KIZUNA

Spring
2024

Linking Japan and the World

JAPANGOV
THE GOVERNMENT OF JAPAN

KANAZAWA SHOKO
Calligraphy Artist

Born in Tokyo in 1985, she started learning calligraphy from her mother when she was five years old. One of the notable young calligraphers of today, her solo exhibitions have been held throughout the world, in cities such as New York, Singapore, and Prague. She was selected as one of the official poster artists for Tokyo 2020.

Welcome to KIZUNA, the official magazine of the Government of Japan.

This bold work of calligraphy is 絆(*kizuna*) written in Japanese. *Kizuna* means the enduring bonds between people—close relationships forged through mutual trust and support.

Originally describing the rope used to tether domestic animals such as horses and dogs, the meaning of *kizuna* has evolved over the years. A passage in *The Tale of the Heike*, compiled in the 13th century, uses the term to refer to the bonds of love between a father and his children. More recently, *kizuna* has gone beyond bonds tying together family and close acquaintances; it is now used in a broader sense of human ties and connections. Of particular note is the *kizuna* born among people during natural calamities, which fosters feelings of solidarity and serves as the underlying strength to overcome hardships.

Similarly, the *kizuna* cultivated among the countries of the world has the power to deepen cooperation for a better future. By reporting on a wide variety of topics concerning Japan, we hope that this magazine will provide opportunities for Japan and the rest of the world to connect and build strong *kizuna*.

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KIZUNA
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COVER

Prime Minister Kishida with Ukrainian Prime Minister Denys Shmyhal at the Japan-Ukraine Conference for the Promotion of Economic Growth and Reconstruction held in Tokyo on February 19, 2024.

Prime Minister KISHIDA Fumio delivering a keynote speech at the Japan-Ukraine Conference for the Promotion of Economic Growth and Reconstruction. He stated that support for Ukraine is "investing in the future" of the country, Japan, and the whole world.

INVESTING IN THE FUTURE:
JAPAN'S UNIQUE CONTRIBUTION TO UKRAINE

FEBRUARY 19, 2024

Full Text: https://japan.kantei.go.jp/101_kishida/actions/202402/19ukraine_kaigi.html

On February 19, 2024, the Leaders' Session of the Japan-Ukraine Conference for the Promotion of Economic Growth and Reconstruction was held in Tokyo, at which Prime Minister KISHIDA Fumio delivered the following keynote speech. At the end of the meeting, a total of 56 signed cooperation documents were unveiled in the presence of both countries' prime ministers. In addition, a joint communique, coordinated between the governments of Japan and Ukraine, was released as an outcome document of the conference.

Prime Minister Shmyhal, Ladies and Gentlemen.

Firstly, let me express my utmost respect again for the courage and perseverance of the Ukrainian people, who have been standing up in defense for the freedom and independence of their country for two years since the outbreak of Russian aggression. As the G7 Chair last year, Japan led international discussions on supporting Ukraine and has provided robust package, including financial assistance. Japan has stood with Ukraine and will continue to do so.

The origin of today's Conference dates back to my own visit to Ukraine March 2023. I visited Ukraine as G7 Chair. In my meeting in Kyiv with President Zelenskyy, he outlined his strong expectations for Japan's experience, its technology and private investment by our country for the long term reconstruction of Ukraine.

Following the visit, I decided to hold this Japan-Ukraine Conference for the Promotion of Economic Growth and Reconstruction with a conviction that Japan has much potential to make what I call "Japan's unique contribution."

President Zelenskyy once stated, "Your money is not charity. It's an investment in global security and democracy." I would like to make one additional statement. That is "investing in the future." The war in Ukraine is still going on at this very moment and the situation is not easy. The promotion of economic reconstruction, however, is not only investment for the future of Ukraine but also investing in Japan and the whole globe. We must strive for the future of all of us. Japan, through both the public and private sectors, will provide robust support for economic reconstruction and industrial enhancement that will lead to the economic growth of Ukraine, a country with significant potential. It is our aim to support Ukraine so that the country can achieve comprehensive economic development from the primary to tertiary sectors, including in such key areas as agriculture, manufacturing, and the IT industry.

With these themes in mind today, I would like to share with the Ukrainian people "3 Principles," "5 Actions," "50 Commitments" for the purpose of realizing "Japan's unique contribution."

To start with, there are three important principles for promoting "Japan's unique contribution."

The first of the 3 Principles is "inclusiveness."

With an emphasis on "human dignity," we will stay right beside with all the Ukrainian people, including women and children, and from a "Women, Peace and Security" or WPS perspective we will support Ukraine's self-sustaining development and reconstruction for the long term.

The second is "partnership."

The main actors in realizing Ukraine's reconstruction must be the people of Ukraine. The very key to promoting the long-term reconstruction of Ukraine in a sustainable manner is to work together with the Ukrainian people, rather than providing unilateral support from Japan. Japan will faithfully address the needs of the Ukrainian side and respond to those needs attentively.

The third is "knowledge and technology."

Japan's public and private sectors will all work together through an all-Japan approach, utilizing the knowledge derived from Japan's postwar and disaster reconstruction efforts, as well as advanced technology and knowhow from the private sector. Of course, the door is open to participation not only by major companies but also by small and medium sized enterprises (SMEs) with high-end technologies.

In addition to these 3 Principles, we will take the following five actions to promote Japanese private investment and create employment in Ukraine. I would like to announce those as important deliverable of today's conference.

First, we will conclude the new Tax Convention as part of the development of a legal infrastructure. We will also commence negotiations for a review of the Investment Agreement.

Second, to boost Ukraine's reconstruction, we will support Ukraine through international financial institutions by contributing to by the European Bank for Reconstruction and Development (EBRD)'s capital increase and by providing a two-step loan through the Black Sea Trade and Development Bank by JBIC.

Third, as a form of bilateral cooperation we will implement public-private partnership projects through ODA and JICA's Private Sector Investment Finance for Ukrainian venture capitalists.

Fourth, we will establish a JETRO office in Kyiv to expand business ties, investment and trade between the two countries. In addition, NEXI will establish new credit lines to reduce investment and trade risks for Japanese companies.

Fifth, we will also introduce measures to relax the multi entry visa requirements for Ukrainian people involved in Japan-Ukraine cooperation projects.

Specific commitments based on the 3 Principles and the 5 Actions are reflected in the over 50 cooperation outcome documents between Japanese companies, including startups, and their Ukrainian partners.

Japan will steadily follow up on these measures and items. Japan will continue to do our very best to support Ukraine's economic development at various phases ranging from initial emergency assistance and the day-to-day livelihood reconstruction of to more robust stages of industrial reconstruction and enhancement. We will also assist Ukraine in its efforts in day-to-day rebuilding of people's lives and in creating new industries through various measures of ours to build economic foundations of the country, which will help make its recovery/reconstruction processes more sustainable and, ultimately, make its whole economy more strong.

The reconstruction of Ukraine will not be achieved overnight. The solidarity of the international community in this line of effort also needs to be strengthened. We will work with our partners and international organizations, and closely coordinate with the G7 and other countries. We will make our measures and efforts closely in line with various developments in the international discussion, including an international Ukraine Recovery Conference to be hosted by Germany in coming June.

It is the very interest of Japan and the international community as a whole that, overcoming the scars of Russia's aggression, Ukraine realizes its reconstruction and regain its vitality. We sincerely ask for your cooperation of all the participants gathering here for today's Conference.

Thank you.

The above text was republished from the website
of the Prime Minister's Office of Japan:
https://japan.kantei.go.jp/101_kishida/actions/202402/19ukraine_kaigi.html

Prime Minister Kishida holding a meeting with Ukrainian Prime Minister Denys Shmyhal. He stated that Japan will continue to stand with Ukraine until peace returns to that beautiful land.

Left: Leaders pose for a commemorative photo at the Commemorative Summit for the 50th Year of ASEAN-Japan Friendship and Cooperation.
Top: Prime Minister KISHIDA Fumio attending the Commemorative Summit for the 50th Year of ASEAN-Japan Friendship and Cooperation.

TRUSTED PARTNERS:

THE OUTCOME OF THE COMMEMORATIVE SUMMIT FOR THE 50TH YEAR OF ASEAN-JAPAN FRIENDSHIP AND COOPERATION

In December 2023, the Commemorative Summit for the 50th Year of ASEAN-Japan Friendship and Cooperation was held in Tokyo. The Joint Vision Statement on ASEAN-Japan Friendship and Cooperation and its Implementation Plan were adopted as its outcome documents.

To mark the 50th anniversary of friendly and cooperative relations between Japan and the Association of Southeast Asian Nations (ASEAN), the Commemorative Summit for the 50th Year of ASEAN-Japan Friendship and Cooperation was held in Tokyo on December 17, 2023. Several related events took place during the three days around the Summit, including bilateral summit meetings with the leaders of countries participating in the commemorative summit, the Commemorative Ceremony for the 50th Year of ASEAN-Japan Friendship and Cooperation, and the first Asia Zero Emission Community (AZEC) Leaders Meeting.

A notable outcome of the commemorative summit was the "Joint Vision Statement on ASEAN-Japan Friendship and Cooperation." Subtitled "Trusted Partners," the statement declares, "Building on mutual trust, ASEAN and Japan will strengthen the Comprehensive Strategic Partnership that is meaningful, substantive, and mutually beneficial under three pillars, embracing ASEAN unity and centrality." The three pillars are titled "Heart-to-heart partners

A banquet was hosted by Prime Minister Kishida and Mrs. KISHIDA Yuko on the first day of the Commemorative Summit for the 50th Year of ASEAN-Japan Friendship and Cooperation.

across generations," "Partners for co-creation of economy and society of the future," and "Partners for peace and stability."

