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Report on Japan: technological capacities and key policy measures

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Section

Introduction

This report has been prepared in the framework of the Advanced Technologies for Industry (ATI) project, initiated by the European Commission, Directorate General for Internal Market, Industry, Entrepreneurship and SMEs and the European Innovation Council and Small and Medium-sized Enterprises Executive Agency.

The objective of the international country reports is to explore the technology and policy landscape of selected non-EU countries. Country performance in advanced technologies is presented based on patent, trade and investment data. The reports provide also a concise and informative review of policies relevant for advanced technology development and deployment.

The starting point of this analysis has been sixteen advanced technologies that are a priority for European industrial policy and that enable process, product and service innovation throughout the economy and hence foster industrial modernisation.

Advanced technologies are defined as recent or future technologies that are expected to substantially alter the business and social environment and include *Advanced Materials, Advanced Manufacturing, Artificial Intelligence, Augmented and Virtual Reality, Big Data, Blockchain, Cloud Technologies, Connectivity, Industrial Biotechnology, the Internet of Things, Micro and Nanoelectronics, Mobility, Nanotechnology, Photonics, Robotics and Security*. The full methodology behind the data calculations is available on the ATI website[1].

The report is structured as the following:

The first section outlines the capacities of Japan in terms of technology generation (patent applications), followed by an analysis of international competitiveness in technology-based products (export shares) and, eventually, entrepreneurial dynamism (venture capital activities and investments in tech firms).

The second section analyses the main Japan policy strategy in support of advanced technologies and provides an overview of some of the key policy initiatives and policy measures in the field.

[1]https://ati.ec.europa.eu/reports/eu-reports/advanced-technologies-industry-methodological-report

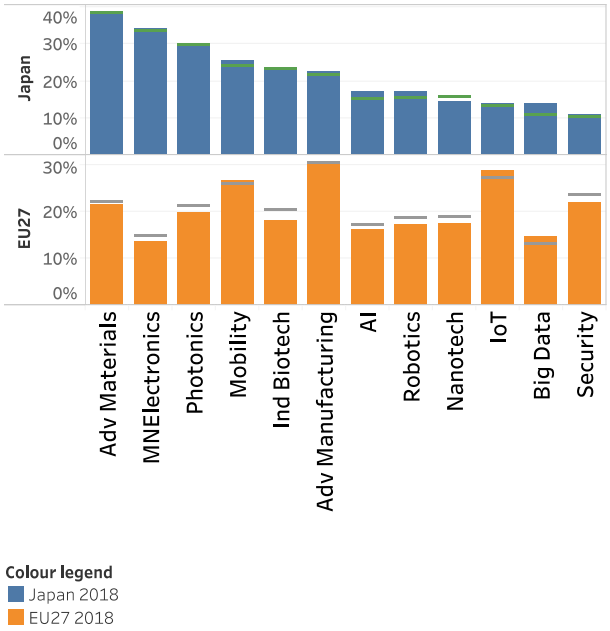
Section 1

1. Activities and capacities in advanced technologies

1.1 Patent applications

Technological trends and development have been captured based on patent data. An analysis of Japan's current share of transnational patent applications helps to evaluate its current technological performance across different fields of advanced technologies. Figure 1 gives an overview of the Japanese share of worldwide transnational patent applications related to advanced technologies in comparison with the EU27 Member States in 2018.

Figure 1: Share in global transnational patentapplications in ATI fields (2017-2018) (bars refer to 2018 value and the green and grey lines indicate the status in 2017)

