NISTEP REPORT No. 101

A report on studies supported by the FY2006 Special Coordination Funds for Promoting Science and Technology

Social vision toward 2025

-Scenario Discussion based on S&T Foresight-

[Summary]

March 2007

Science and Technology Foresight Center
National Institute of Science and Technology Policy

Contents

I. Overview

1. Background and history

The post of Minister of State for Innovation was created in the Abe Cabinet that took office in September 2006. Sanae Takaichi was appointed to the position while simultaneously taking on the portfolios of Minister of State for Science and Technology Policy and other areas. In a policy speech immediately after the formation of the Cabinet, the Prime Minister promised to discuss innovation as a long-term strategy looking ahead to 2025. That promise is called "Innovation 25."

In light of this, in October 2006, Minister Takaichi set forth a schedule under which a report on "The shape of innovation for which Japan should aim through 2025" would collect the wisdom of experts from academia and industry by the end of February 2007. Based on that interim report, a roadmap for strategic policy on realization would be created. The Cabinet Office established the Innovation 25 Strategy Council and the Innovation 25 Special Mission. Kiyoshi Kurokawa was named Chairperson of the Council. Dr. Kurokawa indicated that the following three points should be kept in mind when considering the direction of Innovation 25: "Realization of new wealth in our society from the perspective of the citizens," "Large Asia and growth by coexisting with the world," and "Society where high-spirited, highly creative people are willing to take on any risks to play an active role in society." This history is summarized in Figure 1.

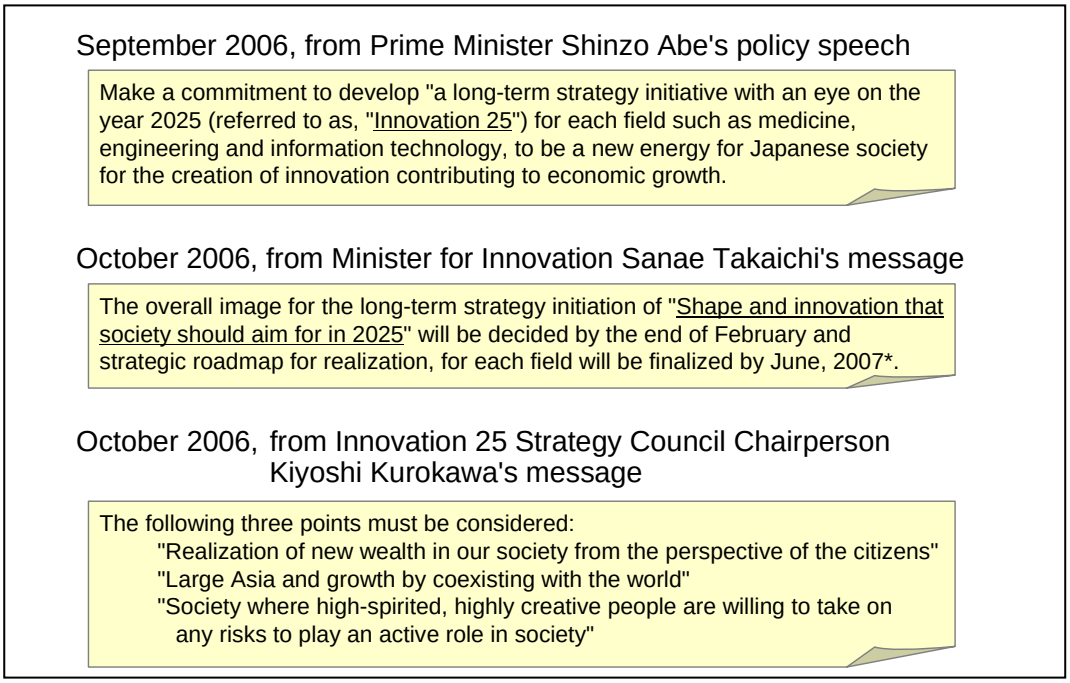


Figure 1. History, schedule, and policies of Innovation 25

(*Creation of the roadmap was subsequently accelerated to the end of May 2007.)

Figure 2 depicts an overview of study in the Innovation 25 Strategy Council. It is important to note that this Innovation 25 study does not limit innovation to technology alone. Instead, it defines innovation to include new businesses and new social frameworks. This is in accordance with instructions that Prime Minister Abe gave personally to Minister for Innovation Takaichi.

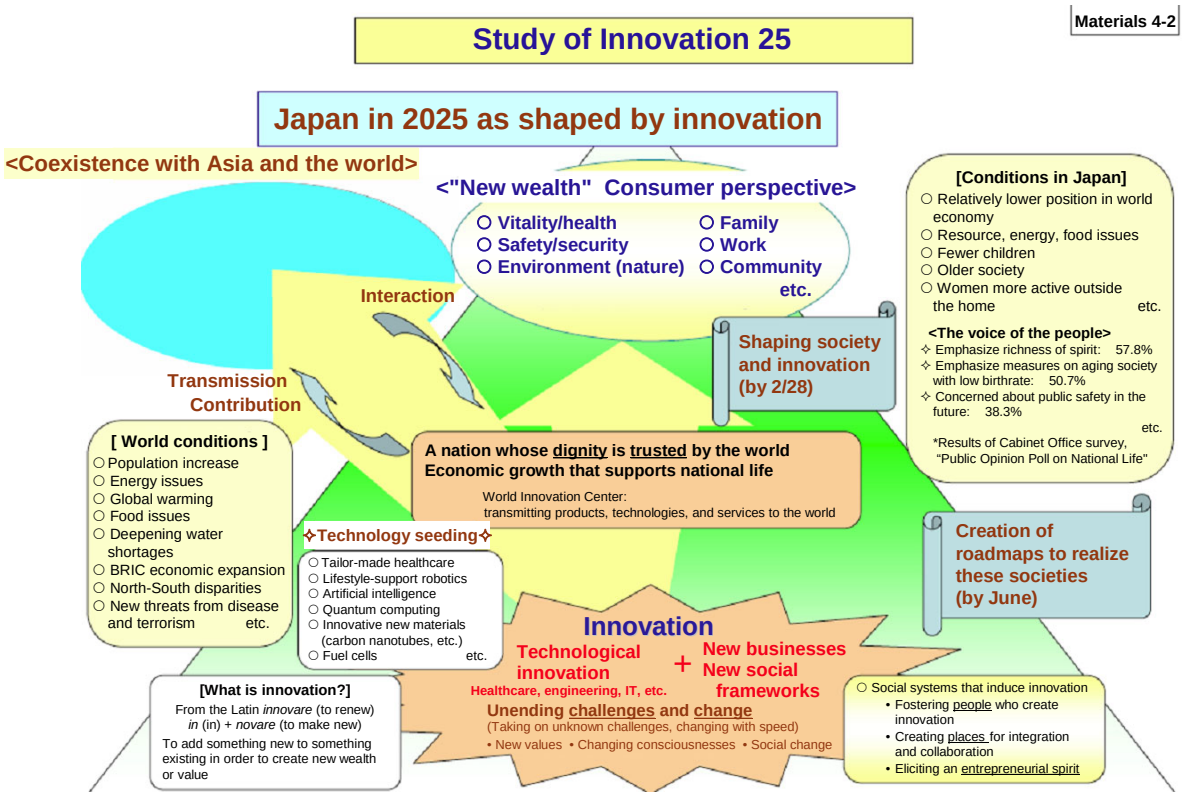


Figure 2. Study of Innovation 25

(Materials 4-2 distributed by the 2nd Meeting of the Innovation 25 Strategy Council)

Commissioned by the Innovation 25 Strategy Council, various institutions such as the Science Council of Japan and the National Institute of Science and Technology Policy began working on the question of "Social vision towards 2025" while making predictions about the future of science and technology. For example, the Science Council of Japan carried out a survey (Committee for the Investigation of Innovation Promotion, Science Council of Japan "The Future Society Envisioned by the Science Community", January 2007) and presented the results to Minister for Innovation Takaichi.