Prime Minister KISHIDA Fumio announced three concrete measures for peace and prosperity through co-creation based on trust to take the ASEAN-Japan relations to new heights for the next 50 years under the three pillars mentioned above. First, to pass on the "heart-to-heart" relationship to the next generation, a new project called "Partnership to Co-create a Future with the Next Generation: WA Project 2.0" will be launched. The project will consist of a series of comprehensive people-to-people exchange programs that will benefit more than 10 million people over the next decade. Further opportunities will also be presented for networking among members of the younger generation through the establishment of the Young/Generation Z Business Leaders' Community for talent exchange and ecosystem collaboration among startups.

In terms of the co-creation of the economy and society of the future, efforts will be made toward enhancing public-private partnerships with a focus on the strengthening of connectivity, climate change measures (including realization of the AZEC concept), and support for small and medium-sized enterprises and startups. Also announced at the summit was the launch of the "ASEAN-Japan Co-Creation Initiative for the Next-Generation Automotive Industry," set up to jointly formulate and implement strategies for ASEAN to continue to be the world's leading automotive production and export hub.

As partners for peace and stability, Japan and ASEAN also aim to jointly create peace and prosperity in the Indo-Pacific region and a world in which human dignity is protected. Specifically, they will take such actions as support for the development of human resources in cybersecurity at the ASEAN-Japan Cybersecurity Capacity Building Centre and humanitarian assistance for the people of Myanmar through the ASEAN Coordinating Centre for Humanitarian Assistance on disaster management.

Japan and ASEAN can discuss co-creation of the future based on the friendship and cooperation that has been nurtured between them for half a century. In the words of the catchphrase for the 50th anniversary of friendship and cooperation, the three days of the Summit truly were "Golden Opportunities" to pass on "Golden Friendship" to the next generation.

Tokyo Tower was lit up in ASEAN colors to commemorate the 50th Year of ASEAN-Japan Friendship and Cooperation. SANKEI

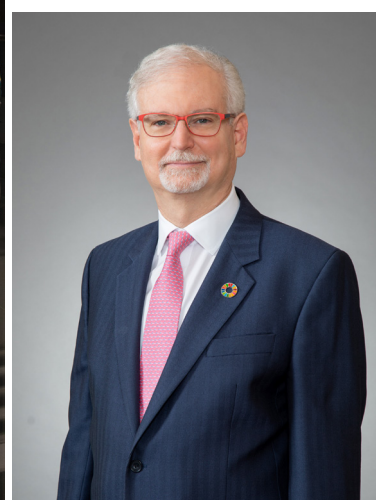
UNRAVELING THE RECENT

RISE OF JAPAN'S FINANCIAL MARKETS

Thanks to recent reforms aimed at helping Japan to become a leading asset management center—promoted by both the public and private sectors—the country's markets are beginning to show signs of promise. What appeal do these markets hold, and what is their background, according to an expert in asset management who is active worldwide?

In late February 2024, Japan's stock market surpassed the record set at the peak of the bubble economy in 1989. Less than two weeks later, the Nikkei 225 index topped 40,000 for the first time, again grabbing global headlines. The high recorded on the final trading day of the 1980s was the product of an inflated asset bubble. However, according to David Semaya, executive chairman of Sumitomo Mitsui Trust Asset Management Co., Ltd., the current strength in Japanese equities is underpinned by robust fundamentals, and there are firm reasons to believe that the best is yet to come.

Semaya pointed out that one of the core factors influencing the current optimism about Japan's markets is the most fundamental of fundamentals: well-run companies. Japan has promoted corporate governance reforms since the establishment of the Stewardship Code in 2014, and the Kishida administration is further encouraging these reforms through its Policy Plan for Promoting Japan as a Leading Asset Management Center. Still a work in progress, the increased



Left: Interior of the Tokyo Stock Exchange. AFLO
Below: David Semaya, executive chairman of Sumitomo Mitsui Trust Asset Management, has been working in asset management in Japan since 1998.

focus on efficient use of capital and profitability should have positive influences. "I think we're in a place now where we have a good balance between shareholder returns and stakeholder needs, demonstrating a very sustainable model," Semaya said.

Better corporate governance is just one pillar of various initiatives underway. In April 2023, the government announced its Action Program for Accelerating Corporate Governance Reform, which includes initiatives to promote dialogue with global investors through further expansion of information in the English language. Moreover, the Tokyo Stock Exchange and business groups are cooperating to push for measures including more accessible markets and easier entry for global players into the financial sector. Also, special business zones are planned to be established soon, tailored specifically to asset management businesses for which administrative procedures can be completed solely in English.

Encouraging more talented fund managers to set up shop in Tokyo should not only boost returns for Japanese investors, but also add value across the domestic asset management value chain through the experience gained by local hires, according to Semaya. The sector has enormous potential in Japan, in no small part due to the prospect of enticing some of the vast pool of household savings into the country's financial markets. Tapping into that to make Japan a leading asset management center is one of the aims of the current

"We will rectify Japan's unique business practices and resolve barriers to entry, and will also introduce a new program to assist new entrants," explained Prime Minister Kishida in September 2023 to leaders at the Economic Club of New York.

reforms. At the end of June 2023, total household assets stood at 2.1 quadrillion yen (around 14.3 trillion dollars). Approximately half of that is currently held in bank deposits, and even if a portion of that were to come into equities and other assets, it would further boost markets and the financial industry as a whole. The upgraded Nippon Individual Savings Account (NISA) tax exemption program for retail investors relaunched in January is designed to do exactly that.

Semaya pointed to another factor in the Japanese economy's favor: the recent arrival of rising salaries and healthy demand-pull inflation after decades mostly characterized by stagnation and a deflationary mindset that held back economic activity. "The increase in wages was significant overall on average last year. And this year, my understanding is that increases will also be significant in most sectors," said Semaya. Higher wages are linked to maintaining healthy inflation, will stimulate the economy, and can contribute to the virtuous cycle of growth and distribution that Prime Minister Kishida vows to realize. In his policy speech in January 2024, he stated, "We aim to bring about a virtuous cycle in which household finances are reoriented towards investment and the increase in corporate value leads to greater household income, giving rise to further investment and consumption."

Semaya believes that this may be one of those rare moments when nearly all the stars are aligned for Japan's markets, something that is not going unnoticed overseas. "I get questions from investors abroad who have not previously followed Japan, such as: 'What's the best way to do our research so that we can potentially allocate capital there?' I think these are very, very good signs. I haven't heard this in 30 years."

An opening ceremony for Japan Innovation Campus took place in November 2023. Attended by entrepreneurs, venture capital representatives and academics, more than 50 companies registered with JIC, including core working members and office members.

ACTIVATING JAPAN'S STARTUP ECOSYSTEM

FROM SILICON VALLEY

The Japanese government has established Japan Innovation Campus in Silicon Valley, a base for supporting domestic startups eager to enter overseas markets. The aim is to create a supportive ecosystem for incubating startups that can compete on the world stage.

"We want to work actively toward building relations with local venture capital firms," says JIC general manager AKASHI Hiroyo.

Startups are frequently torchbearers of innovation, and as such, are indispensable for activating the economy and sustaining its growth. The Kishida Administration, which declared 2022 to be the "first year for founding startups," announced the Startup Development Five-year Plan in November of the same year. The goals of the plan are to create an ecosystem for nurturing startups by promoting collaboration among industry, government, and academia, and to increase investment in startups ten-fold over the five-year period of the plan.

Emphasis was also placed on nurturing startups that can compete in the global market. That led the Ministry of Economy, Trade and Industry (METI) to establish the Japan Innovation Campus (JIC) in Silicon Valley, California, United States, which possesses one of the world's most well-developed ecosystems for startups. JIC acts as a support base for Japanese startups, offering global business development and assistance in

JIC is situated in central Palo Alto. Its proximity to Stanford University means it is excellently located.

pursuing collaboration with U.S. startups and venture capital (VC) firms, as well as linking them to financing from local venture capital firms and networking possibilities with other startups. It also links them to globally ranked universities, other academic organizations, and administrative bodies in the region.

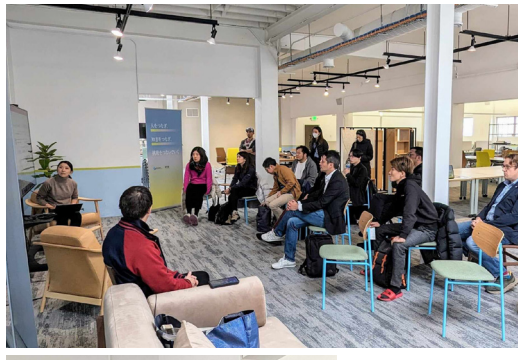
JIC is situated in central Palo Alto, a city south of San Francisco that lies at the center of Silicon Valley. The century-old two-story structure housing its offices has a warm appearance and was once occupied by a local VC firm and a design firm. The opening ceremony, which took place in November 2023, was attended by then-METI Minister NISHIMURA Yasutoshi, former U.S. Ambassador to Japan John Roos, then-Mayor of Palo Alto Lydia Kou, various other leaders of the region, Stanford University officials, and VC representatives. "It was a genial gathering that reflected high hopes for the future of Japanese startups," says AKASHI Hiroyo, JIC general manager.

