We are accelerating innovation to provide solutions to social issues, like the low birth rate, aging population, and shrinking labor supply, while reforming our business foundations to support stable growth.

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Looking to the Future to Achieve Dramatic Innovation

Kawasaki simultaneously advances product innovation, which accelerates the resolution of social issues, and process innovation, which improves the profitability of existing businesses. Furthermore, with an eye to the future we are reinforcing our technological base by engaging in the development of innovative, cross-field basic technologies as well as the human resource development of engineers and technicians.

In terms of product innovation, we aim to create new solutions in the three fields of focus designated under Group Vision 2030 and to transform our business models.

To realize “a safe and secure remotely connected society,” we will further hone remote operation technologies, building on a core comprising the robotics technologies the Group has developed over the years, to realize a society that is safe and inclusive for all. To ensure the safety and security of remote operations, we are taking an open innovation approach to quickly solve such technical issues as response lags and signal interruptions. We aim to expand the use of robots into fields that until now have been dependent on in-person human labor, such as medicine, logistics, construction, and manufacturing.

Regarding “near-future mobility,” we envision smart cities in which means of mobility are interconnected. Various forms of autonomous mobility, such as transport robots, drones, ships, and off-road utility vehicles, will coordinate with one another, seamlessly connecting with individual needs and data from the surrounding area, making it possible to meet diverse logistics needs. This can provide an answer to the last mile problem, which is expanding alongside demographic graying and population decline, and the Kawasaki Group is advancing technological development in this area through the various forms of mobility technology it boasts.

Contributing to Carbon Neutrality by 2050

Under “energy and environmental solutions,” we are taking on the major issue of realizing a carbon-neutral society. The Japanese government’s declaration of its intention to reach net zero CO_2 emissions by 2050 has triggered a major acceleration in the shift to a hydrogen-powered society.

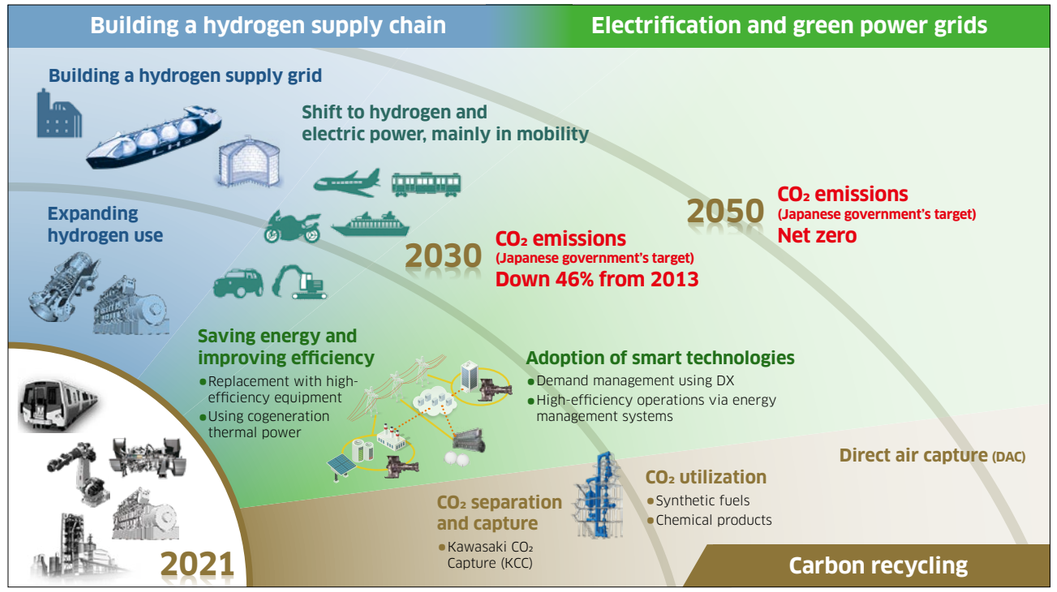
Specifically, expected hydrogen consumption in 2030 has grown tenfold from previous estimates to 3,000,000 tons. There are currently many technological hurdles that will have to be overcome to meet this much demand. These include increasing the size of the tank systems on liquefied hydrogen carriers as well as at liquefied hydrogen bases and developing high-efficiency, large-scale liquefaction systems. However, Kawasaki has the advantage of more than decade of technological development aimed at building a liquefied hydrogen supply chain, and we will continue to lead the way toward a carbon neutral society.

