

tok TOKYO OHKA KOGYO CO., LTD.

Integrated Report 2020

Year Ended December 31, 2020



Think big with nano, make life easy.





Our Philosophy

The e-Material Global Company

Management Principles

Create a frank and open-minded business culture, continue efforts to enhance technology, raise the quality level of products, and contribute to society

Management Vision

The Global e-Material Company contributing to a sustainable future through chemistry

CSR Policy

- Increases the sustainable corporate value as a whole group by improving employee engagement.
- Continues to provide high-value-added products that contribute to technological innovations in order to resolve social issues.
- Strives to grow together with society and remain as an attractive company that earns the trust of all stakeholders.

Source of Value Creation

TOK delivers value in a wide variety of fields, including the manufacture of semiconductors, by rolling out microprocessing and applied technologies for the nanoscale* domain, along with implementing the strategy of building close relationships with customers using technological marketing and experience and developing high value-added technologies from new perspectives.

* Nanometer (1 nm) = one millionth of a millimeter; one hundred-thousandth the thickness of a human hair



Publication of the Integrated Report 2020

TOK marked the 80th anniversary since its establishment in October 2020 and achieved record-high performance in FY 2020/12. These achievements were possible because TOK has continuously provided both economic value and social value with the support and cooperation of many stakeholders. I extend my sincere and deep gratitude.

I consider the long-term sustainable growth of TOK has just started. Under the new management vision, Global e-Material Company contributing to a sustainable future through chemistry, we will attain the long-term TOK Vision 2030 through the joint efforts of the group. The Vision has been formulated to become a 100-year company in 20 years based on accomplishments, economic value, and social value to be achieved through initiatives over the next ten years. In the course of attainment, we intend to consistently contribute to the sustainable development of society by overcoming the unexpected risks that will emerge in cooperation with stakeholders, thereby creating shared value.

The *Integrated Report 2020* explains how TOK will actually contribute to a sustainable future through chemistry as its purpose (meaning of existence), incorporating the viewpoints of marketing, EHS (environment, health and safety), and collaboration with stakeholders, while a variety of global risks emerge, including infectious diseases, climate change, and geopolitical risks.

In writing this report, TOK referred to the International Integrated Reporting Framework (revised 2021) promoted by the International Integrated Reporting Council (IIRC) and Guidance for Integrated Corporate Disclosure and Company-Investor Dialog for Collaborative Value Creation issued by the Ministry of Economy, Trade and Industry. We considered the feedback received in dialogs with shareholders, investors, and other stakeholders, as well as the opinions received regarding *Integrated Report 2019*. This report represents our best efforts to bring together a variety of information related to long-term value creation at TOK through commitment of the management executives and company-wide collaboration among divisions.

August 2021

Noriaki Taneichi

Representative Director, President and Chief Executive Officer





Technologies for Sustainable Development

TOK's photoresists contribute to the sustainable development of society

Innovative semiconductor and other technologies play a major role in finding solutions to the global risks and social issues that have emerged one after another, such as rapid and far-reaching climate change and new infectious diseases. TOK is enhancing its economic and social value by continuously developing and providing high value-added materials for semiconductors to help solve the social and scientific issues in each era.



TOK's photoresists and high-purity chemicals



Semiconductors

Economic value

Contributing to the evolution of all types of industry and technological innovation



TOK's semiconductor material business

Social value

Accelerating solutions to high-level social and scientific issues

Contributing to the reduction of climate change risks and decarbonization



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Our Value Creation

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FY 2020/12
Achieved the record-high performance

SDGs to which we contribute



Since FY 2021/12
To further enhance economic value and social value

TOK Vision 2030

The Global e-Material Company contributes to a sustainable future through chemistry

