The 4th Science and Technology Basic Plan: A National Innovation System for New Challenges – Role of East Asia and Small & Medium Businesses

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Abtract

We give and over view of the Japanese 4th Science and Technology Basic Plan, 1 April 2011 – 31 march 2016, focusing on the four major challenges: recovery & revitalization from earthquake disasters, green innovation, life innovation, and science, technology and innovation system reform. Then we examine two important topics from other essential schemes in the Basic Plan: East Asia Joint Research Program (e-Asia JRP) and Small Business Innovation Research (SBIR). e-Asia JRP consists of multilateral collaboration in science and technology research and funding among participating countries. It will constitute a part of larger East Asian collaborative efforts in science, technology and innovation. SBIR is a scheme to help individuals and new firms develop and then commercialize innovative technology and products. SBIR consists of initial subsidies and then loans on very favorable terms. We also look at three examples of SBIR success: motor insulation ideal for hybrid and electric vehicles, cancer fighting cyclodextrin, and a key system for high security machines.

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1. Introduction

Japan is in the first year of its 4th Science and Technology Basic Plan. The basic plan covers fiscal years 2011 to 2015 (1 April 2011 to 31 March 2016). It is based on The Science and Technology Basic Law (effective November 1995). The plan is based on a report by Council for Science and Technology Policy (CSTP) which will also oversee the execution of the Basic Plan. The Council resides in the Cabinet Office but the Science and Technology Policy encompasses all government activities pertaining to science, technology and innovation (STI) [2].

The original policy (latest version available in English is CSTP December 24, 2010 "Japan's Science and Technology Basic Report") had been finalized by the CSTP by early March 2011. However the recommendation was overhauled after the Tohoku earthquake and the following disasters. The Basic Plan now includes "recovery and revitalization" as one of its four major challenges to be overcome for sustainable growth and prosperity. The four major challenges are recovery & revitalization, green innovation, life innovation, and STI system reform. The Basic Plan also covers other essential areas of emphasis, such as basic research, human resources, and national security. STI Policy is also discussed as part of Japan's international diplomatic strategy. Japan is very much aware of its role as part of East Asia and eager to make a contribution and foster cooperation in terms of STI.

In the next section, I review the four major challenges of the 4th Basic Plan. Then we focus on two of the other essential topics in the Basic Plan: East Asia Joint Research Program (e-Asia JRP) and Small Business Research Innovation (SBIR). The e-Asia is an example of STI in the context of international cooperation. SBRI builds on Japan's backbone of technology and innovation, i.e., small and medium firms, while trying to overcome lack of venture capital.0

2. 4th Science and Technology Basic Plan

In this section I review the four major challenges of the 4th Basic Plan. It is important to note that the issue-driven formulation of the Basic Plan in terms of social and economic challenges (demand pull) is a departure from the 3rd Basic Plan where the

[2] The term "science, technology and policy" is used throughout the Basic Plan. The title remains "Science and Technology Basic Plan" to be consistent with the name of the law that is the basis of the plan..

focus was on the eight fields of science and technology, such as nanotech-materials and information & communication technology (supply push)[3].

The first of the major challenges "recovery and revitalization" covers all aspects of recovery from the Tohoku disaster and implies not merely recovering society and economy to the state prior to the disaster but to develop it to an improved state. Recovery and revitalization includes physical, social and economic infrastructures for fishing, agricultural and industrial production. (The Japanese word is "fuk-ko" meaning recover and develop. The word "resurrection" might be closer in spirit.)

"Recovery and revitalization" also includes addressing the nuclear power crisis: to get crippled nuclear power plant under control, to address safety issues such as radiation monitoring and hazard prevention, and revising energy policy to secure the energy supply. In the longer term, ensuring safety with preparation against natural disasters and reinforcing risk management and communication by analyzing behavior in case of disaster and appropriate system reform to reinforce risk management and communication. In a sense, "recovery and revitalization" is a microcosm of the new formulation of the Basic Plan. That is, all investments in R&D and innovation in a variety of science and technology are done with the ultimate goal of reconstruction. We start with the goal, and then decide which science and technologies need to be developed.