The National Institute of Science and Technology Policy, meanwhile, began "Survey of the Scenario for Fostering Innovation to create a new Japan" as a Grant-in-Aid for Scientific Research project beginning December 2006 based on the results of the "Science and Technology Foresight Survey" carried out in FY 2003–2004. It studied "Social vision towards 2025." This report is a compilation of those results. Intermediate research results for various fields have already been reported at the 6th Meeting of the Innovation 25 Strategy Council (January 31, 2007).

Reference websites:

Innovation 25, Prime Minister of Japan and His Cabinet
http://www.kantei.go.jp/jp/innovation/index.html

Committee for the Investigation of Innovation Promotion, Science Council of Japan
http://www.scj.go.jp/ja/info/iinkai/innovate/index.html

2. Goal setting and research methods

2.1 Research goal setting

From the various deliberations of the Innovation 25 Strategy Council, this research set the goal of sketching "Social vision towards 2025" It highlighted discussion of major changes that should take place in the future. During the course of this research, the Innovation 25 Strategy Council's definition of innovation (see Figure 2) and the three points from Chairperson Kurokawa's message (see Figure 1) were always borne in mind. Their pros and cons were not debated. In addition, this research lasted from December 2006 through the end of March 2007, but the Innovation 25 Strategy Council requested an interim report on the subject of social conditions and environmental improvements (legal preparation, changes in social systems, etc.) that facilitate innovation, and that report was provided while the research was still underway.

2.2 Research methods

(1) The foresight survey upon which this research was based

As illustrated in Figure 1, study by the Innovation 25 Strategy Council was scheduled to be carried out over an extremely short period. It would therefore have been impossible for science and technology research institutes to start from scratch and still contribute to the Council's deliberations. The National Institute of Science and Technology Policy thus undertook to make maximum use of the results of the " Science and Technology Foresight Survey" carried out in FY 2003–2004 and the people who participated in it. (See Figure 3.)

"Science and Technology Foresight Surveys" are comprehensive forecasts of Japanese science and technology that have been carried out eight times. They comprise the four surveys described below. A total of approximately 2,500 experts participated in the four surveys. The Delphi survey in particular shows the results of two rounds of questionnaires answered by more than 2,200 experts.

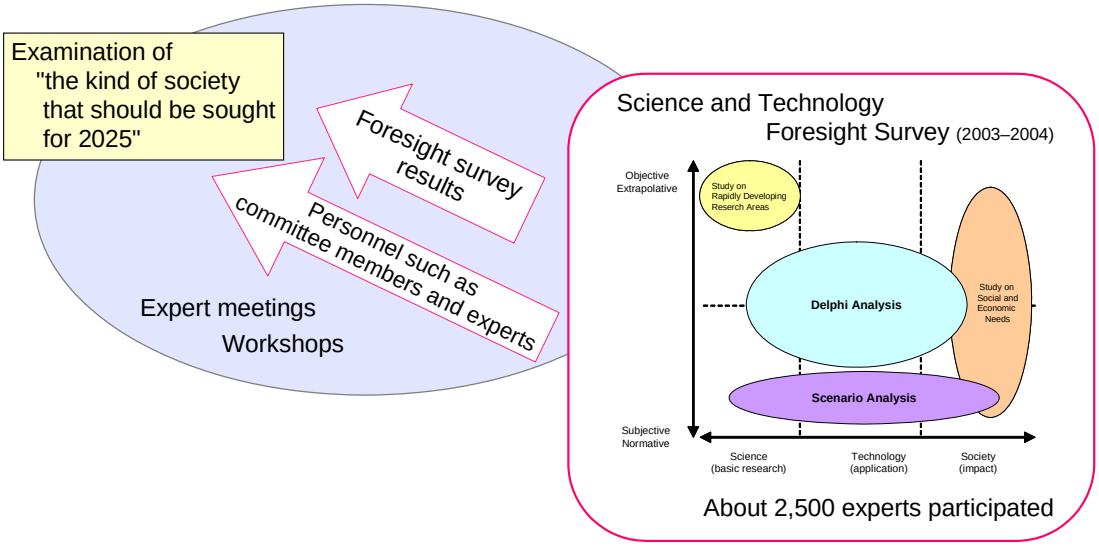


Figure 3. Illustration of this research

FY 2003–2004 Grants-in-Aid for Scientific Research survey:
"Science and Technology Foresight Survey"
1) Study on Social and Economic Needs (NISTEP Report No. 94)
2) Study on Rapidly-developing Research Area (NISTEP Report No. 95)
3) Scenario Analysis (NISTEP Report No. 96)
4) Delphi Analysis (NISTEP Report No. 97)

All these reports are available on the National Institute of Science and Technology Policy website (http://www.nistep.go.jp/achiev/l_all-j.html).

(2) Research methods and process

In this research, we provisionally designated six fields while discussing with the Innovation 25 Special Mission and bearing in mind the results of the foresight survey. Expert meetings and workshops were held for each field to study the question of what kind of society should be sought for 2025. For the expert meetings, specialists considered qualified to discuss each of the six provisional fields were selected and asked to participate. They were primarily chosen from participants in the foresight survey, with a broad view towards ensuring the most interdisciplinary discussions possible. The core functions of the expert meetings were assigned to major participants in the foresight survey (i.e., survey committee members, scenario writers, etc.). Expert meetings were held twice for each field. They discussed future conditions and directions that should be themes, with the head researcher leading the deliberations. This process reexamined the provisional names of each field and determined their final names. The workshops added personnel from the social sciences and younger researchers, presenting the discussions of the expert meetings for the expression of a wide range of opinions. A total of about 300 people participated in the expert meetings and workshops on the six fields. A list of participants and the meeting schedule can be found at the end of this report. Figure 4 provides an overview of the process.

