JSW Vision

Contribute to social development by creating innovations with original technologies

JSW aims to be an “Innovative Company” that contributes to social development by positively exploring potential needs among our continuously changing society through proprietary technologies that we have cultivated throughout our history and cutting-edge technologies that we are under development.

JSW Philosophy

1) Make our customers amazed and impressed

To achieve customer satisfaction and their confidence, JSW always listens to the voice of the market and continuously provides creative products and services that exceed customers’ expectations.

2) Coexist with society and achieve sustainable profitability

JSW achieves sustainable profitability through realization of our customers’, shareholders’ and employees’ satisfaction, coexistence with local communities and fulfillment of our responsibilities to stakeholders.

3) Keep the spirit of continuous innovation

JSW establishes a vibrant culture that seeks change and values initiative, creativity and the spirit of challenge, together with sustaining a culture that values the steady supply of reliable products. JSW thoroughly pursues the principles of “real places,” “real things,” “real situations” (traditional three “real” principles) and “real people.”

Contents

Editorial Policy

In 2021, The Japan Steel Works, Ltd. adopted the integrated reporting format with the aim of better communicating to all stakeholders its initiatives for sustainably creating social value and enhancing medium-to-long-term corporate value. This report is the first such integrated report.

We hope that this report provides readers with deeper insight into the JSW Group from both financial and non-financial perspectives.

Reporting Period

April 1, 2020–March 31, 2021 (“Fiscal 2020” or “FY2020”)

Note: Certain activities and information are included from outside this reporting period.

Reporting Scope

The Japan Steel Works, Ltd. and Group companies

Note: Throughout this report, “JSW” refers to information relating to The Japan Steel Works, Ltd., and “JSW Group” refers to information relating to The Japan Steel Works, Ltd. and its consolidated subsidiaries.

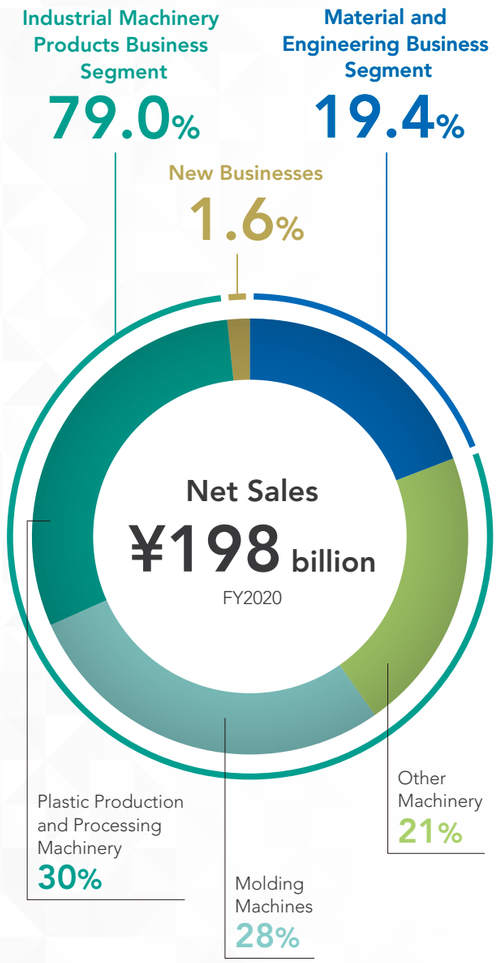
Referenced Guidelines

- *International Integrated Reporting Framework*, International Integrated Reporting Council (IIRC)
- *Guidance for Collaborative Value Creation*, Japan’s Ministry of Economy, Trade and Industry
- *Environmental Reporting Guidelines 2018*, Japan’s Ministry of the Environment
- *GRI Sustainability Reporting Standards*, Global Reporting Initiative

Note on Forward-Looking Statements

The performance forecasts included in this report are judgments based on the information that was available to JSW at the time the report was prepared and are subject to underlying risks and uncertainties. Actual results may differ significantly from these forecasts due to a variety of factors.

At a Glance



Business Segments

Industrial Machinery Products Business Segment

Our Industrial Machinery Products Business Segment comprises three sub-segments: (1) Plastic Production and Processing Machinery, (2) Molding Machines, and (3) Other Machinery, and operates from three bases: the Hiroshima Plant, the Yokohama Plant, and the Meiki Plant.

We offer a lineup of plastic production and processing machinery and plastic molding machines for a variety of applications, and many of our products have a high market share, such as our separator film manufacturing equipment for lithium-ion batteries. In this segment, which accounts for nearly 80% of the JSW Group's net sales, we are working to further expand the scale of our business, especially in the mainstay plastic processing machinery market.

Material and Engineering Business Segment

Our Material and Engineering Business Segment comprises three sub-segments: (1) Steel Castings and Forgings, (2) Clad Steel Products, and (3) Engineering Services, and is operated by Japan Steel Works M&E, Inc. (Muroran Plant), which was established as an operating subsidiary in April 2020.

In steel castings and forgings, we are either the world's only manufacturer or have a high market share for products such as large shaft materials for power plants, pressure vessel components for nuclear power plants, and large components for pile-driving machines used in the construction of offshore wind farms. With the shift to renewable energy, we are working to strengthen our earnings base through business structure reform.

New Businesses

We have narrowed down our new businesses to the three fields of photonics, composite materials, and metallic materials, and are working to achieve profitability in each business by offering products such as optical device materials, carbon fiber reinforced plastic (CFRP), and titanium copper alloys.

Production Bases

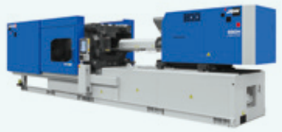
Products

Plastic Production and Processing Machinery

- Pelletizers
- Film and sheet manufacturing equipment
- Twin-screw extruders
- After-sales services

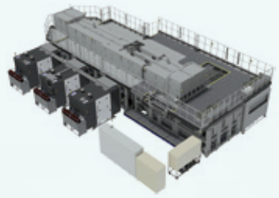
Molding Machines

- Plastic injection molding machines
- Magnesium molding machines
- Blow molding machines
- After-sales services



Other Machinery

- Excimer laser annealing systems
- Defense equipment
- Railway products
- Hot press devices
- Laminators
- Deposition systems
- After-sales services



Steel Castings and Forgings

- Parts for reactors (shells, heads, etc.)
- Parts for steam generators
- Rotor shafts
- Turbine casings
- Die steel
- Steel rolls for steel manufacturing

Clad Steel Products

- Clad steel plates
- Clad steel pipes

Engineering Services

- Steel structures for plants and infrastructure
- Non-destructive inspection and analytical inspection services
- Steel pressure vessels for hydrogen storage and hydrogen storage tanks using hydrogen absorbing alloys

New Businesses

- Photonics
- Composite materials
- Metallic materials

Markets

Petrochemicals | Industrial Machinery | Automobiles | IT | Defense | Electric Power and Steel | Oil and Natural Gas | Renewable Energy | New Businesses

Message from the President

A Future-Oriented Approach Rather than Continuation of Past Practices

Since I became president of JSW in April 2017, I have managed the JSW Group with “welcome change, initiate change” as a constant theme. Amid rapid and large-scale social change—exemplified by moves to decarbonize and advances in plastic recycling—we cannot achieve new successes by following precedent and maintaining the status quo. A spirit of taking on new challenges is necessary. I feel strongly that we must evolve our company in order to grow further.

The JSW Group operates a wide range of businesses, primarily in energy- and infrastructure-related materials and industrial machinery products centered on plastic applications. However, we are clearly headed toward a new era. In addition to the decarbonization trend, advanced technologies such as AI and IoT as well as digital transformation initiatives are fundamentally changing the economy and daily life. I think we are soon to see the emergence of game-changers in various fields that will transform the structure of industrial society.

To pursue sustainable growth in such a time of great change, companies must think about society with a long-term perspective, and then decide what they should do now, rather than plotting their future course based on what they did in the past. In our new medium-term management plan, JGP2025, we identified the issues we should address from a medium-to-long-term perspective and formulated future strategies, and we are now devoting our efforts to executing those strategies and achieving the plan’s targets. In the first half of the twentieth century, the JSW Group contributed to the development of the defense industry as a national project, but after the Second World War, it transitioned to commercial business in response to changing social conditions. We have since developed new product categories, including materials for the energy industry, plastic processing machinery, and more. Now we are once again aiming to grow in the years ahead by reforming our business portfolio.

Ensuring Measures Generate Results by Formulating JGP2025 with a Long-Term Perspective

In the previous medium-term management plan, JGP2020, which ended in March 2021, we focused on shaping the future of the JSW Group and reforming our business structure through the growth of the Industrial Machinery Products Business and the rebirth of the Material and Engineering Business. We split off the Material and Engineering Business, our original business, into Japan Steel Works M&E, Inc., and established alliances with Tsukishima Kikai Co., Ltd. and JX Nippon Mining & Metals Corporation. Due to adverse developments in the external environment, notably the prolonging of trade tensions between the U.S. and China and the COVID-19 pandemic, we were unable to reach our original numerical targets, but we did make steady progress on the three basic policies (priority issues) in JGP2020, including optimization of management resources and strengthening of alliances. However, one issue that we needed to address is the failure to translate our various measures and initiatives into business results. Based on the outcomes and issues of the previous plan, in April 2021 we launched a new medium-term management plan, JGP2025.

Until now, the JSW Group has launched a new medium-term management plan every three years, but this horizon was too short to fully implement measures and produce results. Consequently, we tended to place priority on near-term budget execution, planning and project portfolio-building. That is why we decided to extend the period covered by the new medium-term management plan to five years and concentrate on carrying out priority measures with a longer-term perspective. Of course, with the rapid changes currently happening around the world, predicting conditions five years from now is not an easy task. We plan to examine the progress of measures and make adjustments to the plan after three years.

The key point we emphasized in formulating the new plan is the need to foster and establish a corporate culture of embracing challenges with high goals. We will set goals to aim for, think hard about how to achieve them, and push toward our vision while regularly checking measures and results. This approach is essential to successfully achieving the medium-term management plan.