Innovations in alternative energy, materials, health, safety, and environmental technologies will be particularly important. There also will be reforms of systems and institution at various stages of R&D, innovation and supply chain to provide incentive to develop, to accommodate and to make better use of new technologies. Extensive utilization of Tok-ku (special areas where less stringent laws and regulations are implemented, such as speeding approval process for new medical products) and collaboration of businesses, universities and government (central and local) will be necessary. Research institutions such as Tohoku University is a world class research institution with strength in material sciences, is expected to be essential in such collaborations.

[3] 8 fields were life science, IT, environment, nanotech-materials, energy, manufacturing, social infrastructure, and frontier

“Green innovation” refers to science, technology and innovation to address the challenges of global warming and other environmental issues. It includes development and procurement of low carbon emission energy sources (e.g., hydrogen supply system including storage batteries, fuel cells and recharging infrastructure, low-carbon thermal generation, low emission petroleum refining). More efficient use of energy requires improvements in technologies (e.g., higher grade insulation systems for houses and buildings, stationary fuel cells, more efficient lighting, power control via storage batteries, fuel cells, and power electronics used for next-generation automobiles) as well as new systems such as smart electricity grid and smart transportation systems. These systems will require and then utilize innovations in information and communication technologies.

Promotional measures to achieve green innovation include (i) examination of new regulations and systems pertaining to greenhouse emissions and automobile fuel efficiency standards, taking into account new technologies and competition in both domestic and international markets, (ii) support efforts by industries, local governments, universities, public research institutions both individually and collaboratively to conduct R&D, demonstrate and disseminate integrated new systems such as smart grid, (iii) develop social infrastructure for energy, water, traffic and transportation , (iv) promote transfer of technology to combat climate change, such as agriculture, water management, disaster preventions technologies to developing countries.

Japan leads the world as a low fertility-longevity society. Low fertility and longevity means the age distribution changes as the population declines. It is essential that people are able to remain healthy as they age. Thus life innovation includes preventive care (e.g., understanding lifestyle related diseases, promotion of large scale epidemiological research, development of vaccines for infectious disease, understanding dementia), development of early diagnostic methods (e.g., development of new detection methods, equipment for detection of low trace substances, integration of new methods and equipment), realization of safe and highly effective treatment (establishment of innovative treatments such as nucleic acids medicines and drug delivery systems, innovation of drug dosing methods, development of new medical devices such as radiotherapy equipment and robotic surgical instruments, telediagnosis, telemedicine technologies, promotion of regenerative medicine as a precursor to disease treatment, alternatives to lost function, regeneration, technologies for the proliferation /differentiation of iPS

cells, ES cells, somatic stem cells) and improvement of quality of life of the elderly and the disabled (e.g., life support robots, brain machine interface equilibrium, technologies for personal mobility, technologies to support self-sufficient living)

Promotional measure to achieve life innovation include (i) improvement and strengthening of "regulatory science" (e.g., formulation of safety guidelines, assessment of efficacy and safety of pharmaceuticals and medical devices), (ii) ensure prompt and efficient examination for approval of pharmaceuticals and medical devices, (iii) strengthen infrastructure to promote collaboration of industry, universities, public research institutions and government to support development of new drugs and medical technologies including open medical networks, (iii) investigate systems abroad such as Investigational New Drug and Investigational Device Exemption in the U.S., (iv) develop a system for government – industry consultation at early stage of drug development, and (v)support bio-venture businesses with a long-term time frame. .

