

# Industry & Infrastructure

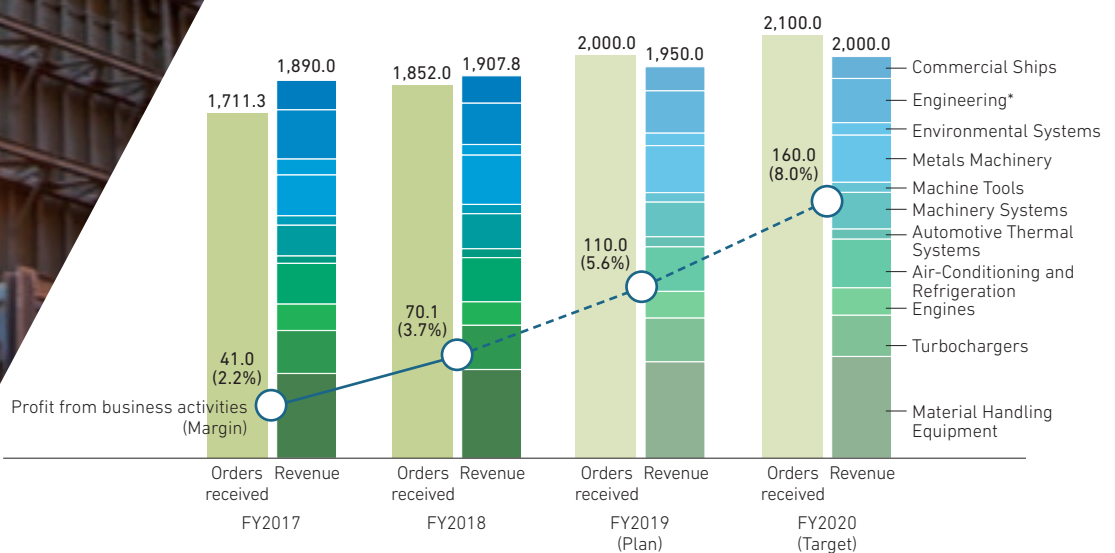
The Industry & Infrastructure domain and its diverse range of environmentally friendly products support people's daily lives in countless ways: air-conditioning systems in households and offices; forklifts in logistics; transportation systems and ships in the movement of people and things; and metals machinery, chemical plants, and a wide range of machinery in the industries and societies, help to make people's lives and society happier and more fulfilling. In January 2018, we completed a structural reform that transformed all operations into business companies. In this new stage of growth, through our technologies and products, we will move forward social infrastructures and living environments to the future.

Main SDGs contributed to



## Operating Performance

(Billions of yen)



\* Chemical plants, transportation systems, etc.

## Business Environment and Addressing Social Issues

Recently, achieving economic development while reducing environmental impact has become an increasingly important social issue. Environmental regulations are growing more stringent in various fields, prompting MHI Group to increase social contribution through its technologies and experience. For example, more stringent international emissions regulations on ship exhaust gas will go into effect in 2020. We view that demand for compliant equipment is rising in response. Additionally, needs are continuously rising for turbochargers that help improve fuel consumption and reduce CO<sub>2</sub> emissions in automobiles and for centrifugal chillers adapted for use with low-environmental-impact refrigerants.

At the same time, the rapid expansion of e-commerce has exacerbated labor shortages in the global logistics market and prompted the need to improve distribution efficiency.

Over the medium to long term, efforts to address social issues such as urbanization and climate change will be of even greater importance.

## Areas of Focus under the 2018 Medium-Term Business Plan

We have divided our business portfolio into three categories: growth investments, earning capacity enhancement, and shift areas of competition/shift to new business models, and are working to strengthen our businesses based on these categories. As for Material Handling Equipment, Thermal Systems and Turbochargers, to expand revenue and profit, we will continue our growth investments in alignment with each strategy to strengthen sales and marketing, as well as developing and launching strategic products. We have positioned Metals Machinery, Engines, Machinery Systems, and Machine Tools under the earning capacity enhancement category. For these businesses, we will strive to enhance efficiency in preparation for business environment changes to secure continuous and steady profit. Focusing on medium- to long-term growth, we will work to achieve differentiation and to shift toward competitive areas for Commercial Ships, thereby strengthening technologies in response to environmental regulations. For Engineering and Environmental Systems, we will work to shift to new business models. Also, in addition to effectively utilizing MHI Group's shared technology function, we will work to mobilize human resources within the domain, thereby enhancing the competitiveness of each business company.

