Since the inauguration of the 2nd Abe Administration, as a part of a strategy for Japan's future growth, a Comprehensive Strategy on Science, Technology and Innovation (STI) has been formulated on an annual basis for approval by the Cabinet

Each year, items to be given priority consideration are clarified in the Comprehensive Strategy on STI in line with the medium-to-long-term policies of the Science and Technology Basic Plan

Operationalizing both of these in an integrated fashion ensures the reliability of policy-related control cycles based on Plan-Do-Check-Act (PDCA) and promotes effective STI policies

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Priority initiatives are set and promoted with principal reference to the four main pillars of the 5th Science and Technology Basic Plan (approved by the Cabinet in January, 2016) (see Chapters 2 through 5)

Society5.0

Items flagged for deeper consideration in the Comprehensive Strategy on STI for 2016

Promoting the Pivot to Society 5.0* (Basic Plan Chapters 2 and 3)

- From the initial year, to vigorously promote the concept of "Society 5.0" newly set out in the 5th Basic Plan, so as to balance the enhancement of Japan's industrial competitiveness with the resolution of social problems (initiatives to further the realization of Society 5.0 and initiatives related to artificial intelligence [AI] are to be promoted in an integrated fashion by industry, academia, and government under the "control tower" function of the Council for Science, Technology and Innovation [CSTI])

Developing High-Quality Human Resources, Especially Among Youth (Basic Plan, Chapter 4)

Integrated Promotion of University Reform and Funding Reform

- As soon as possible, to strengthen university reforms and the training of young researchers, so as to respond flexibly and appropriately to an era of revolutionary change in which it is difficult to discern future prospects

Establishing a Systemic Virtuous Cycle of Human Resources, Knowledge and Capital, by Promoting Open-innovation

- Through full-scale partnerships among industry, academia, and government and the strengthened creation of start, to build systems that will successively give rise to Japanese innovations that will lead the world (Basic Plan, Chapter 5)

Enhancing Functions for Promoting STI (Basic Plan, Chapter 7)

- To enhance the CSTI's "control tower" function and other functions for promoting STI, so as to effectively and flexibly implement policies and measures positioned in the Basic Plan and this Comprehensive Strategy

  To maintain a constantly global perspective so as to engage strategically in international collaborations on the basis of discussions emerging from the G7 Science and Technology Ministers' Meeting in Tsukuba, Ibaraki

***What is Society 5.0?**

Following on from hunting-and-gathering society, agrarian society, industrial society, and information-oriented society, "Society 5.0" refers to a new social mode of production in which:

  By realizing the advanced fusion of cyberspace and physical space,

  And by providing goods and services that granularly address manifold latent needs regardless of locale, age, sex, language, or any other consideration,

  to balance economic advancement with the resolution of social problems,

  To bring about a human-centered society in which people can lead high-quality lives full of comfort and vitality.

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n Priority Initiatives in the Comprehensive Strategy on STI for 2016, by Chapter

Note) A star (◀◀) indicates an item flagged for deeper consideration (i.e., an item deemed especially worthy of extra support for specific implementations)

Chapter 1: Acting to Create New Value for the Development of Future Industry and Social Transformation

(1) Fostering R&D and Human Resources that Boldly Challenge the Future
- Encouraging the development of programs to promote further advances and challenging research and development (R&D) through continuous improvements in the operation of the Impulsing PAradigm Change through disruptive Technologies (ImPACT) Program

(2) Platforms for Realizing "Society 5.0" (The Super Smart Society) as a New Social Mode of Production

 1) Initiatives to Increase Systems Sophistication and Promote Collaboration and Coordination between Systems
- Of the 11 systems set out in the Comprehensive Strategy for 2015, Intelligent Transport Systems (ITS), Optimized Energy Value Chains, and New Manufacturing (*monozukuri*) Systems are to be developed as core systems, with a view to collaboration and coordination with other systems and the creation of new value

 2) Construction of Databases as a Foundation for the Creation of New Values and Services
- The development of five databases available for use in a variety of fields such as transportation, energy, and infrastructure management dealing respectively with three dimensional (3D) mapping information; visual information; global environmental information; population, commodities, and vehicular information; and information to facilitate the circulation of data between different industries

 3) Reinforcing Basic Technologies that Underlie these Platforms
- Reinforcing basic cyberspace technologies (e.g., AI, network technologies, big data analysis techniques) and promoting AI-focused R&D, from innovative basic research to real-world implementation