Our Foundation

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Editorial Policy

Scope and time frame of this report

- Fiscal year ended December 31, 2020 (January 1, 2020, to December 31, 2020) (Includes content after January 2021)
- Organization: Tokyo Ohka Kogyo Co., Ltd., and its consolidated subsidiaries and equity method affiliates (see pages 124–125 “Global Network”), unless otherwise specified in the text
- Publication on the website
Information on the various initiatives related to financial and nonfinancial information, including information not presented in this integrated report, can be found on the Company’s website.
<https://www.tok.co.jp/eng>



Reference guidelines

- *Environmental Reporting Guidelines 2018*, published by the Ministry of the Environment
- ISO 26000: 2010 — *Guidance on Social Responsibility*, released by the Japanese Standards Association
- *GRI Sustainability Reporting Standards*
- *International Integrated Reporting Framework* published by the IIRC (revised 2021)
- *Guidance for Integrated Corporate Disclosure and Company-Investor Dialog for Collaborative Value Creation* published by the Ministry of Economy, Trade and Industry



Forward-looking statements

This integrated report contains forward-looking statements that present the future prospects of Tokyo Ohka Kogyo Co., Ltd., (the Company) in terms of business planning, earnings, and management strategies.
 Such statements are based on management judgment and are derived from information available at the time the information was prepared. Readers are cautioned not to rely solely on these forward-looking statements because actual results and strategies may differ substantially in the event of changes in the Company’s business environment.



Our Flagship

The top share of the world market for semiconductor photoresists

By honestly continuing efforts to enhance technology and raising the quality levels of products as our management principles since the foundation, TOK has become the world's number one manufacturer of photoresists, which are photosensitive materials indispensable for the manufacture of semiconductors. This section describes the functions, performance, and core value provided by TOK's photoresists in the semiconductor manufacturing process.

TOK's Semiconductor Photoresist Business

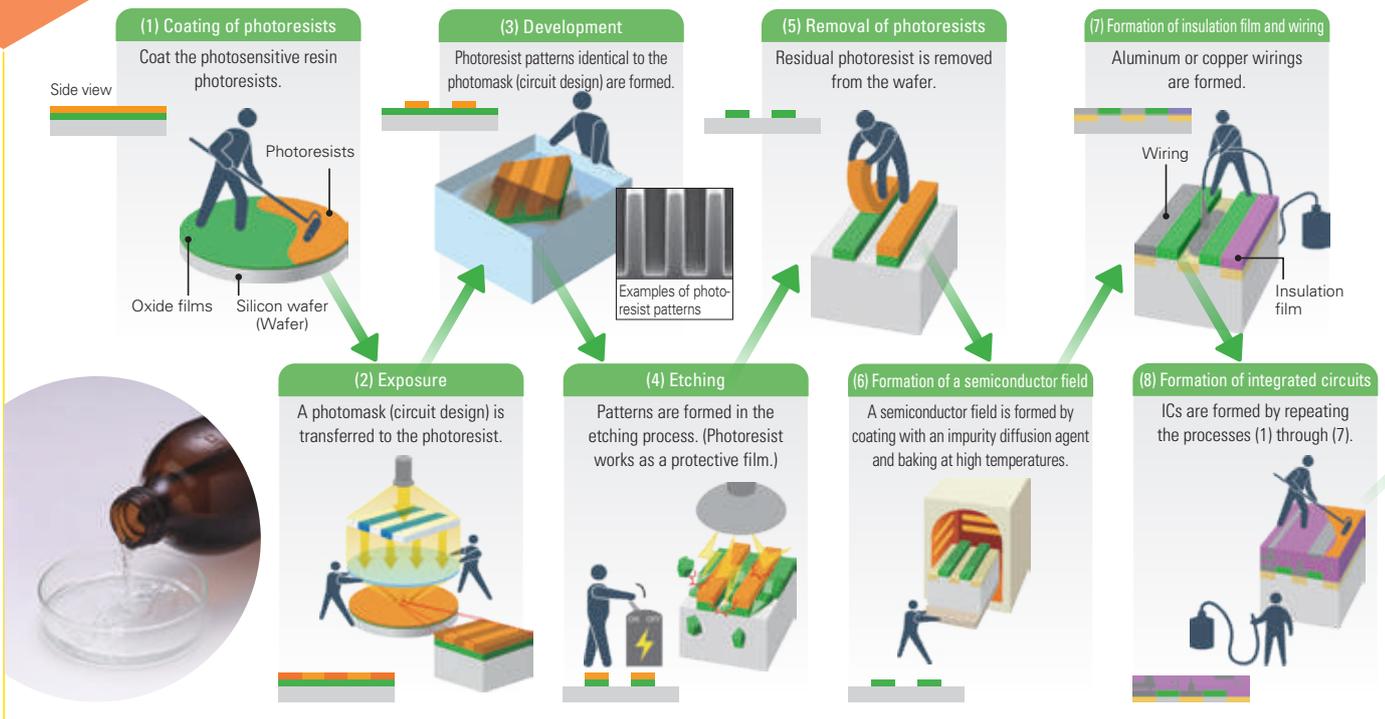
Process of making integrated circuits on a silicon substrate and producing semiconductor chips. The process uses photoresists' resistance to etching.