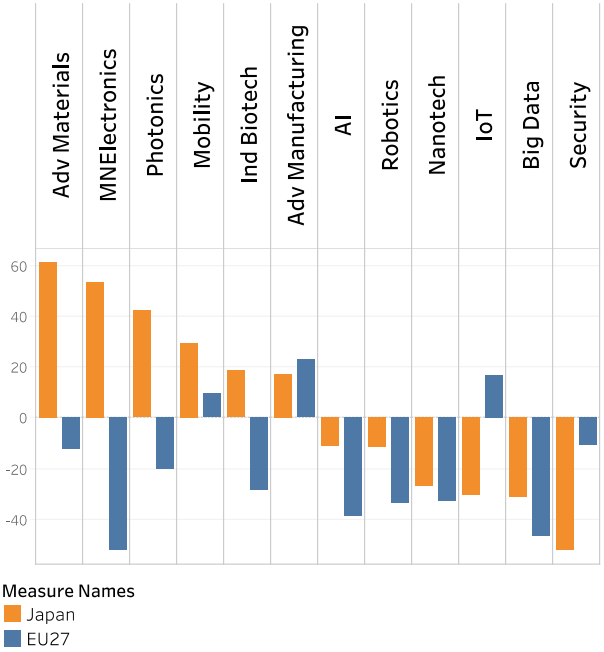


Source: Fraunhofer ISI, based on EPO PATSTAT

As shown in Figure 1, the EU27 holds a higher share of global patent applications than Japan in 8 of the 12 advanced technology fields considered. Japan recorded the highest share of patent applications within the total number of transnational patent applications in the field of Advanced Materials in 2018. Further technologies that played a more important role were Micro- and nanoelectronics, followed by Photonics and Mobility. When comparing the trends over time, the world share of Japan has overall stayed stable, but has increased in AI, Big Data, Robotics and Mobility.

The analysis of the RPA-index[2] as visualised in Figure 2 displays the relative technological specialisation of Japan in all twelve advanced technology fields in comparison with the EU27. In 2018, Japan was the most specialised in Advanced Materials and Micro and Nanoelectronics followed by Photonics and Industrial Biotechnologies (similarly as in the case of its share of world patent applications). On the contrary, the EU27 displayed weak specialisation in all four of these areas. The results of the RPA analysis indicate that although Japan has a rather weak specialisation in AI, Big Data, Nanotechnologies and Robotics, the performance is higher than the one registered by the EU27. In 2017, the EU27 reached a relatively more specialised level in Advanced Manufacturing technologies, IoT and Security compared to Japan.

Figure 2: Technological specialisation RPA-Index of Japan and EU27 (2018)



Source: Fraunhofer ISI, based on EPO PATSTAT

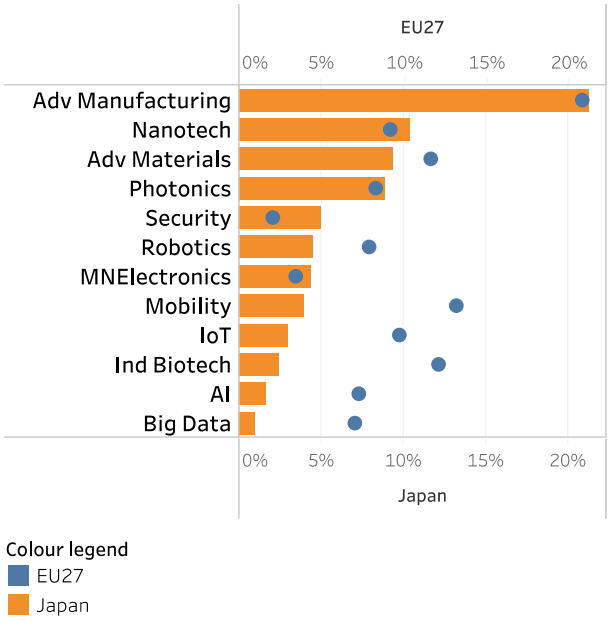
[2] The RPA-Index illustrates the relative specialisation on a scale from -100 to +100, putting the share of a specific field in national applications in relation to the global average share.

1.2 International competitiveness

Trade measures are a common indicator of global competitiveness, as they document the attractiveness of a country's products beyond the home market. Total exports provide evidence about a country's role as a producer, and trade balance captures its sovereignty in certain areas of production.

Figure 3 displays the Japanese share of global exports related to advanced technologies in comparison with the EU27 for 2018. The results demonstrate that the EU27 exports more products than Japan in Advanced Materials, Mobility, Robotics, IoT, Industrial Biotechnologies, AI and Big Data. Japan displays a relative trade advantage over the EU27 in Nanotechnologies, followed by Photonics, Security and Micro and Nanoelectronics compared to other fields of advanced technologies. Japan and the EU27 show a very similar share of global exports in relation to Advanced Manufacturing technologies.