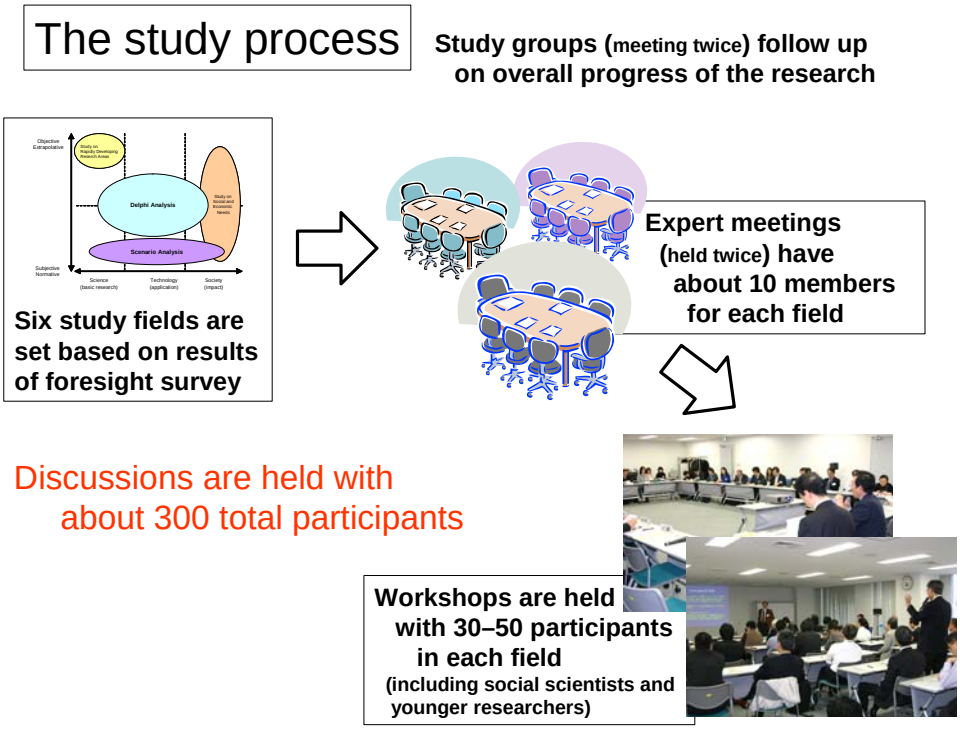


Figure 4. Overview of process

During these discussions, as mentioned in the above section on goal setting, the Innovation 25 Strategy Council's definition of innovation (see Figure 2) and the three points from Chairperson Kurokawa's message (see Figure 1) were thoroughly kept in mind. During this process, there was much discussion of social conditions and environmental improvements that facilitate innovation. Although many meaningful opinions were offered, the subject is outside the scope of this research's goals and thus is not included in this report. Table 1 shows the final names chosen for the six fields, with an overview of the discussions in each field. Meetings for each of the fields were held independently and at the same time. Due to time limitations, no coordination was made among the fields.

Table 1. The six fields discussed

Field	Field name	Content (summary)
Field 1	**The era of lifelong health**	**Designating the kind of society desired and expected by the Japanese people as "extending healthy life spans," discussion focused on the three major diseases (cancer, heart disease, and cerebrovascular disease), cognitive impairment, and lifestyle-related diseases, examining them from the perspectives of disease prevention, diagnosis, and treatment.**
Field 2	**Information environment as life infrastructure: Mature ubiquitous-connection society**	**Study was carried out in a framework with a three-layered structure: elemental technology, infrastructure formed based on elemental technology, and lifestyles reflecting infrastructure. Concrete manifestations will be seen in lifestyles in particular.**
Field 3	**Support for people's activities through advances in brain science**	**Changes that will occur in people's lives through advances in brain science and cognitive science were examined. Technological seeds of brain science and cognitive science will connect with social needs such as lifestyle support through healthcare and robots. Changes in ways of working, learning, and living and in human relations were pictured.**
Field 4	**Safe and sustainable cities**	**Discussions pictured sustainable city life in the future that solves environmental issues and social problems such as traffic accidents through advances in technologies related to living environments while working towards realization of "cities that respond to change and make their residents proud."**
Field 5	**Openhearted living: Diversification of career choices, childrearing, and senior lifestyles**	**Examination of desirable lifestyles was carried from the perspectives of housework, hobbies, leisure, and culture, learning and education, safety, care, movement, communication, and community life, within the frameworks of families with children, senior lifestyles, and diverse career choices.**
Field 6	**Solving of global environmental problems and coexistence with the world**	**Coexistence with Asia and the world was pictured through examination of the contributions Japanese technology can make to solving global environmental problems, especially global warming and water and energy issues.**

(3) Study groups and office

A Committee on "Survey of the Scenario for Fostering Innovation to create a new Japan" was established to supervise and advise this research. It met twice. Table 2 shows the members of the committee, while Table 3 shows the agendas of the meetings. This report includes the general statement of the discussions in the study group as the research results in section II-1.
Research design was performed by the Science & Technology Foresight Center of the National Institute of Science and Technology Policy. The Center and the Institute for Future Technology collaborated on the research office and summaries of the fields.

Table 2. Members of the Committee

<Chair>	
Hiroyuki Mizuno	Vice-President, Osaka Electro-Communication University, Visiting Professor, Ritsumeikan University (former Vice-President of Matsushita Electric Industrial Co.)
<Members>	
Naoki Ikezawa	Cheif Industry Specialist, Nomura Research Institute, Ltd.
Tokuta Inoue	Advisor, Genesis Research Institute, Inc.
Sachiko Karaki	Group Leader, Bio Business Promotion Department, Bioscience Division, Life Science Group, Olympus Corporation
Tadao Saito	CTO, Toyota InfoTechnology Center
Yoshiyuki Sakaki	Director, RIKEN Genomic Sciences Center
Masato Shinagawa	Advisor, Nikko Cordial Securities Inc.
Ken Senoh	Research Professor, University of Tokyo Research Center for Advanced Science and Technology
Kenichi Tsuboi	Director, Diamond, Inc.
Fumio Harashima	President, Tokyo Denki University
Naoyuki Funamizu	Professor, Graduate School of Engineering, Hokkaido University
<Advisors>	
Tateo Arimoto	Director, Research Institute of Science and Technology for Society, Japan Science and Technology Agency
Yoko Ishikura	Professor, Graduate School of International Corporate Strategy, Hitotsubashi University
Yutaka Kosai	Trustee and Senior Advisor, Japan Center for Economic Research
Atsushi Sunami	Associate Professor, National Graduate Institute for Policy Studies
Schumpeter Tamada	Associate Professor, Kwansei Gakuin University Institute of Business and Accounting

Table 3. Meetings of the Committee

○ 1st Meeting
Date and time: January 11, 2007 (Thu.) 10:00–12:00
Agenda: (1) Overview of research (2) Details and progress of research

○ 2nd Meeting
Date and time: February 5, 2007 (Mon.) 10:00–12:00
Agenda: (1) Interim report (draft) (2) How to create the general statement of the final report

II. Research results

1. General statement

1.1. Premises of the research

This research is an attempt to picture "Social vision towards 2025" by gathering leading Japanese experts in science and technology in order to contribute to the discussion of the setting of the "Innovation 25" long-term guidelines set forth by Prime Minister Shinzo Abe. The Innovation 25 Strategy Council defines innovation to include new businesses and new social frameworks rather than just technological innovation. Council Chairperson Kiyoshi Kurokawa has set forth a clear policy of keeping the following three points in mind during deliberations for Innovation 25: "Realization of new wealth in our society from the perspective of the citizens," "Large Asia and growth by coexisting with the world," and "Society where high-spirited, highly creative people are willing to take on any risks to play an active role in society." This research closely adhered to that definition and those points.