JGP2025 is positioned as a five-year period to lay the groundwork for realizing our long-term vision for 2030 and beyond. It will ensure our evolution “towards the unprecedented general manufacturer of plastic processing

machinery in the world" through initiatives such as capturing the top global market share for our existing products. At the same time, we plan to quickly commercialize products in the three fields of photonics, composite materials and metallic materials, and create new core businesses such as products for electronic devices.

Our numerical targets for fiscal 2025, the final year of the new plan, are consolidated net sales of ¥270 billion, operating income of ¥27 billion and ROE of 10%. The entire JSW Group will work together to achieve them.

The *Yompo-Yoshi* Spirit That Supports *Monozukuri* and Value Creation

In my view, the JSW Group's value comes from both *monozukuri* and value creation. Of course, *monozukuri* —good manufacturing practices for producing high-quality products at competitive prices with short delivery times—has always been our foundation as a manufacturer, and that has not changed. But today, with competition intensifying, a company must create and put into practice a business model that meets the real underlying needs of customers in order to achieve sustainable growth. Adding something extra to products or components (including their maintenance) that leads to customer satisfaction, is the essence of value creation. I believe that the combination of *monozukuri* and value creation is the engine that will drive the JSW Group's growth in the years to come. For example, at the Technology Development Center in Hiroshima, which has more than 100 engineers, in addition to creating original technologies, we are conducting development and trial manufacturing of plastic processing machinery to meet customers' requests and technical challenges. Continuing to solve customer problems by developing new products and helping customers cultivate markets is the way we have grown until now.

At the heart of *monozukuri* and value creation is the spirit of *yompo-yoshi*, which calls for us to generate benefits in four areas—for customers, employees, society and shareholders. Simply making customers happy is not enough. Employees who are not enthusiastic about their work cannot perform to their full potential, and harmony with local communities is also important. Furthermore, we have an obligation to our shareholders. I believe that creating businesses with *monozukuri* and value creation based on the satisfaction of these four stakeholders and expanding the value we provide will lead to the JSW Group's future growth.

Evolving Our Business Portfolio to Realize Our Long-Term Vision

The JSW Group's long-term vision has two core objectives: a company with job satisfaction and excitement for employees, and growing to a business scale of 300 billion yen.

While our employees continue to give their best, I feel that we are sometimes a little conservative due to our nature as a traditional company with a long history. For example, to act with the speed and sense of unity of a startup, we need to foster a culture in which employees set goals not for the whole company, but on a smaller scale—say, becoming number one in a certain field—and work toward those goals with enthusiasm. That is what we mean by the first objective, to be a company with job satisfaction and excitement for employees. Making our company an exciting place to work will also give younger employees a stronger sense of personal growth. Management's responsibility will be to stimulate the initiative, creativity and passion of our diverse employees and create the conditions for them to be excited about pursuing innovation.

As for the second objective, growing to a business scale of 300 billion yen, we see today's requirements for decarbonization and a circular economy as major business opportunities, and our most important task is to establish a business portfolio that will position us for long-term growth.

In the Industrial Machinery Products Business, there are still many untapped fields. One that we are looking at in particular is chemical recycling, a method of recycling waste plastic. This process enables the conversion of waste plastic into recycled plastic raw materials with the same physical properties as new materials. We will focus on deploying the JSW Group's technologies and knowledge to expand the chemical recycling field and further advance the integration with the plastic processing machinery field. For molding machines, we will focus on optimizing global production of plastic injection molding machines, and work to expand sales of magnesium molding machines to the automotive industry, with the goal of being among the world's top five in the injection molding machinery industry.

Meanwhile, in the Material and Engineering Business related to energy and infrastructure, we will take steps to ensure continued profit by reinforcing and transforming production systems, while capitalizing on demand for renewal of existing infrastructure.

In new businesses, we will monitor rapidly evolving markets, and build up our business foundation in materials for electronics such as gallium nitride and composite materials for aircraft and automobiles. Our policy will be to respond swiftly to change and customer needs, and rather than handling everything in-house as previously, we will consider collaboration with other companies or mergers and acquisitions to develop new fields and quickly establish a third core business alongside our materials and industrial machinery products.

Deepening ESG Management and the JSW Group's Responsibility

The JSW Group has conducted its business activities with consideration for the environment—examples include the ongoing reduction of CO_2 emissions at production sites, and development of plastics machinery that contributes to recycling of plastic resources. We have also focused on developing human resources that contribute to building a sustainable society and on establishing a transparent management structure. Creating social and environmental value through our businesses and pursuing corporate value by promoting various environmental, social and governance (ESG) initiatives is our goal, and we see it as our social responsibility. The ESG Promotion Committee, established in April 2021, has been given the role and functions of a "command post" that will drive these initiatives forward.

Among specific ESG actions, in the environmental area, we will continue to reduce CO_2 emissions and conserve resources at our production sites, and develop and propose products and systems that contribute to a circular economy and active utilization of hydrogen-based energy. In social initiatives, we will conduct management with consideration for all stakeholders—customers, suppliers, employees, local communities, shareholders and others. For human resources, who are the source of our value creation, we will put greater effort into supporting the empowerment of every employee and increasing diversity. At the same time, we will expand hiring of mid-career talent to bring new ideas and knowledge into the JSW Group.

In governance, we increased the number of outside directors from two to three in June 2020. Adding an outside director with business experience in a field close to end consumers has resulted in more energetic Board of Directors meetings and more effective discussions on the future of management and businesses. By bringing in perspectives different from those of management, we are establishing a monitoring-focused governance structure with more effective supervision and oversight —giving us greater insight into how our business will change in the future from a big-picture perspective. We will continue working to enhance the effectiveness of the Board of Directors and the Audit & Supervisory Board, as well as to practice management with greater awareness of cost of capital. With these approaches, we will further raise the level of governance.

Four and a half years have now passed since I became president. I feel that the fresh perspectives of both employees and officers we have brought in from outside have helped to build the foundation for future sustainable growth. We remain committed to advancing *monozukuri* and value creation based on the spirit of *yompo-yoshi* in order to maximize corporate value. I would like to thank all of our stakeholders for their continued support.

Our History of Creating Value: A Journey in *Monozukuri* and Value Creation

	1907	1945	1970s	2000s	2021
	Founding (pre-war)	Post-war recovery	Rapid economic growth	Preparation for a new era	
Social issues and needs	• Development of defense industry	• Transition to commercial business	• Increasing energy demand in tandem with economic growth • Accelerating adoption of electronics in industry	• Decarbonization-related demand (electric vehicles, use of hydrogen energy) • Increasing LCD demand with the growing use of smartphones • Problem of marine plastic pollution	
	Launch as a national project	Growth based on a portfolio of technologies	Becoming a comprehensive company in materials and mechatronics	Toward establishing a new future vision for JSW	
Phases in our history	In 1907, The Japan Steel Works was established in Muroran, Hokkaido as a joint venture between Hokkaido Colliery Steamship Company and two U.K. firms: Sir W.G. Armstrong, Whitworth & Co., Ltd. and Vickers, Sons & Maxim, Ltd. Weapons manufacture as a national project contributed to the development of the defense industry. The Hiroshima Plant was inaugurated in 1920 to expand weapons manufacture.	After the Second World War, the focus of our business underwent a major shift to commercial products. Giving a new purpose to technologies that had been cultivated through weapons manufacture, we began in earnest to produce large steel castings and forgings, such as rotor shafts for power generation and pressure vessels for oil refineries, and plastic processing machinery, such as injection molding machines and plastic extruders.	We focused on creating new added value in response to market changes such as increasing energy demand and the accelerating adoption of electronics. In addition to manufacturing ultra-large components (pressure vessels and rotor shafts) for nuclear power plants, we switched from hydraulic to electric control of injection molding machines and introduced magnesium molding technology.	As part of our efforts to contribute to a society that is demanding products that are friendly to the global environment, we manufacture and supply separator film manufacturing equipment for lithium-ion batteries, molding machines for large plastic parts for automobiles that excel in weight reduction, and pressure vessels for hydrogen storage to support the hydrogen economy.	

Lineage of technologies and their provision to customers and markets

- Injection molding machines
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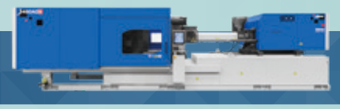
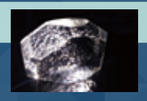
  - 
  - Expansion of materials → Magnesium molding machines
    - 
- Barrel processing technologies → Plastic extruders
  - Expansion to secondary processing equipment → Film and sheet manufacturing equipment
    - 
    - Expansion of product range → Separator film manufacturing equipment for lithium-ion batteries
- Artillery production technologies
  - Material manufacturing technologies → Rotor shafts for power generation
    - 
    - Annealing technologies → Excimer laser annealing systems
      - 
  - Manufacturing technologies → High-pressure cylinders, reaction towers (e.g., for fertilizer)
    - Pressure vessels for oil refining
      - Pressure vessels for nuclear power generation
      - Manufacturing technologies / Pressure vessel manufacturing and high-pressure technologies → Artificial crystals
        - 
        - Pressure vessel manufacturing and high-pressure technologies → Gallium nitride single-crystal substrates
          - 
      - Pressure vessel technologies → Hydrogen pressure vessels
        - Hydrogen handling technologies
          - 
- Special steel technologies
  - Research on hydrogen in steel → Hydrogen storage alloys
  - Material manufacturing technologies → Thick plate rolling → Clad steel plates
    - 
    - Expansion of product range → Clad steel pipes
      - 

Net sales

Value Creation Process

JSW Vision

Contribute to social development by creating innovations with original technologies

JSW Philosophy

1) Make our customers amazed and impressed
2) Coexist with society and achieve sustainable profitability
3) Keep the spirit of continuous innovation

JSW's Operating Environment

Carbon neutrality in Japan by 2050
- Expansion of hydrogen and ammonia businesses
- Evolution of storage batteries
- Expansion of renewable energy
- Decline in natural gas business
- Uncertain outlook for nuclear power generation

Solving the problem of waste plastics
(realizing a circular economy)
- Development of recycling and waste treatment businesses
- Switch to biodegradable plastics

Advances in digital transformation, AI and IoT
- Transformation of business models and how people work
- Full-scale investment in related infrastructure