Selected via numerous open recruitment screenings, about 50 startups, mainly in the IT, bio and healthcare sectors, are currently registered with JIC. Five are "office members"—i.e., startups that use private office spaces,—including HOMMA, a company creating smart homes in the U.S. by integrating all stages of development of the related hardware and software, and Cuorips Inc., a developer of the iPS cell-derived cardiomyocyte sheets needed for heart transplants. The remaining companies are "co-working members," which utilize co-working spaces in the building. Drop-in users have also been accepted.

While JIC will help match business partners and support members as they settle into life in Silicon Valley, its main focus is the creation of a community that brings people and entities together. "A 'campus' is not just a place. Our name—Japan Innovation Campus—reflects the hope that ours will truly be a campus where information and experiences of failure are shared and people learn with and from each other," says Akashi. "It will be a place where the wisdom of individuals is gathered and can be applied to the experiences of others. Cultivating such an environment will expand the ecosystem, supporting the next generation of entrepreneurs and ecosystem members," she adds.

JIC officially opened its doors in January 2024. Numerous events and seminars have already taken place there, with members engaging in lively intergroup exchanges. In Silicon Valley, it is essential for businesses to take off as quickly as possible, so JIC values three attitudes in its support of keen entrepreneurs: chase your vision, fail and learn, and pay it forward.

Akashi explains, "Before all else, a business must succeed as a business. The individuals whose businesses succeed through JIC will add to the high reputation of the Japanese startup ecosystem in Silicon Valley, and they will pass on the knowledge they have gained through the center to the next generation of startups. That is the kind of 'pay it forward' culture that we want to nurture here."



JIC frequently hosts seminars and study sessions where entrepreneurs, local venture capitalists, and accelerators engage in energetic discussions.

Left: The summit discussion between Japan and the Republic of Korea (ROK) held at Stanford University. Condoleezza Rice (center), Director of the Hoover Institution at Stanford University, served as moderator when Prime Minister KISHIDA Fumio (right) and President YOON Suk Yeol of the ROK (left) exchanged opinions.
Bottom: Prime Minister Kishida gave a speech at the beginning of the discussion.

STRENGTHENING COLLABORATION

BETWEEN JAPAN AND THE REPUBLIC OF KOREA IN ADVANCED SCIENCE AND TECHNOLOGY

Japan and the Republic of Korea (ROK) have been deepening their relationship as most important neighbors to each other—as well as "shuttle diplomacy" in which their leaders visit each other without being bound by formality—in earnest since last year. In November 2023, a Japan-ROK event was held at Stanford University in the United States, where the two leaders expressed their desire to strengthen cooperation both bilaterally and trilaterally with the United States in the field of advanced science and technology.

On November 17, 2023, Prime Minister KISHIDA Fumio visited Stanford University in the United States. There, he attended a summit discussion with President YOON Suk Yeol of the Republic of Korea (ROK) on advanced science and technology.

In his opening remarks, Prime Minister Kishida said that, in the field of science and technology, "No one country alone can cause innovation that will change the world." He cited "semiconductors, quantum technology, and AI" as specific examples, and said that for innovations in these fields, "Japan's component and materials technology, Korea's mass production technology, and America's AI chips are all required. And if there is one element missing, there will be no innovation."

In particular, the prime minister noted that semiconductor performance improvement is reaching its physical limitations, and against this backdrop, attention to quantum technology is increasing, stating at the summit discussion that "Quantum technology is a complete game changer." On the other hand, he expressed the view that

"This area is still under development, a work in progress." Referring to the signing of a memorandum of understanding (MOU) between Japanese and Korean national institutes in the field of quantum technology, the prime minister went on to say, "Currently, investment is being attracted to this area across the globe. Through cooperation among Japan, the U.S. and the ROK, we would like to lead in this technology-development competition." President Yoon then said, "In the area of quantum technology, I believe that global cooperation is the most crucial factor, because there is no one country in the world that has a complete understanding of quantum technology and there is no one country that can develop all quantum technologies on its own."

During the question-and-answer session that ensued, both leaders were asked about what efforts Japan and the ROK were making to ensure that the world is united in solving the global crisis that is climate change. In response, Prime Minister Kishida echoed President Yoon's point that there is a global divide between developed and developing nations in terms of the impacts from climate change, saying, "I proposed the Asia Zero Emission Community (AZEC) initiative and am injecting efforts into that initiative. In Southeast Asian countries, there are diverse situations, so there has to be something that achieves both economic growth and zero emissions. Therefore, I am working on setting up a mechanism to attract investments for transition to achieve both of these goals."

Prime Minister Kishida also expressed the view that it was important to build a global ecosystem of startups, saying, "New ideas emerge through multilayered exchange between diverse people." Taking part in a roundtable discussion on the same day as the summit discussion, attended by Japanese and Korean startup companies together with the leaders of both nations, MATSUOKA Yoko, founder of Yohana, said, "Participating in the roundtable made me hopeful for the future and all the ways in which technology can help people be who they want to be." She then spoke of AI technology, elaborating on one of the key topics of the summit discussion, "AI without a doubt will change the world as we know it and will affect everyone's lives in some way. On the other hand, AI is moving too fast and this concerns me. We need to approach AI responsibly and establish guidelines worldwide for its use."

Resuming "shuttle diplomacy" for the first time in 12 years, and holding seven summit meetings in just 2023 alone, Japan and the ROK are expanding their cooperation while improving relations. In his speech, Prime Minister Kishida said, "Partnership in science and technology will become the symbol of the changing Japan-ROK relationship. Japan-ROK and Japan-U.S.-ROK partnerships will change the world." Strengthening cooperation among Japan, the ROK, and the United States in the field of advanced science and technology should go a long way toward helping to solve global issues and improve security.

Top: MATSUOKA Yoko, Executive Officer of Panasonic Holdings Corporation, is also the CEO of Panasonic WELL andYohana, a startup that provides a family concierge service to help people organize and complete household tasks.
Right: A roundtable between the leaders of Japan and the ROK and several startup companies.

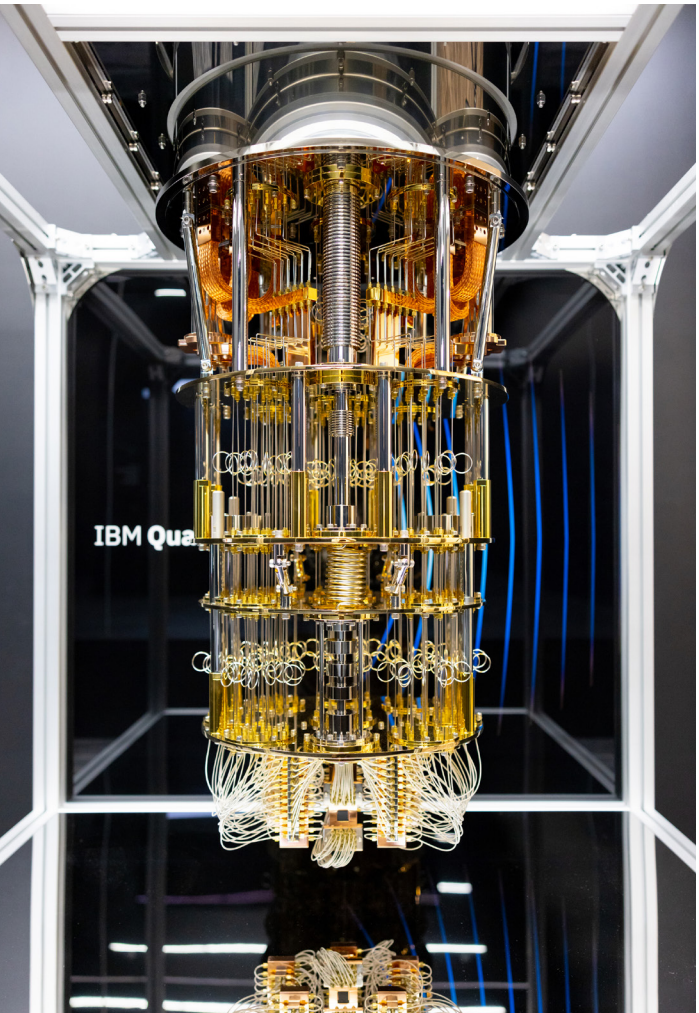
PURSUING THE 100,000-QUBIT

QUANTUM COMPUTER

THROUGH JAPAN-U.S. COLLABORATION

Hoping to accelerate research into quantum technology, which has potential applications in fields as diverse as drug discovery and cryptography and is also crucial for economic security, the governments of Japan and the United States have agreed to strengthen cooperation in education. Industry and academia in both countries are collaborating to pioneer quantum-centric supercomputing.

Quantum technology, which utilizes the quantum nature of substances and energy at the subatomic level, is attracting worldwide attention. As countries race to develop quantum supercomputers with enormous processing power and applications in various fields such as quantum cryptography to ensure more secure communications, Japan and the United States are strengthening their cooperation to develop quantum technology.