When discussing innovation, along with the kind of society that should be sought, discussions of the path to its realization and social conditions and environmental improvements are extremely important. This research, however, focuses on sketching that society, so all other discussions are considered secondary. Ideally, the work of picturing "Social vision towards 2025" should be examined through very wide-ranging discussions over an extensive period. In this case, however, time was extremely limited and the above three points had to be kept in mind. The discussions therefore prioritized only fields and topics where major changes could or should occur by 2025. In addition, by making maximum use of the results of the "Science and Technology Foresight Survey", especially its Delphi Analysis, in discussions of each field, a foundation for discussion could be created and research time could be compressed. Because of the short time period of this research, however, current conditions and the level of future development cannot be compared. Such discussion is to be hoped for in the future.

1.2 Overall discussion arising from discussions in each field

The full report covers 6 discussions in each field of the society that should be sought for 2025. This is the body of this research's result. A simplified summary of each field is given here.

As the rapid development of science and technology in Asian countries demonstrates, it has already become unrealistic to expect to cause innovation by closing off Japan. In order to view the prospects for the coming 20 years, world trends and Japan's position in the world must be considered as innovation is pursued. While each of the six fields is essential when considering Japan in 2025, in light of this international situation, fields where aggressive, major innovation should occur are i) environmental innovation, ii) health innovation, and iii) community innovation. A general discussion of i) through iii), and their preconditions iv) through vi) follows.

i) With changes in the global environment becoming measurable and awareness of issues inevitably growing, Japan should aim to be a respected international leader in the environmental field. In the future, new values regarding the environment will appear regarding aspects such as water, food, and climate. Japan has been considered a leader in environmental technology, but the environmental literacy of its people is not necessarily sufficiently developed, and its environmental businesses have not been successful on a worldwide basis. With worldwide changes giving rise to new values, Japan should gain respect in this field, and, so its environmental businesses can succeed, should raise national environmental awareness, aiming to be a society with viable environmental economics, one that aspires to prioritize contributing to the world. Because information about every aspect of the environment is becoming visible, national environmental literacy will gradually rise, finally resulting in viable

environmental economics. It is therefore necessary to effectively utilize information infrastructure and elemental technologies related to ubiquitous connections in this field.

ii) It is considered certain that society will rapidly age not just in developed countries, but also in many others. Amidst all these countries, Japan with its long average life span is graying faster than any country in the world. Nations that will face the same problem are watching Japan to see how it resolves the issues that accompany a graying society. The biggest issue for a graying society is how to maintain health as life spans lengthen. This is an essential condition for maintaining the soundness of healthcare and social security systems. In addition to the pursuit of happiness by the elderly, another issue is how to establish and maintain the younger workforce and continue Japan's economic growth. From the perspective of keeping elderly people active in society to make up the labor shortage that will arise from population decline as well, maintaining individual health regardless of age is a precondition for a rich national life. Individuals, however, are increasingly demanding advanced healthcare tailored to their individual characteristics. In a society that aims for lifelong health, therefore, promoting advanced healthcare alone is insufficient. Healthcare should be ubiquitous, including remote healthcare, and technical means of preventing disease and maintaining health in daily life regardless of age are necessary to avoid expansion of healthcare needs. Major advances in elemental technologies related to ubiquitous connections, information infrastructure, and brain science including robotics will promote such social change.

iii) With the population's age structure changing and the number of foreign residents increasing, diversification of lifestyles, work styles, and life maps will become even greater. Japan will be in a major social infrastructure renewal period around 2025. It will need social infrastructure upgrades on a scale appropriate to support such diversity on an ongoing basis for the following 100 years or so. Over the next 20 years, however, Japan cannot expect the same kind of rapid changes in hard infrastructure seen in emerging countries. Indeed, from an international perspective, such changes will be gradual. Community formation is attracting attention as one means for Japan to build a safer social structure under these conditions. Japan should aim to become a society in which communities tackle problems and utilize communal strengths to solve them. In the future, people will belong to multiple communities that transcend region, blood ties, or work fields. Local communities will become incubators for local innovation. Furthermore, changes in information environments have already given rise to new communities in which geographical gaps are not noticed. The power of communities of interest in virtual worlds will grow.

The following common points emerged from discussion of i) through iii) as conditions that support innovation and thus should be rapidly upgraded. They could also be called common social systems for effective application of scientific and technological advances in society.

iv) Improvement of information infrastructure is essential for visualization of environmental information in i), ubiquitous connections for health information and healthcare in ii). and strengthening communities in iii). In that sense, information and communications technology is drawing attention, but in the future efforts should concentrate on its role as technology to upgrade information environments rather than on its elemental technology development. In order to turn each element into effective information infrastructure, prompt improvement of information environments, such as necessary standardization, is required.

v) People are always the cause of innovation. Human resources development requires opportunities for learning. Particularly in a graying society or one in which lifestyles are diversifying, school education should not be considered the only venue for human resources development. Diverse lifelong learning opportunities must be increased and upgraded. Fostering a knowledge society creates conditions that facilitate innovation not only on the supply side, but on the user side as well. It also facilitates the formation of consensuses on the uses of new science and technology in society.

vi) "New wealth" does not mean only one's own country prospers economically or receives all the benefits of advanced science and technology. Looking at the development of emerging nations as well,

the "wealth" brought about through scientific and technological development is immeasurable. However, no matter how wealthy a society becomes nor how advanced its technology, risk cannot be completely eliminated. Technologies for handling advanced science and technology will clearly become increasingly important in order to live safely with an accurate awareness of risks and benefits. Development of new science and technology may be accompanied by risk. Committee advisor Yutaka Kosai, the tax commission chair, used the following quotation to emphasize the foolishness of avoiding challenges out of a fear of risk.

He only earns his freedom and existence,
Who daily conquers them anew.
Thus here, by dangers girt, shall glide away
Of childhood, manhood, age, the vigorous day:
And such a throng I fain would see,--
Stand on free soil among a people free! — Johann Wolfgang Von Goethe, Faust

While examining the six fields, the committee reached the opinion that further discussions should have taken place. Topics that the committee believes should also have been discussed include food issues, disease, marine resources, and use of new materials.

1.3. Evaluation of the research methods

As described above, this research used results obtained through the 2003–2004 "Science and Technology Foresight Survey" for its discussions in each field. Examples of kinds of societies found in each field are supported by the results of the Delphi Analysis in particular. In addition, the experts at the center of the discussion in each field were chosen mainly from participants in the foresight survey. During the foresight survey, these people are involved in science and technology and have already thought about future science and technology development and its surrounding environment. This enabled them to understand the goals and premises of this research extremely quickly, share common goals with experts outside their own fields, and develop discussions in accordance with the intent of the research. Thus, this research was able to make sufficient use of the data and personnel from the "Science and Technology Foresight Survey" and successfully carry out interdisciplinary discussion in a wide range of fields over a short period. Because time was short, however, the fields could not be sufficiently coordinated or balanced with each other.

On the other hand, one can consider this research to be part of foresight research. The research process can be taken as an experiment at future foresight research in the following two ways.

1) In future foresight research, merely predicting the development of science and technology may not be considered enough. Such research may be asked to derive society's needs or the proper form for future societies and the scientific and technological development that they will require or that can contribute to them. In other words, science and technology that can elucidate the causes of future social problems or help solve them or the kind of research and development environment that facilitates innovation may be the required outputs of future foresight research. This research is an attempt to sketch the form of future society based on the 2003–2004 8th foresight research "Science and Technology Foresight Survey." It hints at the shape that the above-described foresight research might take.

