How challenges drive innovation

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EU-Japan Centre for Industrial Cooperation
1. Comprehensive Strategy on Science, Technology and Innovation in Japan

2. How does Japanese Government support SMEs innovation?
   (1) Regional Cluster (METI, MEXT)
   (2) SME support
## S&T Basic Law and S&T Basic Plans

### Science and Technology Basic Law Basic (1995)

<table>
<thead>
<tr>
<th>S&amp;T Basic Plan</th>
<th>Major Achievements and Epochs</th>
</tr>
</thead>
</table>
| **1st Basic Plan (1996-00)** | • Support plan for 10,000 post-docs  
|                       | • Implementation of evaluation system  
|                       | • R&D expenditure over \$17tri |
|                      | ◆Introduction of R&D evaluation system('97)  
|                      | ◆Actual support of 10,000 post-docs('99)  
|                      | ◆Competitive funding doubled('00)          |
| **2nd Basic Plan (2001-05)** | • R&D Prioritization  
|                       | • Doubling competitive research funds  
|                       | • R&D expenditure over \$24tri |
|                      | ◆Establishment of CSTP ('01)  
|                      | ◆Establishment of the independent administrative institutions ('01)  
|                      | ◆Intellectual Property Basic Act ('03)  
|                      | ◆Establishment of the Intellectual Property Strategy Headquarters ('03)  
|                      | ◆Establishment of National University Corporations ('04)          |
| **3rd Basic Plan (2006-10)** | • R&D Prioritization with area-setting  
|                       | • Key technologies of national importance  
|                       | • R&D expenditure over \$25tri |
|                      | ◆Long-term Strategic Guidelines “Innovation 25” ('07)  
|                      | ◆Basic Act on Ocean Policy ('07)  
|                      | ◆Act on Enhancement of R&D Capacity and Efficient Promotion ('08)  
|                      | ◆Aerospace Basic Act ('08)             |

### Great East Japan Earthquake

Formulation of the 4th S&T Basic Plan (2011-15)

Courtesy of Prof. Yuko Harayama, Council for Science and Technology Policy (CSTP), Japan
The 4th S&T Basic Plan

Main Points

- Comprehensive promotion of S&T and Innovation
- Issue-driven approach instead of discipline-oriented approach
- Emphasis on the promotion of basic research and human resources development
- STI for Society and STI Policy made with Society

Challenge to Realize Sustainable Growth & Societal Development

- Recovery and Revitalization from the Disaster
- Promotion of Green Innovation
- Promotion of Life Innovation

Courtesy of Prof. Yuko Harayama, Council for Science and Technology Policy (CSTP), Japan
Comprehensive STI Strategy (Chap.1)

Basic Concept

- Comprised of long-term vision and immediate action programs
- Comprehensive package of mission-oriented STI policies
- Clarified roles of various players (between industry, academia and government, between government ministries) and policy-mix (including budget, taxation, deregulation)

Shape of the nation to be attained in 2030

- Remaining a world top-class economic power in a sustainable manner
- People enjoying wellness, security and safety
- Contributing actively to the progress of humankind and international community

3 perspectives to promote STI policies

Acting “smart”, Implementing “system” thinking, Thinking “global”
Comprehensive STI Strategy (Chap.2)

Challenges to be addressed by STI

- Five grand policy challenges to tackle toward realizing the aforementioned shape of the nation
- “Focused policy challenges” and “focused measures” therefor described for each of the five grand challenges
- Roadmap tailored for each of the “focused policy challenges” toward FY2030

1. Realization of clean and economical energy system
2. Realization of a healthy and active ageing society as a top-runner in the world
3. Development of next generation infrastructures as a top-runner in the world
4. Regional revitalization taking advantage of the regional resources
5. Early recovery and revitalization from the Great East Japan Earthquake

Courtesy of Prof. Yuko Harayama, Council for Science and Technology Policy (CSTP), Japan
Implementation Phase of the Comprehensive STI Strategy

Action Plan for S&T Priority Measures for FY2014 (1)

Features of AP for FY2014

1. Promoting measures to address challenges by providing concrete roadmaps
   Providing concrete roadmaps and encouraging relevant ministries to propose measures to address challenges. Roadmaps to be further elaborated to include goals with numerical targets and timelines, concrete measures to achieve goals and the interim goals to enable the examination of results in terms of PDCA process.