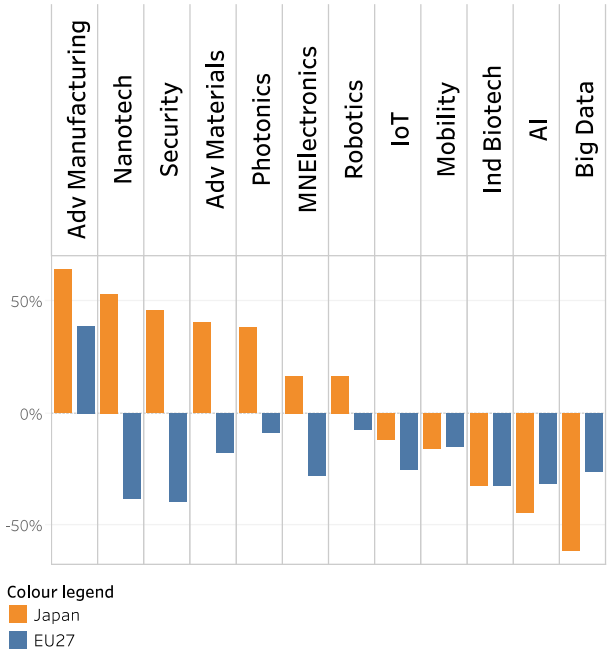
Figure 3: Export share in world total (2018)



Source: Fraunhofer ISI, based on UN COMTRADE

Figure 4 visualises the trade balance[3] in relation to the total trade volume of Japan and the EU27 countries in 2018.

Figure 4: Trade balance in relation to overall trade volume (exp. - imp.) (2018)



Source: Fraunhofer ISI, based on UN COMTRADE

Overall, data related to Japan show a better performance in the majority of the advanced technology fields. Japan exhibits a relative trade surplus in Advanced Manufacturing technologies and Robotics. In relation to Advanced Materials, Micro and Nanoelectronics, Nanotechnologies, Photonics and Security, Japan exhibits a notable relative trade surplus, while the EU27 shows a considerable trade deficit. Both the EU27 and Japan show a trade deficit with regard to goods relevant for AI, Big Data, Industrial Biotechnologies, IoT and Mobility.

1.3 Investment activities

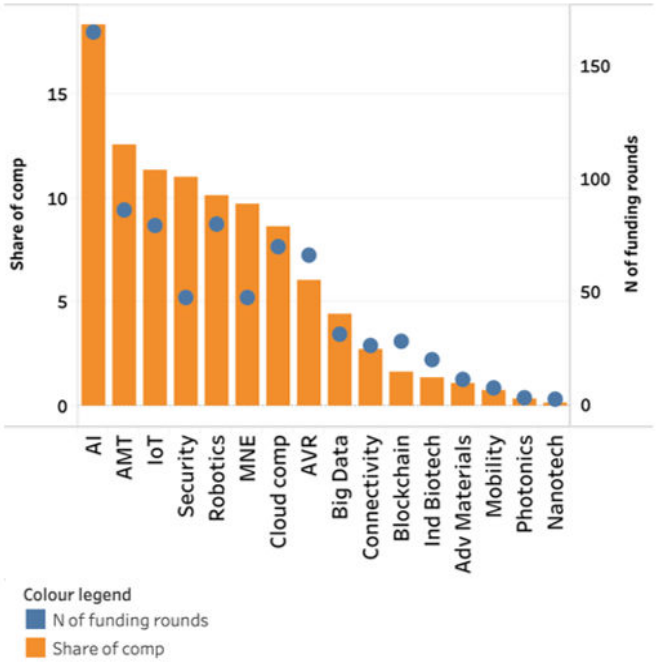
The following figures analyse private and venture capital (VC) investments in advanced technologies in Japan. Figure 5 illustrates the number of investment deals in advanced technologies and the share of investment-backed firms in Japan based on Crunchbase[4] data. The results have to be interpreted with caution since the data from Japanese start-ups and scaleups are limited.

The analysis suggests that the relative number of investment-backed firms in Japan was the highest in Artificial Intelligence and Advanced Manufacturing technologies, followed by Internet of Things and Security.

[3] Exports - Imports

[4] Private equity, venture capital investment and related innovative start-up creation have been explored based on a merged dataset available in Crunchbase and Dealroom. Crunchbase provides information on venture capital backed innovative companies.

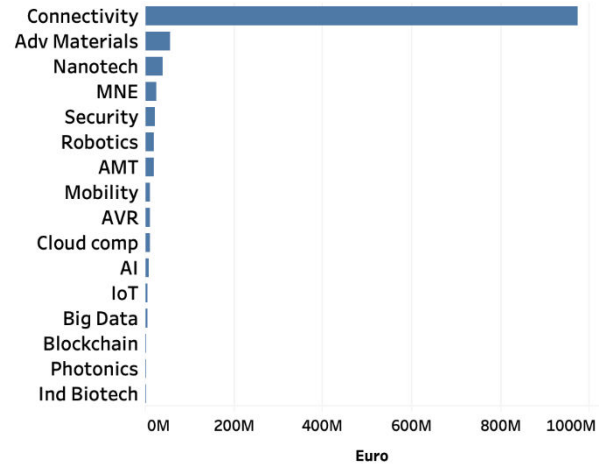
Figure 5: The number of funding rounds and share relative to the number of companies in Japan (2020)



Source: Technopolis Group based on Crunchbase

Figure 6 depicts the average amount (euro millions) of funding deals in all sixteen advanced technologies during the last decade.