The fourth major challenge "science, technology and innovation system reform" has two major reforms. One is the national innovation system itself. The Council for Science and Technology policy will be reorganized into a new organization, tentatively called "STI Strategy Headquarters" (tentative name). A committee of experts was assembled in October 2011 to hammer out the details of the new Headquarters. At end of December 2011, it presented its recommendation. The new Headquarters will have greater representation of the academic organizations (currently the only organization represented is the National Academy of Sciences). The committee has also recommended a Scientific Advisor to advise the Prime Minister. It is expected that a new law will be presented to the diet during it regular session in January 2012 which will allow the new organization to be established in about a year.

Several new systems have been proposed to promote application and commercialization of scientific advances and technologies. Industry – university- government cooperation will be strengthened both at the research stage through networks, and commercialization stage through technology licensing office. There will be government support for acquisition and management of patents in Japan and abroad, and investment in development of professionals to support patent acquisition and management. Government will strengthen financial support for universities and public research institution to commercialization and utilization of technology seeds,

such as greater utilization of private funding such as matching funds. The government will also establish more "places" for industry-university-government collaboration where the entities are physically together, where a successful example of such "place" is the Tsukuba Science City. There are several initiatives to assist new start-ups that translate new technology into products (commercialize), such as the Small Business Innovation Research for financing.

Basic Plan includes other important initiatives in basic research (pure academic research) and human resource investment, national projects in space and oceanic exploration, information and communication infrastructure, intellectual property and standardization strategy, and global integration. In order to achieve the goals set forth in the Basic Plan, the target level of government R&D is 1 % of GDP with the total over five years be about 25 trillion yen. Target for total of government and private R&D is 4% or more of GDP.

3. East Asia Joint Research Program

The East Asia Science and Innovation Area is part of global integration strategy. Japan is eager to contribute her science and technology to solve common challenges among Asian countries in fields of environment & energy, food, water, disaster prevention and contagious diseases. The Basic Plan proposes the East Asia Science and Innovation Area platform for such cooperation. The scheme allows participating countries to bring to the table respective strengths and fosters joint effort among participating countries while remaining open to cooperation with non-participating countries. Cooperation will not only be for research and innovation but also investment in human capital to undertake them. The Japanese government is considering the establishment of an international research fund and implementation of large-scale joint project to enhance S&T and innovation within the participating countries.

The East Asia Joint Research Program (e-Asia JRP) will be one of the collaborations within East Asia Science and Innovation Area. The Program was initiated by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and Japan Science and Technology Agency (JST). The Program has several objectives. First and foremost, is the objective of the East Asia Science and Innovation Area which is to

jointly develop and conduct research in ground breaking scientific research and technology to address issues common to east Asian nations, contributing to social and economic prosperity of the area. The Program will bring Asia Science and Technology Community together and promote the performances of industrial activities within the region.

e-Asia JRP will present loose and flexible collaborative opportunities in science and technology. Its sole goal is to promote science and technology community in the East Asia and is unrelated to any form of political and social integration. The Program takes advantage of and promotes diversity in the East Asia region in the history, people and culture for such diversity is a source of creativity. Diversity along with abundance of high quality human resources should generate "novel knowledge", "competitive technology" and "system reform", all essential sources of a dynamic economy and society.

Specifically, the e-Asia JRP consists of multilateral (three or more) joint research projects among research funding agencies from the 18 East Asia Summit nations, i.e., the ten ASEAN plus Japan, China, Korea, U.S.A., Russia, Australia, New Zealand, and India Participating funding agencies can be public or private as long as funding is competitive.

Once agreement is reached by three or more nations, research areas, such as nanotechnology, -material sciences life sciences, green technology will be determined. There are several forms on joint funding, such as matching funds or on-top funding. See Table 1 for joint funding schemes under consideration. Thus in addition to cooperation among researchers, there will be cooperation among funding agencies, including informational exchanges regarding "best practices".

e-Asia JRP was discussed at the First East Asia Research Forum in held in Singapore in July 2011. There were 22 participants representing 15 agencies from ten countries other than Japan. Both science and technology government ministries and funding agencies participated, as well as the ASEAN secretariat. All aspects pertaining to establishing the Program was discussed.

