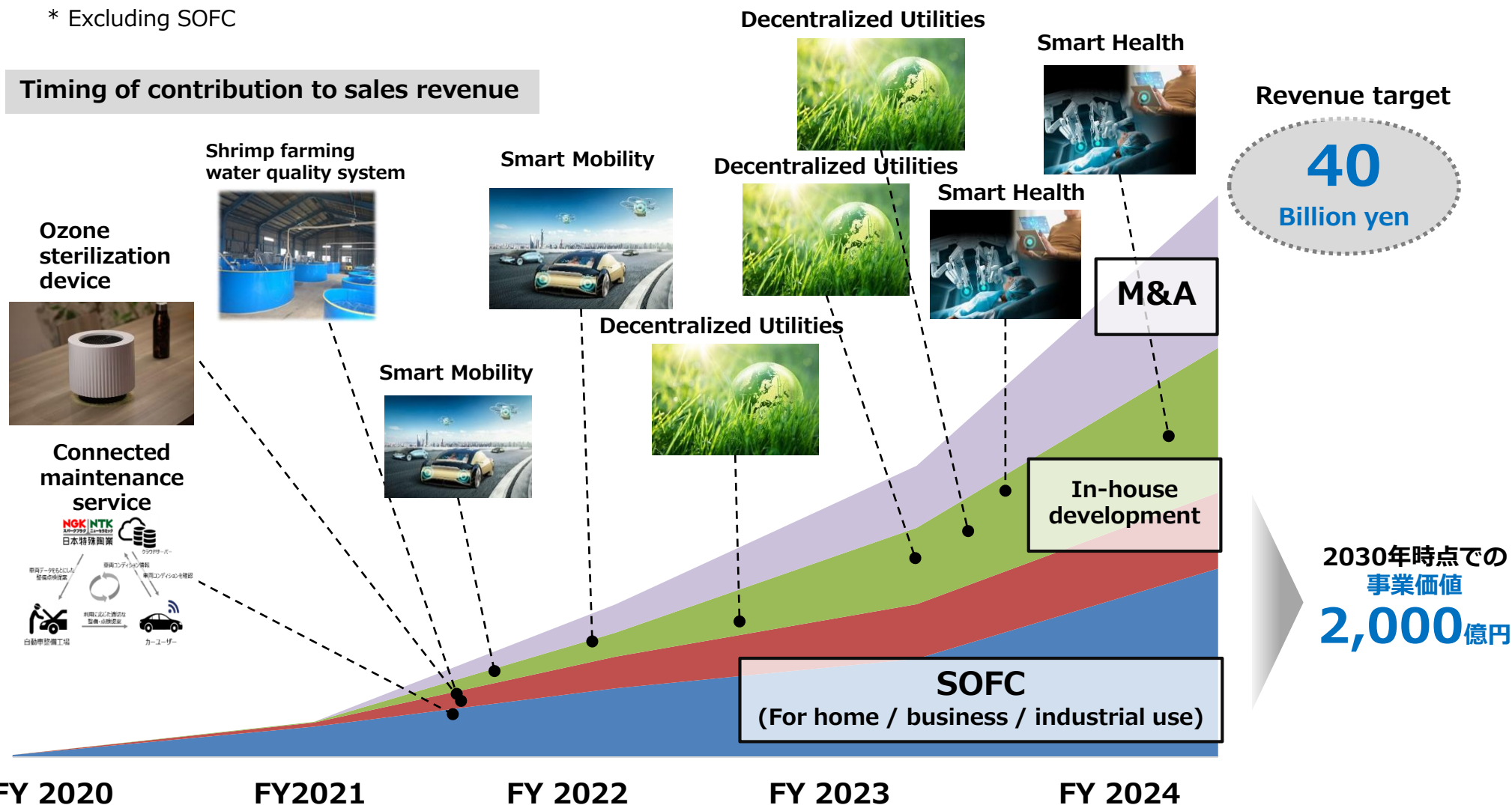
#### Main indicators

Launch of new product  
**FY2024**

Revenue from the Chinese market  
CAGR  
**Above 25%**

**Actively utilize M & A to acquire new markets for sustainable growth .  
Aim to double the business value of new businesses \* as of 2030**

