

Where Do We Come From? What Are We?

Where Are We Going?

- A Japanese Perspective on Japanese Science and Technology Policy



(Where Do We Come From? What Are We? Where Are We Going? , Paul Gauguin, 1897)

Takashi NISHIYAMA
The Embassy of Japan in Canada
Oct. 2nd, 2010
JSAC 2010 at Vancouver

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■ ***Where Do We Come From?***

- History of Science and Technology Policy in Japan
- The 3rd S&T Basic Plan
- Japan's Excellence

■ ***What Are We?***

- Government Structure of S&T Policy
- Current Situation of S&T in Japan

■ ***Where Are We Going?***

- A Future Direction
- My perspective on Japanese S&T policy issues to be tackled in the future

■ ***Summary***

Self-Introduction

□ A science attache
in the Embassy of Japan, Canada



□ Originally from the MEXT

(MEXT: the Ministry of Education, Sports, Culture, Science and Technology)

西山崇志

□ A government officer about S&T Policy
and Nuclear R&D Policy for peaceful-use.

□ Born in 1976.

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■ ***Summary***

History of Science and Technology Policy in Japan

□ S&T Basic Law (November, 1995)

□ S&T Basic Plan

The 1st (FY1996 - FY2000)

The 2nd (FY2001 - FY2005)

The 3rd (FY2006 - FY2010)

4 priority promotion areas

(Life sciences, ICT, Environmental sciences, Nanotech & materials)

4 promotion areas

(Energy, Manufacturing technology, Social infrastructure, Frontier)

□ Changes of Administrative System

■ Establishment of **Council for S&T Policy (CSTP)** (January, 2001)

■ Reorganization of Central Government Ministries (January, 2001)

■ Incorporation of **National Universities** (April, 2004)

■ Incorporation of **National Research Institutes**

History of Science and Technology Policy in Japan – toward 4th Plan

Science & Technology Basic Law (enacted in 1995)
Council for Science & Technology Policy (established in 2001)

1st Basic Plan
(FY 1996-2000)

Total budget
17 trillion yen

- Increase in governmental R&D expenditure
- Enhance competitive research funds

2nd Basic Plan
(FY 2001-2005)

Total budget
24 trillion yen

- Effective/efficient resource allocation
- Strategic priority setting

3rd Basic Plan
(FY 2006-2010)

Total budget (targeted)
25 trillion yen

- Benefit society to be supported by public
- Foster human resources and competitive research environments

4th Basic Plan (FY 2011-2015) is now under
consideration (to be endorsed by the Cabinet in March 2011) .



