

## Research & Development Group

As we work to realize a sustainable society, there are growing expectations for the value that new digital technologies such as Web 3.0 and metaverse can provide in a world transitioning towards carbon neutrality and a circular economy, and value chains are being reconfigured in response to the pandemics and geopolitical risks. It is against this background that Hitachi has embarked upon its Mid-term Management Plan 2024 in which “Green, Digital, and Innovation” feature as key elements in the ongoing evolution of its Social Innovation Business to realize a sustainable society and support people’s well-being with data and technology.

The Research & Development Group is focusing its efforts on the creation of new value through GX and DX to support the continuing growth of Hitachi’s customers’ businesses, and on innovation to resolve future societal challenges. These efforts have evolved from establishing collaborative creation (co-creation) centers at sites in each region under the Mid-term Management Plan 2018 to other initiatives such as expanding co-creation activities leveraging the Kyōsō-no-Mori facility set up the Kokubunji site, in Tokyo to promote innovation and the establishment of the Corporate Venturing Office to invest in and work with startups for new business models, under the Mid-term Management Plan 2021. Such efforts are now being further accelerated under the Mid-term Management Plan 2024, which came into force from FY2022, with steps being taken to develop Lumada-based digital service businesses and to strengthen radical innovation to resolve societal challenges.

The creation of digital service businesses starts with an understanding of the challenges faced by customers, and through “IT, OT, and products” the Hitachi Group works as “One Hitachi” to create new value for customers. To realize this, Hitachi is accelerating innovation through dialogue with customers to gain a deeper appreciation of the challenges they will face in the future and by working with them to deliver value through data-driven co-creation. The section on “Innovation for Advancing with Customers” describes how Hitachi is working toward this goal in different areas.

For radical innovation to resolve societal challenges, Hitachi is backcasting from the anticipated challenges facing customers and wider society in 2050 to identify what needs to be done today. In addition to driving innovation to deliver breakthroughs, Hitachi is working with various stakeholders through ecosystems aiming to overcome the current challenges. The section on “Innovation for Addressing Future Challenges” describes the progress of this research and development work as well as the activities of laboratories that Hitachi has set up in partnership with universities and other research institutions.

By pursuing such initiatives, Hitachi is investing in leading-edge technologies and creating innovations leading to the future. Reports from the front line of research and development are accompanied by coverage of technologies and solutions intended to resolve societal challenges and deliver value to customers.

## Innovation for Advancing with Customers

The Research & Development Group works to deliver innovation on the basis of the Lumada growth cycle for growing in partnership with customers, leveraging GX and DX to resolve the challenges facing customers and wider society. The NEXPERIENCE methodology for co-creation with customers deploys digital technology in work with customers to identify new ways in which they can grow, going on to deliver the innovations needed to put these ideas into practice. As well as classifying ideas based on the characteristics of their business segments and the operations they entail, the Lumada growth cycle also involves the use of co-creation for implementation and scaling.

Activities in the Digital Systems & Services sector include improvements to the transparency of environmental management through the digital transformation of customer operations and social infrastructure. Along with the reform of infrastructure management and security enhancement, this also encompasses measures for automating and optimizing business processes while reducing workforce requirements. The subsequent section on the Green Energy & Mobility and Automotive sectors includes reports on the smoothing of energy supply and demand to help achieve carbon neutrality by enabling greater use of renewable energy, innovation and operational efficiency improvements for rolling stock, and technology for highly efficient EV charging infrastructure. The final section covers the Connective Industries sector and presents ways of optimizing and improving the efficiency of manufacturing plants, innovation in the development of medical products, solutions for smart cities and home appliances, innovative products, and work on a materials platform.

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## Innovation for Addressing Future Challenges >>> Page 143

In the process of formulating the Mid-term Management Plan 2024, the Research & Development Group talked to international institutions, universities, customers, and startups to help identify the societal challenges of the future. Looking ahead to the society of 2050, these consultations were then used as a basis for drawing up a map of areas that combine a high technological impact with a high weighting among customers and wider society. Reviewing this map, the society of 2050 was defined as one that is environmentally-neutral, supports an active 100-year lifespan for its citizens, and features the co-evolution of digital technologies, people, and society. Innovations were then identified that will help to realize this society.

For example, direct air capture and energy storage and supply were identified as helping to achieve an environmentally-neutral society. Similarly, minimally invasive cancer therapies and cell design were seen as ways of overcoming cancer and other difficult-to-treat conditions, important requirements for a society that supports an active 100-year lifespan for its citizens. Similarly, research and development work at Hitachi targeting the co-evolution of digital technologies, people, and society includes the establishment of open innovation ecosystems with universities and startups, one example being in the field of silicon quantum computing aimed at boosting the data economy and computing innovation. Through this research, Hitachi is taking up the challenge of radical innovation as it seeks to resolve the societal challenges of the future by backcasting from 2050. This section presents important examples of this work.