

## Future Growth Businesses

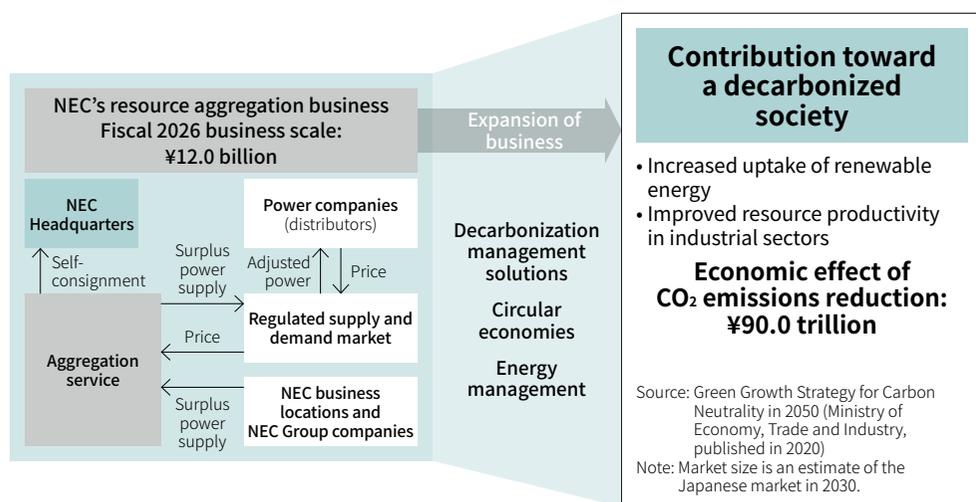
NEC is working to create new businesses that can contribute to realizing its vision for the environment, society, and life set forth in the NEC 2030VISION from a medium- to long-term perspective. Based on our disruptive technologies that have the potential to break the mold of the current mainstream, we are working on commercialization through collaboration with leading-edge customers and research institutions, including those overseas, and by using the new business development expertise and methods that NEC has developed in recent years.

### Green / Carbon Neutrality Businesses

#### Businesses Related to Carbon Neutrality

With the aim of helping to build a decarbonized society, NEC operates businesses related to carbon neutrality among its growth businesses as part of its social contribution efforts. With the increased popularity of electric vehicles (EVs) and all-electric housing and other factors increasing power demand, resource aggregation businesses facilitate optimal and efficient energy use by matching companies with surplus electricity generated from renewable energy sources.

Through our business, we will promote efficient and optimal use of surplus electricity in society and contribute to the carbon neutrality of society as a whole. Over the medium to long term, we will also promote greening in growth businesses such as digital government, core DX, and global 5G, while strengthening resource aggregation and other carbon-neutral-related businesses to expand their scale.



### AI Farm Management (Agriculture)

Amid harsh global environmental conditions such as global warming, climate change, soil contamination, and soaring water and fertilizer prices, it is essential that safe food is delivered to consumers. To address agricultural issues such as demanding farm work and its associated heavy risks, stable food procurement and redistribution in response to climate change and

extreme weather, and the creation of new business models that meet diversifying food needs, we visualize field conditions necessary for farming using soil moisture data and satellite image data, provide AI-based farming advice and harvest control, and optimize the entire value chain in food and agriculture.

Social issues		Agricultural service <b>CropScope</b>	Social value created	
Food supply-demand problem caused by population increase	Aging and shrinking farming population		Increasing production volume per unit area	Achieving the same level of farming as expert farmers, using AI
Responding to surging fertilizer prices and reduction of environmental impact	AgriTech market in 2027: ¥5.16 trillion Annual growth rate: 12-13%	Crop simulation Agricultural digital twin	Portugal demonstration experiment in 2020: <b>Nitrogen fertilizer reduced by 20%</b> (Compared to general farmers' average)	Portugal demonstration experiment in 2022: <b>Yield amount increased by 20% while reducing irrigation by 15%</b>

#### Examples of initiatives: 1)

**DXAS Agricultural Technology: Kagome Co., Ltd. and NEC establish a joint venture in Portugal to provide farming support for processed tomatoes using AI**  
By automating fertilization and irrigation using AI, crop model growth simulation has succeeded in reducing nitrogen fertilizer by 20% and increasing yields by 20% while reducing irrigation by 15%. We will proactively develop the service for provision on a global basis through verification trials.