Declining birthrate and aging populations in developed economies
- Shrinking domestic market, declining workforce

Worldwide population growth
- Expansion and diversification of consumption, especially in emerging economies

Capital

Financial capital
- Shareholders' equity: ¥135,719 million
- R&I rating: A (stable)

Manufactured capital
- Capital investment: ¥12,592 million
- Plants: 3 locations
- Test centers: 3 plastic machine locations, 6 molding machine locations
- Sales locations and Group companies covering major market regions in Asia, North America and Europe

Human capital
- JSW Group employees: 5,442
- JSW employees (non-consolidated): 1,846
- Engineering career-track employees (non-consolidated): 802
- Manufacturing skill training facilities: 2 locations

Intellectual capital
- Research and development expenses: ¥4,586 million
- Patents held: 1,012 in Japan, 676 overseas

Social and relationship capital
- Long-term and stable relationships with customers
- Good relationships with local communities around plants

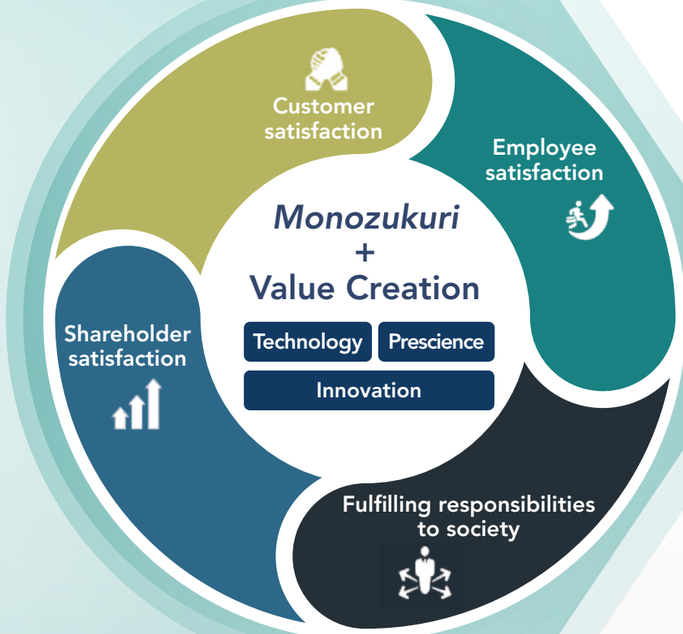
Natural capital
- Energy consumption: 2,714 TJ
- Water intake: 16.29 million m^3

Business Model

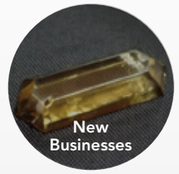
Industrial Machinery Products Business

Material and Engineering Business

New Businesses



Outputs



Value Provided

Customers
- Solutions to customer issues
- Increased productivity
- Reduced environmental impact through our products
- Provision of advanced technologies necessary for next-generation *monozukuri*

Employees
- A work environment with job satisfaction and excitement
- Growth as a highly skilled professional

Business partners
- Stable and ongoing business relationships

Shareholders and investors
- Medium-to-long-term enhancement of corporate value
- Stable shareholder returns

Local communities
- Contribution to the local economy through employment and procurement

Global environment
- Energy and resource efficiency through business activities
- Reduction of CO_2 emissions from in-house sources
- Reduction of CO_2 emissions through our products and businesses

Creation of social value
- Realizing a circular economy
- Contributing to carbon neutrality
- Contributing to a smart society

Sustainable enhancement of corporate value

ESG Issues

Reducing environmental impact

Creating social and environmental value through our businesses

Ensuring product quality

Providing work environments that offer peace of mind and opportunities for growth

Strengthening governance

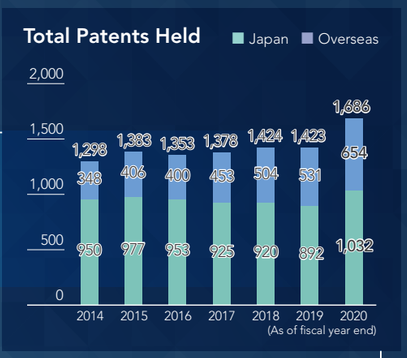
Drivers of Value Creation: Three Capabilities That Create Markets

Since its establishment in 1907, JSW has responded to the social issues and needs of each era, transitioning from the defense industry to commercial business, primarily in the energy field, and then to the industrial machinery field, mainly plastic processing machinery. Throughout this journey, our strength has been in consistently creating value through three sets of capabilities: technology, prescience and innovation.

For example, our capabilities in technology are evident in our track record in pressure vessels and other components for nuclear power plants—a field where there is no leeway for accidents. This track record is backed by customer feedback that says "JSW-made products do not break down easily even in harsh operating environments."

In recent years, we have earned recognition for our prescience and innovation related to technologies able to control the performance and quality of end-products manufactured by our customers on a submicron scale, including separator film manufacturing equipment for lithium-ion batteries, injection molding machines for magnesium alloys, and excimer laser annealing systems for manufacturing high-definition LCDs and OLED displays. These products are the culmination of R&D that is innovative and based on prescience in anticipating future social needs rather than chasing trends after they are already in motion.

We will continue to address social issues and needs, including those relating to the growing use of electric vehicles, plastic recycling and the hydrogen economy. Furthermore, we will demonstrate innovation in applying our accumulated capabilities in technology to new markets and technologies based on prescience.



Technology

Making products that are durable, reliable and high-quality is written in our DNA as a manufacturing company.

Strengths

- We continue to develop solid production systems that meet the requests of our customers. Each of our business bases has an integrated production system, from design and analysis to manufacturing, processing and quality inspection, that enables us to develop new products and technologies based on the emerging demands of our customers and the social issues and needs of society. At Japan Steel Works M&E, Inc., we have one of the world's largest production facilities for ultra-large steel castings and forgings.
- We continue to promote the manufacture of products under our ISO 9001-certified quality management system based on our corporate culture and skilled engineers that have satisfied customers' strict quality requirements since our founding.

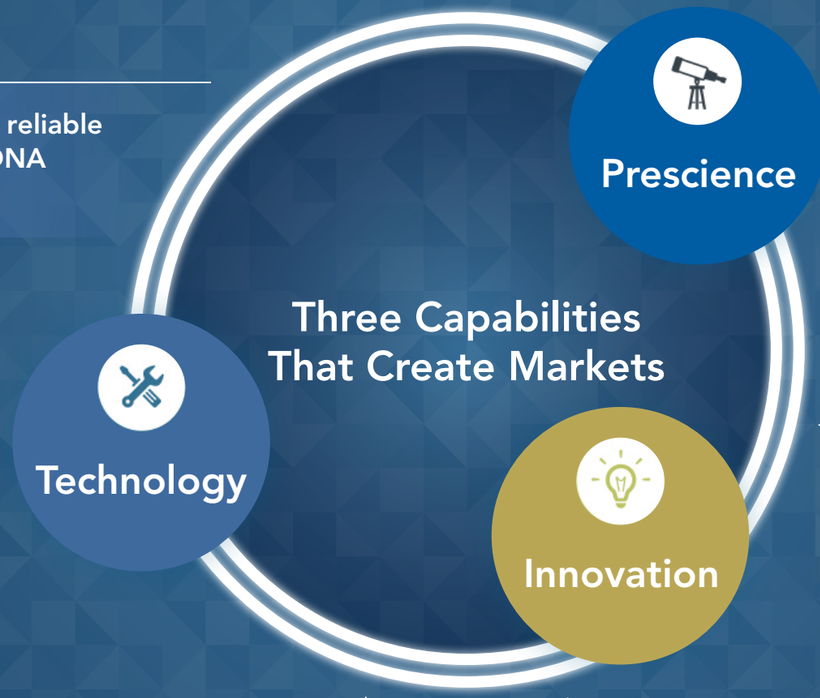
Case Studies

Harnessing Ideas from the Production Floor in the Development and Design of DSI Molding

Our production system facilitates the feedback of ideas from the production floor into design. Proposals arising from this system have included die-slide injection (DSI) molding, weldless pressure vessels, and wear-resistant materials and coatings. In particular, DSI molding, which enables molding of complex plastic shapes, was developed based on ideas from the manufacturing site, which were fed back into the design and prototyping process, and has resulted in the acquisition of many patents through the combined efforts of the technology development team. This ability to integrate the production line from design through manufacturing, making it easy to roll out improvements, is a JSW strength.

100% Market Share for Large Anvils That Meet Strict Requirements

Offshore wind power generation is being promoted as a countermeasure against global warming. We manufacture anvils for stationary monopile pile drivers used to directly anchor wind turbines to the seabed. Anvils are disc-shaped products with an outer diameter of up to 7 meters and we forge them from ultra-large steel ingots weighing over 600 tons using a 14,000-ton press—one of the world's largest. Our anvils must have high strength and toughness, and leverage our material composition, forging, heat treatment and machining technologies as they play a key role in the construction of offshore wind power generation around the world. We hold a 100% market share of large anvils with an outer diameter of 6.5 meters or more.



Prescience

We accurately perceive the trends of the times and boldly tackle fields where there is no precedent.

Strengths

We are always looking to the future in our development. We identify the needs of our customers and collaborate with them based on our technology, know-how and experience, thereby helping to increase social and relationship capital.

Case Studies

Introducing Technologies from Outside Japan to Create a New Market

In addition to plastic injection molding machines, which have been a focus since our shift to commercial business after the Second World War, we have also turned our attention to magnesium alloys, which have excellent characteristics—lightweight, dimensionally stable, vibration-damping, magnetic-shielding and recyclable. In 1992, we developed a magnesium alloy injection molding machine based on thixomolding technology developed in the United States. In order to develop the market for magnesium alloy molded products, we established a subsidiary company, MG Precision Co., Ltd. in 1996 for contracted manufacture of molded products. We continue working to create and expand this market.

Technology Development to Realize a Circular Economy

At the Technology Development Center in Hiroshima, our engineers work as one team to develop new materials and conduct process tests based on proposals from our customers. We have been mixing and manufacturing materials including biodegradable plastics and cellulose nanofibers, which are resin materials with low environmental impact, and conducting molding tests, as well as developing resin recycling processes (chemical recycling and material recycling) using extruders. All of which lead to the creation of products that meet global needs while also utilizing our existing technologies.