2. Promoting vigorous packaging bundling of policy measures
   Promoting vigorous packaging of policy measures to achieve efficient and effective results through cooperation between ministries by presenting the viewpoints of achieving social challenges based on experts' views prior to the proposal of policy measures by the relevant ministries.

3. Clarification of management structure
   Soliciting clear management system including not only the progress management of R&D of the program as a whole but also the progress management and coordination toward social implementation.

Topics of AP for FY2014

Five grand policy challenges of Comprehensive STI Strategy Chap.2 set as the priority target.

1. Realization of clean and economical energy system

2. Realization of a healthy and active ageing society as a top-runner in the world

3. Development of next generation infrastructures as a top-runner in the world

4. Regional revitalization taking advantage of the regional resources

5. Early recovery and revitalization from the Great East Japan Earthquake

Courtesy of Prof. Yuko Harayama, Council for Science and Technology Policy (CSTP), Japan
Implementation Phase of the Comprehensive STI Strategy

Action Plan for S&T Priority Measures for FY2014 (2)

- 98 measures for ¥335bn (request base) identified as those in line with policy challenges designated by AP
- Identified measures expected to be given due consideration in the budget formation process

<table>
<thead>
<tr>
<th>Priority policy issues</th>
<th># of identified measures</th>
<th>Amount of budget request (bn yen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Realization of clean and economic energy system</td>
<td>35</td>
<td>128</td>
</tr>
<tr>
<td>2. Realization of a healthy and active ageing society as a top-runner in the world</td>
<td>7</td>
<td>88</td>
</tr>
<tr>
<td>3. Development of next generation infrastructures as a top-runner in the world</td>
<td>15</td>
<td>57</td>
</tr>
<tr>
<td>4. Regional revitalization taking advantage of the regional resources</td>
<td>15</td>
<td>31</td>
</tr>
<tr>
<td>5. Early recovery and revitalization from the Great East Japan Earthquake</td>
<td>26</td>
<td>30</td>
</tr>
<tr>
<td>total</td>
<td>98</td>
<td>*335</td>
</tr>
</tbody>
</table>

*Accounts for approx. 8% of the total amount of the S&T budget request for FY2014

Courtesy of Prof. Yuko Harayama, Council for Science and Technology Policy (CSTP), Japan
(1) Increase of the supply of renewable energies through innovative technologies

**[Vision]**
Society that fully utilizes clean renewable energies

**[Target]**
Resolving technical issues in order to promulgate renewable energies
- Floating offshore wind power stations implemented by around 2018
- Solar power generation costs reduced to < ¥7/kWh after 2030

**[Measures toward social implementation]**
- Establishment of environment, regulation systems related to installation and security of renewable energy systems
- Promotion of international standardization of technical standards, authentication systems, etc., pertaining to strengthening international competitiveness
- Promotion of activities related to ensuring social acceptability

**Interim goals to be achieved at the intermediary stage (around 2020)**
- Successive implementation and diffusion of low-cost renewable energy technology achieved by cost reduction, etc.
- Environmental arrangement to assist diffusion of renewable energy technology
  - Stable operation of FIT, expediting environmental assessment, power grid, etc.

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**[Main measures]**

<table>
<thead>
<tr>
<th>Present</th>
<th>2015</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>&lt;Development of floating offshore wind power generation systems&gt;</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>0. Elemental technology development</td>
<td>0. Elemental technology development</td>
<td>0. Elemental technology development</td>
<td></td>
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<tr>
<td>- Accumulate small- to medium-scale generation technologies</td>
<td>- Develop technologies for cost reduction</td>
<td>- Develop technologies for cost reduction</td>
<td></td>
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<tr>
<td>- Promote scaling-up and weight reduction</td>
<td>- Practical technology development</td>
<td>- Technology development to coordinate with electric power systems</td>
<td></td>
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<tr>
<td>- Improve durability against salt-damage, etc.</td>
<td>- Practical technology development of operation methods</td>
<td>- Taking the initiative in international standard formulation, ensuring international competitiveness</td>
<td></td>
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<tr>
<td>- Inspect structural designs</td>
<td>- Taking the initiative in international standard formulation, ensuring international competitiveness</td>
<td></td>
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<tr>
<td>- Develop floating system construction technologies</td>
<td></td>
<td></td>
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<tr>
<td>- Develop generation control technologies</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>0. Elemental technology development of operation methods</td>
<td>0. Elemental technology development of operation methods</td>
<td></td>
<td></td>
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<tr>
<td>- Consider techniques of environmental impact assessment, etc.</td>
<td>- Develop technologies for cost reduction</td>
<td></td>
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<tr>
<td>- Develop monitor/access/maintenance technologies</td>
<td>- Practical technology development of operation methods</td>
<td></td>
<td></td>
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<tr>
<td>0. Environmental arrangement</td>
<td>0. Environmental arrangement</td>
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<tr>
<td>- Continue demonstration, expanding fields</td>
<td>- Taking the initiative in international standard formulation, ensuring international competitiveness</td>
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## Main measures