Prioritized Promotion at 3rd S&T Basic Plan

Prioritized 4 research areas

- Life sciences
- ICT
- Environment
- Nanotechnology/Materials

Promoted 4 research areas

- Energy
- Monodzukuri
(Manufacturing)
- Social infrastructure
- Frontier

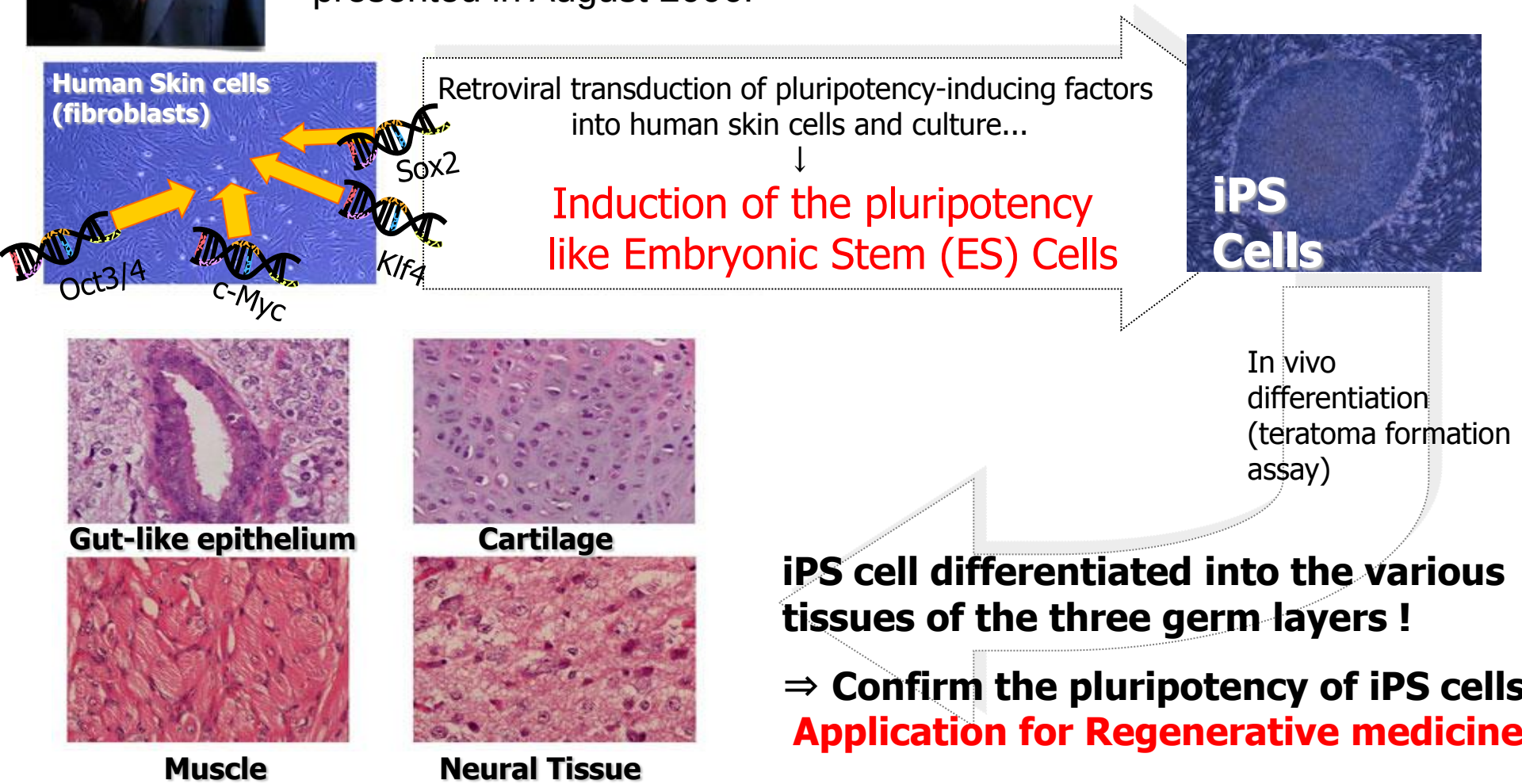
Key technologies of national importance

- Next-generation supercomputer
- X-ray Free Electron Laser (XFEL)
- Fast Breeder Reactor (FBR) cycle technology
- Space transportation system : ISS “KIBOU”, et al
- Global oceans observation system

Japan's Excellence: Generation of iPS Cells



- ◆ In November 2007, Kyoto University's Professor Shinya Yamanaka announced his success in creating human induced Pluripotent Stem (iPS) cells.
- ◆ This is the first achievement in the world following the success with mice presented in August 2006.



Japan's Excellence: Aerospace activities

International Space Station (ISS) Japanese module

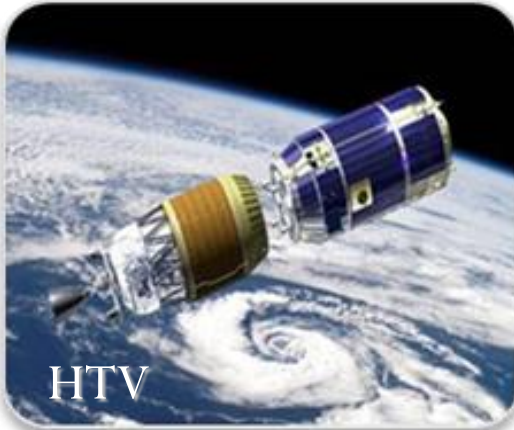


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➤ *Japanese experiment module “KIBO”*

is Japan's first manned facility where astronauts can conduct various experiments which many countries are interested in, under the special environment in space. Kibo's docking and assembly operations to the ISS have been completed in July 2009.

Launch vehicles and space transportation systems



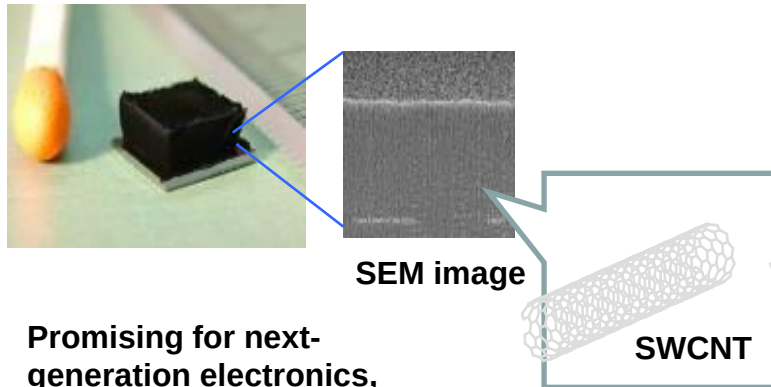
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➤ *HTV (H-II Transfer Vehicle)*

was successfully berthed at the ISS on September 2009. HTV will be the only logistic carrier which is capable of supplying a total of six tons of pressured and unpressured cargo after the retirement of the Space Shuttle.