For more details about the use of our products in the semiconductor manufacturing process, please see our website.

Semiconductor manufacturing flow

Front-end processes of semiconductor manufacturing



Starting point for customer's value creation process

TOK's photoresists create value for customers in their manufacturing process and have a special influence on the quality of customers' output in terms of product quality and yields.

Factors adding value to semiconductor photoresists

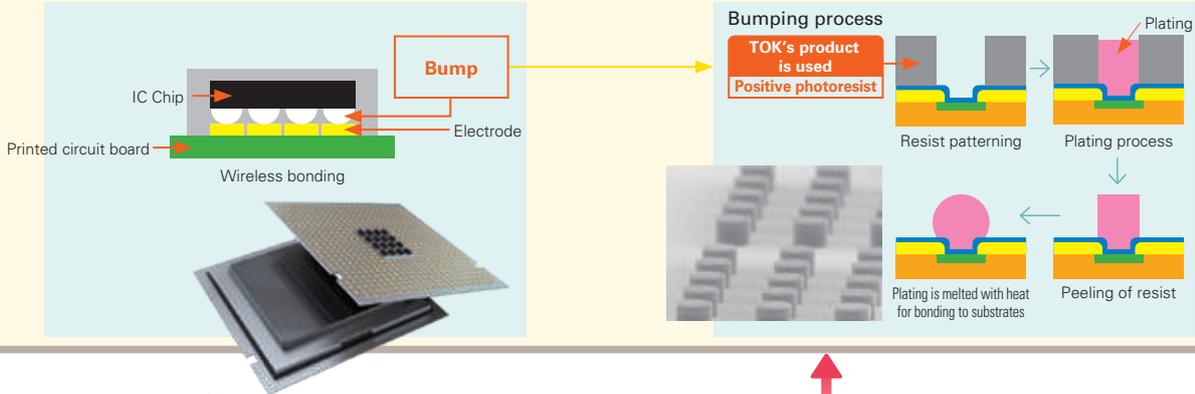
Sensitivity	Resolution	Roughness* * Fluctuations in line width
Etching resistance	Substrate adhesiveness	Processing applicability
Purity	Substance safety	Cost

Our Strength

Providing photoresists as growth drivers in both the front-end and back-end processes of semiconductor manufacturing

Wireless bonding contributes to downsizing, weight reduction, and higher performance

In this method, projected connection terminals called "bumps" are laid out at the bottom of the IC chip without using fine metal wire and come into direct contact with the printed circuit board for energization. By saving the space for wire connections, the IC chip is directly connected to the printed circuit board, which reduces the connection distance and contributes to downsizing, weight reduction, and higher performance of semiconductor packages.

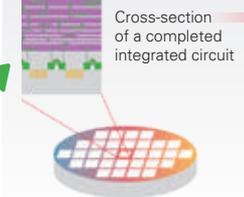


In this process, individual semiconductor chips are cut out to be sealed into different packages. The process takes advantage of the photoresists' thick film forming capacity.