Figure 6: Average of funding amount in Japan (€ million)



Source: Technopolis Group based on Crunchbase

The results indicate that Japanese technological firms had the highest average deal values in Connectivity, followed by Advanced Materials and Nanotechnology with a notable gap. The other advanced technologies in Japan in terms of investment display much smaller average funding amounts.

Section 2

2. Key actors, policy and governance framework

2.1 Overview and policy context

Policy strategy	***Year***	
Fifth Science and Technology Basic Plan	2016-2020	
Society 5.0	2018-ongoing	
Artificial Intelligence Technology Strategy	2017-ongoing	
Smart Japan ICT Strategy	2014-ongoing	
Connected Industries	2017-ongoing	
NESTI 2050 (National Energy and Environment Strategy for Technological Innovation towards 2050)	2016, ongoing	
SIP- Cross-ministerial Strategic Innovation Promotion Program	2018, ongoing	
Japan Healthcare 2035	2015-2035	
Integrated Innovation Strategy 2020	2020 - Ongoing	
Strategy for Semiconductors and the Digital Industry	2021 - Ongoing	
Green Growth Strategy	2021 - ongoing	
Policy measures		
Title	*Year*	*Budget*
New Robot Strategy	2015-2020	~¥100 bn (2015-2020) ~€77 m
METI gBizID single sign on system	2019	
METI Mirapano plus portal for SMEs	2020	
Green Innovation Fund	2021	¥2 tn (€1.5 bn)

Source: authors

Japan is the world's third largest economy[5] and a leading industrial and technology power, particularly in the automotive and consumer electronics industries. Since the 1990's Japan has suffered from deflation and sluggish growth. Since 2012, the expansive economic policies sponsored by the prime minister Shinzo Abe ('Abenomics') combining a bold monetary policy, flexible fiscal policy and structural reforms, helped Japan to return to moderate growth, but increased public debt (226% of GDP in 2018). In the last 3 years 2018-20 economic growth slowed down again due to reduced world trade, natural disasters such as earthquakes and typhoons and Covid-19[6].

Japan is a world leader for digital infrastructures, with a high level of adoption of advanced technologies. For example, Japan leads the OECD on mobile broadband connectivity (with 168 subscriptions per 100 inhabitants) and has the second highest share of fibre connections in fixed broadband (77%)[7]. Japan is second only to Korea in robot density in manufacturing and around 47% of firms use cloud computing. It invests over 6% of GDP in ICT equipment, computer software and databases, R&D and other intellectual property.

However, technology-enabled growth is constrained by uneven innovation capability and digital transformation, due to an ageing population

[5] OECD Statistics – 2019
[6] OECD Economic Surveys, 2021
[7] OECD Japan Policy Brief, 2019

(already reducing the labour force), advanced technology skills gaps, and low business dynamism by traditional industries. SMEs suffer from low productivity and R&D investments: their share of R&D spending at 5% is very low, compared to the OECD average of 30%[8].

2.2 Government policies towards technology development and adoption

Japan has always pursued proactive industrial and technology policies. In the last years, however, the prime minister's cabinet has made science and technology policy a key component of its development strategy, with a view to leverage innovation to kick-start faster growth. To deal with current issues, Japanese policies have expanded to encourage digital and societal innovation through targeted policies such as the Society 5.0 strategy, the Smart Japan ICT strategy and Healthcare 2035. The government has substantially increased the annual science and technology budget from an average level of approximately ¥3.6 tn (€28 bn) in the years until 2017, to ¥3.8 tn (€29.6 bn) in 2018, then to ¥4.2 tn (€32 bn) in 2019 and ¥5.3 tn (€42 bn) in 2020. This has given a boost to technology and digital policies.[9]

The Ministry of Economy, Trade, and Industry (METI), leads economic policies and supports businesses in Japan. The Information Project Office (IPO), the division that deals with digital transformation of METI, is responsible for planning an overall strategy for its digitalisation, budgeting and capacity building.