Japan's Excellence: Nanotechnology

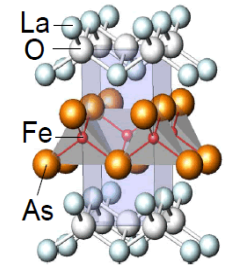
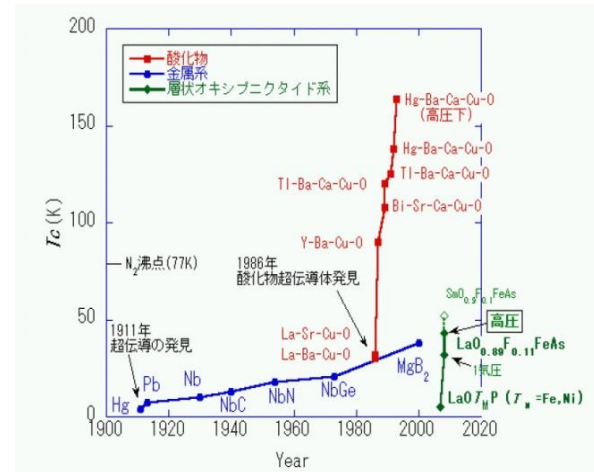
Discovery of carbon nanotube



Promising for next-generation electronics, energy, environment, IT, medical etc.

©AIST

Superconductors incorporating magnetic element



Discovery of Fe-system

©JST

Discovery of photocatalyst

Photocatalyst functions

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Air purification

- Aldehyde decomposition
- NOx (nitrogen oxides) removal

Water purification

- Decomposition of organic materials
- Decomposition of environmental hormone materials

TiO_2 + Light

Self-cleaning

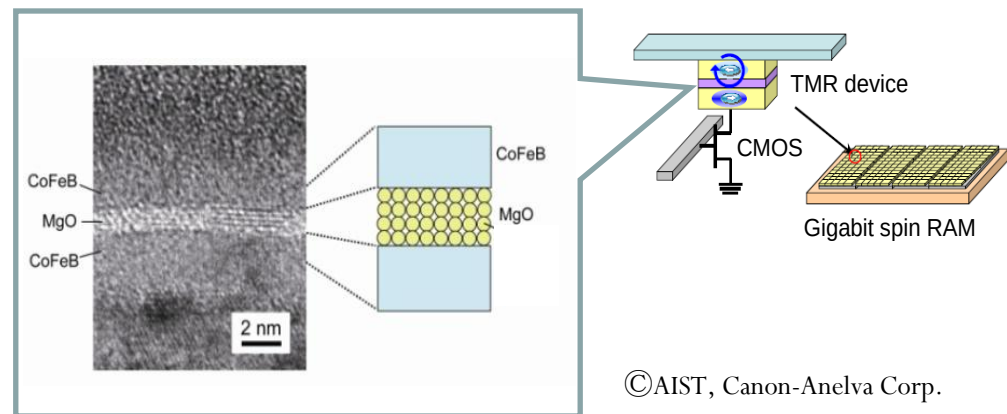
- Oil grease decomposition
- Super-hydrophilic effects

Antimicrobial action and disinfection/sterilization

- Germicidal action on E. coli (coliform) and MRSA (Staphylococcus aureus)
- Virus degradation (decomposition)

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High performance magnetoresistive devices