Back-end processes of semiconductor manufacturing

(9) Completion of an integrated circuit

Multiple ICs are created on the wafer surface using microprocessing technology.



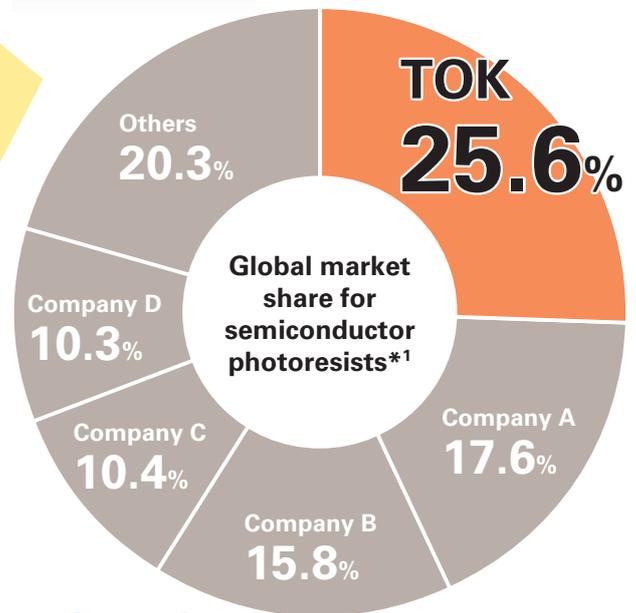
(10) Dicing of wafers

Wafer is diced into chip sizes.



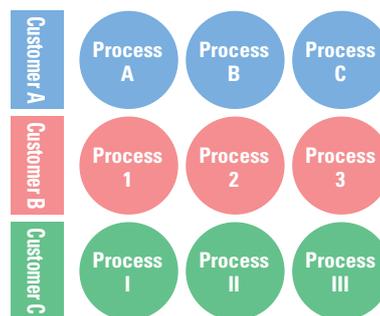
Semiconductor chips completed
Each diced wafer becomes an IC chip.

Global No. 1



Core value of TOK

We can swiftly provide finely tuned tailor-made photoresists for the different needs and requirements of each customer or process



*1 Based on the projected shipment volume of EUV, ArF, KrF, g-Line and i-Line photoresists in 2020 (calculated based on Fuji Chimera Research Institute, "Current Status and Future Outlook of Cutting-edge/Noticeable Semiconductor-related Markets 2020")



Our History

Contributing to a sustainable future through chemistry

TOK ensures that all management resources and initiatives ultimately contribute to society under the four management principles (Create a frank and open-minded business culture, continue efforts to enhance our technology, raise the quality levels of our products, and contribute to society). In the coming years, TOK will contribute to a sustainable future through chemistry, thereby supporting the sustainable development of an affluent society.

1940 Origin



Shigemasa Mukai, TOK founder



Batteries used in the lights on coal miners' caps (image)

DNA in place since TOK's founding

Under his strong ideal of challenging ourselves to develop products, however hard it may be, useful to society, and not offered by other companies, the founder, Shigemasa Mukai, developed the batteries used in the lights on coal miners' caps in 1934 after more than six years of trial and error, thereby enhancing safety in the coal industry in the early Showa era.

1970th Pioneering



Eco-friendly synthetic rubber resists

First semiconductor positive photoresist developed in Japan

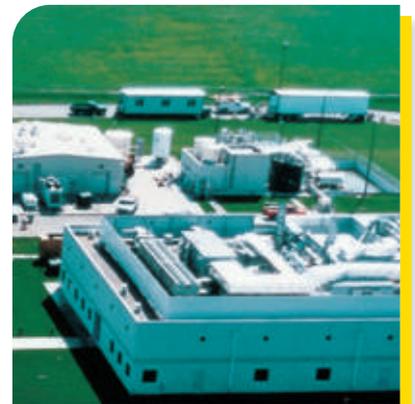


Example of final product: pocket calculator*2

Acquiring TOK's reputation as a supplier of photoresists and responding to environmental requirements