Innovation

We establish new technologies and open up new markets based on our high level of technology and expertise.

Strengths

Our research system nurtures and effectively deploys excellent human resources, and our training system develops high-level engineers by passing on the technologies and skills we have cultivated over many years.

Case Studies

80-Year-Old Research Used in Hydrogen Storage Alloys

Beginning in 1936, we researched theories regarding the formation of white spots in steel being due to hydrogen, and we were the first in the world to confirm the presence of hydrogen in steel. Since then, we conducted research on the phenomenon of hydrogen absorption and embrittlement in steel, and from there research on metals that can store hydrogen (hydrogen storage alloys), later developing products such as actuators and heat pump systems. In 2014, we built a system for storing electricity from solar power generation in the form of water electrolyzed hydrogen. We are continuing to advance R&D and manufacturing to help build a hydrogen economy.

From Steel Heat Treatment Technologies to LCD and Semiconductor Manufacture

Expanding on our knowledge of steel heat treatment technologies, we have been researching annealing technology using laser beams since 1994, and have developed a process for using excimer laser annealing systems to make polycrystalline silicon for semiconductors. This form of silicon is used in LCDs and contributes to higher display resolution in smartphones and other devices. In recent years, it has been used not only in LCDs, but also in the OLED semiconductor manufacturing process.

Special Feature: Cleantech

At the JSW Group, “cleantech” refers to technologies and products that contribute to the realization of a sustainable society. They directly contribute to the energy efficiency of our customers and indirectly contribute to the environment through our customers’ products.

Our cleantech is the result of the three capabilities that the JSW Group has cultivated over many years: technology, prescience and innovation. We will continue to focus on cleantech development.

Our Products

Technologies that contribute to the energy efficiency of our customers

Reducing peak power consumption in plants
Power storage technologies
Power regeneration technologies

Shifting from hydraulic to clean electric
Electric injection molding machine series

Supporting the shift to smart factories
J-WiSe™ (IoT solution)

Improving manufacturing efficiency by integrally molding multiple parts
Providing light, durable and environmentally friendly materials
Magnesium molding machines

Helping customers use resources efficiently
Improving fuel efficiency through weight reduction
Foam molding technologies

Environmentally friendly plastic materials
Processes for biodegradable plastics
Processes for cellulose nanofibers (wood-based materials)

Contributing to the environment through our customers’ products

Supporting the safety of the hydrogen economy
Hydrogen pressure vessels
Hydrogen storage tanks

Supporting the growing use of electric vehicles through batteries
Separator film manufacturing equipment for lithium-ion batteries

Power devices that contribute to energy efficiency
Next-generation semiconductors that support communications infrastructure
Gallium nitride single-crystal substrates

Reducing plastic disposed of as waste and promoting recycling
Material recycling
Chemical recycling

Carbon Neutrality

We help our customers improve their productivity and energy efficiency through the development of energy storage technologies, power regeneration technologies, and high-quality electric products. We also contribute to the realization of carbon neutrality through our storage tanks, which are the key to safety when building a hydrogen supply chain, and separators, which ensure the high capacity and safety of lithium-ion batteries and support the foundation for the growing use of electric vehicles.

Smart Society

With the spread of AI, IoT and digital transformation, society is becoming “smarter.” The JSW Group will continue to contribute to the evolution of a smart society through its IoT solution, J-WiSe™, which supports customers in converting to smart factories, and its technology for the mass production of gallium nitride single-crystal substrates, which are attracting attention as a next-generation semiconductor material.

Circular Economy

Efforts to shift away from plastic and realize a circular economy are accelerating worldwide. The JSW Group will support the realization of a future society with reduced plastic resource use (resource efficiency during molding), recycling (high-quality chemical recycling technology), and more widespread use of alternative materials (magnesium, biodegradable plastics, cellulose nanofibers), by contributing to each of these developments.

Evolution of Growth Strategies

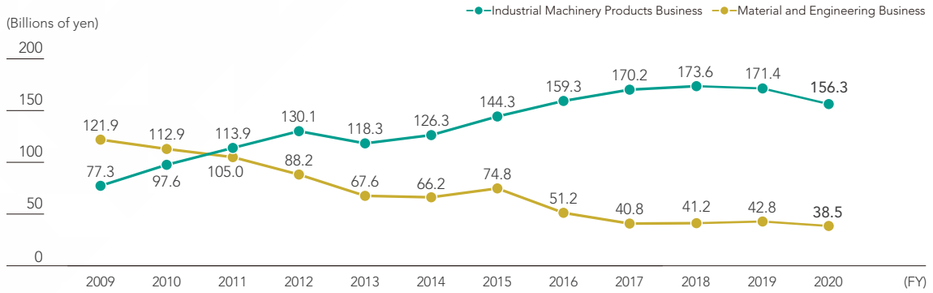
New Medium-Term Management Plan JGP2025

In the previous medium-term management plan, JGP2020, we failed to achieve our numerical targets due to the negative impact of U.S.–China trade friction and prolongation of the COVID-19 pandemic, but made progress on the plan's three basic policies.

The new medium-term management plan, JGP2025, is a five-year plan, which is a change from previous plans that were launched every three years. A three-year period means the focus is more on near-term efforts to meet the net sales and operating income targets that are the basis of the plan, which makes it difficult to set ambitious goals from a long-term perspective. In order to emphasize the original purpose of our medium-term management planning, which is to set goals from a longer-term perspective and then consider the measures needed to achieve those goals, we have set the plan period as the next five years.

JGP2025 is positioned as a key period for laying the foundations to realize our Long-Term Vision, which looks beyond fiscal 2026. As such, we are proceeding with activities aligned with four basic policies, the first of which is "towards the unprecedented general manufacturer of plastic processing machinery in the world."

Business Weighting (Net Sales by Segment)



	JGP2017 From April 2015 to March 2018	JGP2020 From April 2018 to March 2021	JGP2025 From April 2021 to March 2026	Long-Term Vision April 2026 and beyond
Positioning	"Advancing toward Top Global & Niche Corporate Group" Aiming to achieve top share at key points in customer value chains	Building foundations for solid growth of the JSW Group in the next ten years	Towards the unprecedented general manufacturer of plastic processing machinery in the world	A company with job satisfaction and excitement for employees Growing to a business scale of 300 billion yen
Basic Policies	1 Increase profitability of existing businesses 2 Foster new products and businesses and make them competitive as soon as possible 3 Reinforce Group management and promote alliances	1 Optimization of management resources and strengthening of alliances 2 Strengthening of after-sales services (stock-based business) 3 Acceleration in exploration and development of new businesses	Towards the unprecedented general manufacturer of plastic processing machinery in the world Make constant profit in the Material and Engineering Business Create new core businesses Implementation of ESG management JGP2025 Basic Policies	
Management Targets and Results				
Achievements and Issues				

Management Targets and Results

	FY2015	FY2016	FY2017	JGP2017 Final year targets
Net sales (Billions of yen)	223.3	212.4	212.9	220.0
Operating income (Billions of yen)	14.4	12.3	21.3	13.0
Operating income ratio	6.5%	5.8%	10.0%	6%
ROE	-13.5%	-4.6%	9.6%	8%

	FY2018	FY2019	FY2020	JGP2020 Final year targets
Net sales (Billions of yen)	220.1	217.5	198.0	260.0
Operating income (Billions of yen)	24.2	18.7	10.2	30.0
Operating income ratio	11.0%	8.6%	5.2%	11.5%
ROE	16.3%	7.2%	5.1%	14%

Achievements and Issues

Achievements
- Improved productivity and reduced cost of film and sheet manufacturing equipment and injection molding machines through capital investment
- Advanced the Muroran Plant restructuring project
- Reorganized the Research and Development Headquarters to promote development

Issues
- General delays in fostering new businesses
- Although progress made in small-scale business acquisitions, further need to strengthen alliances

Achievements
- Expanded plastic processing machine complex (absorption-type merger of Meiki Co., Ltd.; acquired GM Engineering Co., Ltd. as a subsidiary)
- Spun off the Material and Engineering Business
- Began collaboration with Tsukishima Kikai Co., Ltd. and established a joint venture with JX Nippon Mining & Metals Corporation; commercialized hydrogen-related business and transferred it to Japan Steel Works M&E, Inc.

Issues
- Yet to create new core businesses to follow plastic processing machinery
- Further expansion of plastic processing machinery complex

JGP2025 Basic Policies

1. Towards the unprecedented general manufacturer of plastic processing machinery in the world
2. Make constant profit in the Material and Engineering Business
3. Create new core businesses
4. Implementation of ESG management

	FY2019 Results	FY2020 Results	FY2023 Plan	FY2025 Plan	Change from FY2019
Net sales (Billions of yen)	217.5	198.0	250.0	270.0	+24%
Operating income (Billions of yen)	18.7	10.2	20.0	27.0	+44%
Operating income ratio	8.6%	5.2%	8.0%	10.0%	+1.4 pp
ROE	7.2%	5.1%	8.5%	10.0%	+2.8 pp

A company with job satisfaction and excitement for employees

Growing to a business scale of 300 billion yen

Aiming to respond to changes in the business environment and achieve expansion and growth through sustainable enhancement of corporate value, the JSW Group has formulated a Long-Term Vision that entails growing to a business scale of 300 billion yen by continuing to produce products and services that contribute to society through *monozukuri* and value creation.

To achieve this goal, all of our employees will need to fully apply their abilities to further strengthen our technology, prescience and innovation—the drivers of our value creation. To that end, our ongoing aim is to be a company with job satisfaction and excitement for employees.

New Medium-Term Management Plan JGP2025

JGP2025 establishes basic policies and action plans based on our recognition of business risks and opportunities from a long-term perspective looking beyond fiscal 2026. In particular, with regard to opportunities, we are considering not only the growth of existing businesses, but also the creation of new businesses and inorganic growth.

