Outline of the New Mid-Term Plan

JST
2012.4
Topics

1. Outline of the Mid-Term Plan
2. Strategies for Prioritized Research Fields
3. Reform of R&D Systems
4. JST’s Support Programs for Reconstruction
5. Development of Soft Infrastructure
Outline of the Mid-Term Plan
JST’s Management Policy

Mission

As a core agency to implement the 4th Science and Technology Basic Plan of Japan, JST contributes to the creation of S&T innovation.

Vision

① Achieve S&T innovation by promoting creative R&D

② Maximize achievements through virtual network research management system

③ Promote S&T infrastructures of Japan toward acceleration of S&T innovation
In order to realize sustainable, secure and safe society and reinforce the industrial competitiveness, JST enhances the function of formulating R&D innovation strategies and restructures its programs.

2 key pillars of JST activities

1. Promotion of Creating S&T Innovation
   - Virtual network research management system
   - Prioritizing research fields to meet the expectations of the society
   - Promoting seamlessly from basic research to industrial development
   - Restoration and reconstruction from the disaster

2. Development of S&T Infrastructures
   - S&T information dissemination
   - Fostering next generation human resources
   - S&T communication

Enhancement of planning capabilities of R&D strategies

- Policy proposal to the relevant ministries
- Formulating R&D Strategies for JST
- R&D Strategies for each research fields, R&D systems, “Science and Technology for Society”, etc
Creating S&T Innovation - Role of JST -

“Kotozukuri” (value creation/ story creation) (Producer of Innovation)

Linking

- Industry-academic-government collaboration
- Inter-ministerial collaboration
- Interdisciplinary collaboration
- International collaboration

Risk taking (R&Ds which are difficult for private sector or university alone to implement)

Make a high impact on society or economy through S&T innovation
New approaches in the Mid-Term Plan

- Set strategic program packages
- Formulate promotion strategies with quantitative targets
- Enhance and expand PD and PO’s functions
- Collaborate beyond the boundary of ministries
- Promotion of globalization and brain circulation
- System and Service-Solution Oriented
Strategies for prioritized research fields
Green Innovation

Develop the Frontier of Natural Energy

1. Stable and Low Carbon Energy Supply/Demand Systems
2. Sustainable Resource Uses
3. Sustainable Coexistence with Nature and Environment

Global Warming
- Unstable Energy Supply

Limited Resource Availability

Global Food Shortage
- Water/Ground Pollution

Needs

Creation of Game-changing technology

Stable and Low Carbon Energy Supply/Demand Systems

Increase the Sustainable Energy Consumption

Energy Management
- Storage Device, Use of Exhaust Heat, Systems for Energy Storage/Transportation/Supply, Systems for Energy Saving

Sustainable Resource Uses

Resource Cycle Systems for Stable Securement of Rare Materials

Sustainable Coexistence with Nature and Environment

Systems of Food Production and Water Use with Environment Adaptability and Low Environmental Load

Package of Strategic Programs
Meet Unmet Needs though Medical Innovation

1. Prevention, diagnosis, and medical treatment to important diseases in an aging society
2. Medical equipment to improve QOL of elderly people, people with disabilities and patients
3. Basic technology to accelerate creation of life innovation

Unmet Medical Needs

- Neuropsychiatric Disorder
- Lifestyle-related Diseases
- Cancer
- Immune-mediated or Inflammatory Intractable Disease
- etc.