The following details have been agreed at the Second Forum in October 2011 held at

MEXT in Tokyo. There were 30 participants representing 22 agencies from 13 countries other than Japan. Specific contents of the Memorandum of Understanding and Letter of Intent were discussed. View were exchanged as "Science Talk" over possible topics of research cooperation from selected fields (biomass energy, nanotech-materials plant science, disaster prevention, and infectious diseases) and intentions of participating nations. Letter of Intent template was proposed by Japan at end of October. Interested nations have been invited to submit the letter to JST by end of December 2011.

e-Asia JRP has gained support of various East Asian collaboration bodies. There was explicit support for the Japanese initiative e-Asia JRP within the East Asia Science and Innovation Area concept in Chairman's summary at the end of the 6th East Asia Summit (Indonesia, 19 November 2011). JST bureau chief Nakanishi gave a progress report regarding e-Asia JRP at the "ASEAN COST plus 3" meeting in Korea, 6 December 2011. JST is schedule to visit nations that it envisions participation (Vietnam, Thailand, Indonesia, etc.) to verify their intent, budget and preference for areas of cooperation.

JST will be moving to establish e-Asia JRP with those nations that have submitted the Letter of Intent. Board will be organized by those countries that have signed the basic Memorandum. The Board will discuss the detailed structure of the e-ASIA JRP framework, such as the process for determining cooperative research fields and areas, formation of review panel, and treatment of intellectual property rights. The discussion will be summarized as a Terms of Reference.

4. Small Business Innovation Research

The Japanese Small Business Innovation Research (SBIR)[4] scheme was inspired by the successful scheme in the US to assist firms or individuals start new business ventures. SBIR was incorporated into the Act for the Promotion of the Creation of New Businesses (Shin Jigyou Soushutsu Sokushin Hou) 1998 and the program was initiated February 1999.

Every year, Medium and Small Business Agency will determine the government funding (subsidies, trusts) schemes suitable for starting venture business based on

[4] The Japanese name is "Medium and Small Business Technology Innovation System" but is equal to SBIR..

R&D activity. A proportion of such funding will be set aside as SBIR funding. SBIR currently covers funding from seven government agencies, Ministry of Internal Affairs and Communications, Ministry of Education, Culture, Sports, Science and Technology, Ministry of Health, Labor and Welfare, Ministry of Agriculture, Forestry and Fisheries, Ministry of Economy, Trade and Industry, Ministry of Land, Infrastructure, Transportation and Tourism, Ministry of Environment. Firms and individuals that obtain SBIR funding will be eligible for the following special measures when the new technology is commercialized.

(1) Obtain low interest loans from Japan Finance Corporation (Nihon Seisaku Kin-yuu Kouko). Japan Finance Corporation offers several different programs from which SBIR firms can obtains loans from on of two categories. First category has loans for fostering new firms and consists of (1)new enterprises assistance fund, (2) Women, young people, and senior startup up assistance fund, and (3) new activity promotion fund. While (1) new enterprises fund is to start a completely new firm, (3) is for existing firms that start a new business, either as part of branching out or changing focus. The second category is "food fund" for food related enterprises and for individuals/firms that retail or produce and retail of food and flowers. Please see Table 2 for summary of eligibility, size and terms of the loan.

(2) Greater opportunity to participate in government procurement auctions. Firms receiving SBIR funding will only need to show technology capability in order to participate in government procurement auctions. This is independent of prior eligibility ranking or delivery record.oer performance, which are usually relevant for participation.

(3) Publicize R&D successes and venture business at the "SBIR Special Site"[5] website. The "SBIR Special Site" is a link from J-Net 21, a website for promotion of Medium and Small Businesses. In addition to the description of the scheme and instructions on how to apply, there are case examples of individual business and projects that utilized the scheme.