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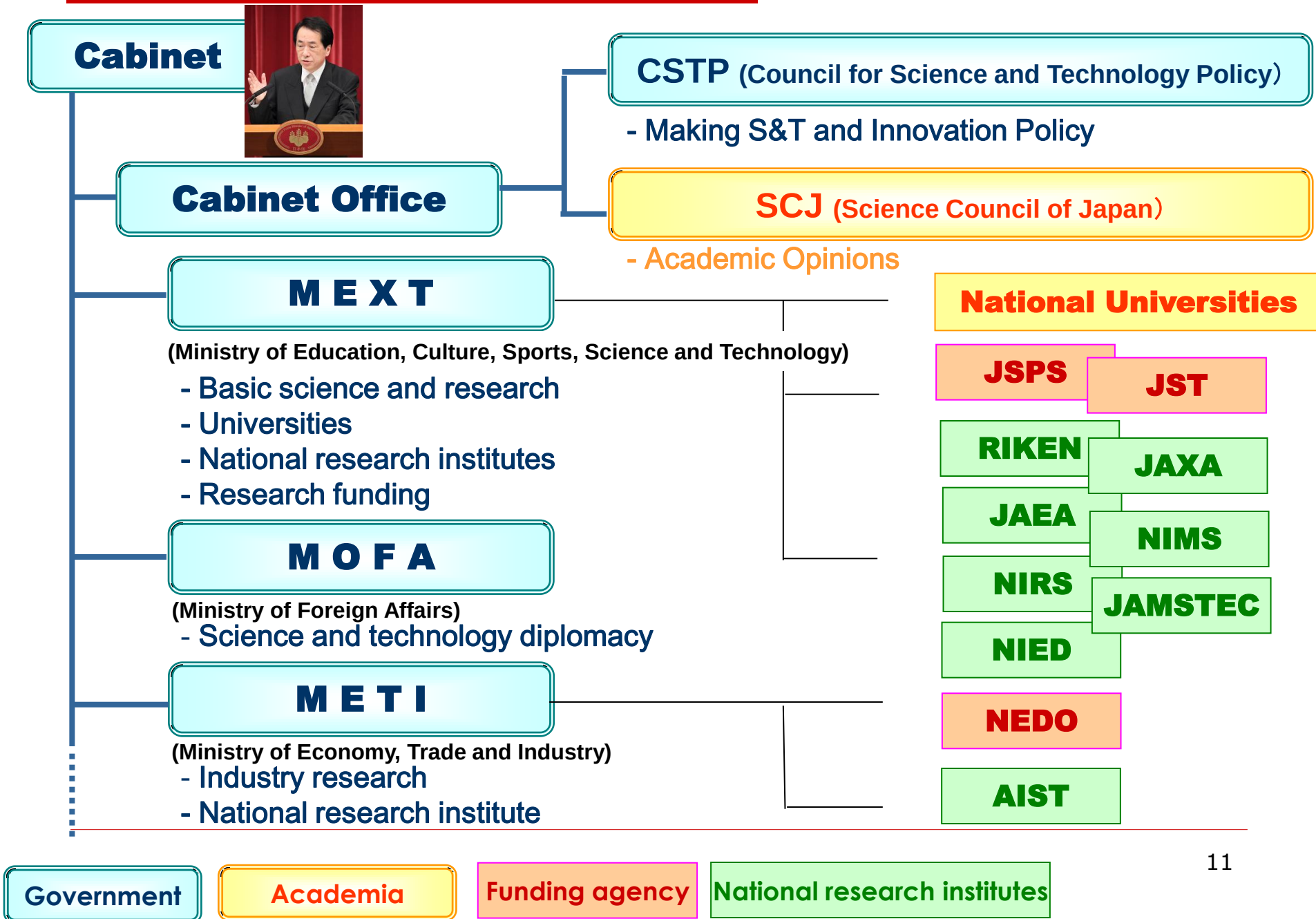
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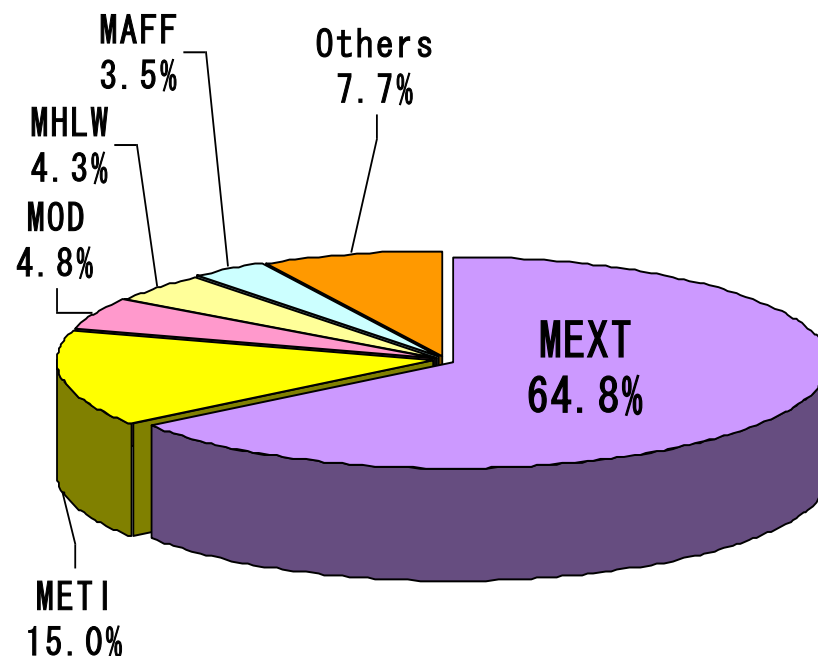
■ ***Summary***

Japanese Government structure of S&T policy



Japan S&T-Related Budget in FY2010

Ministry	S&T-Related Budget (tri JPY)(bln USD)
MEXT	2.32 (23.2)
METI	0.54 (5.4)
MOD	0.17 (1.7)
MHLW	0.15 (1.5)
MAFF	0.12 (1.2)
Others	0.28 (2.8)
Total	3.59 (35.9)