Risks

- Demand shrinkage for plastic processing machines amid a trend toward reducing plastic consumption
- Reduction in investment in thermal power generation and exploitation of oil and gas amid a trend toward decarbonization
- Contraction of demand for separator films after widespread use of solid-state batteries

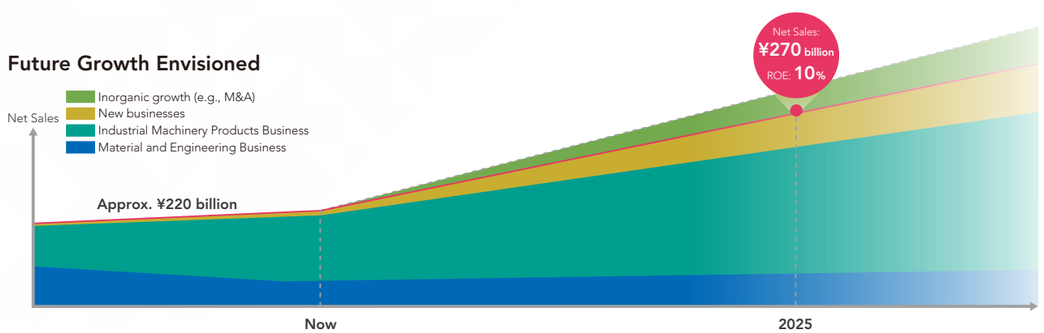
Opportunities

- Electric vehicle market expansion
- Emergence of bioplastics
- Full-scale investment in 5G infrastructure
- Advancement of AI and IoT technologies
- Expansion of consumption chiefly in emerging economies

Priority Measures under Each Basic Policy

1 Towards the unprecedented general manufacturer of plastic processing machinery in the world	• Pelletizers: Continue to increase market share in China • Twin-screw extruders: Further step up overseas sales, chiefly in China and Southeast Asia • Film and sheet manufacturing equipment: Strengthen full-line support for separator film manufacturing equipment; focus on growth areas such as 5G-related films • Plastic injection molding machines: Expand production capacity of small, ultra-large and special molding machines; strengthen sales by focusing on priority regions • Expand plastic processing machinery complex: Boost and capture demand for new products through M&A
2 Make constant profit in the Material and Engineering Business	• Steel castings and forgings: Gain orders for high-value-added functional materials to boost revenue; establish production systems for small and medium products and mass-produced products to win more orders • Clad steel plates and pipes: Build a production system resilient to fluctuations in operation loads by reducing the variable and fixed expenses of plants • Engineering services: Increase competitiveness of hydrogen-related products and market them outside Japan; win projects for welded structures for plants and infrastructure; expand the inspection service business using original technologies
3 Create new core businesses	• Utilize M&A to capture demand for industrial machinery in new fields • Swiftly attain profitability in three new businesses: photonics, composite materials and metallic materials
4 Implementation of ESG management	• Establish a new cross-departmental ESG Promotion Committee to effectively carry out ESG activities • Environment: Conduct business activities with consideration for reducing CO_2 emissions, promoting conservation and recycling of resources, and reducing the environmental impact of products • Society: Implement initiatives to shift the focus from work styles to job satisfaction; develop the next generation of leaders and secure diversity in the workforce • Corporate governance: Assess the business portfolio using a four-quadrant framework; establish criteria for business withdrawal and toughen investment criteria

Future Growth Envisioned

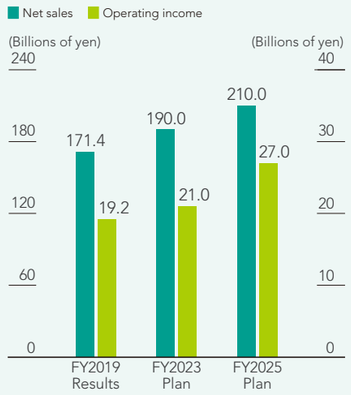


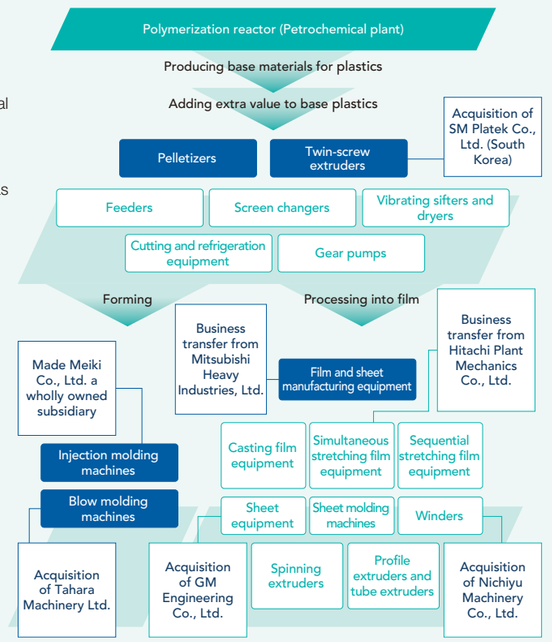
Industrial Machinery Products Business Segment

Priority measure: Expand plastic processing machinery complex

Expanding our plastic processing machinery complex entails expanding our business fields by strengthening existing products and incorporating additional products and peripheral equipment. As of the end of fiscal 2020, we have acquired seven companies/businesses to this end.

We will continue to cultivate sources of synergy within the JSW Group through active M&A, expand our business base as a general manufacturer of plastic processing machinery and support manufacturing that is essential in all areas of society.



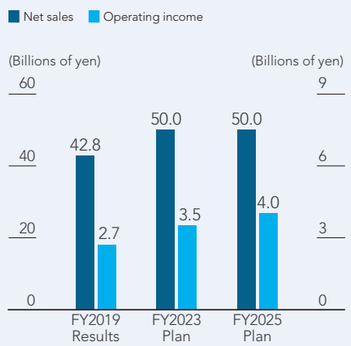


Material and Engineering Business Segment

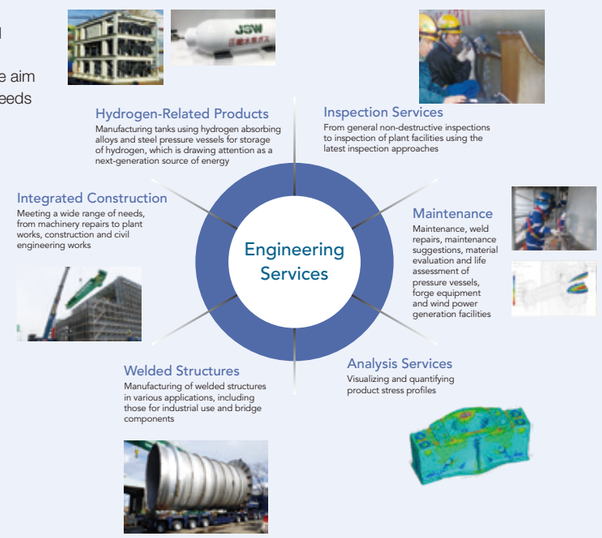
Priority measure: Strengthen our engineering services business

The JSW Group has consolidated the diverse technologies it has been developing and established a system to provide integrated and comprehensive engineering services that cover the entire value chain from design, production and construction to inspection, repair and maintenance.

In the future, by generating further Group synergies we aim to become a total solution business that can meet the needs of our customers on a one-stop basis.



Make effective use of the ability to offer general engineering services to turn this service into a core of the Material and Engineering Business



Plastics Machinery Business

Business Overview

The Plastics Machinery Business manufactures, sells and maintains plastic production and processing machinery, including pelletizers, twin-screw extruders, and film and sheet manufacturing equipment.

The plastic and film products made using our machinery and equipment are used in key components of a variety of products, including IT products such as 5G smartphones, personal computers, tablet devices and keyboards; electronic materials such as capacitors and semiconductor products; home electric appliances; lithium-ion batteries; automotive parts; food packaging film and containers; and catheters and other medical instruments.

We contribute to social development by creating innovations with original technologies. As such, we are expanding our business as an unprecedented general manufacturer of plastic processing machinery in the world.

Top Commitment

Message from the Head of the Division

The Plastics Machinery Business Division provides various equipment for use in the entire plastic processing process, from upstream to downstream. All of the division's products hold large market shares worldwide. To raise the competitiveness of each product and achieve further growth, the division has adopted the slogan **"Mixing Culture, Stretching to No. 1. To be the First Call PLASTIC Partner."** The slogan expresses our commitment to respecting diversity while growing our business (reflected in the words "mixing" and "stretching"), and our goal of being the best partner for customers worldwide.

Japan's push to achieve a carbon-neutral society in 2050 will heighten needs for lighter, more fuel-efficient automobiles, electric vehicles that contribute to decarbonization, and various equipment related to plastic recycling. Along with the development of the plastics industry, we expect the market for plastic processing machinery to also expand. As an industry leader, **we will actively develop technologies for plastic processing machinery and plastic recycling** that can make greater contributions to society, thereby helping to create a society that uses plastics sustainably, while protecting the environment.

SWOT Analysis

S Strengths
- Accumulated original technology and knowledge
- Lineup of plastic processing machinery to meet diverse needs
- Vertically integrated in-house production system for large machinery and equipment, wide variety of extrusion test equipment

W Weaknesses
- Long delivery times due to production of small-quantity orders with a high emphasis on large machines

O Opportunities
- After-sales service market based on long track record of deliveries
- Expansion of electric vehicle market
- Advances in waste plastic recycling, emergence of biodegradable plastics
- Increasing full-scale investment in 5G infrastructure
- Expanding consumption particularly in emerging economies

T Threats
- Decline in demand for plastic processing machinery due to shift away from plastic
- Shrinking demand for separator film due to spreading use of solid-state batteries

Sources of Our Strength

Among the products handled by the Plastics Machinery Business Division, plastic processing machines include large pelletizers, twin-screw extruders, film manufacturing equipment and spinning extruders, which fully incorporate the technologies we have accumulated over many years. On their own, each of these devices exhibit excellent performance, but combining the multiple machines and equipment we have commercialized into a full production line leads to even higher performance and efficiency. In addition to technology for manufacturing and processing plastics, we were quick to begin working on development related to plastic alternative materials and recycling technologies. In that regard, our highly experienced experts at our three technology development centers around the world continue to meet various customer needs relating to plastics.

