

Outline of 2025 White Paper on Science, Technology and Innovation(Annual report on promotion of science, technology and innovation creation in FY2024) (Provisional Translation)

- ◆ The white paper is an annual report on measures implemented by the Government of Japan to promote science, technology and innovation in accordance with the Basic Act on Science, Technology and Innovation.
- ◆ It consists of two parts: **Part 1: Highlight topics for the respective fiscal year** (as Special Feature) and **Part 2: Annual report** (as per previous fiscal year)

[Special Feature] A Look Back at the History of Science, Technology and Innovation Policy -30 Years of the Science and Technology Basic Law-

- **The Science and Technology Basic Law** was enacted in 1995 as a bipartisan legislative initiative by Diet members in recognition of the need to emphasize basic research against the backdrop of the "basic research free ride" theory. Legislators agreed that to develop the Japanese economy, there was a pressing need to break away from the domestic-oriented approach to science and technology, and taken on challenges of new frontier fields to pave the way for Japan to become a global frontrunner. The Basic Law provides a universal recognition of issues that lead to current science, technology and innovation policies, and a direction toward their solution.
- This year’s special issue marks the 80th anniversary of the end of World War II and the 30th anniversary of the enactment of the Basic Law. Chapter 1 (Postwar Period) and Chapter 2 (From the Enactment of the Basic Law to the Present) review the economic, social, scientific and technological developments that have taken place over the years, based on previous white papers. Chapter 3 outlines the future prospects for science, technology and innovation policy. In addition, the appendix includes a preliminary introduction to the results of text mining of previous white papers.

Chapter 1: Postwar to Pre-Enactment of the Science and Technology Basic Law

1945-1955: The era of science and technology for postwar reconstruction and economic recovery

- Dismantling of the wartime system by GHQ and the development of a new science and technology system
- Applying science and technology for livelihood reconstruction and economic revival, promoting technology introduction and human exchanges to revive the decline in science and technology

1956-1970: The era of science and technology for eliminating technology gaps while promoting high economic growth

- Promoting science and technology for economic development and income growth (Establishment of the Science and Technology Agency, increase of human resources in science and technology, promotion of independent technology development)
- Japan’s full-scale entry into the fields of nuclear power development and space development



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1971-1980: The era of science and technology for correcting distortions by economic growth and harmonizing with the global situation

- Responding to the growing pollution problem and the oil crisis
- Progress in life sciences, ocean development, etc.

1981-1994: The era of the creative application of science and technology against the backdrop of trade friction and a strong yen

- Deepening trade friction and promotion of the creative application of science and technology
- Participation in international joint projects (ISS, etc.), advancements in domestic technology in nuclear power, space, etc.
- Cancer control incorporating advanced scientific research, and global interest in global environmental issues



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Chapter 2: 30 Years since the Enactment of the Science and Technology Basic Law

1995-2000: The era of enacting the Science and Technology Basic Law to realize an advanced science and technology-oriented nation

- Establishment of the Basic Plan for Science and Technology with the enactment of the Basic Law, and expansion of government investment, 10,000 Postdoctoral Fellows Plan
- Frequent incidents and accidents that shake confidence in science and technology, and the proximity of science and society, including bioethical and environmental issues
- Advancements in basic science such as the Subaru Telescope and neutrino observation, and the full-scale introduction of intellectual property protection

2001-2012: The era of government reorganization and strategic prioritization of science and technology policy

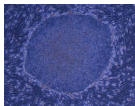
- Strengthening the command post function of science and technology, including the establishment of a minister in charge and the Council for Science and Technology Policy(CSTP)
- Reorganization of ministries and agencies and the incorporation of national research institutes and national universities, and strengthening of R&D capabilities
- Progress in "selection and concentration," including priority fields and national core technologies
- Enactment of Basic Act and establishment of strategic headquarters in intellectual property, space development and ocean development
- Achievements of Hayabusa, iPS cells, supercomputers, etc.
- Changes in attitudes toward science and technology following the Great East Japan Earthquake, etc.