	Ministry of Education, Culture, Sports, Science and Technology (MEXT)
	Ministry of Economy, Trade and Industry (METI)
	Ministry of Defense (MOD)
	Ministry of Health, Labor and Welfare (MHLW)
	Ministry of Agriculture, Forestry and Fisheries (MAFF)
	Others

NOTE The exchange rate : 1 USD = 100 JPY

Some S&T Indicators Comparison Between Canada and Japan

	Canada	Japan
R&D amount (total)	¥ 2.5 trillion (CAD 29.8 billion)	¥ 18.8 trillion
Ratio of expenditure by the Government	24.2 %	17.8 %
Ratio of R&D expenditure against GDP	1.95 %	3.44 %
Number of researchers	143 thousands	656 thousands

New Growth Strategy (June, 2010. Cabinet Decision)

Growth boost led by demand-side policy measures

Green Innovation

- Rapid increase in renewable energy by introducing feed-in tariff system
- “Future City” Initiative
- Forest and forestry revitalization plan



Life Innovation

- Medical institution selection system to promote practical application of new medical care
- Medical interaction (acceptance of foreign patients)



Asia

- Infrastructure-related / system export
- Reducing the effective corporate tax rate and promotion of Japan as an Asian industrial center
- Fostering global talents and increasing acceptance of highly-skilled personnel
- Strategies for intellectual property and standardization and exporting Cool Japan
- Economic partnership strategy through Free Trade Area of the Asia-Pacific (FTAAP)



Tourism-oriented nation and local revitalization

- Introducing a “comprehensive special zone system” and promoting full open skies
- The “Program to Boost the Annual Foreign Visitor Number to 30 Million” and promotion of staggered holidays
- Doubling the size of the existing housing and remodeling markets
- Opening public facilities to the private sector and promoting projects by using private sector funds



Growth boost led by supply-side policy measures

Science-and-technology- IT oriented nation

- “Leading graduate school” and other schemes to enhance international competitiveness and foster human resources
- Promoting utilization of information and communication technologies
- Enhancement of R&D investment



Employment and human resources

- Integration of kindergartens and nursery schools, etc.
- Introduction of the “Career Grading” system and “Personal Support” system
- New concept of public service



Financial Sector

- Establishment of an integrated exchange (securities, financing and commodities)

Main Issues of 4th S&T Basic Plan (Draft)

Basic concept

Provisional Translation

Positioning of Basic Plan in National Strategy

○A five-year-plan with the foresight of 10 years ahead, based on “New Growth Strategy”.

Comprehensive promotion of science, technology and innovation policy

Promotion of two major innovation as the national strategic pillar

Green Innovation

To realize low carbon society with sustainability

- Renewable energy, Low carbon of energy supply and demand, Saving energy, Green infrastructure
- Accelerate innovation by affirmative legal framework
- Establish “National Lab” with proper regulation easing
- Develop strategies for the international standardization

Life Innovation

To realize high quality of life in an aging society

- Promotion of preventive medicine, Development of innovative diagnostic and treatment method, Development of life-supporting technology for elderly and challenged people
- Promote translational research
- Promote regulatory science
- Accelerate innovation by affirmative legal framework

The new device which promotes creation of the innovation

To construct the system which create issue-solving innovation

- Establish Innovation Strategy Platform
- Establish Open Innovation Centers
- Create a new market by the new affirmative legal framework

Main Issues of 4th S&T Basic Plan (Draft)

Provisional Translation

Promotion of R&D which sustains the nation and produces new advantage

Bases for the high quality of life

- Maintain necessities: food/resources/energy
- Maintain safe life



Bases for the industry

- Extend advantage of Japan
- Create new advantage for the future



Bases for the nation

- Maintain a technology bases for security
- Develop a new frontier



Common Bases for R&D

- Maintain cross-sectional key technologies
- Establish hubs of advanced R&D



Drastic Reinforcement of S&T Potential

Drastic reinforcement of basic research

- Reinforce basic research based on originality/variety
- Reinforce the world top-level basic research
- Form the group of "Research Universities"
- R&D Hub for International research network

Reinforcement of human capital for S&T

- Drastic reinforcement of the graduate school education

Formation of research environment of international standard

- Domestic/international maintenance and utilization of large research facilities

International openness integrated with world vitality

- "East-Asia Science and Innovation Area" Initiative

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A future direction

- ❑ More focus on policy of S&T innovation
 - ❑ More focus on R&D in the fields of Environment, Clean Energy and Life Sciences where new markets will be created
 - ❑ Constructing the S&T system which will create issue-solving innovation (including integrated roadmap)
 - ❑ Increasing investment on S&T human resources
 - ❑ Close cooperation between industry and academia, and establishment of technology clusters
-