To achieve a hydrogen-powered society, stimulating demand among potential large-scale users of hydrogen will also be important. We are already working on the development of high-efficiency hydrogen gas turbines and hydrogen gas engines. In addition, we are advancing development aimed at securing our position as a leader in the field of hydrogen-fueled airplanes, looking at the development of new aircraft and engines as well as airport infrastructure for rapid refueling.

In carbon recycling, we have begun demonstration testing of the Kawasaki CO_2 Capture (KCC), an energy-saving system for separating and capturing CO_2. Building on this technology going forward, we envision direct air capture (DAC) for capturing CO_2 directly from the atmosphere. Low-cost hydrogen supply is key to these efforts as well, and we are nurturing nascent technologies that we hope will allow us to realize business models based on new material chains that are not reliant on fossil fuels.

Achieving net zero CO_2 emissions will also require the balanced use of renewable energy. To prevent the danger of large-scale blackouts, sophisticated energy management systems (EMSs) that control power supply in response to demand will be crucial. We are examining the possibility of building on the EMS-related technologies we have developed to optimize the operations of our customers’ power stations and plants to create systems that provide stable regional power supplies.

Technological Development Aimed at Carbon Neutrality



We also see the shift to electric-powered mobility as essential and are working to rapidly develop technologies for electrification, including that of airplanes, ships, hydraulic systems, and motorcycles.

From Selling Products to Selling IP and Services: Creating Businesses in Licensing and System Operation

The other major area of development is process innovation.

We have begun efforts in this area with the reinforcement of total quality management (TQM) aimed at enhancing the efficiency of existing business processes. At the same time, we are advancing digital transformation (DX) in our value chains and operational management to strengthen and streamline our business foundations.

In terms of DX, beginning in fiscal 2021, we are focusing on building the foundations of work style and professional fulfilment reforms, a management data platform, and next-generation cybersecurity. Furthermore, we have been quick to begin building digital innovation platforms with the intention of transforming the Group’s business models by shifting from selling physical products to selling IP and services. For example, in the hydrogen business, in order to respond to future demand growth, we plan to advance into such fields as licensing, the supply of core components, the provision of services, and the operation of hydrogen systems.

We are implementing an initiative to enhance development and design processes, dubbed Kawasaki Design Process Transformation (K-DPX), with the ultimate aim of unifying and standardizing design processes Company-wide. Furthermore, we are employing digital technologies to reinforce coordination between engineering chains and supply chains and more actively utilize existing expertise. Unifying and standardizing design processes will facilitate the flow of people between internal companies and is also important in terms of reducing procurement and quality control costs at the Group-wide level.

Developing Human Resources and Technologies to Be Ready for Future Risks

Even the most cutting-edge technologies will eventually become obsolete. The sustainable management of a business therefore requires the strategic turnover and activation of human resources and technologies. Foreseeing the issues that society will face in 10 or 20 years is not easy, and I think that imagining and preparing for a variety of possibilities is the only way to ensure our ability to rapidly respond to emerging needs. In fact, I would say that preparing for risks and developing the technologies and people to avoid them is the core impetus for everything that the Corporate Technology Division does.

For example, the rapid uptake of electric technologies could disrupt the stable procurement of motors. The development of motors that use no rare-earth magnets is a way of preparing for and avoiding this business continuity risk. Holding seminars on applying AI and programs for nurturing young engineers to develop personnel with the technical skills to create new solution businesses is also among the measures we need to take to be ready for the future.

Striving to ensure we can meet the needs of society no matter how times change, we will continue to advance product innovation and process innovation while further honing our basic technologies and creating new value using digital technologies. By doing so, we will ensure that Kawasaki will continue “Changing Forward.”