TOK started the full-scale photoresist business in 1968, developed an eco-friendly synthetic rubber resist in 1971, and then created the first semiconductor positive photoresist in Japan in 1972 by leveraging its high purification technology and microprocessing technology. The Company has acquired a reputation as a supplier of photoresists indispensable for semiconductor production and has supported increasing efficiency in business by contributing to the higher performance of pocket calculators and the emergence of word processors and PCs.

1980th Resilience



Established Ohka America, Inc., (current Tokyo Ohka Kogyo America, Inc.) as the first overseas site



i-Line photoresists

Example of final product: PC

Strengthening management foundation and taking steps toward further growth

TOK achieved growth by increasing its market share for g-Line photoresists and promoting the equipment business. Although the Company faced difficulties in the semiconductor recession that started in 1985, TOK took bold action by listing in 1986 and marketing i-Line photoresists in 1987, as well as establishing Ohka America, Inc., as its first overseas site. These actions led to further growth from the 1990s.

Global Semiconductor Market
1986
US\$26,355 million



1990th Global No. 1



Koriyama Plant



KrF excimer laser photoresists

Example of final product: mobile phone

Toward a global niche top company

TOK went on a growth trajectory again and strengthened its structure for increased production by opening the Koriyama plant in 1994. The KrF excimer laser photoresist, which TOK developed in 1997, has been used by many semiconductor manufacturers as the global standard. TOK continued to strengthen its development and production systems in Japan and overseas, thereby solidifying its position as the top global manufacturer of photoresists in the high-added value niche field.

2000th Opportunity Expansion



ArF excimer laser photoresists

Zero Newton bonding machine



Example of final product: smartphone

Pioneering new blue oceans

TOK has also expanded its technological horizons by pioneering future blue oceans, including increasing the overseas sales ratio that exceeded 50% in 2004, the development of high-density integration material in 2003, and the development of 3D packaging equipment in 2008. TOK has continued long-run development via a frank and open-minded business culture, which led to a major leap in high-density integration materials from the 2010s, in addition to the key role played by the 3D packaging equipment in power semiconductors, which contribute to decarbonization.

Since 2010s Innovation Driven



TOK Taiwan Co., Ltd.



TOK Advanced Materials Co., Ltd.

2020
Achieved the record-high performance



EUV photoresists



Target markets: 5G&IoT and AI

Pursuing innovative business by deepening customer-oriented strategies and marketing

To strengthen customer-oriented strategies in Asia with remarkable growth in the semiconductor industry, TOK Advanced Materials Co., Ltd., (South Korea) was established in 2012, and the Tongluo Plant of TOK Taiwan Co., Ltd., was established in 2014. A similar structure was also bolstered in the United States and Japan in response to the raw voice of customers through the trinity of development, manufacturing, and sales, while enhancing its marketing force, thereby establishing strengths in the cutting-edge semiconductor field of EUV photoresists.

Global Semiconductor Market
2020
US\$440,389 million

1990th
Line width of semiconductors
600–130nm

2000th
Line width of semiconductors
130–32nm

2010th-
Line width of semiconductors
32–5nm

*1 The accounts were closed on November 30 until 1987, on March 31 from 1988 to 2017, and on December 31 since 2018 (excluding irregular periods caused by changes in the fiscal year-end).

*2 The photos of examples of final products on this page are conceptual images.

*3 Includes TOK's estimates for the decades shown



Our Resources

Management resources to enable continued enhancement of economic value and social value

TOK has never stopped refining its core value in the semiconductor-related business, addressing customer needs and social issues in each era, and accumulating robust financial capital and unique nonfinancial capital.