<table>
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<th>2015</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>&lt;Development of solar power generation systems&gt;</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>□ Elemental technology development</td>
<td>□ Elemental technology development (achieve ¥14/kWh)</td>
<td>□ Elemental technology development (achieve ¥7/kWh)</td>
<td></td>
</tr>
<tr>
<td>- Drastically improve efficiency and cost-effectiveness of existing solar power generation (e.g., Si systems, CIS systems)</td>
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<td>- Drastically improve efficiency and cost-effectiveness of existing solar power generation (e.g., Si systems, CIS systems)</td>
<td></td>
</tr>
<tr>
<td>- Develop next-generation solar power generation (e.g., organic systems, quantum dot, nanowire systems)</td>
<td>- Develop and implement next-generation solar power generation (e.g., organic systems, quantum dot, nanowire systems)</td>
<td>- Develop and implement next-generation solar power generation (e.g., organic systems, quantum dot, nanowire systems)</td>
<td></td>
</tr>
<tr>
<td>□ Taking the initiative in international standard formulation, ensuring international competitiveness</td>
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<td>□ Taking the initiative in international standard formulation, ensuring international competitiveness</td>
<td></td>
</tr>
</tbody>
</table>

| **<Other renewable energy systems (e.g., geothermal, wave-power, ocean thermal conversion)>** | | | |
| □ Elemental technology development | □ Elemental technology development | □ Elemental technology development |
| □ Practical technology development | □ Practical technology development | □ Practical technology development |
| □ Technology development of operation methods | □ Technology development of operation methods | □ Technology development of operation methods |
| □ Environmental arrangement | □ Environmental arrangement | □ Environmental arrangement |
| □ Taking the initiative in international standard formulation, ensuring international competitiveness | □ Taking initiative in international standard formulation, ensuring international competitiveness | □ Taking initiative in international standard formulation, ensuring international competitiveness |
| □ Environmental arrangement | | |

### Related indicators
- Implementation of world’s first floating offshore wind power generation (by around 2018)
- Cost reduction of solar power generation systems (< ¥7/kWh after 2030)
Implementation Phase of the Comprehensive STI Strategy

**ImPACT**
(Impulsing PAradigm Change through disruptive TTechnologies)

**Background**
- Need to realize discontinuous innovations to overcome keen global competition
- Need to conquer serious socio-economical issues confronting Japan

**Establishment of ImPACT program**
- High-risk/high-impact R&D toward creation of innovative STI which possibly revolutionizes industrial and social system modeled on DARPA
- Establishing program manager (PM) system and combining PMs’ planning/managing abilities with nation’s top class R&D potential.

Total amount TBD (budget request for FY2014)

Courtesy of Prof. Yuko Harayama, Council for Science and Technology Policy (CSTP), Japan
METI’s Industrial Cluster Project

METI has been promoting the Industrial Cluster Project since FY2001, which aims to form industrial clusters for bringing about a stream of innovation and venture companies in regions. Presently, 10 projects nationwide, with the joint cooperation of regional Bureaus of Economy, Trade, and Industry and promotion organizations of the private sector, are building close cooperative relations with about 10,200 regional SMEs taking on the challenge of new businesses and researchers etc. and more than 560 universities in total (including industrial colleges).

While forming industry-university-government networks, promoting the formation of industrial clusters that develop one after another new businesses that will be viable throughout the world, through comprehensively and effectively introducing various kinds of support measures. Also, functionally supporting the strengthening of organizational power, by providing in a timely manner information necessary for the dynamic operation of the networks.

METI has allocated 15.6 billion yen as the budget related to these activities in FY2009.

Regional expansion of 18 Industrial Cluster Projects nationwide (FY2009)
Knowledge Cluster Initiative

Map of Knowledge Clusters

Knowledge Cluster Initiative (2nd Stage)

1. Purpose

Following the results obtained during the Knowledge Cluster Initiative (1st stage), MEXT strongly supports the establishment of world-class clusters while focusing on a "Synergy and Concentration" approach.