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2013-present: The era of science, technology and innovation as the core of economic growth and national strategy

- Expectations for science, technology and innovation for economic revival and the realization of Society 5.0 (Revision to the Basic Act on Science, Technology and Innovation, revision of related laws, reorganization into the Council for Science, Technology and Innovation(CSTI), support for startups, etc.)
- Implementation of measures to address the decline in research capabilities (establishment of the University Endowment Fund and J-PEAKS, strengthening international talent mobility and circulation, etc.)
- Promotion of trending research such as infectious diseases, carbon neutrality, semiconductors, AI and quantum technology
- Enhancement of the importance of economic security (growth of technologies in important areas, prevention of knowledge leakage)
- Popularization of Japanese innovations including blue LEDs and lithium-ion batteries

Chapter 3: Toward the Promotion of Science, Technology and Innovation in Japan

A review of Japanese science and technology 30 years since enactment of the Basic Law

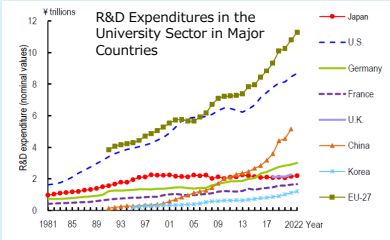
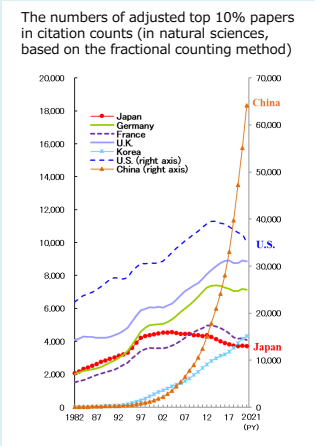
- The Science, Technology and Innovation Policy implements various measures while flexibly changing its role to correspond to the changing times and demands in the era.
- Meanwhile, the decline in basic research capabilities, the deterioration in employment environment for young researchers, and the shortage of research support personnel both recognized as issues in the Basic Law, remain unresolved. In addition, while major nations have increased investment in the university sector, Japan's investment has remained flat.
- For this reason, it is important to secure basic funding and diversify financial resources for universities and other institutions, taking into account recent increases in personnel and material costs, while reforming the system of human resources and payment, to expand opportunities for young researchers and research support personnel and to advance the shared use of research facilities and equipment.
- To achieve these goals, it is crucial to improve personnel management, and organizational management related to personnel and payment.

Responding to rapid changes in the circumstances surrounding science, technology and innovation

- Strengthen support for start-ups and promote further collaboration between industry and universities, etc., in line with the increasing proximity of science and industry.
- Strengthen intelligence functions in order to quickly identify signs and trends of cutting-edge science and technology, and to reflect them in policies and measures without delay.
- Science, technology and innovation are important to protect autonomy, superiority, and indispensability as a nation, given the importance of economic security.
- Strengthen the participation of Japanese researchers in the international talent mobility and circulation while paying attention to research integrity and research security.

Toward the 7th Basic Plan

- Addressing the current challenges we face is extremely urgent and must be further examined in deliberations of the 7th Basic Plan.



Policy Trends from Text Mining of White Papers (column and appendix)

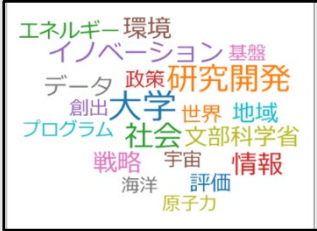
- Text mining was conducted on the white papers on “science and technology” and “science, technology and innovation” published to date.

*"Word Cloud":

A method of visualizing words by changing the size of letters according to their frequency of occurrence

"A heatmap of the frequency of occurrence of related terms."

A visualization method that expresses changes in the frequency of related words used in the same sentence as a specific word by means of color shading.



An example of the columns: "2013-present era" as seen in the word cloud analysis.

設定単語	前定前	出現回数/年 (※期間中の各年次白書の平均)					
		第1期	第2期	第3期	第4期	第5期	第6期
大学	105.0	297.8	306.4	413.0	431.4	439.4	347.7

関連語	前定前	出現回数/年 (※期間中の各年次白書の平均)					
		第1期	第2期	第3期	第4期	第5期	第6期
研究	75.5	105.5	107.5	131.4	107.2	71.4	94.7
推進	34.0	84.0	48.4	51.0	53.0	50.2	36.3
支援	3.5	32.2	27.2	51.0	75.4	60.6	67.0
教育	18.0	45.8	34.2	40.2	36.4	44.4	28.7
事業	15.5	44.0	39.0	43.6	34.8	32.6	29.3
整備	20.5	57.4	34.6	31.4	44.6	27.4	16.3
国立大学	5.0	27.6	24.6	89.2	9.2	21.4	20.0
地域	6.0	17.4	23.0	48.2	46.0	27.4	26.0
研究開発	19.0	50.0	32.4	28.2	39.0	13.6	15.3
研究者	21.0	42.0	29.8	26.8	30.0	23.0	26.3

An example of the appendices: Heatmap of the frequency of occurrence of the word, "university" and related words