METI Digital Transformation initiatives

The Digital Transformation Office (DTO) in the Ministry of Trade (METI) is focused on the digitalisation of the administration and the provision of digital services for businesses. One of the initiatives of DTO is the creation of a unified authentication system by IPO, named 'gBizID', a single-sign on system for businesses in order do access METI's digital services since 2019. Its usage will be expanded to other ministries from 2020 onwards.[10]

The Japanese government is also offering and expanding financial support to SMEs which want to invest in new technologies and using public procurement to boost innovation in SMEs. The SMEs Agency in METI has developed a portal for SMEs called 'Mirasapo Plus' which was launched in April 2020. This all-in-one portal provides SMEs with information of the supports available for them and how to apply for government services, as well as provide data for the government to finetune its policies[11].

Society 5.0

The Society 5.0 strategy is a central component of the Abe government's growth strategy, a way to leverage innovation to propel Japan beyond the low growth trap of the last decades.[12]

A key element of the 5th Science and Technology Basic Plan, Society 5.0 is a vision of a super smart society that can resolve various social challenges by incorporating the innovations of the fourth industrial revolution (including the Internet of Things (IoT), Big Data, Artificial Intelligence (AI), Robotics and the sharing economy) into every industry and social life. The 'cyber-physical system', in which cyberspace and the physical space are tightly integrated, is expected to become a pervasive technological mode supporting Society 5.0. Leveraging the power of technology, Japan is expected to overcome social challenges such as the decrease in productive-age population and environmental issues. Society 5.0 is projected to bring solutions to the current challenges in healthcare, mobility, infrastructure and financial technologies (fintech).

Artificial Intelligence (AI) Technology Strategy, 2019

In 2016, the Japanese government established an 'Artificial Intelligence Technology Strategy Council' considering it as Japan's[13] key pillar for Society 5.0. It characterises AI as a service and foresees three phases for AI development and use: (1) expanding use of data-driven AI in each service domain, (2) general use of AI and data across services, and (3) the formation of ecosystems through a complex merger of these services.

The AI strategy[14] was updated most recently in 2019 targeting five designated priority areas (manufacturing, transportation and logistics, health and medical care, agriculture and disaster response). An important goal is also to use AI to help solve major societal problems like ageing society or labour shortage, diversification of energy sources, GHG (greenhouse gas) reduction or more efficient waste management, which lines up perfectly with achieving Sustainable Development Goals.

The Japanese government recognises that data is a necessary enabling condition for AI and is investing in the development of a data linkage infrastructure. All the practical applications of AI planned in the new AI Strategy are designed as

[8] OECD Japan Policy Brief, 2019
[9] UNESCO Science Report, 2019
[10] OpenGov Asia, 2019
[11] Ministry of Trade, 2020
[12] Abenomics, Realizing Society 5.0
[13] http://www.nedo.go.jp/content/100865202.pdf
[14] Japan Cabinet Office, AI strategy 2019

two-way data flows – one direction is technology and data deployment into the industry area and the other is the data gathered from users feeding further development of AI.[15]

Among high profile AI initiatives,[16] we should mention the Artificial Intelligence 'boy' who was granted residency in Tokyo, Japan, in November 2017. The AI system is a chatbot programmed to act like a seven-year-old boy named Mirai, which is a part of a project aimed at making local government more familiar and accessible to locals. The chatbot is available to listen to the opinions of Shibuya residents.

In 2018, METI opened a portal website of 'Future Classroom-Learning Innovation' project which aims to broadly convey to the public the progress in a series of demonstration projects, information on the latest trends in EdTech at home and abroad. This project aims at raising awareness in the Japanese society about the need to coexist with Artificial Intelligence (AI).

Smart Japan ICT Strategy

This strategy was launched in 2014 by the Ministry of Internal Affairs[17] and communication and is based on two main pillars, a national strategy to create innovation through pervasive ICT-based connectivity and an international strategy to promote Japan's global competitiveness and outreach in ICT. Both pillars aim at promoting economic growth and the Japanese contribution to international society through innovation by ICT.

The strategy includes investments in ICT infrastructures and skills, as well as multiple initiatives (priority projects) addressing sectors such as smart cities and smart agriculture. One of the strategic goals was to realise the world's most advanced ICT environment for Tokyo 2020 Olympic and Paralympic Games, postponed because of the Covid-19 pandemic to 2021.

Smart Agriculture is a key component of this strategy. Growing concerns over agricultural sustainability, including forecasted water shortages by 2030, compelled Japan to develop a digital farming technology. By leveraging the Internet of Things and Artificial Intelligence to collect and analyse data from farming practices and the surrounding environment, this technology enables to improve agricultural productivity even in areas with limited access to water. This technology is expected to bring a huge change to the future of sustainable agriculture.