Needs

Conduct basic research to realize Proof of Concept

- Identification of target molecules for drug discovery
- Identification of biomarkers in diagnostics
- Demonstration of effects in animal model experiments
- Completion of prototype of medical equipment

Package of Strategic Programs

- Neuropsychiatric Disorder
  - Preemptive Medicine
- Lifestyle-related Diseases
  - Preemptive Medicine
- Cancer
  - Molecular Target Treatment
- Immune-mediated or Inflammatory Intractable Disease
  - Therapy
- Epigenome
  - to determine diseases
- Reproduction of Diseases
  - to accelerate drug discovery
- Nanomedicine
  - by new functional materials
- Diagnostic Technology
  - for possible medical settings
Solve Social Problems through Realization of Nanosystems

1. Reform of R&D system for nanotechnology and materials: Active utilization of “open innovation” platform
2. Development of new basic industries: Creation of new basic industries through vertical integrated R&D
3. Promotion of intelligent strategy, standardization strategy, HR strategy and global strategy

Needs

Collaboration with R&D Centers and Related Projects

- TIA nano
- SACLA etc.

Package of Strategic Programs

- Element Strategy
- Catalyst and Process for Material Transformation
- Materials for Creating, Storing and Saving Energies
- Measurement and Analysis Infrastructure for Light and Quantum
- Low-power-consumption and Multi-functional Nanoelectronics
- S&T Infrastructure for Materials and Processing Process
Knowledge infrastructure building and application technology for big data

1. System infrastructure technology to transform into Aging/Low Carbon/Secure, Safe Society.
2. Highly dependable/low delay network and mass rapid information-processing technology responding to information explosion period.
3. Harmonization/coexistent technology of the human and the information equipment environment in highly-computerized society.

Needs

Creation / Construction of the innovative concept aiming at **Global Standard**
A Challenge to **Innovative Information-Communication Device** in anticipation of Nanosystem.

### Package of Strategic Programs

- **by ITC**
  - Dependable
  - Semantic Information Processing
  - Media, Digital Contents
  - HPC and Simulation
  - Cyber/Physical/System

- **of ITC**
  - Environmental Energy
  - Medical And Health
  - Resilient and Secure, Safe
  - Culture with rich sense of Humanity・Creation
  - Next Generation Social Infrastructure System
Science and Technology for Society

Reconstruction of resilient society

1. Sustained realization of the life with security, safety and rich in spirit.
2. Building social infrastructure which contributes to the economic growth, by controlling resource/energy utilization.

Dwindling birthrate and an Aging population, Global Warming
Change in Industrial Structure (Appreciation of Yen, Deindustrialization)
Prompt Reconstruction of the disaster-affected area, Increasing Risk

Needs

Examine the Solution in Society involving the Government and the Public.
Pursue Possibility of creating new Industry and Employment.

Package of Strategic Programs

Society and Science
Service Science
Communication of Society and Science (Includes Science for Policy and Ethics)

Distortion of Social Infrastructure
Aging Society
Low Carbon Society

Security/Safety
Information Security
Disaster Prevention • Disaster Mitigation • Crime Prevention

Earthquake Disaster Reconstruction
Reconstruction of Resilient Society
Bases for Reconstruction In Tohoku
Reform of R&D Systems
Promotion of S&T Innovation in an Integrated Manner

Innovation-oriented sectoral promotion strategies targeting from basic research to technology transfer
～Transform “top science” into “top innovation”～

Packages of Strategic Programs

Promotion of Strategic Basic Research
CREST PRESTO ERATO RISTEX ALCA

Technology Transfer through Industry-Academia Collaboration
S-Innovation, Collaborative Research based on Industrial Demand, Technology-Transfer Advanced Measurement and Analysis, A-STEP

Promotion of International Research Cooperation
SICORP SATREPS
Promoting Strategic Basic Research

Strategic Basic Research Programs
CREST / PRESTO / ERATO, ALCA, RISTEX

- Socio-tech/ Socio-infrastructure 3%
- ICT 18%
- Nanotechnology/Materials 38%
- others 3%
- Life Innovation 32%
- Green Innovation 6%

55 billion yen (2010)

Creating Mission-Oriented S&T innovation

R&D systems which could contribute to innovation

- Strengthening of strategies (portfolio management etc.)
- Institutional Improvement directly leading to Innovation
Technology Transfer through Industry-Academia Collaboration