### Timing of contribution to sales revenue



## Business Strategy : New Business(SOFC)

### Target area

Business development with a full lineup from commercial and industrial use (~ 50kW) with a large market size to industrial use for large power sources and distributed power sources of 100kW or more

**MORIMURA**  
SOFC

**CECYLLS**

⇒Common to both companies, CO2 reduction effect of about 30% on grid power



### Priority Issues

Improvement of power generation performance for industrial use

Development of next-generation products for home and business use

Reduction of production cost

Establishment of production system for mass production

### Environmental awareness

For home and business use

For Industrial

#### External Environment

Increased demand for renewable energy, expansion of hydrogen business in each country

#### Market Needs

- Lowering cost
- Smaller and lighter

Expanding demand for distributed power sources and fuel cells

#### Our Position

Entering the market of 100kW or less, which has a relatively low unit price of electricity

Advantage in life cycle cost

#### Value Provided

- Potential of ultra-high power generation efficiency
- High degree of freedom in design

Fuel cell life and high heat utilization



## Business Strategy : **New Business(Other new development)**



### Social value

Providing solutions that can contribute to improving the QOL of people around the world

### Business value

Leverage our core assets to solve the potential needs of people around the world

## Environmental awareness

### External Environment

- New demand is increasing not only in developed countries but also around the world due to population growth on a global scale and expansion of the middle class
- trends such as SDGs, CASE, pandemics, and aging

### Market Needs

- Existence of new unmet needs (cheap medical access for all, safe and secure food, clean air, water and energy, mobility for all)

### Our Position

- Ceramic materials, piezoelectric / ultrasonic elements, sensing technology, plasma global automobile-related customer base, global sales network, etc.

### Value Provided

- Solving the unmet needs of people around the world with systems and solutions that utilize our assets

## Business Strategy : **New Business(Other new development)**

### Focus area

Focus on areas where sustainable and high growth can be expected in the next 5 to 20 years, and utilize our core assets

#### Decentralized Utilities

- Land based Aquaculture
- Air and water Purification
- Energy management
- Greenplant management

#### Smart Mobility

- Mobility Service Platform
- xEV System
- Energy converter
- Charging solutions

#### Smart Health

- Home health monitoring
- Wound healing
- Rehabilitation

### Efforts to increase speed and probability

|                  |  |
|------------------|--|
| Thinking process | <ul style="list-style-type: none"> <li>✓ Human-Centered Design Approach</li> <li>✓ Agile development using the Scrum method</li> <li>✓ Holacracy to foster a culture of open discussion without segregation</li> </ul>   |
| Organization     | <ul style="list-style-type: none"> <li>✓ Flattening of the organization, transfer of authority, global cross-functional teams</li> <li>✓ Revision of evaluation and incentive systems Resources</li> </ul>   |
| Resource         | <ul style="list-style-type: none"> <li>✓ Appointment of external human resources with extensive experience</li> <li>✓ Advisory board composed of industry experts</li> <li>✓ Accelerate start-up investment using CVC as well as M&amp;A</li> <li>✓ electronics, software technology, UI/UX know-how, big data analysis, image analysis</li> </ul> |



# External investment strategy

## Minority Investments

- 5+ minority and 1-2 M&A per year
- Seed to series A for minority investments
- Ticket size 10's of million to 100's of millions JPY
- Only investments that can expand ongoing internal projects:
  - additional markets, regions, market segments
  - technical, marketing, manufacturing capabilities
  - adjacent business areas
- Target markets with at least JPY 10 billion potential



Partnership with PEGASUS TECH VENTURES

1. Fund Size: Up to \$100 million
2. Deal flow to PMI M&A support

## M&A

- Series A to running businesses
- Investment criteria :
  - Acquire technology, IP, and customer base that NTK does not have
  - Acquire human resources and teams with skills that NTK does not have
  - Acquire business portfolios around our business area periphery
- Budget: Around JPY 50 billion / 4 years