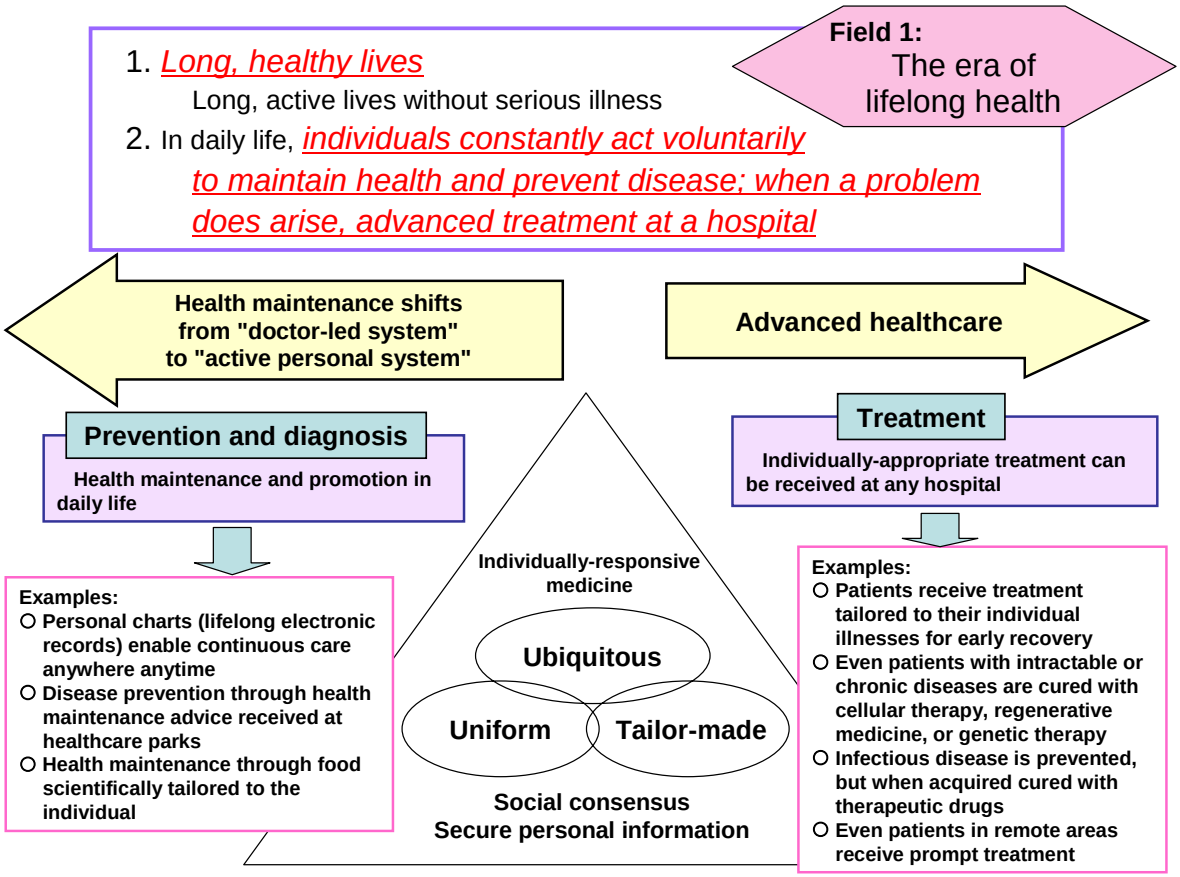
2) The 8th foresight research "Science and Technology Foresight Survey" was the first multi-foresight survey in that it used a number of survey methods in parallel. However, it did not combine multiple surveys to derive its results, so it did not attempt to make them mutually complementary. The method used in this research, i.e., combining Delphi Analysis with scenario writing in an attempt to picture the form of future society (i.e., its needs) through discussion among experts, can be called a model of mutually complementary multiple-method foresight research. In that sense, this research is an experiment in foresight research.

2. Overview of fields

Field 1: The era of lifelong health

In the ultra-gray society of 2025, a paradigm shift in thinking on healthcare is occurring. The meaningful point is that it is the arrival of the era of self-care, in which people actively contribute to their own healthcare to maintain their health rather than having doctors manage their healthcare. Meanwhile, medical technology is developing. Most intractable and chronic diseases have been conquered. Along with living fulfilling home lives, people are enjoying healthy, meaningful lives in society, without regard to age or gender.

The shape of "the era of lifelong health" is seen in the following two areas. 1) Long, healthy lives: people are enjoying long, active lives without serious illness. 2) In their daily lives, people are constantly acting voluntarily to maintain health and prevent disease. When a problem does arise, they can receive advanced treatment at a hospital. Along with treatment of disease (at medical facilities), people are very interested in health maintenance and promotion (in their daily lives) to stay healthy and prevent disease. This is individually appropriate (shift to tailor-made healthcare), on the same level (equalization of healthcare), and available to everyone (shift to ubiquitous healthcare).



Field 2: Information environment as life infrastructure: Mature ubiquitous-connection society

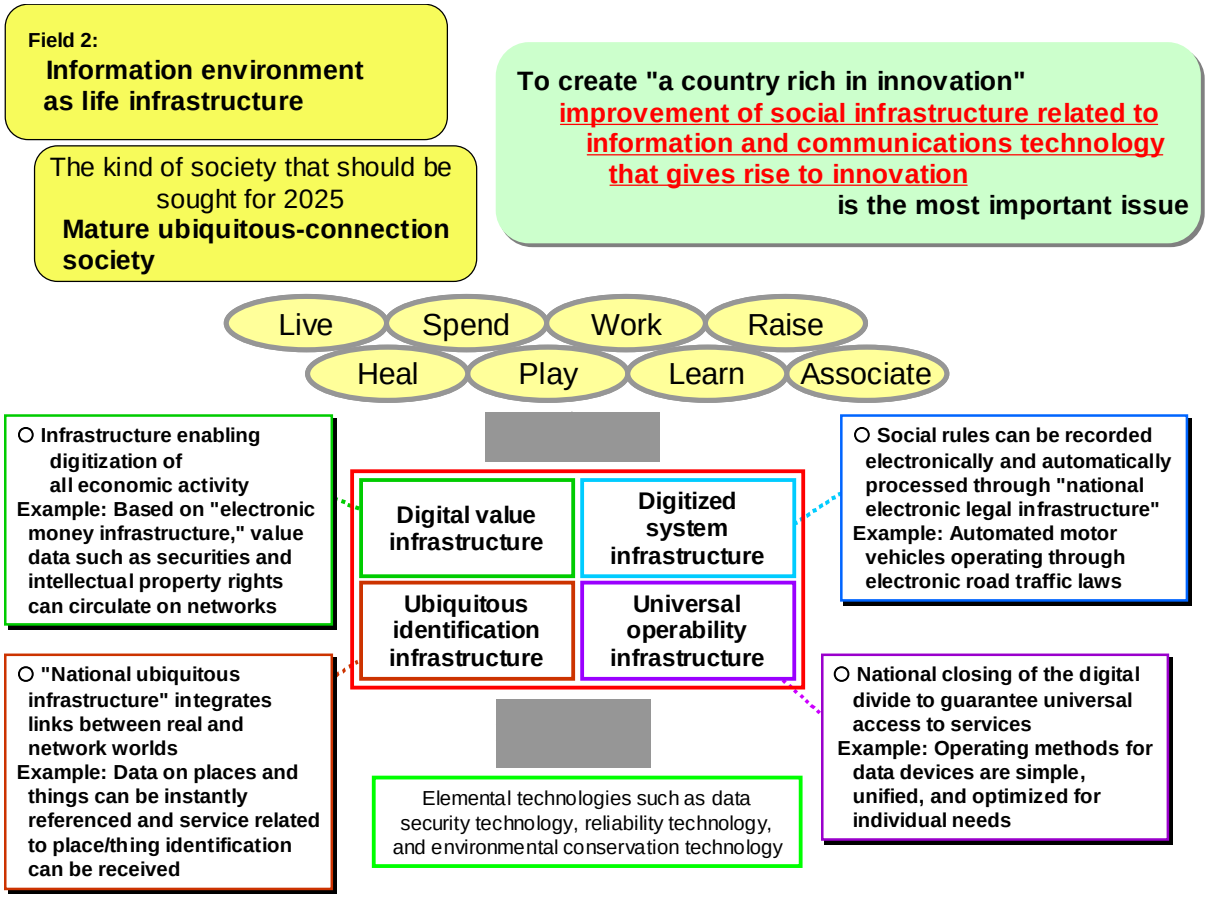
The rise of the internet was an enormous innovation in itself, but it also became infrastructure for many other innovations. The speed of change will increase. No government or organization will be able to do anything without collaborating with others. Policy weight will shift to environmental upgrades. Many innovations will be seen in people's lives through the information infrastructure below.