**R&D Programs Focused on Technology Transfer**

- Collaborative Research based on Industrial Demand, S-Innovation, Technology-Transfer
- Advanced Measurement and Analysis, A-STEP

**Promotion of returning the achievements of mission-oriented basic research to society**

- Put more emphasis on:
  - Performing as a bridge between mission oriented basic research and society (S-Innovation)
  - R&D based on the future needs of Industry (Collaborative Research based on Industrial Demand)
  - Strategic research fields (A-STEP)

**Bridging the achievements of basic research to top innovation**

**Statistical Data**

- **2010**
  - 22.8 billion yen
  - 1,376 programs

**Pie Charts**

- Socio-tech/ Socio-infrastructure: 3% (2010)
- ICT: 8%
- Nanotechnology/Materials: 20%
- Others: 10%
- Life Innovation: 49%
- Green Innovation: 10%

- Socio-tech/ Socio-infrastructure: 4%
- ICT: 10%
- Nanotechnology/Materials: 27%
- Others: 14%
- Life Innovation: 36%
- Green Innovation: 9%
JST’s International Activities

Joint research with developing countries
SATREPS

Joint research with advanced countries
SICORP

Research cooperation mainly with advanced countries.
SICP

48 country and region (248 projects) -as of April, 2012-

Strategic Basic Research Programs, R&D Programs Focused on Technology Transfer, etc.

Acceleration of globalization
Rise of emerging countries

Strategic promotion of international activities
—Basic strategies for advanced countries and for emerging countries—

Strengthening S&T diplomacy

Acceleration of S&T Innovation

Utilizing overseas’ potential (especially emerging countries)
Promoting brain circulation

Globalization of S&T Innovation
JST’s IPR activities

- Patents owned by JST: about 7,400 (as of March 31, FY2011)
- Patent applications supported by JST: 1,542 (FY2011)
- Mediation/Licensing IPR: 40 (FY2010)

Applying, maintaining and administrating patents

- Proper management of JST’s Patents
- Supporting universities in overseas applications

Promotion of the use of IPR

Promotion of utilizing patents

Support activities of universities (TLO)

- Organizing strong patent groups by Packaging
- Collaboration with investment institutions (The Innovation Network Corporation of Japan, DBJ Capital, etc.)
Challenges to Ethical, Legal and Social Issues

- Prevention of misconduct in research
  Measures for Fabrication, falsification of the research publications.
- Proper spending of research fund
- Compliance with regulations and contracts
- Impartiality in review process
  Secure transparency of the review process, etc.
- Proper Management of Conflict of Interest
- Consideration to Environment & Safety
- Bioethics
  Including measures for new challenges in embryologic and regenerative research, infectious disease research, etc.
- Personal Information Protection
  Personal data protection in clinical research, etc.

Further Enhancement

- Upgrading the system of audit and compliance
- Ensure social credibility of JST through science communication tools, etc.

Activities by utilizing JST’s research and analytical functions
JST’s Support Programs for Reconstruction
Promoting R&D which could lead to commercialization by companies in disaster-affected area by utilizing innovative technology of universities, etc.

Promote the development of radiation measurement/analytical technology and devices, which would take a certain period of time but based on strong governmental and local demand. This technology and devices could enable us to detect radiation dose immediately with high accuracy and sensitivity.

**Targets to be focused on:**

- Advanced measurement technology/devices to detect radioactive substance contained in foods
- Advanced monitoring technology/devices for radioactive substance in soil
- Establishment of the technology/devices which could measure alpha/beta emitting radionuclide in a short time
By collaborating with industrial association in Tohoku Area (TOHOKU ECONOMICAL FEDERATION, etc.) and local government, JST achieves the practical use of the innovative technology seeds of universities across the country in cooperation with companies in the disaster-affiliated area, and contributes to the reconstruction of the area.

Industry-Academia collaboration

- Matching Support
- Support toward commercial application, etc.