My perspective on Japanese S&T policy issues to be tackled in the future

□ Formation of Science and Technology Stakeholders

(Importance of S&T Stakeholder involvement on S&T policy making process)

□ Increasing investment on basic science and research

(Innovation means the creation of new values, not just commercialization)

□ Strategic establishment and utilization of S&T infrastructure

(formation of COE and international network, utilizing S&T infrastructure)

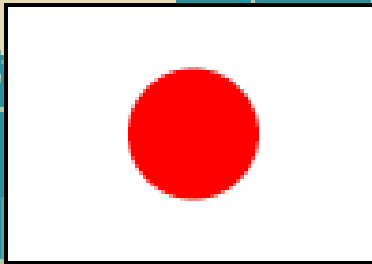
□ International cooperation between Canada and Japan

(common benefits for both countries)

Summary

- Japan has achieved much success on S&T, placing great importance on, and investing in this field.
- Now, we are facing on a critical turning point at which the draft 4th S&T basic plan is being considered.
- It is common sense for S&T policy officers in each country that it is important to make the best circumstances to create 'innovation' in my own country.
- However, there are many insights and issues to be tackled in the future for S&T policy. The recommendations of S&T policy from academia would be of great effect to establish 'Science and Technology Country'.
- Needless to say, it is of quite importance to establish strategic international S&T cooperation. We will discuss about it in Canada-Japan Joint Committee on S&T, which will be held at Ottawa on Nov. 9.

Thank you for your attention!



If any questions, please contact...

Takashi NISHIYAMA

First Secretary, the Embassy of Japan (Ottawa)

takashi.nishiyama@mofa.go.jp²¹

Science and Technology Cooperation

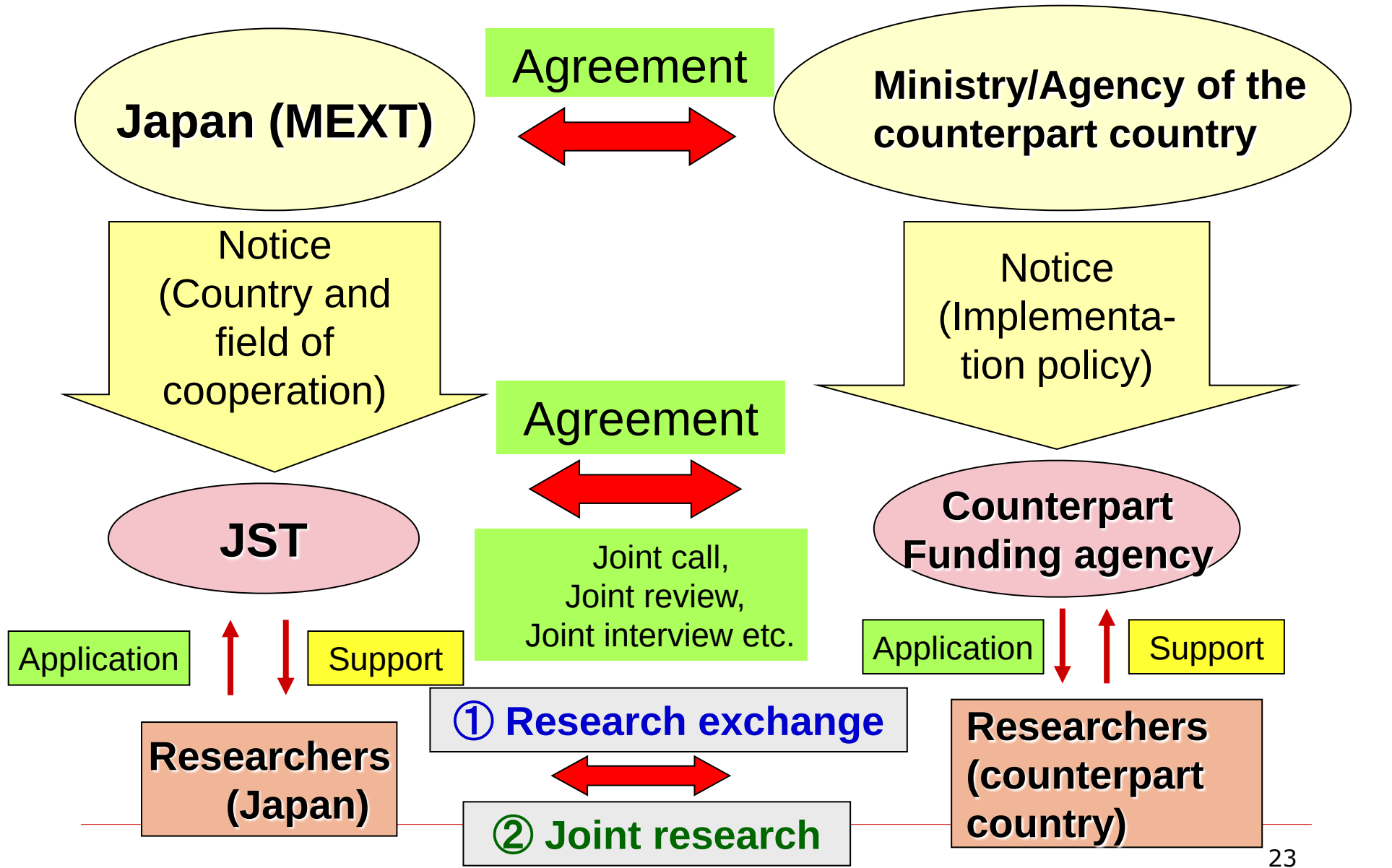
Strategic International Cooperative Program (SICP)