1) Digital value infrastructure: economic activity will shift completely to an electronic network basis. In addition to secure electronic money, value information related to economic activity, such as currency and stocks, will circulate securely as standardized digital data. Copyrights and other property rights can be confirmed as digital data and can circulate on networks in accordance with designated standards.

2) Digitized system infrastructure: basic social systems such as laws, contracts, and rules will be recorded electronically, and negotiation among them will be automated as much as possible. In a mature ubiquitous-connection society, social rules will be digitized, much machine control will be automatically optimized, and social systems will operate more efficiently.

3) Ubiquitous identification infrastructure: the real world and network worlds are linked in an integrated fashion. Places and things are assigned unique identifiers, enabling open identification that transcends organizations and applications. Communication with places and things is possible, and they can be electronically identified and linked with relevant information. Personal authentication, individual recognition, and location/time authentication mechanisms are improved, with guaranteed accuracy.

4) Universal operability infrastructure: everyone is guaranteed the use of various services in a ubiquitous-connection environment. Public operation interfaces are unified, easing the burden on people involved with the operation of devices.



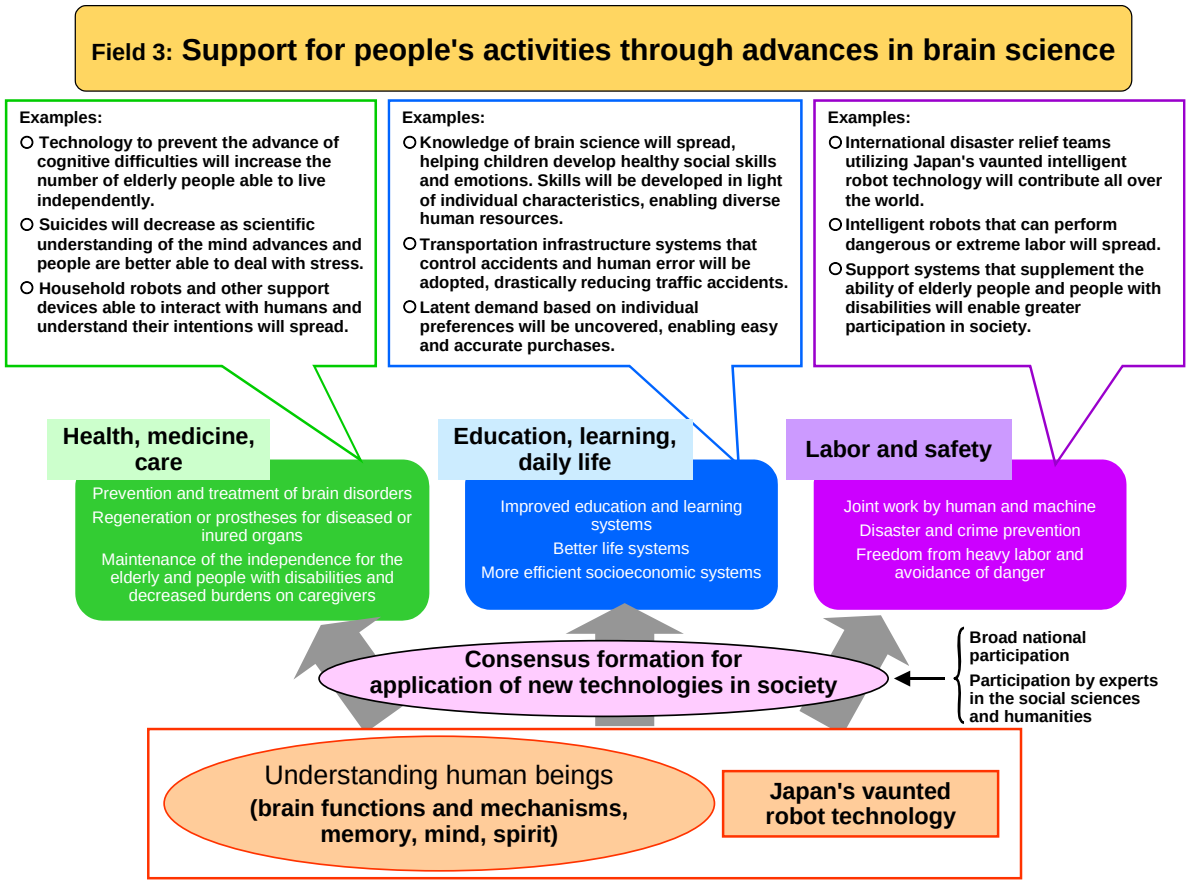
Field 3: Support for people's activities through advances in brain science

By 2025, brain science in a broad sense—integrating neuroscience, cognitive science, healthcare, and engineering (robotics, etc.)—will have advanced. Along with advances in human understanding, technology applications in social activities will progress rapidly. As a result, the ways ordinary people work, learn, live, and interact with each other will change in the following ways.

1) Improved health, medicine, and care: Early detection, prevention, and treatment of diseases related to cerebral nerves, the motor system, and cognitive function will be possible. The spread of robots and other machines to care for the elderly and people with disabilities will advance systemic improvements that enable them to live as independently as possible. The number of healthy elderly people who want to work will increase, and the burden on caregivers will decline. Social systems that allow people from various generations to respect and help each other as hey live together will improve.