Reflecting the needs of disaster-afflicted area

- Industrial associations in Tohoku Area (TOHOKU ECONOMICAL FEDERATION, etc.)
- Local Government/Official R&D institutes etc.

Understand the needs of disaster-afflicted area and industries in Tohoku Area

Implement industry-academia collaboration research matching their needs

Contribute to reconstruction of the economy of the disaster-afflicted area by S&T Innovation
To promote supporting reconstruction, JST established 3 bases in Tohoku Area and provides community-based and detailed assistance to disaster-afflicted area.

Center for Promoting Reconstruction
Morioka Office

Center for Promoting Reconstruction
Sendai Office

Center for Promoting Reconstruction
Koriyama Office

※JST placed matching planners in each office (about 18 people in total)
Development of Soft Infrastructure
Promoting S&T Infrastructures for Creating S&T Innovation - Development of Soft Infrastructure to Support Innovation -

**Development of Soft Infrastructure to Support creating S&T Innovation of Japan**

- S&T information dissemination
- Promoting S&T information dissemination, linkage and application
- Integration of life science database

- Fostering next generation’s human resources

- Promotion of S&T communication
- Risk communication, promotion of outreach activities by Scientists, utilizing facilities such as Miraikan
Promoting S&T information dissemination, linkage and application

Accelerate S&T Innovation by S&T information

Establish the environment where S&T information can be utilized as high value added service.

Utilize S&T information in decision making such as policy making and management strategy planning, etc.

Preparing S&T information foundation of our country and Promoting dissemination of S&T information

- Networking of digital information resources
- Data standardization
- Adding high value to S&T information
  - Strengthening of capability to link information such as articles, patents and facts etc.
  - Promoting automation of extracting knowledge

Establishing human networks

- Forming researcher/engineer networks beyond organizations and research fields

Industrial needs
Extrication of policy issue
Social needs
Acceleration of R&D
Information transmission to the world

Understand the demand of users and improve these systems’ functions, etc from their viewpoints.
Integration of Life Science Database

Under the cooperation of 4 ministries, develop a national knowledge infrastructure of life science

- CSTP
  - Life Science Project Team
  - Task Force for Integrated DB Promotion

National Bioscience Database Center (NBDC)

1. Strategy planning
2. Portal website management
3. Development of fundamental technology for Database integration
4. Promoting integration of bio-related databases in Japan

Develop a national life science intellectual infrastructure

Contribute to Life Innovation

integbio.jp
Japan should lead the world in S&T now and future years.

Continuous and systematic training for gifted students

Integration of R&D, practice and promotion

Program to help gifted students develop their talents

Program to improve educational capabilities regarding S&T
Promotion of Science & Technology Communication

Various Science & Technology Communication Activities

Support various activities, events and networking

Science & Technology Communication Field

Miraikan
Visitors in 2010: Approx. 101 million

Deepening relations between society and S&T Innovation

Further promotion of S&T communication activities including risk communication

Integration of R&D, practice and promotion

Promotion of various activities and expansion of field management
Changes in budget

Initial budget

- Development of S&T Infrastructures
- Promotion of Creating S&T Innovation
- Enhancement of planning capabilities of R&D strategies
- Promoting Science Communication
- Promotion and Support for International Cooperation in Science and Technology Research
- Promoting Dissemination of Scientific and Technological Information
- Technology Transfer and Innovation Program
- Creation of Advanced Technology

The New Mid-Term Plan (H24～28)

- Others (Including Commissioned Projects since FY2011)

The Second Mid-Term Plan (H19～23)

[million yen]

FY19  FY20  FY21  FY22  FY23  FY24

[112,935]  [114,118]  [115,376]  [111,184]  [117,808]  [115,772]
JST’s Budget Transition in the Last Five Years [by research field]

- Life innovation
- Nanotechnology/Materials
- ICT
- Green Innovation
- Science and Technology for Society
- Others

(billion yen)