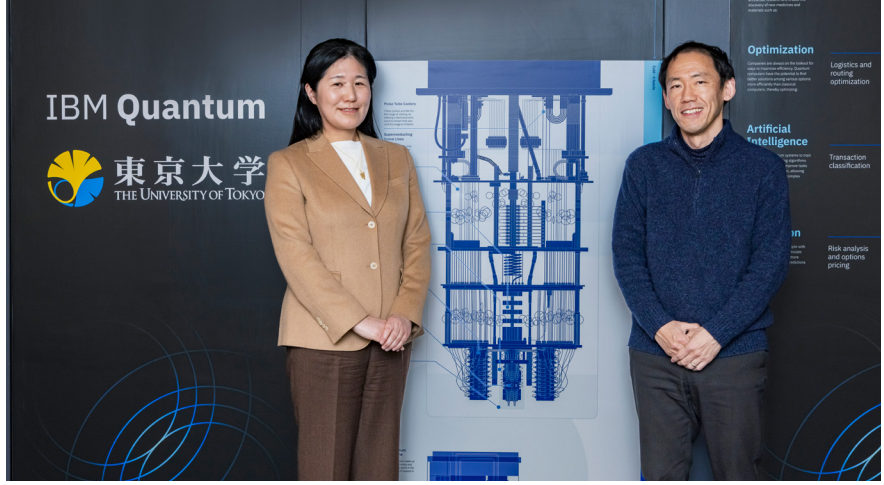


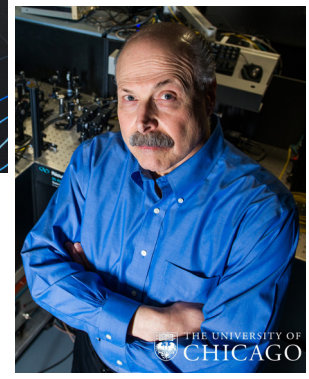
The University of Tokyo partnered with IBM in 2019, leading to the launch two years later of the gate-based commercial quantum computer known as IBM Quantum System One. IBM

In May 2023, on the occasion of the G7 Hiroshima Summit, IBM, the University of Tokyo, and the University of Chicago agreed to enter a partnership to build a cooperative relationship in quantum research. IBM will provide 100 million dollars over the next decade to advance technological innovation toward the development of a 100,000-qubit quantum-centric supercomputer.

While classical computers, in common use today, process information as binary digits (bits) in one of two states—0 or 1—quantum computers use quantum bits (qubits), which can be not only in the two "basis states" representing 0 and 1 but also in their superposition that is neither 0 nor 1. It is an entirely new technology that can perform complex calculations by taking advantage of the properties of superposition. The realization of a 100,000-qubit quantum-centric supercomputer could lead to solutions to pressing problems that even the most advanced supercomputers of today may never be able to solve.

The University of Tokyo has already been collaborating with IBM on quantum research for some time. The two parties signed the Japan-IBM Quantum Partnership in 2019 and established the Quantum Innovation Initiative Consortium the following year, involving a wide range of partnerships from industry and academia. This led to the launch in 2021 of Japan's first gate-based commercial quantum





Top: Professor MURAO Mio (left) of the University of Tokyo's Graduate School of Science, and Associate Professor TERASHI Koji of the International Center for Elementary Particle Physics from the same university. Right: Professor David Awschalom of the Pritzker School of Molecular Engineering, University of Chicago.

computer, IBM Quantum System One. Then, in the fall of 2023, the quantum computer, equipped with the 127-qubit Eagle processor, began operation. Owning the exclusive rights to use the processor, the University of Tokyo has been leading the field of quantum research in Japan by promoting research on its use collaboratively with participating companies and research institutions.

"Now that quantum computers are here and can actually be used, researchers and students have become more inclined to develop ever more useful applications for them. In that sense, I believe that our partnership has had a significant impact on quantum research in Japan," says MURAO Mio, a professor specializing in quantum information theory at the University of Tokyo.

According to Professor Murao, the strength of the university's quantum research lies in its breadth of fields and wide-ranging perspectives. "We have an advantage in this kind of unique research. For example, Professor NAKAMURA Yasunobu created the basic element of superconducting quantum computers, and Professor FURUSAWA Akira achieved impressive results in the development of the optical quantum computer."

Meanwhile, the University of Chicago is home to the Pritzker School of Molecular Engineering, the first educational institution in the United States to offer a doctoral program in quantum engineering. It has been involved in research in a variety of fields, from quantum algorithms to quantum cryptography communications. Talking about the partnership, David Awschalom, Liew Family Professor of Molecular Engineering at the University of Chicago, makes these comments: "Collaboration—across borders, fields, and sectors—is critical to fully realizing the transformative potential of quantum computers. I believe that some of the most seismic impacts of at-scale quantum computing are yet to be discovered." He adds, "We've already held joint workshops, identified powerful new areas for collaboration, and are launching graduate student exchange programs between Tokyo and Chicago."

Also, TERASHI Koji, associate professor at the University of Tokyo, states, "We aim to openly innovate while complementing each other's technologies. We hope that this experience of personnel exchange with the University of Chicago will lead to the development of the next generation of researchers."

However, creating a supercomputer with 100,000 qubits is by no means an easy task. There are many difficulties to overcome, such as maintaining quantum superposition and correcting errors caused by noise. "I think it's important at this stage to research algorithms that will prove useful and beneficial for the future, for when we will have realized quantum computers that are able to maintain proper operation in the event of errors," explains Terashi.

Quantum computers, which until recently were only a theoretical concept, are now becoming a reality. That is why universities and companies across Japan and the U.S. are complementing each other and competing to usher in a new paradigm of quantum computing.

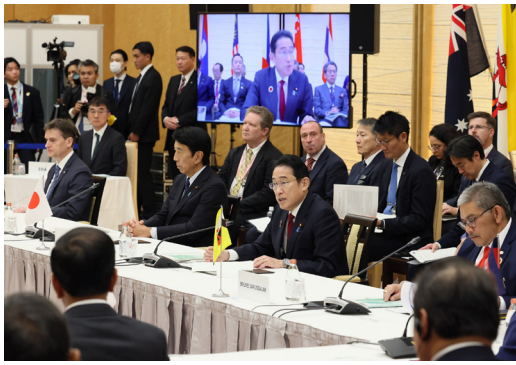
AZEC: ASIA'S VARIOUS PATHWAYS TO NET ZERO
CO-CREATED BY JAPAN

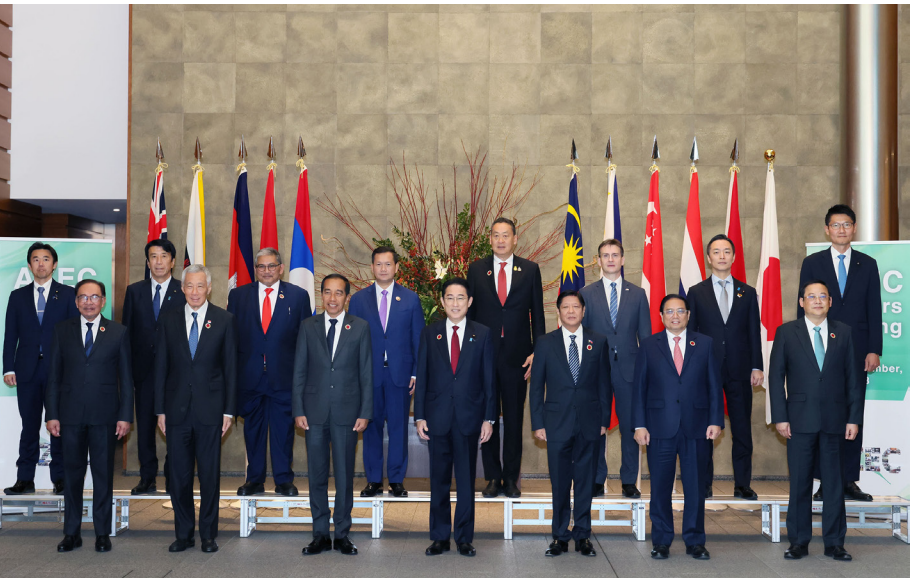
The Asia Zero Emission Community (AZEC) was launched by 11 partner countries in 2023. The platform seeks to further advance decarbonization in Asia toward the goal of carbon neutrality while achieving economic growth and energy security, creating various pathways tailored to each country's circumstances.

Decarbonizing the Asian region is key to global-level carbon neutrality. Heightened by economic growth and increasing energy demand, carbon emissions in Asia now account for more than half of all the world's emissions. Yet, further economic growth and energy security are also key issues for Asian countries. It is therefore vital that these objectives can be achieved along with decarbonization. Additionally, industrial structures, social contexts, geographical factors, as well as the stage and rate of development, all vary from country to country, which is why various pathways are required in order for each country and region to reach carbon neutrality.

The Asia Zero Emission Community (AZEC) was proposed by Prime Minister KISHIDA Fumio in 2022, and launched by 11 partner countries in 2023, as a platform to promote decarbonization in Asia. To date, Japan has reduced carbon emissions by approximately 20% compared to fiscal 2013 levels, and is making steady progress toward its goal of achieving net-zero emissions by 2050. Japan faces challenges similar to that of other Asian countries in terms of its energy situation; for example, the country has an uneven distribution of renewable energy potential and poor connectivity between power grids owing to its numerous islands. The purpose of AZEC therefore is to support Asian countries in the fields of technology, with the aim of achieving an energy transition tailored to the particular situation of each country.

The AZEC Leaders Meeting was held in Tokyo on December

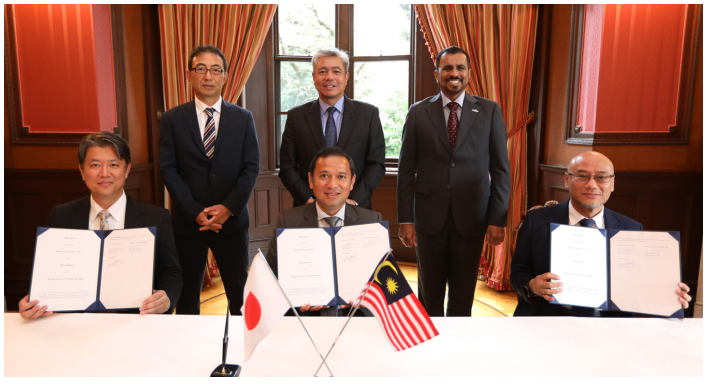




Top: On December 18, 2023, Prime Minister KISHIDA Fumio held the Asia Zero Emission Community (AZEC) Leaders Meeting at the Prime Minister's Office.
Left: Representatives from the AZEC partner countries (in alphabetical order): Australia, Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, the Philippines, Singapore, Thailand, and Viet Nam.