- Financial capital policy for the super-long term
- Dividend policy based on net assets

■ Balance Sheet Management

Pursuing an optimal balance between investment, cash reserves, and shareholder returns

- Executing the niche top strategy in cutting-edge fields
- Aggressively taking risks as an R&D-driven company

■ Strategic Policy on Cash Reserves

Established a policy on cash reserves of working capital, investment reserves, and risk reserves

- Developing technologies with a super-long time frame, continuously tackling challenges over a super-long time frame, and responding to unexpected events, such as major disasters
- Representing top-class financial soundness in the chemicals sector (equity ratio 75.3%, D/E ratio 0.07 times*)

* Both as of December 31, 2020

■ Enhancement of Dividends

A dividend policy targeting a DOE of 3.5%

- Steady and continuous shareholder returns

■ Pursuit of Higher Asset Efficiency

Target ROE: 7% (FY 2021/12*) / 10% or higher (FY 2030/12)

- Promoting investment and business strategies using ROIC and IRR as monitoring indicators

* The targets for FY 2021/12 are based on figures announced on February 15, 2021.



- World-leading microprocessing technology
- World-leading high purification technologies

■ Microprocessing Technology

Development and manufacture of materials to make semiconductor circuit line widths fine and materials used to make high-density semiconductor packages
Development and manufacture of materials for stacking semiconductor devices in three dimensions

- Continuing to satisfy the sophisticated needs of the manufacturers of semiconductor and electronic components

■ High Purification Technologies

Supplying clean solutions, thinner, and developing solutions with the highest purity in the world by absolutely minimizing impurities in the product

- Realizing shared value with customers by improving yields on mass production lines for cutting-edge devices
- Making our strengths effective in highly challenging domains, such as controlling performance down to the molecule

■ Niche Top Products

DNA of the founder, Shigemasa Mukai: "Create materials that are supported by advanced technologies and that cannot easily be imitated by other companies"

- Focusing on niche business fields shaped by radical and rapid technological changes
- Developing a business model that continues to develop and bring to market new, high-end, high-value-added products



- Sustaining high levels of R&D investment
- Corporate culture supporting long-run development

■ High Ratio of R&D Costs to Net Sales

Maintaining ratio of R&D costs to net sales around 8%

- Strengthening R&D functions in Japan, the United States, South Korea, and Taiwan
- Continuing development for the further evolution of microprocessing and high purification technologies centered on research into functional polymer materials and the development of applied technologies
- Focusing on the development of new high-functional materials, equipment, and production technologies; Also expanding and accelerating open innovation

■ Marketing Capabilities in R&D

Blue ocean strategy

- Thirty percentage point increase in R&D efficiency* in the past five years as a result of setting development fields with a view to future blue oceans and further refining the marketing of technologies

* R&D efficiency = Operating income over the past five years/ R&D costs over the preceding five years

■ Long-run Development

A willingness to accept challenges based on the management principle of creating a frank, open-minded business culture

- Fostering a frank, open-minded business culture that can support the persistent pursuit of development over 10 years development in cutting-edge fields becomes more difficult each year

TOK will further increase its capital to enhance both economic value and social value, while various global risks continue to emerge.



Human
capital



- Personnel measures that emphasize happiness
- Diversity and inclusion

■ **Policy on Utilizing Human Resources “Never forget that business all begins with people”**
Increasing investment in human capital

- Average annual salary per person increased by ¥1.59 million over the past 10 years*¹, and average tenure figure rose by 3.4 years*¹.

- Ratio of paid leave taken stood at 72.0%, significantly higher than the national average of 56.3%*².