(4) Patent fees waived. For those patents applied within 2 years after SBIR funded R&D is completed, examination request fee and maintenance fees for 1st to 3rd years are half the usual fees

(5) Qualifies for special Provisions of the Small and Medium-sized Enterprise Credit Insurance Act (Chuusho Kigyou Shinyou Hoken Hou). Insurance limits will be extended from 200 mil yen to 300 mil yen for individuals and firms, from 400 mil yen to 600 mil yen for associations. Insurance limit for loans without collateral will be extended from 50 mil yen to 70 mil yen and third party guarantor is

[5] http://j-net21.smrj.go.jp/expand/sbir/

unnecessary for up to 20 mil yen. There is additional insurance according to Act on Special Measures for Industrial Revitalization.

(6) Qualifies for special provisions of the Small and Medium Business Investment & Consultation Corporation Act (Chushou Kigyou Toushi Ikusei Kabuseikikaisha Hou.) Even firms with capitalization more than 300 mil yen will be able to get investments in order to incorporate, and for additional activities for those that are already incorporated.

(7) Qualifies for Special Provisions of the Act on Equipment Installation Support for Small Enterprises (Shou-kibo Jigyousha Setsubi Dounyuu Sikin Josei Hou). A firm may borrow up to 2/3 of the total equipment installation cost, rather than the usual 1/2.

Here are examples of firms using SBIR from the adapted from the SBIR Special Site.

Kawamura Sangyo Kabushikigaisha[6] used the SBIR scheme to undertake project to develop production technology for H-type insulation material for next generation hybrid vehicles. The firm obtained funding from "Assistance of Production of Innovations" which is part of SBIR scheme. The firm was then able to get a low interest loan from Japan Finance Corporation which enabled it to expand production scale.

Kawamaura Sangyo has been fabricating insulation material for motors and transformers since it was founded in 1967. The firm has been an innovative leader in this field and is now focusing on insulations for motors of hybrid vehicles (HV), electric vehicles (EV), railroad carriages and industrial machineries. SBIR enable the firm to develop, produce and start sale of "Namil", a innovative new high performance insulation for motors. Traditional motor insulations typically made from layers of aramid paper and PEN film is 0.26 mm thick and can withstand temperatures up to 155C degrees. The new product "Namil" uses PPS as insulation material covered by aramid paper. As result, total thickness is 0.2mm and it can withstand heat up to 180C degrees. The 23% reduction in thickness allows it to release heat more efficiently and is also lighter. These properties make Namil ideal for EV and HV which require small and efficient parts. The company was able to bond PPS and arid sheet together, a feat previously considered not possible, by employing plasma equipment and rolling press.

The company got a 90 million yen subsidy from the SBIR FY 2008 Innovation Adoption Subsidy scheme of New Energy and Industrial Technology Development Organization (NEDO) to develop the new insulation. The money was used for introduction of plasma

[6] http://www.kawamura-s.co.jp/

surface treatment equipment, wages and cost of materials.

After the successful development of the product, it was necessary to implement large scale production. The company took advantage of the SBIR scheme and obtained a loan of 300 million yen from Japan Financing Corporation under its New Enterprise Assistance Fund scheme. The term of the loan was for two years at rate of 0.3% (the rate after Special Provisions of the Act on Equipment Installation Support). 250 million yen from the loan covered the cost of a custom made laminator for fusing PPS and aramid sheet together. The remaining 50 million yen was use d to convert the factory into a "clean room" environment. The favorable rate of the loan, not available from a bank, allows the firm to persevere the first few years of low revenue immediately after the introduction of new product, until new demand is materializes. The company is in the process of building up new demand at home and abroad.

NanoDex [7] is a bio-venture started by Dr.Kanjiro Hattori. He commercialized his research after he retired from Department of Engineering at Tokyo Polytechnic University. While working with cyclodextrin, he found that folate cluster-type cyclodextrin ND1 accumulates in epithelial cancers while holding anticancer agents in its cavity. It is able to seek and accumulate particularly in digestive system cancer, epithelial lung cancer and ovarian cancer that over express folate receptors. This phenomenon can be used to diagnoses cancer, as a tumor marker and for cancer treatment.