18, 2023, and was where the AZEC Leaders' Joint Statement was adopted. In this statement, the leaders shared the basic principles of AZEC and agreed to establish the Asia Zero Emission Center as a platform to support policy development and coordination, foster public-private partnerships, strengthen cooperation in the field of decarbonization technologies such as those involving hydrogen and ammonia, as well as carbon capture, utilization, and storage (CCUS), establish green industrial supply chains, and emphasize the importance of transition finance, among other commitments. The leaders of each nation expressed high expectations for the activities of AZEC.

Currently, more than 350 tangible projects are underway in collaboration with both the public and private sectors, including approximately 70 memoranda of understanding (MOU) signed in the run-up to the AZEC Leaders Meeting. For example, Mitsui O.S.K. Lines, Ltd. (MOL), a major Japanese shipping company, is developing a liquefied CO_2 carrier to create a global hub for carbon capture and storage (CCS). To build such a global CCS hub in Malaysia where carbon captured from Asian countries can be transported and stored, MOL will work together with Malaysian energy and shipping companies to develop liquefied CO_2 carriers and look at optimal business models with the aim of starting operation in 2028. "In order to meet the various future needs for liquefied CO_2 transportation, Malaysia expects us to develop and provide the most efficient way of such transportation, including suitably sized ships with safe operation," said an MOL representative. "We are seeing the cooperation among countries being strengthened through AZEC's efforts, and we feel that it will become even stronger in the future. We look forward to AZEC working to establish a fair framework so that no one country or region benefits more than others or loses out." Under AZEC, the company is also working to build a value chain for clean hydrogen and ammonia in Thailand.



Top: A CG rendering of a liquefied CO_2 carrier (right) and a floating storage and offloading unit (left). MITSUI O.S.K. LINES, LTD.
Bottom: MOL has reached a fundamental agreement with Malaysia's companies to establish a joint venture for the development and ownership of liquefied CO_2 carriers. MITSUI O.S.K. LINES, LTD.

In his opening remarks at the AZEC Leaders Meeting, Prime Minister Kishida emphasized the importance of "One Goal, Various Pathways" to achieving the common goal of net zero through a variety of pathways, and the "Triple Breakthrough" to achieving decarbonization, economic growth, and energy security simultaneously. Japan will leverage its advanced technological capabilities and wealth of experience to drive decarbonization throughout Asia.

THE ROAD TO NET ZERO WITH GREEN STEEL

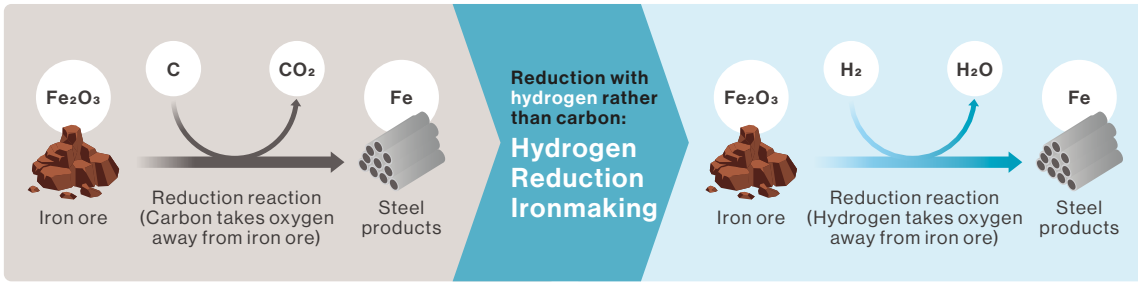
Japan's goal of carbon neutrality by 2050 necessitates reductions in industrial carbon emissions. The country's steel industry is taking steps toward that goal by using hydrogen to decarbonize the steelmaking process. The aim is to lead the world in technological innovation and the transition to "green steel" production.

Katana (Japanese swords)—pliable enough not to break, yet strong enough to cut neatly and sharply—are the time-honored epitome of high-grade steel. Just as the traditional swordsmith meticulously works steel to combine those contradictory properties within a sword, Japan's steel industry produces high-performance, high-quality steel materials fit for a variety of applications, supporting its global competitiveness in industrial products. The quality of Japanese steel is rated very highly, with 40% of all domestically produced steel exported overseas, mainly to other parts of Asia.

The development of blast furnace hydrogen reduction technology is underway using NEDO's Green Innovation Fund (photo of Nippon Steel's hydrogen reduction test furnace in Kimitsu, Chiba Prefecture).

The steel industry in Japan is now assiduously taking on the challenge of going carbon-free. As Japan seeks to become carbon neutral by 2050, industrial decarbonization has become an ever more pressing problem. Accounting for 14% of Japan's carbon emissions, the domestic steel industry has targeted a 30% reduction in total emissions by 2030, compared with a 2013 baseline. Having already achieved the world's highest level of energy efficiency within its

Image of Hydrogen Reduction Ironmaking



production process, the industry is energetically working to develop innovative technologies in order to achieve this 2030 goal and carbon neutrality by 2050.

One of the most advanced initiatives now taking place is the development of steelmaking technology that uses hydrogen. Japan's steel industry developed through the blast furnace process, which is energy efficient and capable of mass-producing high-quality steel with few impurities. Still, such a process uses carbon to reduce (remove oxygen from) iron ore, the raw material, making carbon (i.e., CO_2) emissions inevitable. However, if some of the carbon used for the reduction process is replaced with hydrogen, the resulting byproduct is water, not CO_2.

In 2008, Japan launched COURSE50, a national project supported by the New Energy and Industrial Technology Development Organization (NEDO). The project aims to reduce carbon emissions by 30% from 2013 levels by combining technologies that separate and recover CO_2 with technologies that reduce CO_2 emissions from blast furnaces through injecting hydrogen generated on-site into the blast furnace. Verification experiments are scheduled to begin in 2026.

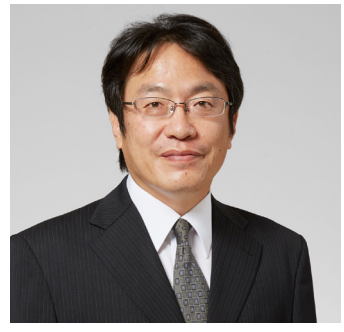
Furthermore, in 2022, the major domestic steel companies of Nippon Steel Corporation, JFE Steel Corporation, and Kobe Steel, Ltd. formed the Hydrogen Steelmaking Consortium along with the Japan Research and Development Center for Metals. Aided by NEDO's Green Innovation Fund, the Super COURSE50 project was launched with the goal of halving CO_2 emissions by using heated external hydrogen. Last year, the project confirmed a 33% reduction in such emissions from a test blast furnace—the highest reduction levels in the world to date. "We hope to establish Super COURSE50 commercialization technology by 2040," says ORIHASHI Eiji, Managing Executive Officer at Nippon Steel.

In addition to blast furnaces, the Green Innovation Fund project is developing multiple hydrogen reduction technologies in collaboration with the consortium. For example, direct hydrogen reduction technology uses hydrogen instead of natural gas to reduce low-grade iron ore, while electric arc furnace technology removes impurities and produces high-grade steel with low emissions. However, the kind of steelmaking process used differs depending on the country as several factors come into play, such as the availability of high-quality iron ore or scrap that can be used. "Every decarbonization process has its advantages and disadvantages, requiring a multi-track approach. Although we have yet to find the perfect solution, if we develop innovative technologies, they will eventually become widespread around the world, leading to a reduction in global CO_2 emissions. I believe that this is where our technological capabilities can be applied," asserts Nippon Steel's Orihashi.