Connected Industries Policy

In March 2017, the Ministry of Economy, Trade and Industry (METI) released the policy concept 'Connected Industries' as a goal for Japanese industries to create new value through connecting things, people, technologies, organisations and other societal elements. Under this initiative, Japan will strive to identify priority fields and intensively invest policy resources in those specific fields, as well as promoting cross-sectoral policies, thereby allowing Japanese industries to gain a foothold in the competitive global 'real-data' markets.[18]

The initiative is structured around 5 priority fields, namely: a) Automated Driving and Mobility Services; b) Manufacturing and Robotics; c) Biotechnologies and Materials; d) Plant/Infrastructure Safety Management; e) Smart Life.

National Energy and Environment Strategy for Technological Innovation towards 2050 (NESTI 2050)

In Japan, more than 90% of greenhouse gas (GHG) emissions are CO2 emissions. Electricity generation accounts for almost half of this due to its dependence on fossil fuels, mainly coal. The country aims to reduce GHG emissions by 26% relative to 2013 level, by 2030. As part of driving the economic growth, the country is also committed to cutting GHG emissions by 80% by 2050. According to the OECD,[19] it is essential that Japan increases the share of renewable energy and develops a low greenhouse gas emission development strategy with a horizon to 2050.

To deal with this need, the Ministry of Economy, Trade and Industry (METI) launched the NESTI strategy.[20] Compiled by the Council for Science, Technology and Innovation (CSTI) of the Cabinet Office, NESTI 2050 deals with the integration of technologies for energy systems. The Ministry identified several innovative technologies with the potential to make a huge impact on emission reductions, with a focus on energy conservation and the expansion of renewable energy. By promoting an integrated development of these technologies, the Cabinet Office believes that Japan can achieve its environmental goals and contribute to the development of the 'Society 5.0' vision.

Cross-ministerial Strategic Innovation Promotion Programme (SIP)

Led by the Council for Science, Technology and Innovation (CSTI) of the Japanese Government,

[15] The rapid growth in AI in Japan, 2020
[16] Future of Life Institute, 2018
[17] Smart Japan ICT strategy, 2014
[18] Connected Industries Initiative Tokyo 2017
[19] OECD Economic surveys, 2019
[20] Japan for sustainability, 2016

SIP is a national programme for the implementation of scientific and technological innovation in the country[21]. This programme promotes interdisciplinary research and development, covering from fundamental research to the application stage, with industry-academia-government cooperation. The Cross-ministerial Strategic Innovation Promotion Program has identified 11 research and innovation priority areas from the fields of energy, next-generation infrastructure and regional resources. The main goals are to solve the Japanese social problems, to revitalise the economy, and to bolster Japan's industrial positioning in the world.

Japan Healthcare 2035 – Leading the world through health

Japan Healthcare 2035 is a vision for the health system in the next 20 years promoted by the Ministry of Health, Labour and Welfare[22]. The vision starts from the recognition that increasing healthcare needs and costs cannot be managed through simple financial adjustments. Healthcare 2035 aims at transforming the healthcare system, leveraging the advances in medical technology to respond to the needs of all lifestyles and all people. The vision foresees each citizen to be empowered to realise their full wellness potential and take ownership of their health needs. A priority objective is to deal with the issues raised by a rapidly ageing population but achieve sustainability of the system. This means a paradigm shift to a multidimensional health network able to deal with social needs not only from the medical point of view, but also concerning aspects such as access to housing, community building and employment. This paradigm shift means transforming the health system priorities from quantity to quality, from inputs to value, from government regulation to autonomy, from cure to care, from fragmentation to integration.

Integrated Innovation Strategy 2020

Considering the impact of coronavirus disease and the position of Japan in digitalisation, the Council for Science, Technology and Innovation has adapted the Integrated Innovation Strategy. The main aim of the strategy is to accelerate digitalisation with a sense of crisis and urgency to create innovation that transforms social systems and strengthen the research capacity which is the source of innovation.

The results will see the realisation of a sustainable, resilient and human-centred Society 5.0 that leads the world using comprehensive knowledge that also incorporates knowledge of the humanities and social sciences[23].

Strategy for Semiconductors and the Digital Industry

The Ministry of Economy, Trade and Industry (METI) established the Semiconductor and Digital Industry Strategy in order to examine future policy directions regarding semiconductors, digital infrastructure and the digital industry.