## Business Opportunities in the Near Future

For our diverse range of businesses operated across the globe, we view every need of environmental initiatives and technological innovation in each region or in each industrial field as business opportunities. At the same time, we view every effort to address social issues and respond to global warming, which are now needed to an even greater extent in the global market, as business opportunities. Over the long term, we will capture the changes in infrastructure toward distributed/autonomous configurations as well as changes in flow of resources toward recycling and reuse to create new business opportunities and spur innovation.

## Cultivation of Key Technologies and Creation of Synergies

Toward the realization of sustainable social infrastructure, we will focus on development of environmentally friendly and energy-saving solutions, and on improvement of efficiency in operations with labor-saving and unmanned technologies. Furthermore, collaborating with the corporate shared technology functions and utilizing external resources, we will strive to establish and provide common platforms of digitalization for business companies. Through these efforts, we will work to strengthen our businesses.

Strengths	<b>S</b>	Expertise cultivated in a wide range of product fields and effective utilization of resources within the domain
	Material Handling Equipment	• Third-largest business scale in the world
	Thermal Systems*1	• Extensive product lineup and world-class environmental and energy-saving technologies
	Turbochargers	• Development of highly efficient products leveraging high-speed rotational technologies
	Metals Machinery	• Full product lineup and global presence
	Engineering group*2	• Engineering capabilities that create added value through the integration of technologies
	Transportation Systems	• Advanced system integration capabilities in urban transport and extensive experience with APM*3
Chemical Plants	• Advanced EPC*4 management capabilities based on extensive plant experience	
Commercial Ships	• Superiority over competitors in environmental and energy-saving technologies	

\*1 Thermal Systems: Air-conditioning & Refrigeration, Automotive Thermal Systems \*2 Engineering group: Engineering, Environmental Systems  
\*3 Automated People Mover (fully automated, driverless vehicles) \*4 Engineering, Procurement, and Construction

Weaknesses	<b>W</b>	Tendency to be affected by short-term economic fluctuations
	Engineering group	• Volatility in orders received
	Commercial Ships	• Relatively weak cost competitiveness on repeated construction of ships with the same specifications

Opportunities	<b>O</b>	Material Handling Equipment	• Increasing market for logistics solutions with expansion of e-commerce business
	Thermal Systems	• Rising awareness toward environmental preservation	
	Turbochargers	• Growing trend toward downsized engines with turbochargers in response to environmental and fuel performance regulations	
	Engines	• Growing power generation market in line with increases in demand for distributed power systems	
	Metals Machinery	• Increasing demand for energy savings and low-environmental-impact products, expanding demand for high-value-added products such as high-grade steel sheets	
	Engineering group	• Increase in customer needs through the entire plant lifecycle of the EPC business • Rising global awareness of environmental issues	
	Transportation Systems and Environmental Systems	• Market growth in emerging countries due to economic development and urbanization	
	Chemical Plants	• Increasing plant investment in natural gas-producing countries (including the U.S. and Central Asian countries)	
	Commercial Ships	• Increasingly stringent environmental regulation of maritime transport	

Threats	<b>T</b>	Rise of manufacturers in emerging countries and sense of uncertainty in the global economy
	Engineering group	• Emergence of new players due to the arrival of alternative technologies • Increasing risks due to changes in the external environment (geopolitical risks, etc.) and customer demands
	Commercial Ships	• Increasingly severe competition as the gap between supply and demand for new ships persists, reorganization of South Korean shipbuilding industry