*¹ Tokyo Ohka Kogyo Co., Ltd. only

*² Source: Ministry of Health, Labour and Welfare’s 2020 Summary of General Survey of Working Conditions for 2019 or fiscal 2018

■ **Pursuit of Happiness in Personnel**

Pursuing measures that align with individual values of personnel and their happiness

- Introduction of new personnel system (planned for 2022)
- Establishment of the Executive Fellow system (implemented in 2019)
- Revision of remuneration system for directors (implemented in 2020)

■ **Advancing Promotion of Non-Japanese Employees and Female Personnel**

Merit-based hiring and promotions regardless of nationality or gender

- The consolidated ratio of non-Japanese employees has increased, and local personnel with a deep understanding of the management principles in the sales, development, and manufacturing divisions are making a significant contribution to cutting-edge value creation.
- The number and ratio of female employees increased, and a female general manager of the Human Resources Division was appointed in 2020. Advancing diversity and inclusion into the next stage



Social and
relationship
capital



- Staying abreast of customers who are leading global cutting-edge technology
- Supplier engagement

■ **Establishing Development and Manufacturing Sites in the United States, South Korea, and Taiwan, Where Many Customers Are Located**
Introducing prototype production lines equal to the ones of customers who are leading global cutting-edge technology

- Quickly commercialize the results of development and build a robust customer base with solid trust relationships in the fast-changing semiconductor and electronics industry

■ **Building Innovation Ecosystems with Various Stakeholders**

Collaborating with stakeholders and customers to drive innovation in the cutting-edge semiconductor fields where difficulty in development has been increasing each year

- Discovering and supporting venture companies with technological advantages, engaging in joint research with academics, and participating in a variety of consortiums

■ **Creating Cutting-edge Value with Suppliers**
Strengthening and improving supplier engagement

- Creating cutting-edge semiconductor materials for semiconductors from the formulation of raw materials together with suppliers
- Cooperating closely with suppliers to manage chemical substance risks to protect the global environment



Natural
capital



- Creating environmental value through business activities
- Minimizing environmental risks

■ **Creation of Environmental Value in Both Materials and Equipment**

Provision of environmentally beneficial products

- Reducing energy consumption through miniaturization of semiconductors by supplying cutting-edge photoresists
- Having a top share* of the world market for g-Line and i-Line photoresists is essential in the manufacture of power semiconductors used to conserve and control energy in renewable energy systems, electric vehicles, and hybrid cars. Sales of g-Line and i-Line photoresists have reliably accounted for almost 10% of consolidated net sales.
- Developing multiple types of power semiconductor manufacturing equipment with repeat orders from many customers

* Based on the projected shipment volume in 2020 (calculated based on Fuji Chimera Research Institute, “Current Status and Future Outlook of Cutting-edge/Noticeable Semiconductor-related Markets 2020”)

■ **Responsible Care Activities**

Appropriate management as a manufacturer that handles chemical substances and uses large volumes of water in the production processes, combined with efforts to reduce greenhouse gases toward decarbonization

- Focusing efforts on minimizing environmental risk in the production process and throughout our supply chain
- Focusing on Responsible Care activities* as a part of our GMS (Group Management System) that reinforces the Group management structure globally