#### Examples of initiatives: 2)

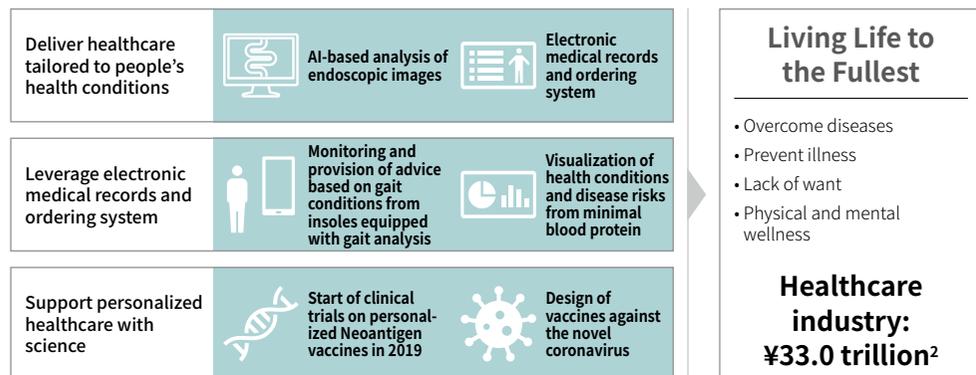
**Applying the know-how from tomato cultivation to other crops**  
Applying the AI farm management know-how developed through tomato cultivation to other crops, we have already provided services in 11 countries for 14 different crops and are expanding our efforts worldwide through cooperation with various companies and research institutes. We aim to contribute to the resolution of global environmental issues by significantly reducing the amount of water used for agriculture, which accounts for approximately 70% of the water consumed worldwide, through AI farm management.

Future Growth Businesses

### Healthcare and Life Science Businesses

NEC will expand businesses centered on the medical care, lifestyle support, and life science domains using AI and other technologies that serve as its strengths. Based on the concept that we want every patient, family member, and healthcare provider to live as they would like to

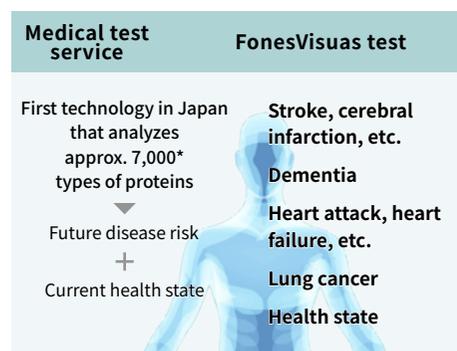
live, we are developing our businesses with the goal of "live as you: know yourself and make the right choices for you," and are targeting a business value of ¥500 billion<sup>1</sup> for healthcare and life science businesses in fiscal 2031.



<sup>1</sup> Calculated using both the comparable company method and the DCF method based on a target for 2030 (revenue of ¥100.0 billion)  
<sup>2</sup> Source: Future Direction of the Next Generation Healthcare Industry Council (published by the Ministry of Economy, Trade and Industry, 2018). Market size is an estimate of the Japanese market in 2025.

### FonesVisuas: A Health Promotion and Medical Test Service

Japan is known as a "super-aging society," and social security costs, particularly medical costs, are increasing, driven in part by the state of medical care and welfare. In addition, the aging society is an even deeper issue in rural areas of Japan. To establish a sustainable social security system and build a society in which each of its citizens can flourish for longer, it is imperative to realize a society where people can enjoy good health and longevity. NEC provides testing services to predict future diseases and determine the body's current condition by utilizing technology that analyzes approximately 7,000 types of proteins. In addition, we also offer lifestyle improvement services tailored to various needs such as nutritional, mental health, and dental



\* FonesVisuas is the first and only test in Japan using SomaLogic's analytics.

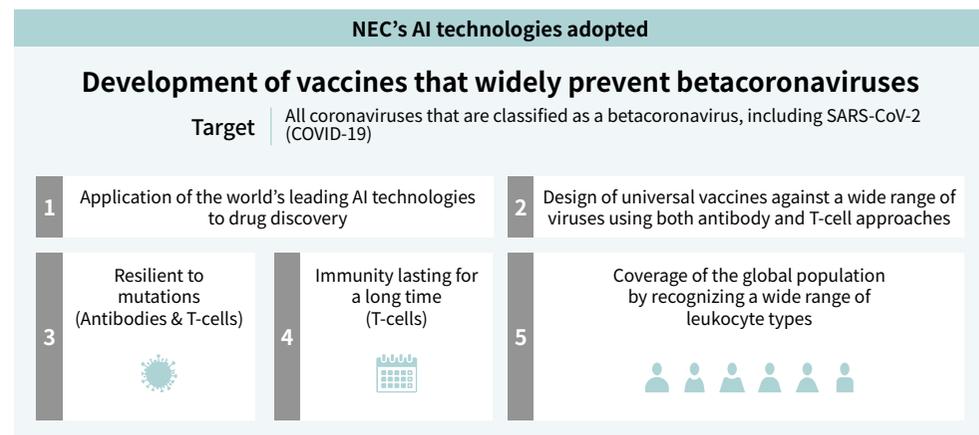
### AI Drug Discovery

The number of new cancer patients worldwide was approximately 18 million<sup>1</sup> in 2018, while cancer is the leading cause of death<sup>2</sup> in Japan, prompting the need for improvements in effective cancer treatment. NEC is applying cutting-edge AI to the field of drug discovery to develop safer and more effective advanced immunotherapies. We were the first Japanese company to be selected by the Coalition for Epidemic Preparedness Innovations (CEPI), an international fund that finances pharmaceutical

companies and research institutes engaged in vaccine development, to begin development of next-generation vaccines effective against all betacoronavirus genera, including SARS-CoV-2 and its close relatives, with the aim of contributing to next-generation medicine in the drug discovery and genome fields as well as other areas.