He formed NanoDex in 2008 to develop and commercialize the technology. Starting from April 2009, the company has conducted joint research with Pharmaceutical Department of Kumamoto University, Bioresource Science Department of Nippon University, Pharmaceutical Department of Nagoya City University, Yakult and others. It had sales of 8 mil yen from four core businesses cancer diagnosis from tumor markers, image markers for cancer diagnosis, anticancer drug, and cancer gene therapy.

Although the firm has only three employs, being a bio-venture, R&D cost is over 10 mil yen. The company seeks public funding to supports its research. In 2009, it successfully applied for Kanagawa Industrial Technology Center's "Product Development Assistance for Early Stage Business". This enabled the firm to secure a

[7] http://www.nanodex.jp/ http://www.nanodex.jp/english/

R&D Lab in the Center with very low rent. The same year, it successfully applied for 20 mil yen subsidy from NEDO's Industrial Technology Commercialization Development Assistance. Half of it was used to purchase three new machines.

In order to secure sufficient funding to continue the research, it turned to Japan Finance Corporation. First it obtained a 10 mil yen loan, and further 6 mil yen loan from Challenge Assistance Finance Scheme (Chosen Shien Yu-ushi Seido) which had been newly established in February 2009. The company was the first in Kanagawa Prefecture to secure this new loan. It is a subordinate loan that is paid back after seven years. Term of the loan is particularly important since it takes at least three years to evaluate the product after it has been introduced to the market.

Daiwa Locks[8] is manufacturer of locks established in 1971. It developed a system of lock and keys (FA key and US key) called "FAUS key system" for high security products such as ATM machines and vending machines. With high security machines, the manufacturer of the machine is only given the lock so that only the final owner of the machine has the keys. This means lock cannot be tested at the factory and an automatic lock accidently locked causes a big problem. With FAUS key system, the FA key is used at the factory for testing and resolving accidental locking. The final owner is given the US key which has a bit at the tip that remains in the lock after the US key is used. The bit in the lock makes the FA key useless. The key-way has been patented.

The key system had been developed but the firm however lacked the funds to commercialize. The firm learned about SBIR from a Small and Medium Enterprise Management Consultant (government qualification). It applied for "Monozukuri Medium and Small Businsess Product Development Assistance Project (Prototype Development Assistance) as part of SBIR scheme in August 2009 and was approved in November of that year and received subsidy of 45 mil yen.

It used the subsidy to get sample material and machine tools. It developed an original multifunctional machine tool that is able to fabricate lock, key and the bit at the end of US key all in one machine. It also developed a code generating software program using original numerical control system. These innovations lead to the FAUS key system prototype the March 2010.

[8] http://www.daiwalocks.co.jp/index.html

Then the firm obtained a loan of about 40 mil yen from Japan Finance Corporation at very favorable rates, taking advantage of the SBIR scheme. It built a new factory dedicated to FAUS key system production. The factory houses several original multifunctional machine tools. The details of the machine tools are trade secrets, Production began in June 2010.

The firm was able to sell the FAUS key without marketing due to the originality of the product and firm's reputation for its expertise. However, sales have come to a standstill after the Lehman financial crisis. The firm plans to apply for SBIR subsidies to finance a marketing effort of participating in fairs and printing and distributing informational material.

5. Reference

Council for Science and Technology Policy, "Japan's Science and Technology Basic Policy Report," December 24, 2010.