- Mutually complementary research collaboration with institutes in counterpart countries in fields with of strategic importance for both Japan and counterpart countries
- Strategic promotion of international research exchange and joint research

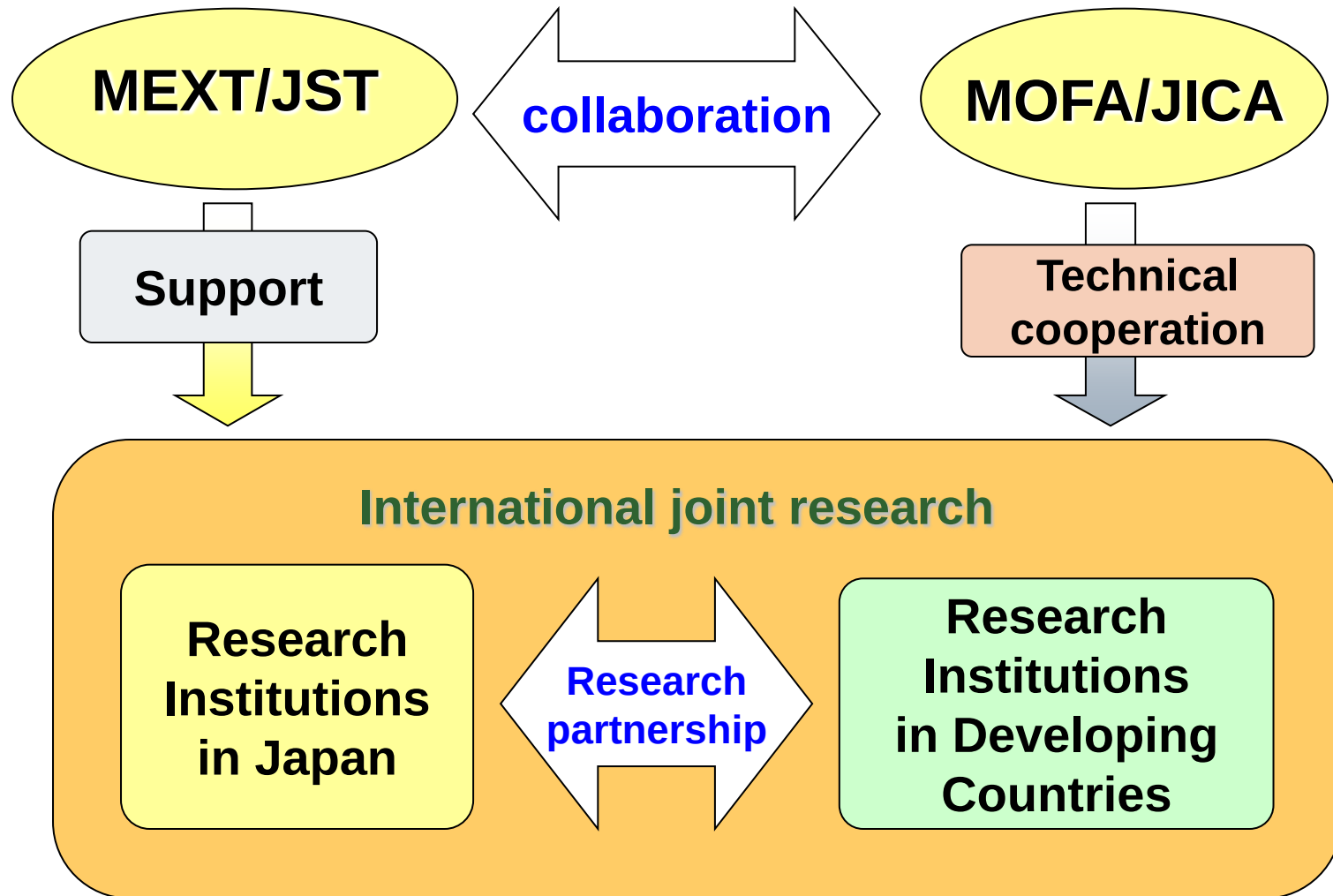
S&T Research Partnership for Sustainable Development (SATREPS)