2. Budgetary Measures

On 100B yen/year, 7.5 billion yen

Detailed budget allocations to regions according to their R&D field and their degree of progress, over the years.

Clusters concentrating on core competencies (e.g., science and technology foundations) designated by local governments.

- Tyuyama/Gifu

- University of Osaka, Toyo University, Osaka Prefectural University,

- Kansai National University, Osaka University, Kansai Institute of Technology,

- Osaka Prefectural University of Pharmaceutical Science, Osaka Institute of Technology, etc.

- Nara and Kii

- Kansai University, Kwansei Gakuin University,

- Osaka Prefectural University, Osaka City University, Kansai University, Kansai Institute of Technology,

- Kansai National University, Osaka Institute of Technology, Kansai Institute of Technology, etc.

- Yamanashi

- Kansai Keio University, National Institute of Technology, etc.

- Fukuoka

- Kyushu University, Kyushu Institute of Technology, etc.

- Hiroshima

- University of Hiroshima, Hiroshima City University, etc.

- Shiga

- University of Shiga Prefecture, Kochi National College of Technology, etc.

- Takamatsu

- University of the Arts, Kochi National College of Technology, etc.

- Nagoya

- Nagoya University, Nagoya Institute of Technology, etc.

- Hamamatsu

- Hamamatsu University, Kochi National College of Technology, etc.

Knowledge Cluster Initiative (Innovative Stage)

Purpose

The purpose of this program is to promote the development of internationally competitive clusters in regions whose industry, academia, and government have collaborated in order to enhance the competitiveness of regional industry and to create new industries. To accomplish this, MEXT promotes global cooperation among these clusters by taking full advantage of strong and distinctive host potential and core technologies, while encouraging each region's independence.

Budgetary Measures

- Post-Budget: 1.2 Trillion yen

- Detailed budget allocations to regions according to their R&D field and their degree of progress.

- 100B yen/year, over the years

- To enhance regional independence further, each region is mobilized for activities equivalent to more than half of the national expenses allocated for cluster formation.

- 9 clusters (2nd Stage)

- 4 clusters (Innovative Stage)

- Core Research Organization
Organization for Small & Medium Enterprises and Regional Innovation, Japan (SME Support, Japan)

Support for start-ups/new business development

We provide various support measures including consultation at advice counters and dispatching experts, in order to resolve problems related to start-ups and new business development.
- Supporting your challenges

Support for SME growth/development

We provide support towards business enhancement, such as responding to the advanced management issues of SMEs, in collaboration with local SME support organizations.
- Supporting progress

Support SMEs with safety nets

We provide “security” through a small-scale enterprise mutual aid system and business safety mutual relief system to those who wish to be prepared for future what-ifs.
- Supporting your security

Support infrastructure

We offer support in terms of infrastructure to those who wish to improve facilities, or who are looking for new sites/space for business.
- Supporting development
Functions to Receive and Transmit Information inside and outside Japan

Promote business negotiations towards direct transactions starting from finding candidate business partners, through enabling receipt of buyers' information such as overseas local enterprises and large manufacturers (limited to SMEs published on the Web) as well as transmitting information of Japanese superior SMEs extensively inside and outside Japan.

- Overseas enterprises, overseas institutions, domestic large enterprises, local governments, etc.

- General window (SME Support, JAPAN)

- Corresponds to English and Asian multi-languages.
- Possible to search by free words and by field, product, technology, country in which an enterprise is planning to start business, etc.
- Maintains data quality by updating registered enterprises every year.
The Collaboration of SME Between UAE and Japan
Improvement of the marketability of Emirate home-based incense artisans
SMEs meet retired businessmen to find an appropriate advisor
SMEs

Needs
- Technical advice
- Globalization
- Improvement of manufacturing method
- Market expansion

Match-making meeting

SMEs credit associations
(Total 271 in Japan)

Needs
- to Strengthen SMEs

Retired businessmen
(55~75 years old)

Needs
- Working opportunity

Database: 3000 retired businessmen
(1) SMEs credit association select SMEs which need advice
(2) SME advisors identify a precise necessity of SME
(3) About 20 SMEs list will be sent to retired businessmen
(4) Retired businessmen will select SME for giving advice
(5) Finally a match-making meeting will be held