<sup>1</sup> "Global Cancer Statistics 2018": GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries URL: <https://doi.org/10.3322/caac.21492>  
<sup>2</sup> Ministry of Health, Labour and Welfare of Japan: "Vital Statistics of Japan 2017"

### Making innovations in vaccine development for infectious diseases with a view to achieving the 100 days mission



### Promotion of Personalized Treatment for Cancer Patients

NEC promotes personalized treatment through a strategic global partnership with BostonGene Corporation, a company that provides genomic testing for physicians in support of personalized treatment for cancer patients. In October 2020, we collaborated on genetic analysis of ovarian and head and neck cancer patients in clinical trials, and in December 2021, we expanded our

collaboration globally. BostonGene's analytical technology allows us to present recommended treatments, possible mutations, and biomarker responses to treatment. This will promote precision medicine in clinical practice in order to provide personalized treatment to cancer patients, most notably cancer immunotherapy.

## Employee Roundtable

# Realizing Sustainable Agriculture through DXAS Agricultural Technology

In June 2022, NEC and Kagome Co., Ltd. established a joint venture, DXAS Agricultural Technology (DXAS), in Portugal. We interviewed three employees of DXAS who are using the CropScope ICT platform to work together with tomato farmers to solve the difficult issue of how to improve cultivation efficiency and ensure a stable harvest and supply of crops while facing numerous challenges such as climate change, labour shortages, and environmental concerns.

🌐 For more details on CropScope, please follow the link below.  
<https://www.kagome.co.jp/english/smartagri/#page1>



**Ana Duarte**  
Business Developer

Ana

**Tiago Caetano**  
Agricultural Technician

Tiago

**Takashi Irie**  
Chief Operating Officer

Irie

**Q. Could you tell us how you came to work for DXAS and what the experience has been like?**

**Ana**

I'm an engineer at NEC. Gardening was a hobby of mine, and I had an interest in agriculture, so I happily stepped forward when the joint project with Kagome began in 2015. Agritech is technology that is developed based on the prerequisites necessary for agriculture, so it is an area in which I can make good use of my knowledge. From a technological standpoint, agriculture is one of the most difficult business fields as it is greatly affected by factors such as unpredictable weather.

**Tiago**

I joined Kagome's Agri-business Research and Development Center in 2019, despite being in the middle of my master's program in agriculture, to

participate in the ongoing CropScope project. I came from a farming background and grew up watching my grandparents and parents farm, so agriculture is in my DNA. I also have an interest in the use of technology and am very proud to be able to contribute to agriculture by combining these two interests.

**Irie**

I started out at NEC in Japan in domestic sales and then moved to the European market as an overseas sales representative. I then moved to Kenya for five years, where I was senior sales coordinator of NEC Africa, before returning to Japan to engage in new business development. I joined the Agritech team in 2021 and have been in Portugal since May of 2023 to promote DXAS.

**Q. What are some of the thoughts driving your efforts to transform agriculture?**

**Ana**

Agriculture is, and always has been, one of the most difficult professions. It involves working long hours, managing vast plots of land, and having to make countless decisions every day. Something unexpected always happens. The more I learn about farmers' work, the more I can't help but have respect for them. With CropScope, the AI learns the knowledge of

experienced farmers, meaning that decision-making and response to known events can be left to AI. This allows farmers to devote their time to tackling unknown issues and improving cultivation efficiency, thereby contributing to the expansion of farmers' businesses. Agritech has incredible potential, and if technology can help farmers in any way, I would be immensely happy.

Employee Roundtable

**Tiago**

For farmers, agriculture is their livelihood. They make investments and run the company with an eye to the future. With the future of whole families, including families of employees, at stake, it is no wonder that bringing in changes to conventional methods carries a risk. As such, we sometimes tend to be tenacious in our negotiations for proposals to increase crop yields. Our job is not to simply create and sell a product or service. We sincerely worry and think together with the farmers about their challenges, anxieties, and struggles as if they were our own. It's a very emotional job that takes a great deal of energy. But I believe that it is through this sharing of concerns and building of relationships of trust that we have been able to work together with the farmers toward the same goal and make the progress that we have seen.