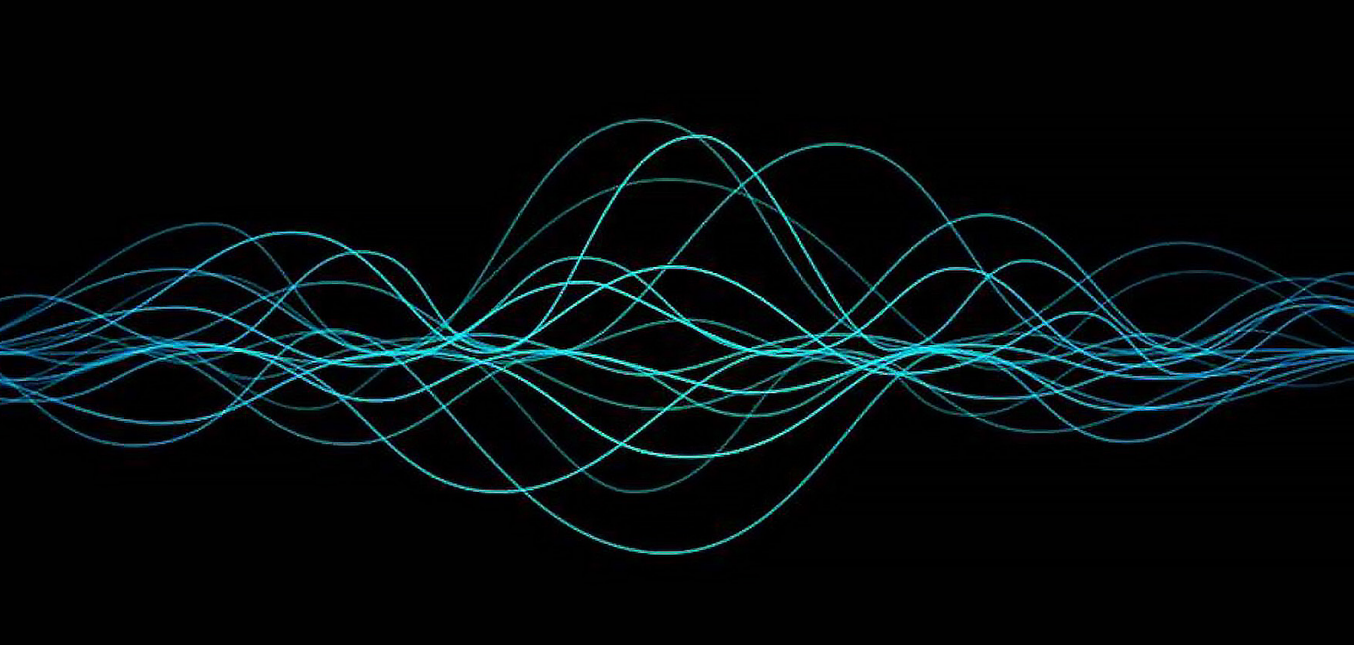
Abundant in terms of resource availability and easy to recycle, steel is a remarkable material and supports every aspect of our lives, from infrastructure and cars to electrical appliances. To make the steel industry sustainable, Japan will work with the public and private sectors to pave the way toward producing "green steel." ●

Green Innovation Fund Project on "Hydrogen Utilization in Iron and Steelmaking Processes"

COURSE50 blast furnace	Development of hydrogen reduction technologies utilizing hydrogen from within steelworks
Super COURSE50 blast furnace	Development of low-carbon technologies using external hydrogen and CO_2 contained in blast furnace exhaust gas
Hydrogen-based direct reduction furnace	Development of direct hydrogen reduction technology
Large-size electric arc furnaces that produce high-grade steel	Development of technology to remove impurities in electric arc furnaces using directly reduced iron



"I believe that the decarbonization of the steel industry needs to be tackled as a mission shared by all of Japan," says ORIHASHI Eiji of Nippon Steel.



THE MICROWAVE TECHNOLOGY TURNING THE

CHEMICAL INDUSTRY GREEN

Chemical products that are essential in today's manufacturing require huge amounts of energy to produce. Now, an ambitious new startup company, Microwave Chemical Co., Ltd., has built the world's first chemical mass production plant that uses microwaves, leading the way in the green transformation (GX) of the chemical industry.

The world's first microwave chemical mass production plant was completed in 2014.

In today's world, chemically derived products such as plastics and synthetic fibers are indispensable to manufacturing in a wide variety of fields. The chemical reactions that are used in their production often require heating at high temperatures. Consequently, the chemical industry consumes a lot of energy, accounting for about 30% of the entire industrial sector's total energy consumption. The chemical industry is also a big CO_2 emitter, making the green transformation (GX) an urgent issue.

Founded in 2007, Microwave Chemical Co., Ltd. is a startup company that brings innovation to production processes in the chemical industry. By more accurately controlling the same technologies as those used in microwave ovens, the company aims to bring about the GX of chemical manufacturing processes.

Conventionally, substances within a chemical reactor—an enclosed container where chemical reactions take place—are heated through steam or other means. With this method, heat is transferred indirectly from an external heat source through the reactor to the substance inside, so it takes time for the whole substance to be heated. In contrast, microwaves transmit heat directly to the substance at the molecular level, doing so quickly and at a uniform temperature, targeting only the intended subject and nothing else. Since the microwave method can create chemical reactions more efficiently, it is possible to save energy and reduce the size of equipment.

Top: PlaWave's demonstration facility. Left: Decomposed oil (left), recovered styrene monomer (center), and recycled polystyrene (right) were all chemically recycled using PlaWave's small pilot unit.

Companies introducing this method have successfully reduced their energy consumption by up to 70%.

The use of microwaves on an industrial scale has previously been considered impossible due to the difficulty of controlling microwaves. However, through long-term research, Microwave Chemical has established unique technologies in its reaction system design to find the optimum frequency and amount of energy input by measuring the degree to which various reactants absorb microwaves, as well as its reactor design to ensure that microwaves work both safely and efficiently without leakage, thereby paving the way for their industrial use. The company began shipping chemically derived products produced using the microwave process in 2012, and in 2014 completed the world's first microwave chemical mass production plant.

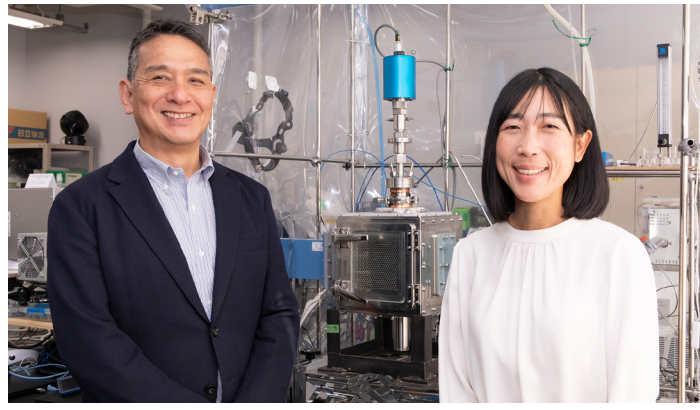
Besides joint projects with chemical manufacturers, the company has also been collaborating with companies in an assortment of fields, such as steel, glass, and pharmaceuticals. "Just as there are huge platform providers in the IT field, at Microwave Chemical we aim to be a platform provider for manufacturing technologies. This is something that has become one of our strengths. The more problems we solve for customers, the more technology we accumulate, and the more we can solve problems that were previously unsolvable, thereby creating a virtuous cycle," said co-founder and CEO YOSHINO Iwao.

One of the platforms provided by Microwave Chemical that is attracting attention is PlaWave, a chemical recycling technology platform that uses microwaves in the chemical recycling process to decompose used plastics at high temperatures and return them to oil and chemical raw materials for reuse. Being a solid material, plastic is difficult to heat efficiently using conventional methods, as these involve indirect heating using hot air, but microwaves are well suited to the task since they can transmit energy directly. Microwave Chemical is now carrying out demonstrations of its PlaWave concept with multiple companies, mainly chemical manufacturers, with the aim of commercializing chemical recycling.

"The Japanese government's 2020 pledge to be carbon neutral by 2050 was a huge tailwind for our company. Manufacturing technology such as ours is Japan's strength, which is why we want to make every effort to put it into practice moving forward," said OKUNAKA Mao, a spokesperson for Microwave Chemical.

"I believe that our technology can contribute to carbon neutrality in a plethora of areas. For example, in the case of electric vehicles, not only do microwaves reduce carbon emissions during the manufacturing process but they also keep down power consumption in the process of dissolving and smelting lithium—the battery material—from ore," stated Yoshino.

Benefiting from the versatility of microwaves, which can save energy in all kinds of heat treatment processes, Microwave Chemical aims to apply its technology not only to the field of chemical manufacturing, but to many others too.



YOSHINO Iwao (left), CEO of Microwave Chemical Co., Ltd., and OKUNAKA Mao (right), the company's public relations manager.

JAPAN'S PURSUIT OF A GAME-CHANGING TECHNOLOGY AND ECOSYSTEM FOR SEMICONDUCTORS

With the goal of revitalizing Japan's semiconductor industry, Rapidus was founded to establish design and manufacturing bases for next-generation chips. This article explores the company's quest to develop a 2-nanometer (nm) chip mass production system that boasts high speed and can meet various requests, as well as the strategies being taken to achieve this.

Next-generation semiconductors are a core material for realizing digitalization and decarbonization, and are also indispensable to generative AI and autonomous driving. Securing a supply chain for such chips is a pressing global issue. Against that backdrop, Rapidus Corporation was founded in 2022 to work on a project at the heart of Japan's semiconductor strategy. Rapidus aims to develop a system for mass producing leading-edge 2-nanometer (nm) chips, which has yet to be realized anywhere. Major Japanese companies—including Toyota Motor Corporation and the Sony Group—have invested a total of 7.3 billion yen in this massive public-private partnership, while the Japanese government has announced support totaling 330 billion yen so far. A large-scale R&D facility and production plant is currently under construction in Chitose City, Hokkaido Prefecture. The company plans to set up a pilot production line in April of 2025, and to begin mass production in 2027.

Japan occupied more than half of the global semiconductor market in the 1980s, but other countries have been leading in this industry ever since. While plants in other parts of the world are currently mass producing 3-nm chips, the most advanced generation produced in Japan now is the 40-nm chip. "The architecture of the 2-nm chip is totally different from that of the 3-nm one, making mass production of the former a blank-slate challenge for all players. This critical juncture is a prime opportunity to break into the market," said SHINDO Yukiko, senior human resources manager at Rapidus.