In light of the transitions and changes in the environment surrounding semiconductors, digital infrastructure and the digital industry, specific strategies tailored to the following fields have been formulated: (1) semiconductors, (2) digital infrastructure, and (3) the digital industry. The strategy is built to secure the commitment of the industrial world and the effective use of private-sector funding. The foundations of the digital industry—semiconductors, data centres, clouds, etc.—will support the economy, society and democracy in the 21st century. In view of this, among the businesses that constitute those foundations, the strategy is to identify the organisations that should be targeted through the appropriate internal government processes, and then consider establishing a system for special measures to treat them beyond normal industrial policy.

Green Growth Strategy

The Ministry of Economy, Trade and Industry (METI) has updated the 'Green Growth Strategy Through Achieving Carbon Neutrality in 2050'.

The strategy leads to sustainable growth and innovation by incorporating all necessary policies into the effort. It will further raise the feasibility of achieving a carbon neutral society by 2050. The government will accelerate structural changes in the energy and industry sectors, and bold investment to make innovation.

'The Green Growth Strategy' will produce and direct all available policies, including budget, taxation, finance, regulatory reforms/standardisation and international cooperation towards that goal. This will support the forward-looking challenges of companies, such as making bold investments to make innovation, and realise transformation in the industrial structure and social economy. In order to trigger a spiral of innovation, the strategy focuses on the following two points: 1) updating policy measures and goals to be achieved in each area, and 2) presenting benefits to people's lives, in addition to decarbonisation effects.

[21] Japan Science and Technology Agency, 2018
[22] Ministry of Health, 2015
[23] Council for Science, Technology and Innovation, 2021.

2.3 Government initiatives to foster specific advanced technologies

Under the over-arching umbrella of the 'Society 5.0' vision, the Japanese government has launched several initiatives to promote the emergence of an ultra-smart society. In this vision, all things will be connected through IoT technology and all technologies will be integrated, thereby improving the quality of living.

Blockchain

The Japan Blockchain Association (JBA) was established in 2016 and includes two divisions: one dealing with virtual currency and the other with blockchain technologies in general. The former group — which concerns consumer, tax and financial regulatory issues — includes bitcoin exchanges such as Kraken, bitFlyer and Coincheck. The latter group — which concerns definition and policy proposals for non-currency blockchain technology — includes Microsoft Japan, payments gateway GMO Internet Group, blockchain cloud computing platform Orb and blockchain identity startup Soramitsu.

The use of blockchain technologies for voting systems is encouraged in Japan as part of the Society 5.0 vision. In 2018, the city of Tsukuba was the first city to introduce a new online voting system based on the 'My Number identification' system and blockchain technology[24]. The system allows voters to cast ballots via a computer display after placing the 'My Number card' on a card reader. With blockchain technology, voting data is prevented from being falsified or read.

5G Development Roadmap toward 2020

Japan's 5G development Roadmap toward 2020 was developed in 2017 by the Ministry of Internal Affairs and Communications (MIC) in collaboration with the industry-led Fifth Generation Mobile Communications Promotion Forum (5GMF).[25] MIC has collaborated with Japanese telecom provider NTT DOCOMO, Japanese commuter railway company Tobu Railway and Chinese ICT solutions provider Huawei to conduct 5G field trials in Tokyo Skytree Town, a modern commercial centre in Tokyo.

The Ministry of Internal Affairs and Communications has started allowing certain 4G frequencies to be converted to 5G in the summer of 2020, which would let providers use existing base stations to power 5G networks. Softbank, the nation's third-largest mobile phone carrier by number of subscribers, announced its 5G services are available in Tokyo, Osaka, Chiba, Aichi, Hiroshima, Ishikawa and Fukuoka prefectures. The operator aims to install over 10 000 5G base stations by the end of March 2023.[26]

The NEC Corporation, KDDI Corporation and Obayashi Corporation carried out an operation in which the next-generation mobile communication system 5G was used to remotely control two construction machines in a cooperative manner. This field experiment applied the key features of 5G communications, such as high speed, high capacity, and low-latency communication.

Robotics

In April 2018 the Ministry of Economy, Trade and Industry confirmed and reinvigorated Japan's New Robot Strategy that was launched in 2015.[27] The strategy aims to tackle the low level of productivity within the service sectors and, more specifically, in the manufacturing industry. The strategy introduces further improvements to spread the use of robotics technology thus exerting a big stimulus on the production line. The initiative intends to reinforce Japan's leading position in robotics by strengthening and enlarging the scope of this technology applications to novel fields. This includes healthcare ('nursing and medical care' to reduce care workers' risks due to heavy workload and reforming nursing care insurance); agriculture (to introduce automated driving tractors by 2020 and contribute to labour savings by introducing a wide range of robot types in the fields); construction (to improve productivity, protect labour from hazards but also to repair ageing critical infrastructure and achieve higher targets of unmanned construction efficiency).