## Strategies

### Dividing Existing Businesses in Three Categories

Expand revenue and profit in growth markets		<ul style="list-style-type: none"> <li>• Strengthen sales (expansion of direct sales, strengthen sales network, etc.) &gt; Material Handling Equipment, Thermal Systems</li> <li>• Promote unmanned and automated operations &gt; Material Handling Equipment</li> <li>• Develop and launch strategic products such as low-environmental-impact products &gt; Material Handling Equipment, Thermal Systems, and Turbochargers</li> </ul>
Material Handling Equipment	<b>Growth investments:</b>	
Thermal Systems		
Turbochargers		
Enhance efficiency in preparation for the business environment changes		<ul style="list-style-type: none"> <li>• Promote further optimization of structure and processes following previous years' PMI and strengthen lifecycle businesses &gt; Metals Machinery</li> <li>• Focus resources into core competencies &gt; Engines</li> <li>• Resource sharing and mobilization of human resources &gt; Machinery Systems</li> <li>• Pursue mass customization and launch new products &gt; Machine Tools</li> </ul>
Metals Machinery	<b>Earning capacity enhancement:</b>	
Engines		
Machinery Systems		
Machine Tools		
Improve earning capacity through differentiation		<ul style="list-style-type: none"> <li>• Accelerate shift to high-value-added areas such as high-density outfitted ships</li> <li>• Strengthen marine engineering businesses in response to environmental regulations, etc. &gt; Commercial Ships</li> <li>• Strengthen lifecycle businesses &gt; Engineering/Environmental Systems</li> </ul>
Commercial Ships	<b>Shift areas of competition</b>	
Engineering/Environmental Systems	<b>Shift to new business models:</b>	

## Growth in the Mass and Medium-Lot Product Manufacturing Business

The mass and medium-lot product manufacturing business, such as Material Handling Equipment, Thermal Systems, and Turbochargers, is currently driving growth for MHI Group. In these businesses, we will focus on growth investments, including M&A, as we work to achieve further business expansion.



Laser-guided type AGF



Centrifugal chiller with low-GWP\* refrigerant

\* Global Warming Potential

In the mass and medium-lot product manufacturing business, we have continued to achieve an annual growth rate of 16% since fiscal 2012 owing to our global expansion initiatives and the series of collaborations with overseas partners, M&A, and so on. In fiscal 2019, we expect to record revenue of ¥1 trillion. To steadily achieve the goals of the 2018 Medium-Term Business Plan, we will implement the following initiatives.

For Material Handling Equipment, demand is increasing due to the spread of e-commerce. At the same time, the need for automation and safety in operation is rising due to labor shortages in the logistics industry. Under these circumstances, we are further enhancing sales and marketing and have acquired direct sales stores in North America that allow us to expand direct sales and enter into new business such as the rental/used vehicle business. We will also strengthen our global collaboration with overseas partners. Furthermore, we will strive to achieve differentiation by providing unmanned and labor-saving solutions such as the laser-guided type AGF\* that leverage our technological capabilities.

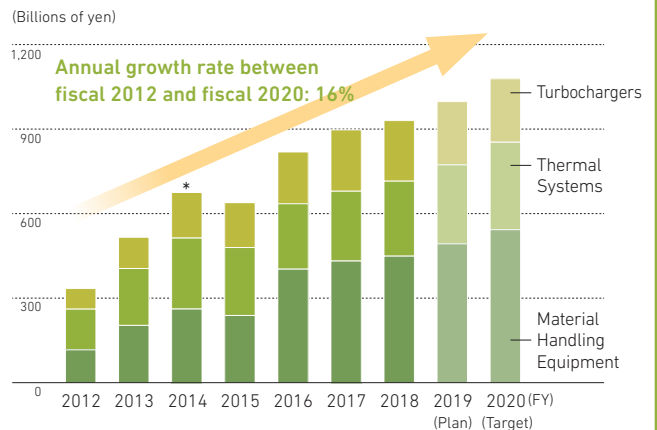
\*Automated Guided Forklift

For Air-conditioning & Refrigeration Systems, we foresee stable market growth to continue due to the strengthening of environmental regulations, centered on advanced countries, and the economic growth in emerging countries. In response to this, we will further reinforce our global sales network especially in Europe and China and continue to introduce environmentally friendly products. In addition, for Automotive Thermal Systems, we will

expand the electric compressor business with a view to rapid growth of the EV market. To ensure the success of these initiatives, we will strengthen our R&D activities as well in both of these businesses.

For Turbochargers, we will aim to maintain and expand our share in the global markets where we are seeing market growth due to the further tightening of fuel efficiency (CO<sub>2</sub> emissions) regulations. We will also work to increase sales in emerging countries, where motorization continues to progress. At the same time, we will promote the development of products designed for EVs, hybrid vehicles, and plug-in hybrid vehicles in response to the diversification of powertrains. We are also improving our productivity applying IoT, aiming to further strengthen our profitability.

### Revenue Results and Forecasts for the Mass and Medium-Lot Product Manufacturing Business



\* 15-month accounting period, due to change of account closing at some consolidated subsidiaries