2) Advanced education, learning, and daily life: Learning can be tailored to children's abilities, individuality, and environments. Desire for learning with clear goals will increase. Support for healthy development of social skills and emotions will be available. Opportunities for lifelong learning and improvement in response to individual suitability and history will be provided. The will of the people will be better reflected in society through support systems for social decision making.

3) Changes in labor, safety, and security systems: Labor systems including machinery will make up for difficult to avoid human characteristics such as carelessness and fatigue, expanding the environments in which humans and machines cooperate. The transfer of knowledge and skills among diverse people and organizations will become simpler, and efficient and people-friendly production systems will be utilized. Decision making systems for dealing with disasters, accidents, climate change, disease, and so on will improve. Ordinary people will deepen their understanding of disasters and their management, responding on their own to the extent possible. Disaster relief systems will also improve. Mutual aid with countries in Asia and elsewhere will be achieved, and Japan's international contributions will be respected worldwide.



Field 4: Safe and sustainable cities

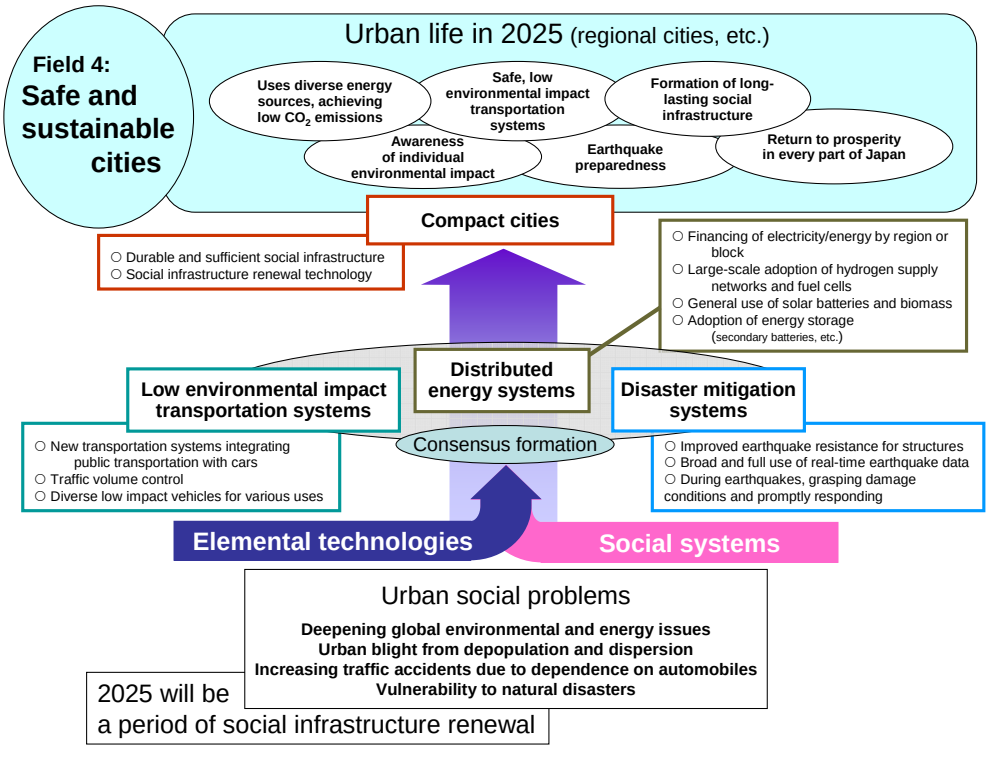
Because social problems exist in advanced and intensified form in the cities where human activity is concentrated, large cities face deepening environmental and traffic problems, while regional cities must deal with the blight of advancing depopulation. For the living environment in 2025 to be sustainable, it must be energy conserving, with low environmental impact, highly durable, and safe. At the same time, cities must be beautiful and urban life must be vital even in the face of declining population. Much urban infrastructure will need replacing around the year 2025. It will be a turning point for urban renewal that will determine the shape of social infrastructure for a hundred years.

1) Compact cities: Urban planning that sets size goals in light of 100-year estimates for population decline will achieve compact cities that use land and energy efficiently. Housing and jobs will be close together, and beautiful cityscapes will raise the value of cities and sustain them. Prosperity will return to life in every part of Japan. Beautiful regional cities that harmonize natural environments and urban convenience will attract people from all over the world, creating virtuous circles that concentrate knowledge and production.

2) Environmentally-friendly urban transportation: Advanced integration of public transportation with low environmental impact cars and road infrastructure will create new urban transportation systems. This will ease traffic jams, decrease accidents caused by elderly drivers and other human errors, achieving safe, environmentally friendly movement.

3) Distributed energy systems: Network energy systems will be adopted, integrating small distributed energy systems and large intensive energy systems in appropriate mixes. Effective use of waste heat and recycling of waste products will advance, decreasing the amount of resources and energy invested in cities. In regional cities, new businesses offering local production for local consumption will appear.

4) Cities with few disasters: Various information networks will become more advanced. Pre-assessment of potential disasters and quick and accurate understanding of conditions when they occur will enable full physical and mental preparation for earthquakes. Complete insurance menus for protection by region or block will become available, enabling economic preparation as well. Local residents will seek measures rooted in their communities, creating a virtuous circle that advances effective policies.



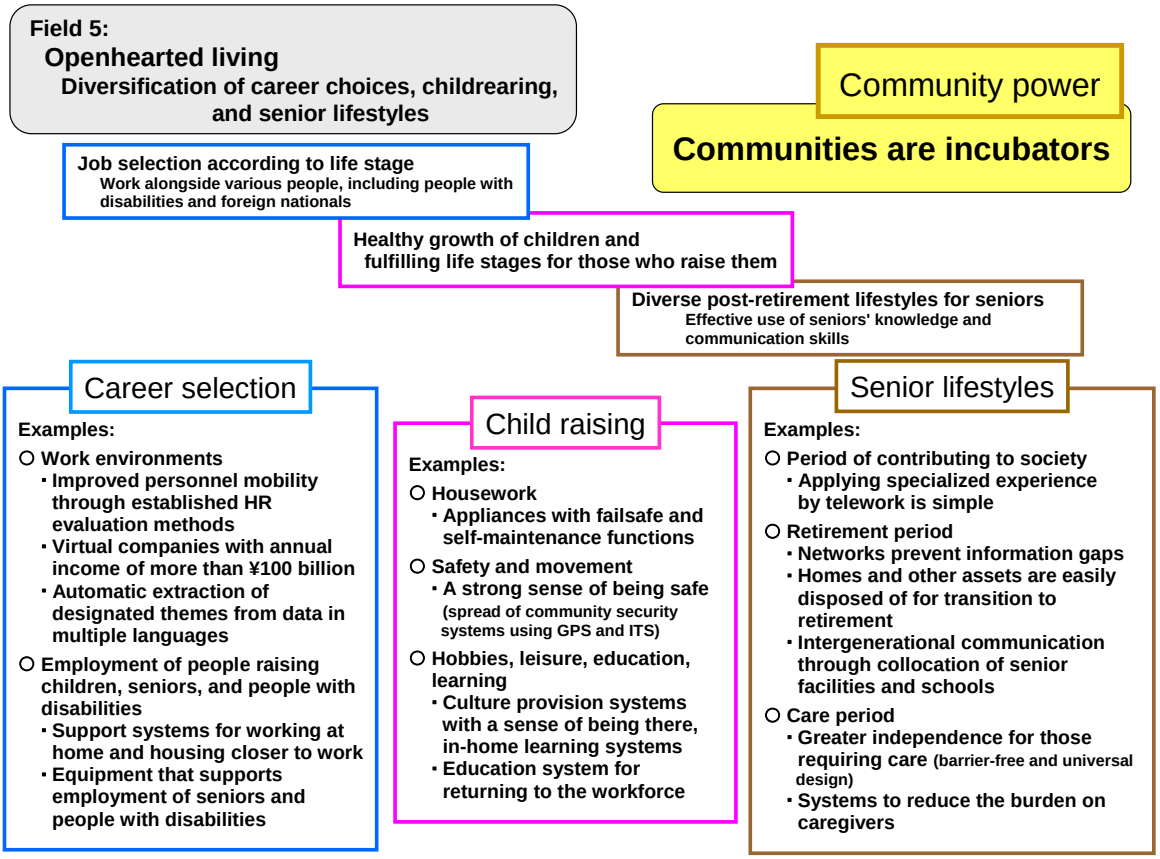
Field 5: Openhearted living: Diversification of career choices, childrearing, and senior lifestyles