- Reinforcing basic physical space technologies (e.g., robotics, device development, nanotech and materials technologies, photonic and quantum technologies)
- R&D focused on (1) robotics that will contribute to productivity improvements and (2) assistance robots designed to improve quality of life

 4) Promotion of Intellectual Property Strategies and International Standardization
- Formulating reference models for ensuring mutual connections between systems and identifying zones of competition and zones of cooperation

 5) Promotion of Regulatory and Institutional Reforms and Cultivation of Social Acceptance
- Putting in place the necessary rules for the social implementation of goods and services
- Implementing comprehensive research through STI advances that involves both the industrial and academic sectors and is inclusive of ethics, laws, and social impact (ELSI) perspectives

 6) Promotion of Capacity Development and Personnel Training
- Implementing personnel training as a means of ensuring cybersecurity against increasingly sophisticated threats
- Extending the motivations, skills, and talents of young students through highly advanced science and technology, science and maths education, and information literacy

Chapter 2: Addressing Economic and Social Challenges

(1) Sustainable Growth and Self-sustaining Regional Development
  I   Ensuring stable energy, resources and food
    i) Optimization of Energy Value Chains
       (building energy platforms / stabilizing and reducing the cost of clean energy supply / the stabilization of energy usage by leveraging new technologies and storage batteries so as to realize a hydrogen energy-based society / reducing consumption and improving energy efficiency through new technologies / the broad-based application of innovative materials and devices / the promotion of energy and environmental innovation strategies)

    ii) Smart Food Chain Systems
       (next-generation breeding systems / needs-oriented production systems / processing and distribution systems / systems for transmitting valuable information to end users and consumers)

    iii) Smart Production Systems
       (cultivation, production, and management support systems)

  II Achieving a sustainable society to handle hyper-aging, depopulation, etc.
    i) Establishment of a Society in which people enjoy long and healthy lives with World-leading Medical Technology

    ii) Intelligent Transport Systems (ITS)
       (focused initiatives toward important issues bearing on the development of autonomous cruising systems / the promotion of large-scale field trials involving autonomous cruising systems / initiatives conducive to Society 5.0 / the establishment of application implementations and business models and the promotion of the development and demonstration of technologies and systems associated with the support of autonomous cruising systems)

    iii) Systems for Community Living to Foster a Healthy Nation
       (promoting the utilization of health information through the use of information and communications technology (ICT) and other technologies / R&D focusing on assistive technologies for providing effective assistance of nursing and other care-based services, as well as promoting autonomy for individuals requiring support / research that will contribute to accessible and humane residences and community development)

  III Improving Competitiveness in Manufacturing and Creative Industries (monozukuri and kotozukuri)
    i) New Manufacturing (monozukuri) Systems
       (building supply chain systems platforms / developing innovative production techniques)
    ii) Integrated Material Development Systems
       (building highly reliable material databases / establishing materials development techniques that take advantage of these databases / establishing high-speed, high-efficiency prototypes, as well as measurement and evaluation techniques)

(2) Ensure Safety and Security for Our Nation and its Citizens and a High-Quality, Prosperous Way of Life
    Realizing the Efficient and Effective Maintenance, Upgrading, and Management of Infrastructure
       (techniques for accurately assessing structural deterioration and damage [e.g., inspections] / evaluation techniques to judge the importance of repair and upgrades based on the results of inspection / techniques for effectively providing structures with the requisite strength and durability [e.g., compliance] / the construction of asset management systems)

    Realizing a Resilient Society in the Face of Natural Disaster
       ("preventive" technologies / "predictive" technologies [e.g., the development of techniques for predicting hazard level, as well as for the early prediction of earthquakes and tsunami / "responsiveness" technologies [e.g., the development of real-time damage estimation systems])

    Addressing National Security Issues
       (security relationships / counterterrorism relationships)

    Hospitality (omotenashi) Systems
       (multi-lingual speech translation systems / spatial imaging systems)

(3) Addressing Global Challenges and Contributing to Global Development
    Building Global Environment Information Platform

(4) Pioneering Strategically Important Frontiers
    The CSTI, in partnership with the Headquarters for Ocean Policy and Office of National Space Policy and with a view to remaining consistent with the Basic Plan on Ocean Policy and Basic Plan for Space Policy, will promote initiatives toward the resolution of various technological and developmental challenges bearing on the maritime and space frontiers