Operating Environment

Plastic has many excellent properties, including formability, insulation, light weight and cost-effectiveness, and will remain an indispensable material. However, the problems of marine plastic pollution and plastic waste have drawn considerable global attention in recent years. In fulfilling its role and responsibility as a general manufacturer of plastic processing machinery, the JSW Group will not only sell plastic processing machinery but apply its technology, prescience and innovation to solve these environmental problems and help to realize a circular economy. Furthermore, as the shift to electric vehicles gains momentum in line with the move toward carbon neutrality, the JSW Group will increase the performance and productivity of its separator film manufacturing equipment to meet increasing demand for lithium-ion batteries associated with that shift.

Strategy and Measures for Growth

Under the previous medium-term management plan, JGP2020, the division's basic policy was to center our business on industry-leading plastic processing machinery and industrial machinery that contributes to society, and to be a corporate group that provides proactive solutions to customers.

We expanded the global market share of our pelletizers, and successfully increased orders and sales backed by the technological excellence of our separator film manufacturing equipment. We also upgraded production facilities at the Hiroshima Plant, while GM Engineering Co., Ltd. (which excels in plastic sheet equipment), and Nichiyu Machinery Co., Ltd. (which designs and manufactures a wide range of winders) were added to the JSW Group, making our lineup of plastic processing machinery more comprehensive.

In the new medium-term management plan, JGP2025, the Plastics Machinery Business is positioned as a business that will create profit and drive growth as JSW's core business. Specifically, we will strengthen the competitiveness of existing products to make our plastic processing machinery more comprehensive, and expand our business through active collaboration and alliances. In addition, we will contribute to the realization of a circular economy and carbon-neutral society through initiatives in plastic recycling, improvement of energy efficiency of equipment and reduction of plastic waste, as we expand our business value together with customers. By leveraging the comprehensive capabilities of Group companies, we will respond flexibly and quickly to changes in the global market.

Highlight

Establishment of Chemical Recycling Technology with Twin-Screw Extruders

JSW has established chemical recycling technology using twin-screw extruders. This technology achieves closed-loop recycling by pyrolyzing used acrylic resin and reprocessing it into raw materials. Acrylic resin made from reprocessed raw materials recycled with this technology has basic properties such as transparency and strength on par with those of resin made from virgin materials.

We will promote the recycling of plastics by making chemical recycling technology widely available. Turning plastic that would previously have been disposed of as waste into a raw material will help establish an environmentally friendly circular economy.

Building on a proven track record in thermal recycling and material recycling, we expect our twin-screw extruders to see expanded use for chemical recycling. We plan to open a chemical recycling technology development center at the Hiroshima Plant in 2022 to provide technical support geared to related needs.

TEX series twin-screw extruder

Injection Molding Machinery Business

Business Overview

The Injection Molding Machinery Business manufactures, sells and maintains plastic injection molding machines, blow molding machines, magnesium molding machines and other products.

Our plastic injection molding machines are electrically powered with excellent environmental performance. They range from small machines with a mold clamping force of 30 tons to ultra-large machines with a clamping force of 3,000 tons. These machines, together with our other products, including vertical injection molding machines and special molding machines, mean we are able to cover virtually the entire plastic secondary processing field, and meet the diverse needs of customers as one of our strengths. Our injection molding machines have a dominant share in their largest market, namely the automotive field. Furthermore, we are developing molding machines capable of producing larger magnesium alloy components—a key material under the CASE (connected, autonomous, shared, electric) paradigm—and we are strengthening sales of small and ultra-large plastic injection molding machines.

Of the 13 manufacturers of injection molding machines in Japan, JSW ranks first in shipment value and third in market share of units sold. We already hold a dominant share in medium and large machines, and we are promoting business activities to grow shipments and unit sales of small and ultra-large machines based on the strategy of expanding our plastic processing machine complex (see page 20).

Top Commitment

Message from the Head of the Division

At the Injection Molding Machinery Business Division, we are carrying out activities harnessing three main capabilities—product (improvement), sales (proposal) and service (response) capabilities.

In the Japanese market, we are strong in the automotive field, and are **focusing on environmentally friendly products** to actively capture capital investment demand, which is set to increase with the shift to electric vehicles as part of a carbon-neutral society. In overseas markets, we have positioned the United States, China, Southeast Asia and Europe as key sales regions, and we plan to expand our customer base among companies headquartered outside Japan. By product, we will expand production capacity for small machines at our plants in Hiroshima and China, and significantly strengthen our global production network. For ultra-large machines, we will expand our product lineup and enhance optional functions to precisely meet customer needs. We are aiming to be **among the world's top five manufacturers, with the leading domestic share of sales volume, as well as net sales of ¥85 billion or more within five years and ¥100 billion or more within ten years.**

SWOT Analysis

S Strengths
- A full product lineup from small to ultra-large machines, blow molding machines and special molding machines
- Extensive track record and supply capacity for medium and large machines for customers in the automotive field
- Safe and reliable customizable products and ability to customize for the needs of each customer

W Weaknesses
- Track record in sales of small machines (precision molding field) and ultra-large machines
- Inventory strategy to respond to sudden large orders

O Opportunities
- Increase in new capital investment with the shift to electric vehicles
- Expansion of renewable energy
- Expansion of needs for eco-friendly technologies (bioplastics, plastic reduction, effective use of electric power)

T Threats
- Acceleration of shift away from plastics
- Performance improvements among Chinese manufacturers with much larger production capacity

Sources of Our Strength

JSW's distinctive characteristics are its ability to consistently provide safe, reliable and highly customizable machines by continuously improving base machines with periodic model updates (improvement capabilities) and to offer flexible customization according to the specific requests of each customer (proposal capabilities). Our extensive track record and dominant supply capacity for medium and large machines for customers in the automotive field are unmatched by any other company. We provide our products through a sales network spanning ten locations in Japan and 21 locations in 11 countries outside Japan, and our worldwide service network (response capabilities) gives customers assurance and peace of mind. In addition, we have quickly worked to put our magnesium thixomolding technology (developed in the United States) into practical application. Through this technology, we are able to produce molded products with stable quality while ensuring their safety and environmental performance. We are also actively working to develop larger magnesium components for automobiles.

The JSW Group has a highly vertically integrated in-house production process. With our flexible production capabilities, we provide reliable injection molding machines through cooperation among the Hiroshima Plant, Meiki Plant and domestic and overseas production bases. Furthermore, we have a structure that allows us to provide products tailored to customer needs by combining different units, and to offer a diverse product lineup with easily customizable basic designs and standardized components.

Operating Environment

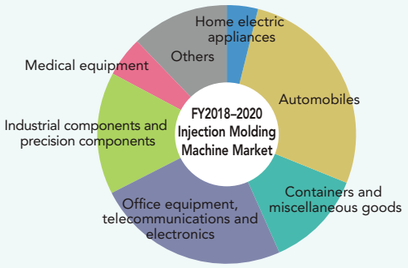
Our strengths in the injection molding machine market are in the fields of home electric appliances, automobiles, and miscellaneous goods and containers.

In home electric appliances, plastics are used in the exteriors and various other components of white goods. We have responded to the recent shift of major appliance manufacturers to high-end products, and to the diverse needs of newly emerging appliance manufacturers.

In automobiles, we provide plastic products such as bumpers, side mirrors, instrument panels, engine covers, intake manifolds and lamps, as well as injection molding machines for magnesium alloy products, which are finding increasing use in instrument panels. In particular, magnesium alloys are a promising material for molded products in the field of large automotive components. In addition to sales of injection molding machines, we manufacture large automotive components at a Group company. This will lead the adoption of molded products in this field.

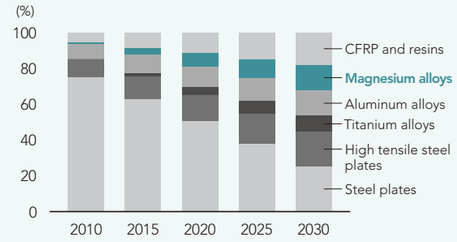
In miscellaneous goods and containers, the importance of injection molding machines has increased as the market for plastic pallets and household goods such as storage cases and drawers has grown with the expansion of online sales.

While we already have a strong position in medium and large machines, by improving our production system and



Source: Prepared by JSW based on data from the Japan Society of Industrial Machinery Manufacturers

Materials Used for Automobile Production



Source:
Extracted and edited materials created by the Ministry of Economy, Trade and Industry on the basis of data from the U.S. Department of Energy: *Vehicle Technologies Program: Goals, Strategies, and Top Accomplishments.*

Strategy and Measures for Growth

During the previous medium-term management plan, JGP2020, we increased sales and market share by expanding production capacity and flexibly meeting customer needs under a mass customization strategy centered on medium and large machines. At the same time, we built the foundation for growing sales of small machines by expanding production in China, and for growing sales of ultra-large machines by consolidating the Meiki Plant, which had been a subsidiary, and standardizing its production system and other operations with those of the Hiroshima Plant.

Under the new medium-term management plan, JGP2025, we will build on these achievements to expand sales of small and ultra-large plastic injection molding machines, and expand sales in our key regions—Japan, China, Southeast Asia, the United States and Europe—by strengthening production in China, the United States and Europe.

In the automotive field, the shift to electric vehicles calls for further weight reduction. Magnesium alloys have excellent properties in terms of specific strength, high rigidity, electromagnetic shielding and heat dissipation, and are also recyclable. These alloys are expected to find increasing use in the frames of drivers' displays, which are increasing in size, and in the casing materials of electronic control units for safety features and automated driving functions. To meet this need, we are developing larger magnesium molding machines, and are developing new applications using the demonstration equipment of subsidiary MG Precision Co., Ltd., which will lead to further expansion of the market.

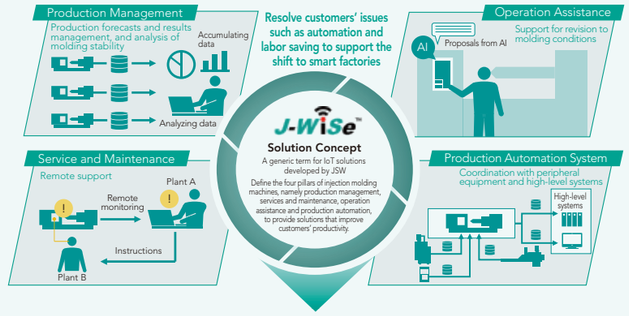
building a track record for small and ultra-large machines, we aim to secure the leading share in this field.