Japanese Cabinet, "Fourth Basic Science and Technology Plan," August 13, 2011. (in Japanese)

Ministry of Education, Culture, Sports, Science and Technology; Japan Science and Technology Agency. "Discussion Points for the e-Asia Joint Research FORUM," October 2011

Medium and Small Business Agency "FAQ About SBIR" (in Japanese)
http://www.chusho.meti.go.jp/faq/faq/faq07_sbir.htm

Table 1:Resarch Funding Schemes for Consideration (First Forum, July 2011)

Scheme	Explanation
Joint Research by Matching Fund	50,000USD/year per research team (with one Principal Investigator (PI)) from own country Research funds will not basically cross borders. In case researchers gather at core research institute in other countries, research funds may be commissioned to the core institute.
Research Exchange by On-top Fund with existing projects at the core	10,000-25,000USD/year per research team from own country in hope for research exchange.
Support for Building Up Partnerships	10,000-15,000USD per PI from own country in hope for building up collaboration with partner candidates.
Symposium Regarding Best Practices	In case of hosting a symposium, 10,000-20,000USD per symposium
Promotion of Research Exchange Among Young Researchers	In case of preparing special expenses for young researchers, 5,000USD per person.
Contribution to secretariat functions (image)	In case of voluntary in-kind contribution for activities of secretariat members (office rental, office operation cost, expenses for travel and stay, etc, but excluding personnel), 50,000USD/year per person. In case of hosting meetings as activities of secretariat (Board Meeting, Advisory Council, Peer-review Panel, etc), 20,000USD per meeting.

Table 2: Loans offered by Japan Financial Corporation

Fund	New Enterprise Promotion Fund	Women, Young People, Seniors Start-up Assistance Fund	New Activity Promotion Fund	Foodstuff Fund
Use	Facitliy building or operating expense for new enterprises	Facility building, long operating expense, short term operating expense	For branching out or changing business	
Eligibility	Individuals/firms starting enterprise with high growth potential satisfying following all 3 conditions (1) Within 7 years since starting enterprise (2) has been deemed by JFC's committee enterprise is novel and has growth potential or satisfies other conditions such as, has IP not practiced by anyone, receives SBIR funding (3) will be able to function smoothly with guidance from JFC	Women, young people (30 years or younger), seniors (55 years and older)	Individual or firm planning to branch out or change business	Individuals and firms engaged in retail or produciton&retail of food or flowers.
Maximum loan	600 thousand yen	S&M Business:Direct loan 720 mil yen (of which operational expense up to 250 mil yen) ; Proxy loan 120 mil yen; Seikatsu: 720	72 mil yen (of that operational expense up to 48 mil yen)	

(Continues on next page)

Table 2 (continued): Loans offered by Japan Financial Corporation

Fund	New Enterprise Promotion Fund	Women, Young People, Seniors Start-up Assistance Fund	New Activity Promotion Fund	Foodstuff Fund
Interest	Special rate 3 up to 5years, basic +0.2% thereafter; for bonds and equity basic interest. May be adjusted according to credit risk and length	S&M Business:Facility investment up to 270 mil yen Special Interest Rate 1; If technology/know how is novel and sales guarateed, then Special Interest Rate 3; ove (of which operational expense up to 250 mil yen) ; Proxy loan 120 mil yen; Seikatsu: Over 270 mil yen stand- ard Rate. May be adjusted according to credit risk and length. Seikatsu: Special Interest RateA, If technology/know how is novel and sales guarateed, then Special Interest Rate C.	Facility Standard Rate, If technology/know how is novel and sales guarateed, then Special Interest Rate b; Operational expense Standard Ragte	Standard rate, Special rate A, Special rate b, Special rate C, If technology/know how is novel and sales guaran- teed, then Special Interest Rate C.
Length	Up to 15 years for facility; up to 7 years for operating expense; Up to 7 years for bonds and equity	S&M Business: Facility up to 15 years, Operational Expense up to 7 years. Seikatsu: Facility up to 15 years, Opera- tional Expense up to 5 years.	Facility up to 15 years (20 years in special case); Operational expense up to 5 years (7 years in special case)	Up to 13 years for facility building

Source: MEXT and JST, Discussion Points for the e-Asia Joint Research FORUM, October 2011