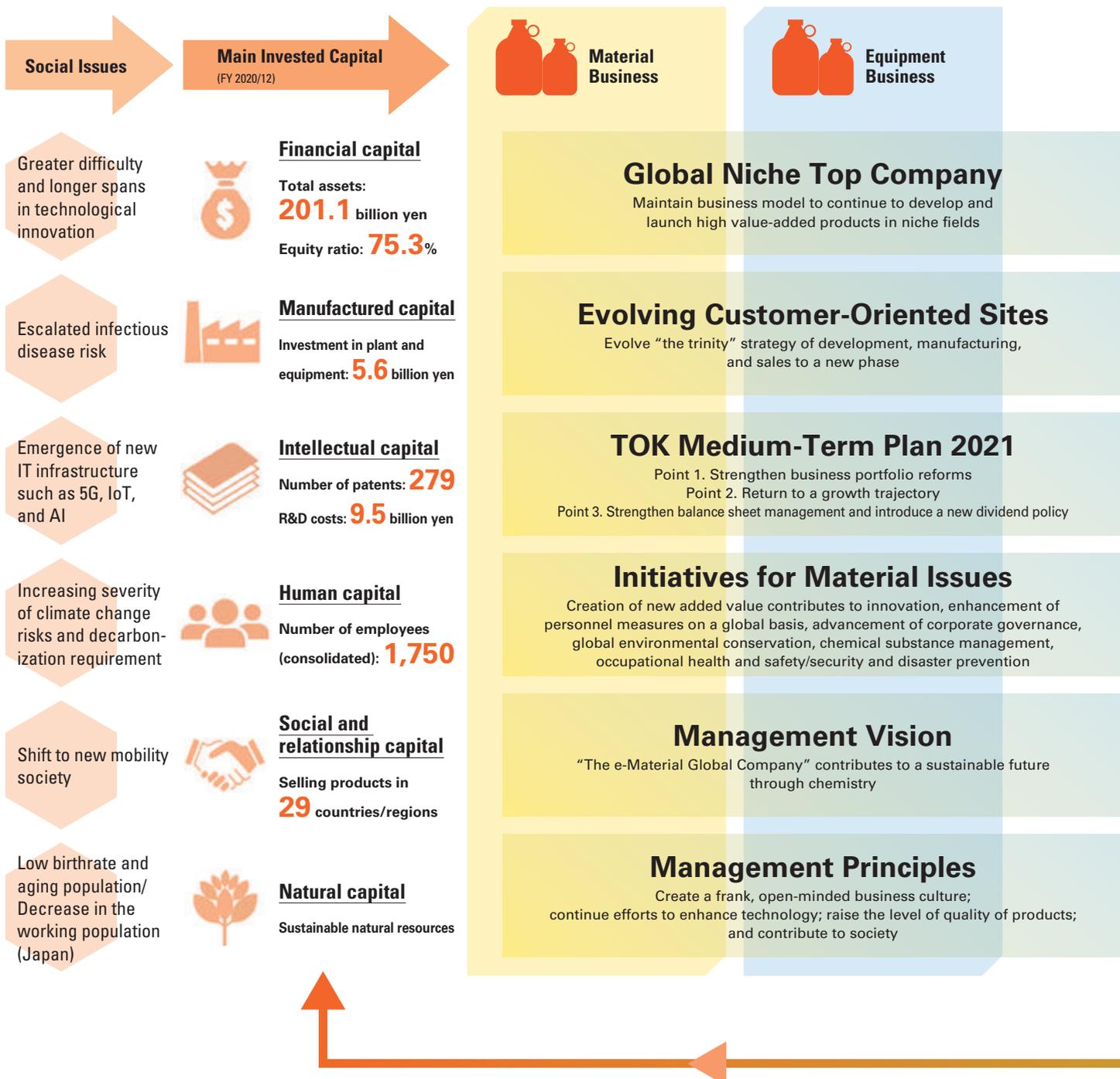
* Activities in which companies handle chemical substances voluntarily implement environmental, safety, and health measures in every process from chemical substance development through manufacturing, logistics, use, and final consumption to disposal and recycling, and announce the results of these activities while communicating with the public (Defined by Japan Chemical Industry Association)



Our Value Creation Process

TOK's long-term sustainable value creation process

Toward 2030, TOK pursues the management vision of becoming the Global e-Material Company by contributing to a sustainable future through chemistry. As a top global niche company, TOK is helping to resolve social issues by developing products that are useful to society that are not offered by other companies based on a solid customer foundation within and outside of Japan. Cutting-edge value creation in the semiconductor-related and electronics-related businesses, where technologies change at an extremely fast pace, is supported by a financial foundation with a super-long-term view,



TOK Vision 2030: overarching aspiration (quantitative aspects)

Net sales	EBITDA	ROE
¥ 200.0 billion	¥ 45.0 billion	Over 10%

world-leading technological capabilities, constant R&D, investment in human capital, and initiatives for material issues. TOK will continue to flexibly implement and evolve the value creation process while closely monitoring global risk trends. By continuing to contribute to high-level social and scientific issues in this way, TOK will sustainably increase corporate value.