In 2025, with the population declining and globalization advancing, all kinds of people, including parents, seniors, people with disabilities, and foreign nationals are all working happily together. The following lifestyle has been achieved.

1) Career choices appropriate to life stages: Diversification of employment types and portability of corporate pensions have made job changing easier. An improved lifelong education system enables career planning and job selection appropriate to each stage of life. Barrier-free, universal design, housing closer to employment, automated translation, and so on enable people with disabilities, seniors, and people raising children to continue working, and it is easy for all, including foreign nationals, to work together.

2) Society accommodates families with children in various ways: The life course of people raising children are fulfilling. Communities support the healthy growth of children. Childbirth is safe in every community and childrearing anxieties are relieved. Improved safety systems make people feel that theirs is a safe society. Information systems enable immediate receipt of shared information and advice on childrearing. Travel is easier because of barrier-free design. To make it easy for people raising children to work outside the home, career resumption guarantee systems and remote lifelong education systems are in place. Automation of housework enables people raising children to have more time for them.

3) Seniors can choose among diverse lifestyles: Senior citizens can choose among diverse lifestyles, such as transferring to new types of businesses, pursuing volunteer work or hobbies, moving so they can enjoy retirement, and so on. The necessary education systems are in place. Seniors can collaborate with other generations or pass on their knowledge through the community, making the most of their wisdom and experience and communication skills. Those who require care can receive cooperative care through collaboration between their families and caregivers.



Field 6: Solving of global environmental problems and coexistence with the world

In order to avoid or mitigate global crises such as global warming, issues related to water, food, energy, and so on must be understood as interrelated world problems rather than as individual issues. Improvement as integrated decentralized systems by region is necessary. The shape for which Japan should aim through 2025 is as follows.

1) A sustainable society leading the world

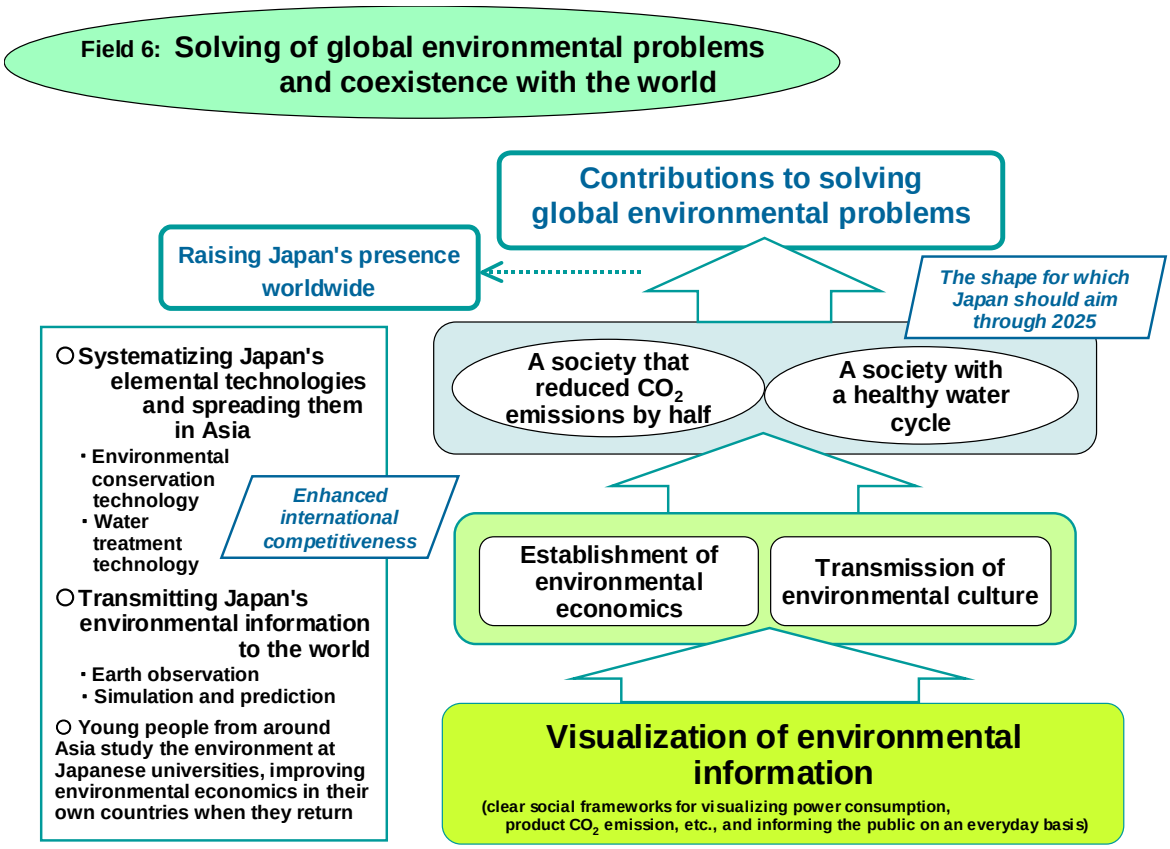
With some of the world's best environmental conservation technology, the Japanese government, businesses, and the public working together have drastically reduced CO2 emissions and are contributing to improving global environmental problems such as waste disposal and water issues. The public cares about the environment, actively engaging in volunteer work, which is supported by corporations as well.

2) A recycling-oriented society that serves as a world example

Green purchasing and socially responsible investing are givens. Advances in recycling technology have built a recycling-oriented society that reuses waste heat, water, and garbage. Distributed energy has spread, making regions independent. Problems related to water resources and disaster response have been overcome, and a sustainable, recycling-oriented society has been achieved.

3) Coexistence with the world

Foreign trainees come to Japan to learn about its world-leading environmental cleaning technology and energy conservation technology. When they return to their home countries, they improve the environmental economics there. Japanese personnel who have received outstanding environmental educations domestically are active around the world, expanding Japanese environmental businesses and enhancing the competitiveness of Japanese corporations.



Social vision toward 2025
-Scenario Discussion based on S&T Foresight-
[Summary]

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