Highlight

IoT Solution J-WiSe™

J-WiSe™, developed by JSW and launched in April 2020, is our IoT solution for assisting customers in their shift to smart factories. We offer practical solutions in the four fields of production management, operation assistance, services and maintenance, and production automation.

Beyond existing applications, we are enhancing functionality to continue to evolve J-WiSe™ solutions. We also plan to broaden applications to our industrial machinery products in general, including twin-screw extruders, in addition to molding machinery products.



Industrial Machinery Business

Business Overview

The Industrial Machinery Business manufactures, sells and provides after-sales service for semiconductor-related equipment, including laser application products, hot presses and vacuum laminators for the manufacture of printed circuit boards (PCBs); flat panel display (FPD)-related equipment including excimer laser systems; and railway products that support economic infrastructure. Additionally, this business has responsibility for creating new core businesses.

Top Commitment

Message from the Head of the Division

The COVID-19 pandemic has sped up the transition from real-world services involving face-to-face contact to digital services delivered online. This "new normal" is expected to become take root and develop further in the post-pandemic era. In addition, Society 5.0 is taking shape, led by the accelerating digital transformation.

The Industrial Machinery Business Division handles manufacturing equipment for electronic devices as its core product. We view the new normal and digital transformation as an opportunity to **expand existing products and services**, and to apply our technologies and knowledge to **branch out into new products and businesses**.

SWOT Analysis

Strengths
- High market share and extensive track record in specific fields
- Development of equipment that reflects the wishes of customers that are industry leaders in their fields
- Wealth of experience in after-sales service

Weaknesses
- Dependence on smartphone demand (launch of new business lines)

Opportunities
- Continuous growth in demand for electronic devices due to new normal and digital transformation
- Emergence of new customers in tandem with decentralization of production bases to reduce risk of supply chain disruptions
- Market demand for high definition in FPDs expanding beyond smartphones and other small displays to medium and large displays

Threats
- Technological barriers due to industrial policies in various countries (shrinkage of target markets)
- Price competition

Operating Environment

- **Position in the Value Chain**

  Market demand for high definition in FPDs has expanded beyond smartphones and other small displays to medium and large displays, creating needs for new functions and reduction of manufacturing process costs. In the field of semiconductor products necessary for 5G communications infrastructure, for example, manufacturing equipment that enables more advanced manufacturing technology is required.

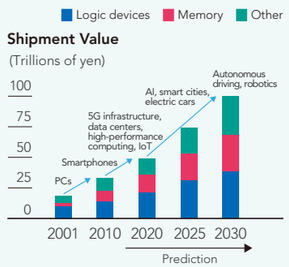
- **Market and Demand Trends and Future Outlook**

  The acceleration of digital transformation and global structural changes in the semiconductor industry are driving expansion of semiconductor demand. In addition, demand for manufacturing equipment is also likely to expand, partly due to the diversification of device production bases.

- **Market Competition**

  Price competition is a risk in this business. To avoid such competition we will continue to develop and provide high-value-added equipment by enhancing processing capability and quality.

Global Semiconductor Market



Source: *The Strategy for Semiconductors and the Digital Industry (Summary)*, Ministry of Economy, Trade and Industry (June 2021)

Strategy and Measures for Growth

In the semiconductor field, our vacuum laminators have contributed to the evolution of PCBs and semiconductor package substrates. Under JGP2025, we will develop a new model. We will restructure our existing excimer laser annealing systems business by integrating manufacturing and sales with after-sales service and by capturing market share in China. As part of that effort, the flat panel display device business was integrated into JSW Aktina System Co., Ltd. in 2021, and we are launching a specialized service company in China.

To develop new products and new businesses, we will identify new markets with good growth potential and future prospects where we can leverage our core competencies to build a competitive advantage. We plan to enter such markets through M&A and other approaches.

New Businesses

We have narrowed down our new businesses to three fields and are striving to rapidly achieve profitability in each business.

Photonics Business

Business Overview

The Photonics Business manufactures artificial crystals such as gallium nitride and lithium niobate single-crystal materials and develops a variety of technologies. Artificial crystals such as gallium nitride are manufactured in a high-temperature, high-pressure environment using large autoclaves that utilize our manufacturing technology for large forgings and castings. Using our strengths in manufacturing technologies for these single crystals and processing technologies for bonding and film deposition, we will manufacture and sell various crystal products, including crystal substrates and bonded substrates for optical communications.

Operating Environment

The market for devices related to high-speed, high-capacity communications is projected to grow at a rate of more than 10% annually in response to the growth of the 5G and IoT markets and rising needs for solutions to social challenges such as power saving. These devices are expected to find applications in various fields such as power semiconductors and high-intensity and high-power lasers that reduce energy use.

Strategy and Measures for Realizing Profitability

With our strengths in adding value with three types of high-grade crystal materials—crystals, lithium niobate and gallium nitride—and film deposition technology, we will supply products and contribute to solutions for high speed, high capacity, low loss and low power consumption.

Composite Materials Business

Business Overview

The aviation and automotive fields have been adopting thermoplastic carbon fiber reinforced plastic (CFRP) to reduce CO_2 emissions by improving fuel efficiency. In response, the Composite Materials Business is developing molding processing technologies for CFRP products, obtaining material design technologies, and developing and improving systems, including quality assurance.

Operating Environment

The size of the global thermoplastic CFRP market was ¥1.4 trillion in 2020, and is projected to grow to ¥2.2 trillion in 2025 and ¥3.9 trillion in 2035. The aviation field, which accounts for about half of the current market, is expected to show solid growth after the pandemic winds down.

Source: *Carbon Fiber Composite Material (CFRP/CFRTP) Technical Application Market Outlook 2020*, Fuji Keizai Co., Ltd.

Strategy and Measures for Realizing Profitability

We will expand this business with a focus on aircraft components by applying our standard compliance and quality management capabilities cultivated in the defense and nuclear power industries, and our expertise in manufacturing large composite material products (wind turbine blades) developed in the wind power generator business. The Composite Materials Business will help to reduce the weight and improve the energy efficiency of various modes of transportation, and will contribute significantly to the realization of a sustainable society.

Metallic Materials Business

Business Overview

Titanium copper and other high-performance metals need to be thinner and more functional, and the market is expected to expand further with the development of IoT and 5G. Against that background, JSW and JX Nippon Mining & Metals Corporation set up a joint venture, Muroran Copper Alloy Co., Ltd., to develop the business of producing high-performance metal products with high purity and quality.

Operating Environment

The expansion of IoT and 5G will fuel a rapid increase in data traffic. This will lead to higher performance requirements for smartphones, tablet devices and other telecommunication devices, which will result in expansion of the market for high-performance and high-quality metal products.

Strategy and Measures for Realizing Profitability

JX Nippon Mining & Metals Corporation, a global leader in the development and manufacture of high-performance metallic materials and products, and JSW, which has excellent melting and casting technologies, such as nonmetallic inclusion control, will introduce new equipment, designed with cutting-edge technology that will surpass any that is currently available. This equipment will be used to produce high-performance metal products with a high level of quality.

Material and Engineering Business

Business Overview

Japan Steel Works M&E, Inc., which conducts the Material and Engineering Business, was established as an operating subsidiary in April 2020 through the merger of JSW's Steel and Energy Products Business and wind power generator maintenance service business with four JSW Group companies. The Muroran Plant, where Japan Steel Works M&E is based, has for more than 100 years been involved in the development and manufacture of pressure vessels, various industrial machinery, large steel castings and forgings, thick plates, clad steel plates and other products used in public infrastructure and various plants. Going forward, Japan Steel Works M&E will strive to maximize the properties of copper to meet needs for more advanced and diversified materials, and add nonferrous metals and composite materials to its portfolio to provide a greater range of materials and improve reliability.

Taking advantage of its technologies and experience, the company is also building the capability to provide one-stop services from design, production, construction and installation to maintenance and inspection, analytical evaluation, and repair by applying engineering that enables solutions for a wide range of customer needs.

Top Commitment

Message from the Business Segment Head

In the Material and Engineering Business, we will **contribute to society with products that apply JSW's resources** to needs such as carbon neutrality, digital transformation and Japan's National Resilience Plan. We also plan to **review our business portfolio and steadily accumulate orders that will lead to new product initiatives and business expansion**. Breaking down plans by unit, the Steel Castings and Forgings Unit will seek to optimize its product portfolio, taking a firm defensive approach in larger products, such as conventional electric power and nuclear power rotors and rolls used in iron mills, combined with an aggressive approach in slabs for the IT field and products related to renewable energy, which are small and medium-sized products. The Steel Materials and Steel Pipes Unit is exploring demand peripheral to the oil and gas market to bring in new products, and is working to establish the flexibility to accommodate high-variety, low-volume production and products with short delivery times. The TES (Total Engineering Services) Unit has integrated the knowledge and customer connections that each business and company cultivated before the merger, and will pursue growth and expansion of business scale with maximum synergy.

SWOT Analysis

S Strengths
- Equipment that enables manufacturing of large forgings and castings
- Quality and safety honed in electric power and nuclear power products
- Ability to provide one-stop engineering services

W Weaknesses
- Cost competitiveness and operating rate are low because of build-to-order manufacturing
- Weak in handling small products and mass-produced products

O Opportunities
- Adaptation to the hydrogen economy to switch away from carbon
- Renewable energy-related products
- Focus on infrastructure projects, including Japan's National Resilience Plan

T Threats
- Decline in coal-fired power generation and oil and gas industries due to adaptation to zero-carbon society

Sources of Our Strength

The Muroran Plant has the facilities and technology to manufacture 670 tons of steel ingot, among the largest capacities in the world. Steel ingots manufactured to match the size of the end product are forged and heat treated on a large 14,000-ton press, and finished into their final shape in a machine shop with ultra-large machine tools that have a maximum processing weight of 400 tons.