Under the framework of the New Robot Strategy, the Government aims to expand the robot market size to ¥2.4 tn (annually) (€18.6 bn)– versus a current market size of ¥650 bn. The government also wants to reduce costs for the initial introduction of robots by 20% and double the number of human resources assisted by robots to 30 000 by the end of 2020. The plan is also to support and enhance testing by funding a new robot test field in Fukushima and developing a testing field for robots and drones. In order to accelerate the diffusion of robots, the government also launched an annual World Robot Summit in Japan.[28]

Augmented & Virtual Reality

Japan's Ministry of Economy, Trade and Industry (METI) provides grants for content creators that leverage advanced content creation technologies, including AR/VR, to promote products, services or tourism in Japanese regional areas.[29]

[24] The Japan Times,2018
[25] Kohei Satoh, 5GMF, 2017
[26] European 5G Observatory, 2021
[27] Ministry of economy, Trade and Industry, 2018
[28] https://worldrobotsummit.org/en/
[29] Australian Government, 2018

Major Japanese telecommunication companies such as NTT Docomo, KDDI and Softbank plan to set up AR/VR viewing platforms utilising 5G at sports games and other live events to offer new experience to audiences. A range of industries such as healthcare, tourism, retail, education, real estate, defence and manufacturing are expected to use VR/AR technologies mainly for experiential/training purposes (mainly VR) and navigation.

Government-led cloud computing services

Japan is one of the top global cloud services market. Since 2009, Japan's government has strengthened cloud infrastructure through the 'Digital Japan Creation Project' with annual rollouts of new government-led cloud services through 2015. This project, the 'Kasumigaseki Cloud,' supports all government ICT systems and has been key in growing Japan's cloud market. This cloud has enabled public and private sector collaboration on processing of government documents and included increased online applications to encourage public use of mobile devices in accessing government functions.

However, in February 2020[30] the Japanese government announced plans to use Amazon Web Services to help move human resource systems and document management tools onto the cloud in a more than ¥30 bn (€231 m) contract through fiscal 2026. The government aims to put systems currently operated by different ministries and agencies on the cloud in four to eight years. Amazon Web Services has been chosen to build 20 core government wide systems to kick-start the process, due to its pricing and quality of services.

Industrial Biotechnology

The Japanese government has made great efforts to boost industrial biotechnology (biotech) within its borders.[31] One such example is the government-funded Okinawa Health Biotechnology Research and Development Centre, which provides free research facilities to qualified biotechnology companies. The centre's mission is to create new industries and improve manufactured products through government, industry and academia collaboration.

Green Innovation Fund

METI decided in March 2021[32] to develop a Green Innovation Fund at the level of ¥2 trillion (€15.5 bn) as part of the New Energy and Industrial Technology Development Organisation (NEDO). The fund places full emphasis on companies engaging in the fields having high policy effects and requiring long-term, continuous funding support measures focusing on R&D projects, including social implementation, among the priority fields on which the Green Growth Strategy stipulates action plans.

METI's support will focus on priority fields for which implementation plans have been formulated within the Green Growth Strategy, where policy effects are significant and long-term continuous support is required to trigger implementation.

[30] Nikkei Asian Review, 2020
[31] Biotechnology Innovation Organization
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About the 'Advanced Technologies for Industry' project

The EU's industrial policy strategy promotes the creation of a competitive European industry. In order to properly support the implementation of policies and initiatives, a systematic monitoring of technological trends and reliable, up-to-date data on advanced technologies is needed. To this end, the Advanced Technologies for Industry (ATI) project has been set up. It provides policymakers, industry representatives and academia with:

- Statistical data on the production and use of advanced technologies including enabling conditions such as skills, investment or entrepreneurship;
- Analytical reports such as on technological trends, sectoral insights and products;
- Analyses of policy measures and policy tools related to the uptake of advanced technologies;
- Analysis of technological trends in competing economies such as in the US, China or Japan;
- Access to technology centres and innovation hubs across EU countries.

You may find more information about the 16 technologies here: https://ati.ec.europa.eu.

The project is undertaken on behalf of the European Commission, Directorate General for Internal Market, Industry, Entrepreneurship and SMEs and the European Innovation Council and Small and Medium-sized Enterprises Executive Agency (EISMEA) by IDC, Technopolis Group, Capgemini, Fraunhofer, IDEA Consult and NESTA.

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