Chapter 3: Reinforcing the "Fundamentals" for STI

(1) Developing High-Quality Human Resources
  • The acceleration of discussions aimed at the formation of "Program for inter-institutional, inter-sectoral Collaboration on innovative Doctoral Education" (provisional) equipped with world-class research and teaching capabilities
  • The construction of career development systems for supporting younger staff that account for career mobility and stability, such as through the introduction and expansion of fair and highly transparent evaluation and training systems (e.g., tenure track systems) and "outstanding researcher systems"
  • Training personnel through cooperation among industry, academia, and government through initiatives such as the Industry, Academia, and Government Roundtable Conference on Human Resources Development in Science and Technology
  • Promoting the appointment of women in leadership positions, and creating environments conducive to continued and active participation by women
  • The strong promotion of initiatives to cultivate curiosity, interest, and understanding of careers in science and technology
  • Promoting the introduction of systems that promote the mobility of personnel between the various sectors of industry, academia, and government (e.g., cross-appointment systems, faculty review)

(2) Promoting Excellence in Knowledge Creation
  • Reform and enhancement of the Scientific Research Grant Program (KAKENHI); the reform and enhancement of strategic basic research
  • Promoting the formation of world-class research hubs; developing and sharing leading-edge research infrastructure
  • Building platforms for sharing research results and data from a basic stance of promoting open science

(3) Strengthening Funding Reform
  • Promoting initiatives to strengthen functions that maximize the individual strengths and features of Japan's national universities; promoting reform initiatives through the leadership of university presidents (e.g., promoting reforms to HR and payroll systems)
  • Reform of open-application funding grants (e.g., improving convenience, promoting the shared use of research equipment, investigating the introduction of overhead costs to research funding that does not come from competitive grants)
  • Integrated promotion of national university reform and research funding reform

Chapter 4: Establishing a Systemic Virtuous Cycle of Human Resources, Knowledge and Capital, for Innovation

(1) Enhancing Mechanisms for Promoting Open-innovation ◄◄
  • The promotion of joint research between industry and academia in interdisciplinary research fields; the training of personnel through research guidance
  • Promoting awareness to promote open innovation in industry
  • Promoting powerful industry-academia collaboration systems that match organization to organization; enhancing the "spaces for co-creation" role of collaborations involving industry, academia, and government
  • Deepening and expanding initiatives at the National R&D Institutes as a preliminary step in the strengthening of bridging functions

(2) Enhancing the Creation of SMEs and Startup Companies to Tackle New Business Opportunities
  • Expanding the base of personnel with an entrepreneurial mentality cultivated from elementary, junior high, and high school through to university
  • Formulating the "Venture Challenge 2020"; the integrated promotion of initiatives aimed at encouraging the creation of entrepreneurial ventures
  • Investigating the possibility of ensuring initial market demand for startup companies by taking advantage of options such as government procurement

(3) Review and Development of IP Standardization Strategies and Systems for Innovation
  • Matching the needs of small and medium enterprises (SMEs) with intellectual property and seed technology from large companies and universities, etc.
  • Identifying standardization, institutional, and regulatory challenges, and investigating review as necessary

(4) Developing Innovation Systems that Contribute to "Regional Revitalization"
  • Discovering and supporting the consistent growth of SMEs as a driving force for local economies
  • Supporting the adoption of innovation systems based on the particular strengths and characteristics of local areas

(5) Cultivating Opportunities for Generating Innovation in Anticipation of Global Needs
  • Building long-term analytical systems and science and technology forecasts oriented to the creation of new business

Chapter 5: Enhancing Functions for Promoting STI

  • Reforming Universities and Enhancing their Function (e.g., establishing "designated national university corporations"); Reforming National R&D Institutes and Enhancing their Function (e.g., the rapid and effective improvement of procurement based on the characteristics of R&D, developing a "Designated National R&D Institutes" system)
  • Promotion of "Society 5.0" (initiatives to further the realization of Society 5.0 and initiatives related to artificial intelligence [AI] are to be promoted in an integrated fashion by industry, academia, and government under the "control tower" function of the CSTI)
  • Pursuing Effective STI Policies and Enhancing the Chief Controller Function (understanding the progress of the Basic Plan, identifying challenges, follow-up / the steady implementation of SIP and ImPACT / information collection and analysis functions and strategic planning functions)