## Establishment of Group Ecovision 2030

Select the most important issues from the viewpoint of impact on society and our business. Incorporate global environmental issues into our business strategy and aim to deepen our efforts through information disclosure

(In July 2020, announced support for the TCFD proposal)



### 4 important issues

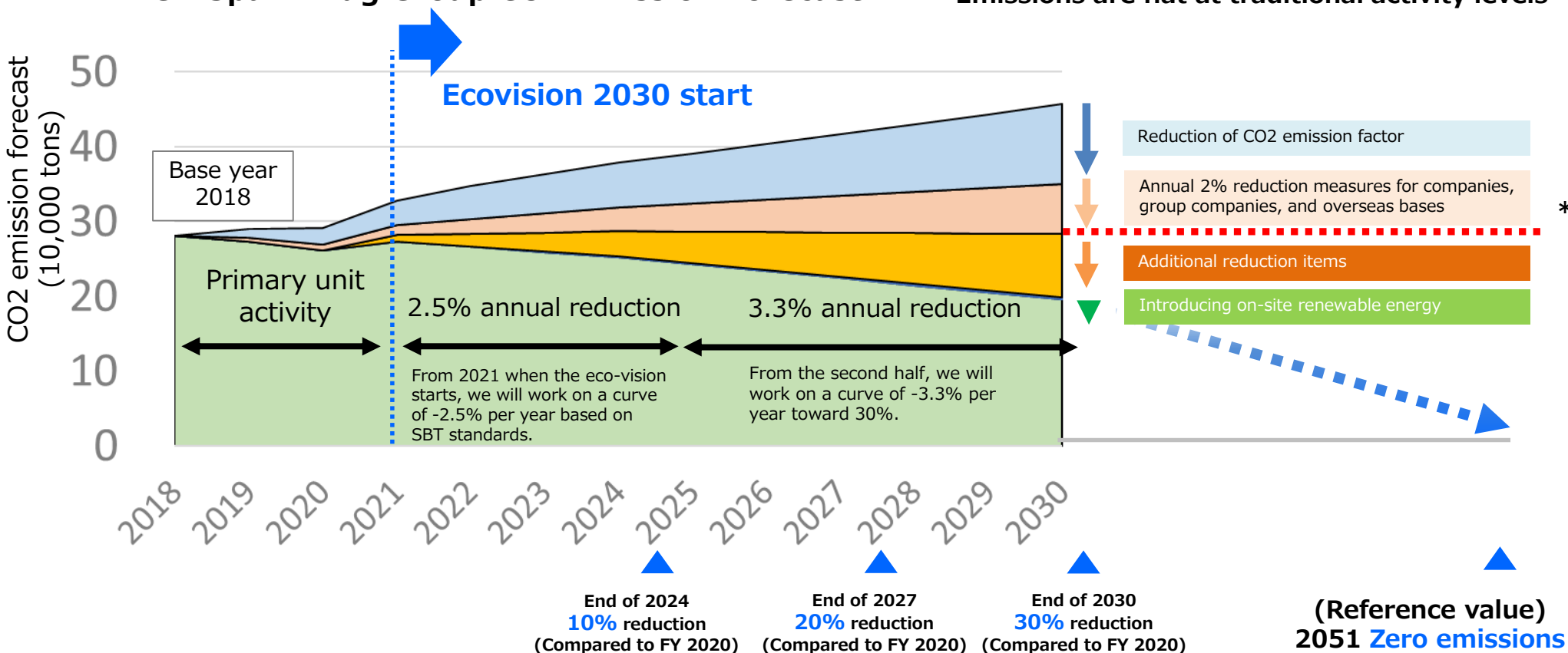
| Issues                                      |   | The milestone to be achieved in 2030  |
|---|---|---|
| Responding to Climate Change                |       | CO2 emissions 30% reduction compared to FY 2018   |
| Expanding Environmentally Friendly Products |       | Expand Nittoku Green Products   |
| Conserving Water Resources                  |    | Water consumption intensity:<br>Keep below FY2018 level   |
| Waste Management                            |   | <ul style="list-style-type: none"> <li>● Achieve over 95% effective utilization rate</li> <li>● Reduce at least 1% of waste intensity compared to FY2018</li> <li>● Promote 3R (reduce, reuse, recycle) activities</li> </ul> |