**Irie**

Stable food supply is a very important issue in light of external factors such as global population growth and the abnormal weather events of recent years. Since 2015, we have collaborated with Kagome in various ways to address this issue and commercialize our efforts. I have only been involved in these efforts for one and a half years, but I feel that it is an appealing and challenging business area from the standpoint of building a better future. I have learned a lot and been inspired by the use of ICT—one of NEC's assets—in the seemingly unrelated field of agriculture.

**Q. How did you overcome any difficulties in your journey so far? Also, what do you feel will be the key factors in DXAS's business growth?**

**Ana**

When the project started out, we were following our own ideals. After two or three years, however, the project underwent a drastic overhaul that wound up inconveniencing our customers. With every new challenge comes a change in trajectory, but making that decision to change course can be extremely difficult. We used the project's overhaul as an opportunity to come together, broaden our horizons, and make improvements by sincerely taking on board users' opinions. This gradually led to CropScope receiving high ratings from customers. Shortly after that, we were unable to meet with farmers face-to-face for two years due to the COVID-19 pandemic. In the meantime, however, farmers started using Zoom, and we expanded our business by incorporating ideas from young people like Mr. Caetano and conducting sales promotion activities via webinars.

without being able to reap the benefits of such technological developments. To overcome this issue, we needed to create something that was intuitive and easy to use. We are constantly focused on ways to incorporate ever-evolving, complex technologies into the simplest possible form. CropScope is popular because it is easy to understand and simple to use. While there is still room for improvement, I believe that the product we have developed is great as a foundation.

**Ana**

I also think a large factor in CropScope's popularity is that positive reviews have spread by word of mouth among the farming community. Firsthand user experience can be very persuasive.

**Irie**

I believe the joint venture with Kagome was a key element in our business expansion so far. Had NEC approached this project alone, its lack of agricultural knowledge would have lengthened the business development process and gaining the trust of the farming community would have been difficult. DXAS exists because NEC and Kagome have made full use of the knowledge they have in their respective fields of ICT and agriculture, and this will also be the key to further business expansion in the future.

**Tiago**

Among Portugal's aging farming population, a large number of farmers have difficulty getting used to modern technology such as smartphones. Also, as Ms. Duarte said, farmers work long hours and have almost no time to become familiar with those kinds of devices. Meanwhile, technology is evolving by the day, and if things continue as they are, farmers will be left behind



Employee Roundtable

**Q. DXAS is developing its business globally. What do you think will be important as you expand into new regions?**

**Ana**

The key to business development will be how well we can build relationships of trust and work together with local farmers in each region. There will be issues that arise in other regions that we have not faced in Portugal. Developing technology that can address these issues together with local farmers will continue to be a major challenge going forward. This, however, is what makes agritech so exciting.

**Tiago**

Also, the circumstances of each region and the mentality of the farmers there will differ. For example, in Senegal, where we installed sensors last year, we had to start by searching for the necessary tools to complete the task. No matter what the circumstances, it is important that we never give up. I feel that this approach also leads to personal growth.

**Irie**

It is important to strike a balance between standardization and individual optimization. The platform CropScope is a system that is as standardized as possible to efficiently support farmers. On the other hand, methods of producing the same crop may differ greatly from region to region, giving rise to a risk in using standardized systems. I believe that incorporating services that are individually optimized for each region while striving for standardization is the key to expanding into new regions.



**Q. In today's society, food crises and environmental problems are pressing global issues. As a member of the DXAS team, which is tackling these issues head-on, do you have anything you would like to say to NEC's stakeholders?**

**Ana**

There is strong worldwide demand for the solutions that DXAS has to offer, and business expansion is inevitable. I'd like stakeholders to think of their support for DXAS as give-and-take, like watering or fertilizing plants. In return, we are committed to delivering results and ensuring that our efforts bear fruit.

**Tiago**

Optimizing invested resources is a major issue for achieving sustainable agriculture, and everyone at DXAS is open-minded and shares the ambition to wholeheartedly tackle such issues with the aim of realizing a better world. We hope that, by giving us their support, stakeholders feel that they are working together with us to resolve such social issues.

**Irie**

This is a very challenging business that aims to be successful while tackling issues that are difficult to commercialize, such as food crises and environmental problems. However, farmers have very high expectations of DXAS, and they highly commend our commitment to innovation in agriculture and to solving problems with a focus on the front line. We will do our best to contribute to Kagome and NEC from a business perspective through the growth of DXAS. We look forward to your continued support.

Related Articles:

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[Kagome and NEC establish a joint venture in Portugal to provide farming support for processed tomatoes using AI](https://www.nec.com/en/press/202206/global_20220615_01.html)
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[Kagome and NEC's joint venture DXAS provides AI farming advice and an automatic irrigation control service for low-volume, high-frequency irrigation \(in Japanese only\)](https://jpn.nec.com/press/202210/20221020_01.html)