In the clad products field, we are one of the few companies capable of handling integrated manufacturing from the manufacture of steel plates to pipe-making. For wide and thick steel plates, we have a rolling mill that was converted to electric power in fiscal 2020. We also have a steel plate straightening apparatus and a pipe-making press, and supply clad steel plates and steel pipes.

The steel castings and forgings and clad steel plates and steel pipes made with this equipment are used in public infrastructure and various manufacturing plants. Our basic technologies developed over many years to meet the stringent requirements of the electric power and nuclear power fields include special melting technology for extra-large castings and forgings, and forging and heat treatment technologies, and we have established them as key differentiators.

With the launch of Japan Steel Works M&E, Inc., the design, welded structure manufacturing, construction, inspection and repair services developed by individual Group companies have been centralized in the TES Unit. We are aiming to expand business and create a structure that enables us to meet customer needs in one stop with information sharing and synergies between different groups within the unit.

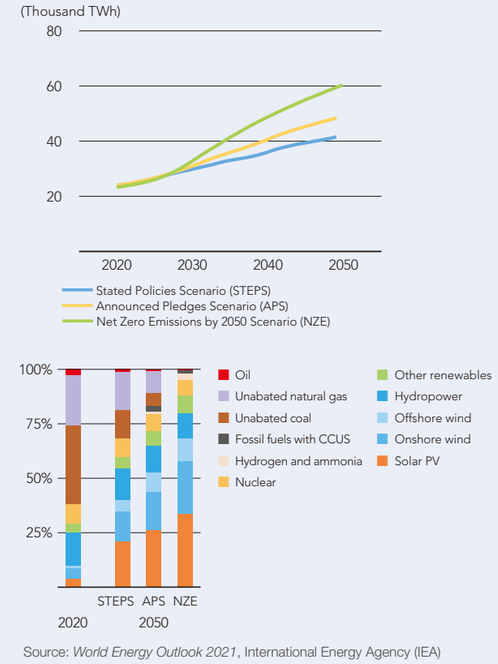
Operating Environment

Global energy demand is predicted to increase in every scenario considered by the International Energy Agency (IEA). Particularly in the net zero emissions scenario, a decrease in coal-fired power and an increase in natural energy are expected. As for the impact on our business, although new orders for large coal-fired thermal power plants will decline, there will be growth in gas turbine combined cycle power generation and replacement demand for services. Amid the withdrawal of competitors and industry reorganization, we anticipate that we will be able to secure a steady level of operations and sales.

For example, among the anvils used in the monopile pile drivers for anchoring the wind turbines of offshore wind farms to the seabed, we hold a 100% share of large anvils with an outer diameter of 6.5 meters or more. A further increase in size is projected in the future, and growth in the amount of offshore wind power in the energy mix in 2050 is expected (see figure on right), so we expect solid demand for our products.

The core businesses of the TES Unit are installation and repair work of manufacturing equipment and civil works for public infrastructure. Substantial growth in capital investment cannot be expected in manufacturing industries, but investment related to the renovation of aging equipment is expected to continue and grow, as are budgets for civil works as part of public works to address aging infrastructure facilities.

Global Electricity Demand and Generation Mix through 2050 by Scenario



Source: *World Energy Outlook 2021*, International Energy Agency (IEA)

Strategies and Measures for Growth

In the previous medium-term management plan, JGP2020, we achieved profitability despite falling short of targets, and spun off this segment into Japan Steel Works M&E, Inc. in the final year and transitioned to a new structure to improve profitability through organizational optimization, business restructuring and integrated operations. We will reinforce efforts for stable profitability under the new medium-term management plan, JGP2025.

Each unit will work to develop this segment's core business and to expand revenue. In the Steel Castings and Forgings Unit, we will incorporate high value-added functional materials that apply differentiating technologies. In the TES Unit, we will grasp societal needs such as hydrogen-related services and demand related to Japan's National Resilience Plan, and provide comprehensive engineering services throughout the value chain, from sales of hydrogen-related products and welded structures to plant construction and maintenance. On the other hand, in the Steel Materials and Steel Pipes Unit, the environment for orders continues to be tough amid postponements and reconsideration of natural gas projects, and so we will focus on strengthening the unit's revenue foundation by shifting to a production system that is resilient to operational change.

Highlight

Application of Differentiated Technologies: Invar Materials for the Electronic Components Industry

We are applying the high-purity steel ingot manufacturing technology we have cultivated to manufacture and sell invar, which has exacting requirements for inclusion size. Invar is a nickel and iron alloy, and is characterized by a low coefficient of thermal expansion at room temperature. It is used as a material in electronic components and precision instruments. We will continue to leverage our differentiating technologies to contribute to the supply of materials for IT and other new fields.

Electroslag remelting furnace

Manufacturing with electroslag remelting furnace

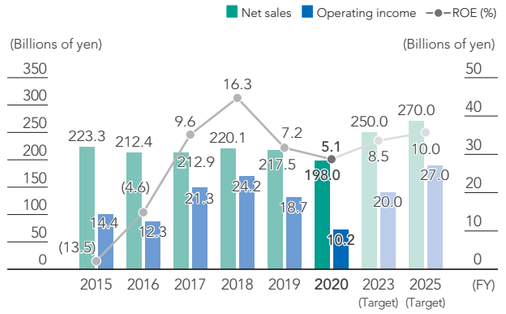
Rolling slabs
Applications: lithography equipment, electronic components, etc.

Financial and Capital Strategy: Message from the CFO

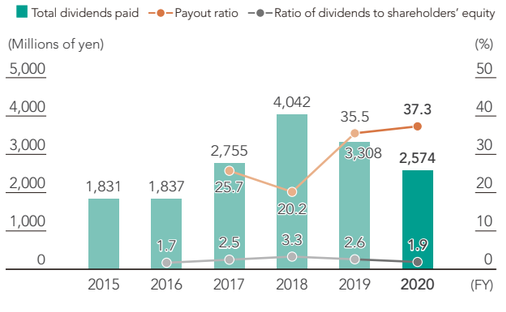
We will pursue sustainable improvement in corporate value with a policy of balancing growth investment and shareholder returns.

Hiroki Kikuchi
Director & Managing Executive Officer
CFO, in charge of Finance & Accounting Department and General Manager of Corporate Planning Office

Net Sales, Operating Income and ROE



Total Dividends Paid, Payout Ratio and Ratio of Dividends to Shareholders' Equity



Basic Financial Policy

JSW's basic financial policy is to maintain an appropriate balance between growth investment and shareholder returns, with the goal of sustainable improvement of corporate value. Achieving sustainable growth through *monozukuri* and value creation will require an optimal balance of growth investment aimed at increasing corporate value over the medium and long term and stable shareholder returns in proportion to results. Based on this financial strategy, we are executing the new medium-term management plan, JGP2025, with a framework centered on four basic policies: 1) Towards the unprecedented general manufacturer of plastic processing machinery in the world, 2) Make constant profit in the Material and Engineering Business, 3) Create new core businesses, and 4) Implementation of ESG management.

Financial Strategy of New Medium-Term Management Plan JGP2025

In JGP2020, the previous medium-term management plan, which ended in March 2021, we worked hard to achieve three objectives: optimization of management resources and strengthening of alliances, strengthening of after-sales services (stock-based business), and acceleration in exploration and development of new businesses. We made steady progress on most measures, but their results were not readily apparent. Our financial figures fell substantially short of targets due to escalating U.S.–China trade tensions in fiscal 2019 and the impact of the COVID-19 pandemic in fiscal 2020.

Based on the results of and reflections on the previous plan, in April 2021 we launched the new medium-term management plan, JGP2025. In JGP2025, we are emphasizing a long-term perspective in monitoring the progress of the plan, so we extended the period covered to five years. In terms of numbers, we positioned net sales, operating income and ROE as KPIs, and set three quantitative targets for fiscal 2025: net sales of ¥270 billion, operating income of ¥27 billion, and ROE of 10%.

As for returns to shareholders, we aim for a consolidated payout ratio of 30% or more, to pay dividends based on a dividend on equity (DOE) ratio of 2% or higher, and to pay total dividends of ¥20 billion during the period of the plan. Previously, we had adopted a dividend policy of paying a stable dividend as well as a performance-based dividend, but after seriously reflecting on the fact that the dividend was reduced for a second consecutive year in fiscal 2020, we revised our shareholder return criteria. We hope that this will increase the transparency of our dividend-related decision-making process and provide reassurance to shareholders and investors.

Allocate a Total of ¥105 Billion to Capital Investment, R&D Investment and M&A

Our plan for cash flow allocation in JGP2025 calls for a total of ¥105 billion on capital investment, research and development investment and M&A to reinforce the competitiveness of existing businesses and create and nurture new businesses. We will use cash on hand and deposits (¥89.4 billion as of March 31, 2021) and proceeds from sales of cross-held shares with a view to converting non-operating assets to earning assets, in addition to cash generated from operating activities during the period of the medium-term management plan. From the standpoint of strengthening our financial position, funds for investment are determined with a preference for cash first, then debt, then equity, based on the pecking order theory, and have decided to cover the investment plan of JGP2025 entirely with cash (including cash from sales of assets). If there are promising M&A opportunities in excess of the cost of capital, we will flexibly take advantage of them.

Optimizing Our Business Portfolio

To upgrade our business portfolio management, the Board of Directors is discussing and considering ways to accurately gauge the cost of capital in each business and use that information in decisions on investment and business withdrawal. However, we do not intend to set uniform standards for assessing growth potential and return on capital, and mechanically make withdrawal decisions. The key to effective business portfolio management is accurate assessment of the future of each business. To avoid falling into a situation in which the equilibrium is diminishing, we need our decision-making to be effective and to constantly reinforce business competitiveness and enhance profitability.

Contributing to Society with the Spirit of *Yompo-Yoshi*

The JSW Group is working diligently to implement ESG management with the aim of achieving sustainable growth through *monozukuri* and value creation, and to contribute to society with the spirit of *yompo-yoshi*.

Promoting ESG management will lead to not only value creation for customers and society, but also sustainable improvement of the JSW Group's corporate value. We believe this will enable employees to share in the joy of our achievements and realize personal growth.

We will continue to practice appropriate information disclosure and enhance dialogue with stakeholders to be a corporate group that is trusted by society.