

Message from our CTO

Societal Issue Resolution by NTT Group's Technology



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Using Technology to Address Societal Issues

Providing customers with reliable telecommunications services is the most important role for NTT Group to fulfill. For NTT, it is necessary not only to prevent serious failures, but also to strive for additional technological innovation as we look toward the future.

As IoT becomes more widely used and the services that are essential to our daily lives diversify, the amount of traffic continues to grow, and we are approaching various limits in terms of data volume, latency, and power consumption.

The innovative technology that will break through these limits and usher in fundamental change is the IOWN concept in which NTT Group is engaged. While NTT Group initially

aimed to commercialize the concept around 2030, a number of social issues have emerged, including the aforementioned rapid increase of network load, the global situation regarding carbon neutrality, the expansion of traffic due to a spike in remote usage spurred by COVID-19, and soaring oil prices. For these reasons, NTT Group will move its 2030 target forward and aim for practical implementations at an earlier date. After we have put some technologies to practical use by the end of FY2022, we would like to show everyone the results of our IOWN-related efforts at the 2025 World Exposition in Osaka, Kansai in particular, as well as implement these innovations at NTT Group facilities by 2026.

The Value that IOWN Provides and Collaborating with Our Partners

Additional utilization of optical technology is important for implementing the IT infrastructure with both high performance and low power consumption that IOWN is aiming for. We will introduce optical technology, which can handle signals while using less power than electricity, not only for transmission, but also for processing. This will enable us to achieve advanced fusion of light and electricity (photoelectric merging technology), in which optical technology is applied in extremely close proximity to the parts where operations are performed. Incorporating this technology into semiconductors will fundamentally solve the aforementioned issues. Photoelectric merging technology is an area in which NTT excels, given the optical-related technologies it has amassed. At present, Japanese companies possess significant technology and manufacturing capabilities in

the semiconductor value chain. However, we have not yet achieved the kind of presence a global stakeholder should have. Our goal is for Japan to spearhead IOWN in collaboration with our global partners and become an indispensable global player in the semiconductor value chain.

Established in the United States in 2020, the IOWN Global Forum has already attracted more than 100 members from Europe, the United States, and Asia. This forum is unique in that it is not limited to the IT and telecommunications industries, but also encompasses the automotive, plant, and financial industries, as well as academic institutions. We believe that we can work hand in hand with the members of the forum to create a value chain that utilizes IOWN in every industry.

Investing in Intellectual Property Acquisition, Human Capital, and More

NTT has traditionally accumulated research and development of technologies for the next generation. R&D expenditures for FY2021 were ¥248.0 billion, but this figure is limited to expenses spent from the basic and fundamental research phase through R&D for practical applications. For example, we invest in the development phases of the series of processes for creating new services and providing them to our customers, and we naturally promote ICT utilization and DX initiatives in addition to R&D. If we take these into account as well, I am proud to say that NTT Group's investment in intellectual property is on par with that of the world's largest companies.

I believe that investors are interested in whether these investments in intellectual property acquisition will lead to further enhancement of NTT Group's corporate value. We intend to further strengthen information disclosures as we communicate our R&D activities and results so that investors can gain a better understanding of our activities.

Of course, investment in human capital is essential as well if we wish to continue producing research results. We need the best talent in the area, and we would love to have them join NTT Group. For example, Dr. Brent Waters, who joined

NTT Research, Inc. in 2019, is the No. 1 expert in the world of cryptography, and he was honored at Crypto 2022, one of the leading international conferences on cryptographic research, in August. He received the sole Best Paper Award at this year's conference. More than 20% of the papers recognized at the conference originated from the NTT Group. The NTT Group is the leader in the world of encryption technology. With the emergence of quantum computers, the possibility of conventional encryption technology being breached has increased dramatically, but NTT Group's encryption technology can offer security that is free from breaches. Encryption technology is also closely intertwined with security, and we believe that we can make strong contributions in this domain as well.

Going forward, we will need excellent researchers not only in encryption technology, but also in the energy and other fields. To this end, we will aim to make NTT Group more attractive, not only in terms of compensation, but also in terms of prestige, the research environment, and many other aspects so that people wish to work here.