The first, essential step in achieving mass production is collaboration with overseas partners. According to Shindo, "We need to cooperate with various

In December 2022, IBM, which developed the 2-nm chip, and Rapidus, which will carry out its mass production, announced that they would be forming a partnership for joint development.
KYODO NEWS/GETTY IMAGES

In December 2022, immediately after the announcement of the partnership between Rapidus and IBM, Prime Minister Kishida gave an address at the international exhibition SEMICON Japan, stating that the national government will continue to fully support investment in semiconductor mass production in Japan.

companies around the world, since particular technologies and processes are being advanced by different leading-edge firms." In 2022, Rapidus formed a partnership with IBM, which has successfully developed the 2-nm chip technology. Around 100 engineers from Rapidus have already been dispatched to IBM's R&D center—the Albany NanoTech Complex in the state of New York—to jointly develop technology for the chip's mass production. It also plans to open a business base in Silicon Valley, home to major IT and AI development companies. Additionally, Rapidus has formed a cooperative relationship with Interuniversity Microelectronics Centre (imec), an international organization in Belgium for semiconductor research, to receive technical support in such matters as the development of extreme ultraviolet (EUV) lithography systems.

Speed and customization are the key features of the production system being pursued by Rapidus. The company aims to establish a system that enables flexible responses to the needs of rapidly evolving, innovative fields such as AI. The semiconductor manufacturing process consists of (1) the design of the circuit, (2) the front-end process, in which the circuit is formed on the silicon wafer, and (3) the back-end process, in which the wafer is diced into individual chips and turned into products. As these processes are usually undertaken by different companies, even 3-nm chips require nearly two years from development to production. Rapidus aims to conduct both the front-end and back-end processes in-house, and also to support product design that optimizes production by utilizing big data obtained in the front-end process, thereby accelerating the speed of production exponentially—"like the difference between a regular slow train and a bullet train."

Organizations such as imec, along with the major chip-making equipment manufacturers ASML, Lam Research, and Applied Materials, have already decided to establish bases around the Rapidus plant in Hokkaido, and other related companies are expected to follow soon after. Blessed with vast land and abundant nature, the large plant at Chitose, reportedly constructed at a total cost of 5 trillion yen, is expected to involve several hundred engineers from Japan and abroad by the time operation starts.

Shindo noted, "Across-the-board capabilities—from factory safety and quality control to the ability to move things forward as a team—are the strengths of Japan's manufacturing. We aim to make the most of those strengths and work with our partners worldwide to establish a new center for the semiconductor industry, contributing to the development of leading-edge technologies that will enrich people's lives." ●

Top: Artist's rendering of the completed Rapidus plant in Chitose City, Hokkaido Prefecture. The future aim is for the surrounding area to become a green- and digital-transformation hub that brings together related industries and research institutes from across the globe.
Bottom: "Now 20 to 30 employees join Rapidus every month. Although varying in age and specialty, they share the strong desire to accomplish the same goal," said SHINDO Yukiko, the company's senior human resources manager.

THE HIROSHIMA AI PROCESS: LEADING THE GLOBAL CHALLENGE TO SHAPE INCLUSIVE GOVERNANCE FOR GENERATIVE AI

Amid the growing global debate over advanced artificial intelligence (AI) systems such as generative AI, the Hiroshima AI Process was launched by the G7 under Japan's presidency in May 2023, with the aim of promoting safe, secure, and trustworthy AI. This article delves into the significance of its output, the Hiroshima AI Process Comprehensive Policy Framework—the world's first international effort toward that end.

The rapid development and spread of advanced AI systems such as generative AI have become an important global issue in recent years. The Hiroshima AI Process was launched in May 2023 for international discussion, following the Leaders' direction at the G7 Hiroshima Summit under Japan's presidency. Recognizing the need to build up and promote inclusive global governance on AI in order to maximize its innovative opportunities while mitigating the risks and challenges from advanced AI systems, work began on establishing international rules to serve as the foundation of such governance. And in December of last year, agreement was reached on the world's first international framework, known as the Hiroshima AI Process Comprehensive Policy Framework.

The framework presents a set of elements, including both the "Hiroshima Process International Guiding Principles for All AI Actors" and the "Hiroshima Process International Code of Conduct for Organizations Developing Advanced AI Systems." The International Guiding Principles are the set of principles that should be applied to all actors across the AI lifecycle. In addition to principles mainly geared toward AI developers, such as publicly reporting advanced AI systems' capabilities and domains of inappropriate use, and protecting intellectual property, they also include those that call on users to improve digital literacy dealing with such risks as disinformation.

The International Code of Conduct, on the other hand, lists in more detail the actions that AI developers must abide by. A certain level of abstraction is employed in the wording of both the International Guiding Principles and the International Code of Conduct so that stakeholders from various perspectives can agree on them. Yet at the same time, the International Code of Conduct also contains some references that are more detailed, ranging from examples of risks requiring the attention of developers to the

Prime Minister Kishida participated online in the inaugural AI Safety Summit hosted by the U.K. in November 2023. He stated that he would like to work closely with such efforts to drive the creation of rules that would benefit the international community as a whole.

At the G7 Hiroshima Summit in May 2023, leaders confirmed the need for generative AI governance and agreed to establish the Hiroshima AI Process as a forum for further discussion.

development and deployment of technology enabling users to identify AI-generated content. "While prioritizing international consensus building, it is also very important to be as specific as possible. In that sense, it was a great achievement to have been able to include a certain level of specificity here," said Professor MATSUO Yutaka of the Graduate School of Engineering at the University of Tokyo, who also chairs the Government of Japan's AI Strategy Council.

Matsuo also pointed out that it was of paramount significance that this international framework, which could serve as a common foundation, was realized just seven months after the launch of the Hiroshima AI Process. "Speed is of the essence here because technology is advancing at such a rapid pace."

From now on, the G7 plans to expand outreach to partner governments to broaden support for the International Guiding Principles and the International Code of Conduct, and to further advance the Hiroshima AI Process by intensifying coordination and cooperation across multilateral forums including at the Organisation for Economic Co-operation and Development (OECD) and the United Nations (UN). Japan is slated to inaugurate the AI Safety Institute, whose roles will include conducting research on AI safety evaluation methods. The country additionally plans to establish the Tokyo Center of the Global Partnership on AI (GPAI)—an international public-private partnership—to conduct research and analysis on generative AI.

According to Matsuo, "Overall, Japan tends to take a positive stance on the development and use of AI. Simultaneously, it is actively engaged in ensuring safety, thus placing itself in the middle ground between those in the world who promote the use of AI and those who lean toward regulation. It will be important to demonstrate Japan's leadership in the future while continuing to balance international discussions on AI."

With the goal of promoting safe, secure, and trustworthy AI, Japan will promote the outcomes of the Hiroshima AI Process while continuing to strengthen global dialogue and cooperation.

As AI capabilities improve further, discussions on an international framework will become increasingly important, said Professor MATSUO Yutaka of the University of Tokyo's Graduate School of Engineering, who chairs Japan's AI Strategy Council.

GENERATIVE AI AND MANGA:

TAKING ADVANTAGE OF JAPAN'S STRENGTH IN REFINEMENT

Generative AI is a rapidly advancing technology. How will it impact such entertainment as anime, manga, and videogames, all of which represent Japan's soft power? The big question for creators is how to make the best use of AI.

Japan's anime, manga, and videogames have global fan bases. Recently, generative AI, a product of remarkable technological innovation, has begun significantly impacting those kinds of entertainment. While the pool of potential creators is expanding, some have called for guidelines governing the use of AI across borders. In 2023, G7 leaders endorsed the Hiroshima AI Process Comprehensive Policy Framework, the first international framework aiming to promote safe, secure, and trustworthy advanced AI systems.

How should AI be managed in the context of Japanese entertainment? "AI itself holds only potential. That's why it's important to know how to use and fine-tune it in a way that creates diverse, appealing kinds of entertainment, which is Japan's

SADOSHIMA Yohei, President and CEO of Cork, Inc. His agency has signed numerous creators, editing their work, creating their e-books, and managing their copyrights, fan communities, social media, character merchandise planning and sales.
CORK

Left: Sadoshima (far right) attends a meeting as a member of the Cabinet Office's AI Strategy Council. Right: Sadoshima, who used to work for a publishing company, brought the popular manga *Space Brothers* to the world as an editor. The manga's author, KOYAMA Chuya, is under an agency contract with Cork.

KOYAMA CHUYA, *SPACE BROTHERS*, KODANSHA

forte," says SADOSHIMA Yohei, President and CEO of Cork, Inc., and a member of the Cabinet Office's AI Strategy Council. After working as a manga editor at a publishing company, he founded Cork, an agency for creators, putting him in a position to protect those creators' rights.

He says, "For example, the internal combustion engine was invented abroad, but Toyota Motor Corporation succeeded worldwide by improving its quality in the form of better automobiles. That shows how Japan excels at making products that are easy to use. In terms of AI, there is a good possibility that Japan can take a leadership role in various industries by providing unique services that can do subtle things in the form of fine tuning."

One positive outcome that AI will bring to Japanese entertainment content is the ability, in Sadoshima's words, "to break down language barriers." If AI could take on the task of translation, creators could distribute more of their works overseas, while fans worldwide could enjoy new releases without delay.

While some manga artists are starting to utilize AI, he says, there are still some things that AI cannot do. For instance, it can create the setting for science-fiction manga, and interacting with it is an effective way to "brush up" a work to make it more interesting, no matter what genre it is. However, AI cannot understand the subtle "waves" and changes in human emotions.

There is also the question of managing the copyright protections that AI might threaten. Sadoshima thinks that copyrights are not about prohibitions and protections. "Rather, I believe that they serve to generate profit. In the future, I expect that the rules for how we manage copyrights will change rapidly, and that will be done in many ways. In our era, the question for the agents protecting authors' rights will be whether they have accumulated the knowledge to manage copyrights in various cases."