## Efforts to reduce CO2 emissions

### Set long-term goals and milestones for 2030

#### ■ NGK Spark Plug Group CO2 Emission Forecast

\*Emissions are flat at traditional activity levels



## Promotion of work style reform

### Formulated "Work Style Reform Declaration" in 2021

We recommend "diversified work styles" in order to become a "Creating an organization comprised of passionate individuals working together" of Nittoku BX.

#### ■ Promote comfortable remote work to employees

→ Create an environment with a goal of a **remote work rate of 70% or more.**

#### ■ Prepare tools that respond to change and create new value

→ To that end, we will **invest in digital solutions.**

And we want you to find the best for yourself from the many options and become an "autonomous human resource who can continue to add value." NGK Spark Plug Group respects each person's values and aspirations



Promote productivity improvement and development of independent human resources

## Promotion of health management

- (1) Efforts to improve health literacy ... Issuance of health communication, holding of health seminars
- (2) Measures against lifestyle-related diseases ... Implementation of health improvement program
- (3) Mental health measures ... Held a stress check group analysis result briefing session
- (4) Measures against second-hand smoke ... No smoking in the office (April 2023-)

## Reducing long-term risk by strengthening ESG: G (Governance)

### Analysis and Evaluation of the Effectiveness of the Board of Directors(FY 2019)

- The Board of Directors' **composition is appropriate in terms of knowledge, capabilities, experience and diversity** of background necessary to perform its roles and responsibilities.
- The Board of Directors ensures that the management seeks sustainable enhancement of corporate value by taking appropriate measures to address sustainability-related issues including social and environmental problems.
- The Board of Directors makes decisions on the basic policies regarding establishment of group-wide internal control systems and provides appropriate supervision over the establishment and operation of such systems
- With respect to cross-shareholdings, the Board of Directors verifies the appropriateness of such shareholdings for each individual stock based on comparison between **capital cost and medium- to long-term risk and return**.












#### 2020 Priority Issues and Responses

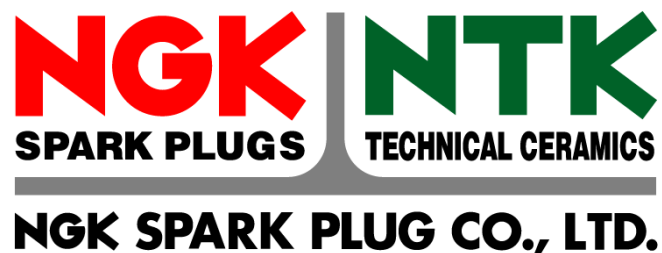
"Sophistication of deliberation on management strategy and business strategy" and "Enhancement of executive training"

- ✓ Implementation of continuous deliberation for formulation of medium-term management plan and long-term management plan
- ✓ Implementation of systematic orientation for newly appointed outside officers

### Diversity of human resources

- Increase the number of independent outside directors
- Ensuring transparency and objectivity of decision-making by appointing outside directors who have experience and expertise cultivated in an environment different from our company

|          | June 2017  |   | June 2021 (plans)  |  |  |
|----------|--|---|--|--|--|
|          | Outside  | Internal  | Outside  | Internal   |  |
| Director |  3 people |  7 people |  4 people |  7 people |  Japanese Male     |
| Auditor  |  2 people |  2 people  |  3 people |  1 people |  Japanese female  |
|          |  |   |  |  |  Foreigner female |



***IGNITE YOUR SPIRIT***

#### FORWARD-LOOKING STATEMENTS

This presentation contains forward-looking statements concerning the future plans, strategies, beliefs and performance of NGK Spark Plug Co., Ltd. and its subsidiaries. These forward-looking statements are not historical facts. They are expectations, estimates, forecasts and projections based on information currently available to the Company and are subject to a number of risks, uncertainties and assumptions. As such, actual results may differ materially from those projected.