- Research collaboration with the institutes in developing countries for mutual benefit
- Reinforcement of capacity in developing countries to find solutions for problems by their own

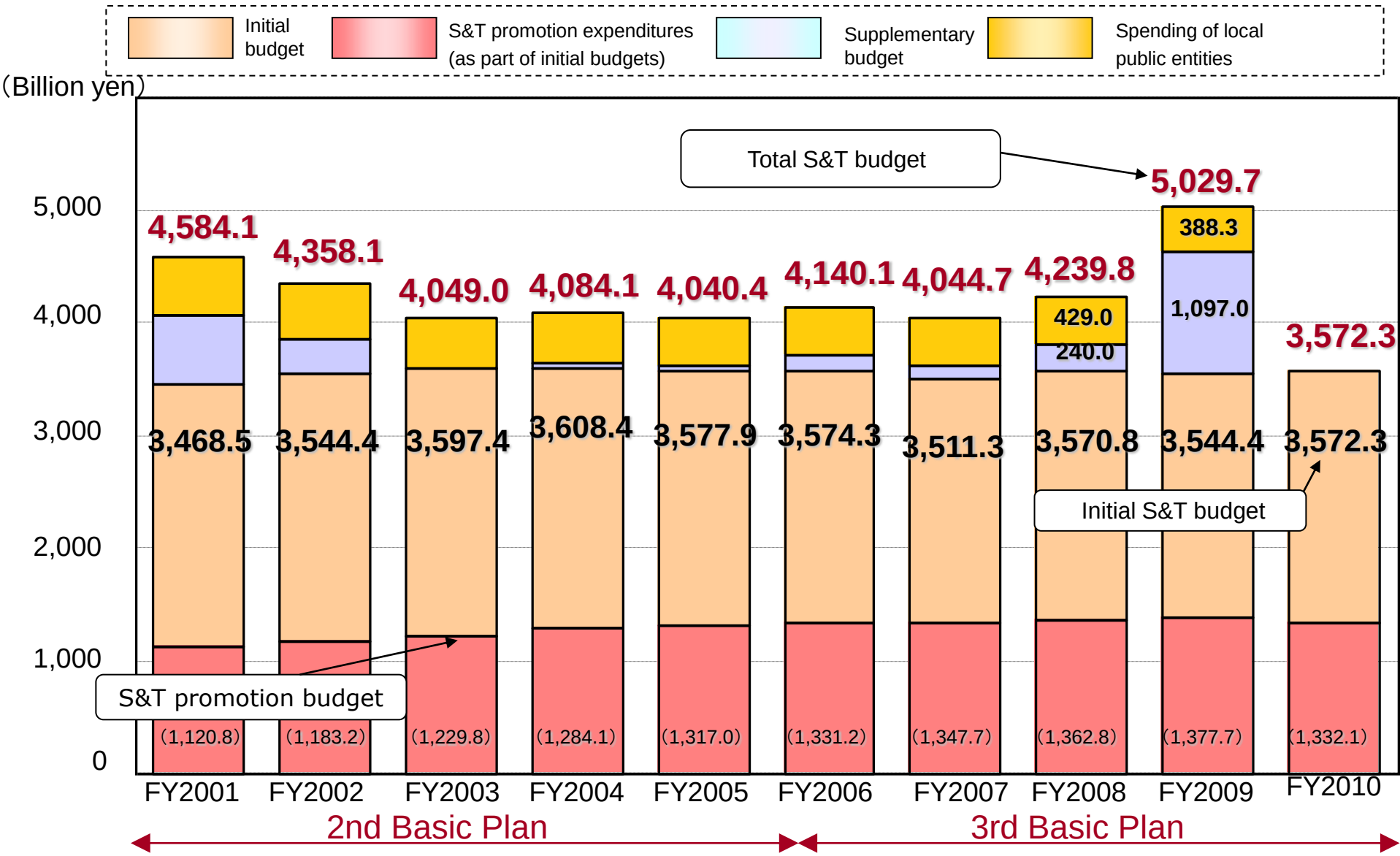
Strategic International Cooperation Program (SICP)



S&T Research Partnership for Sustainable Development (SATREPS)



Trend in the S&T Budget in Japan



1st Plan (FY1996-2000)
Investment under the basic plan
Approx. 17 trillion yen
Actual budget: 17.6 trillion yen

2nd Plan (FY2001-2005)
Investment under the basic plan
Approx. 24 trillion yen
Actual budget: 21.1 trillion yen

3rd Plan (FY2006-2010)
Investment under the basic plan
Approx. 25 trillion yen