He also points out that "Japan has the advantage of being able to adapt quickly to the diversifying entertainment landscape." As a case in point, the world's first VTubers (virtual YouTubers) came from this country. Japan, meanwhile, continues to produce a wide variety of quality content that captivates the world, including anime, manga, and videogames, all of which are conducive to integration with AI. ●

Although not a work directly involving Cork or Sadoshima, *Cyberpunk: Peach John*, the world's first full-color comic drawn with an AI image generator, was released by Shinchosha in 2023.

ROOTPORT, *CYBERPUNK: PEACH JOHN*, SHINCHOSHA

AGE-OLD SAKE BREWERY IN NOTO

TAKES ON NEW CHALLENGES IN WAKE OF EARTHQUAKE

On New Year's Day 2024, the Noto Peninsula was struck by a major earthquake, heavily damaging many buildings, including a long-established sake brewery that had been using traditional brewing methods for more than a century. Emerging from the devastation, however, the female proprietor of the brewery, with a passion for sake brewing and Noto itself, has started to produce a new sake thanks to support from all over the country.

Jutting into the Sea of Japan from central Honshu, the Noto Peninsula of Ishikawa Prefecture presents a rich natural landscape in which residents have peacefully led their daily lives over the centuries to create a unique culture. The Food and Agriculture Organization (FAO) of the United Nations has recognized the Noto Peninsula as a "Globally Important Agricultural Heritage System," acknowledging its *satoyama* and *satoumi* as "areas extending from the mountains to the sea that are closely connected and entwined in terms of land use, agriculture, forestry and fisheries," as well as its food culture, festivals, crafts, and biodiversity. In recent years, Noto has become a popular destination for foreign tourists as well, as they come to get a glimpse of its nature and culture.

Terraced rice fields such as these—the Shiroyone Senmaida of Wajima City—are typically found throughout the Noto Peninsula. The rice paddies (shown pre-quake in the photo) were also damaged by the January 1 tremor, but restoration efforts are already underway.

As a peninsula surrounded by the sea on three sides, one of Noto's specialties, naturally, is fresh seafood (top). The region's sake is characterized by a strong taste that brings out the flavor of seafood.

On January 1, 2024, a major earthquake struck the peninsula. One of the structures that suffered extensive damage from the quake was an old building with more than 150 years of history—Matsunami Shuzo, a sake brewery founded in 1868 in Noto Town. Looking beyond the rubble to the future is KINSHICHI Seiko, the seventh-generation proprietor of the brewery.

Giving her impetus and encouragement, several sake breweries from outside the region contacted her a few days after the quake, telling her, "We will do whatever we can to help." With more offers of support continuing to come in, some of the brewery's rice—the raw material for sake—was salvaged from a collapsed warehouse about a month later. Using that rice, Kinshichi has started brewing a new sake at a different brewery in the same prefecture that fortunately went unscathed during the tremor. "Sake is what we do for a living," she says. "It is something we enjoy and want to continue; that is why I create sake."

Matsunami Shuzo makes sake in the traditional fashion, using water pumped from wells and authentic wooden tools. Most of the brewing process is done by hand, without the use of large machines—that is the brewing method that Kinshichi hopes to pass down in Noto well into the future. Indeed, it is her ardent desire to keep Noto's sake alive, as it is created out of a passion for tradition, culture, and community.

Since ancient times, a group of master sake brewers in Noto has been supporting sake-brewing activities throughout the country, helping to hand down brewing skills. Kinshichi emphasizes, "Sake is not just a luxury product. Both sake and sake breweries are an integral part of this land." In this region, where old customs and festivals remain, sake is still a part of everyday life. Sake is so entwined in the local culture that if it were to disappear, so, too, would the culture around it. The residents' message to Kinshichi resonates with emotion: "The reconstruction of our town begins with the rebuilding of the sake brewery."

Sake breweries nationwide have also joined forces to protect sake brewing in Noto, with steady progress being made in a variety of ways. Additionally, beneficial use is being made of the knowledge gained from sake breweries in Tohoku that survived the Great East Japan Earthquake of 2011. Living in such a disaster-prone country, the people of Japan have a deeply felt urge to share experience and knowledge for mutual aid.

Although Noto is still in the process of recovering, other areas in Ishikawa Prefecture were less affected by the earthquake—not only the ancient city of Kanazawa, but also areas such as Komatsu and Kaga—and they all offer their own unique cultures, and by extension, their own sake. Accordingly, now is the time to visit those other areas and experience the culture and food rooted in the prefecture, as Kinshichi recommends.

At the same time, she also expresses her desire to export Matsunami Shuzo sake overseas at the earliest opportunity, a goal of the brewery since before the earthquake. "I hope that people will come back to Noto again someday. Personally, I would also like to travel abroad more often," Kinshichi says cheerfully.

KINSHICHI Seiko salvages sake rice from a collapsed warehouse (left). Many volunteers from all over the country came to help.

JAPAN'S HISTORICAL LANDMARKS

ADORNED BY PLANTS IN SPRING

Colorful flowers bloom gorgeously in the spring.
Historical buildings full of ancestral sentiments become even more attractive when adorned by flowers and plants in their season.
To experience such living history and tradition,
why not visit Japan during the spring?

SHRINE WITH WISTERIA

Nara is famous as the ancient capital of Japan. Here, Kasuga Taisha Shrine was founded in 768 by order of the ruling empress of the time. Both the shrine and the sacred old-growth forest behind it constitute part of the "Historic Monuments of Ancient Nara" UNESCO World Heritage Site. The emblem of the shrine depicts wisteria, a vine growing naturally within the shrine grounds since ancient times. Near the main building, one special tree, purported to be over seven centuries old, extends its flower bunches over one meter in early May, creating a splendid contrast with the bright vermilion of the shrine.

ARLO

west/amuratmages

BRIDGE IN SPRING

Near the western tip of Honshu can be found Kintaikyo Bridge—one of the world's rare five-arch wooden bridges—situated in Iwakuni City, Yamaguchi Prefecture. First built in 1673, it measures approximately 193 meters long and five meters wide. The bridge, embodying both the passion of those of the past, who wanted "a sturdy bridge to withstand floods," and the skills of successive craftsmen, charms sightseers with its wooden arches and beauty. In spring, the bridge offers wonderful views of cherry blossoms and rapeseed flowers blooming along the riverbank. Excursion riverboats are also popular for enjoying both the bridge and flowers from the river.

WATERED RICE PADDIES

The period extending from May into June is the best time of year to visit the countryside and glimpse scenes of traditional Japanese life. Rice paddies filled with water are neatly planted with rows of seedlings, whose vibrant green adorns the reflection of the surrounding scenery and blue skies on the water surface. Rice planting is a special yearly event in all parts of Japan, as the grain is a staple food. The photo here shows a minuscule temple nestled amidst paddies in Nagaoka City, Niigata Prefecture, which boasts the highest volume of rice production in the country. Such a sight can be considered true to Japan's original landscape.

KIZUNA

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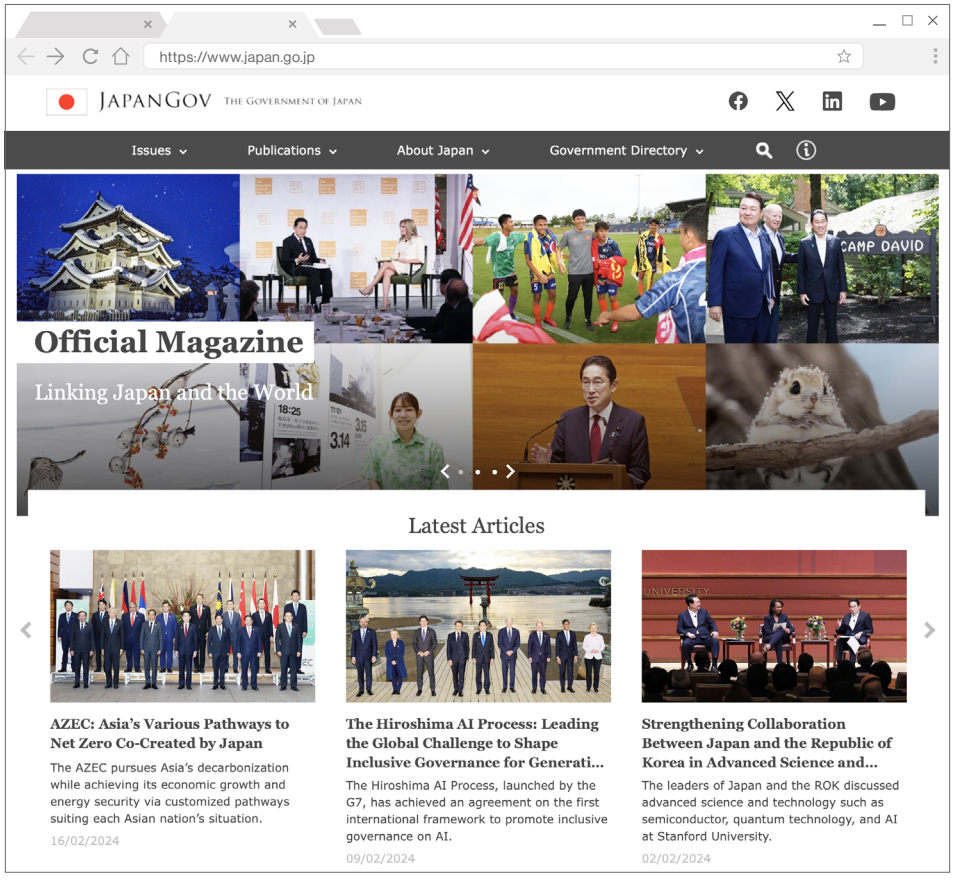

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