



## Creating Technological Innovation through Cross-ministerial, Industry-academia-government Cooperation, Contributing to a Japanese Economic Recovery through Society 5.0

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World-leading scientific and technological innovation is vital for our nation to achieve economic recovery and growth. The Cross-ministerial Strategic Innovation Promotion Program (SIP) was launched in 2014 by the Council for Science, Technology and Innovation (CSTI), and currently promotes 11 research programs focused on critical issues which our nation must overcome by any means possible.

The number one feature of SIP is that it promotes strong cross-ministerial, industry-academia-government cooperation to fast-track each program from basic research to practical application. Through the endeavors of each program's Program Director (PD) and all the members supporting the PD, many programs have already begun producing research and development (R&D) results.

Why has the SIP achieved success? There are multiple reasons in addition to the cross-ministerial, industry-academia-government cooperation.

The first of these is the strong leadership demonstrated by the PDs. Hailing from both industry and academia, Japan's top-class business managers and researchers participate in each program as either PDs or Sub-PDs. Leaders from industry take charge of exit strategies. Leaders from academia assume responsibility for delving deeper into technology. By clearly defining their respective roles, the programs have produced a great deal of outputs and outcomes.

Another factor underpinning the success of SIP has been the rigorous evaluations carried out on all programs at the end of each fiscal year. Thus far, each program has been evaluated three times on its progress, with outside assessors who specialize in respective areas of the 11 programs also weighing in.

The main point of the evaluations is to focus on practical applications and commercialization as R&D outcomes. For example, a research program granted an annual budget of ¥3 billion will have been invested a total of ¥15 billion over the course of five years. To recover profits over a 10-year span, the program must generate a business of ¥300 billion, an average of ¥30 billion per year, at an assumed profit margin of five percent. Such a recoupment plan for R&D investments through the creation of new markets is also taken into account in evaluations. While some performance reports have stated that programs have developed a new generation of professionals or established foundation technologies, these should be expected from the beginning. The key measure is whether programs result in the creation of new businesses and/or strengthen our nation's industrial competitiveness.

In 2016, the Fifth Science and Technology Basic Plan was launched, mapping our nation's science and technology policy for the next five years.

The most important issue of the Basic Plan is to realize Society 5.0.

Society 5.0 refers to a human-oriented society, where notably advanced information and communications technology (ICT) is utilized

to create both economic development and solutions to social issues. Realizing such a society requires creating new value in industry and society by means of a cyber-physical system in which the cyberspace and the physical space (real world) are highly merged using ICT.

It is also necessary to thoroughly strengthen both fundamental technologies in cyberspace (such as artificial intelligence, Big Data, cyber-security and networks) and fundamental technologies in physical space (such as sensors, actuators, power-saving devices and robotics), as well as to build a Society 5.0 platform by developing databases supporting each system.

For the purpose of strengthening these fundamental technologies, building a cyber-physical system and building a Society 5.0 platform, SIP continues to properly modify each research program, including by adding new development activities. It would not be an exaggeration to say that SIP has created a role model of Society 5.0.

In the year 2020, the Olympic and Paralympic Games come to Tokyo. Previously, Japan took the opportunity of the 1964 Tokyo Olympics to develop and roll out the famous Shinkansen bullet trains and introduce the Olympics to the world via live satellite broadcast. In order to showcase to the world Japan's impressive innovations in science and technology again in 2020, we are promoting nine initiatives, including smart hospitality and next-generation urban transportation systems. Including in coordination with these initiatives, we remain fully committed to creating scientific and technological innovation through each of the SIP programs.

### Profile

Dr. Kazuo Kyuma received his Ph.D. in electronics engineering from the Tokyo Institute of Technology in 1977. That same year, he joined the Central Research Laboratory of Mitsubishi Electric Corporation. In 1998, Dr. Kyuma was named artificial retina LSI business project manager in the Semiconductor & Device Business Group. After that, Dr. Kyuma was promoted to other posts, including general manager of the Advanced Technology R&D Center (2003), executive officer (Corporate R&D 2006), senior vice president (Semiconductors & Devices 2010), executive vice president (2011), and senior corporate advisor (2012). Dr. Kyuma was named to serve full time on the Council for Science and Technology Policy (CSTP) in 2013, and on the CSTI when it was reorganized from the CSTP in 2014.

## Members of the SIP Governing Board

### [Governing Board Chair]



### Kazuo Kyuma

Executive Member, Council for Science, Technology and Innovation, Cabinet Office

### [Members]



### Takahiro Ueyama

Executive Member, Council for Science, Technology and Innovation, Cabinet Office



### Yuko Harayama

Executive Member, Council for Science, Technology and Innovation, Cabinet Office



### Takeshi Uchiyamada

Chairman of the Board, Toyota Motor Corporation  
Executive Member, Council for Science, Technology and Innovation, Cabinet Office



### Motoko Kotani

Director, Advanced Institute for Materials Research (AIMR), Tohoku University  
Professor, Mathematical Institute, Graduate School of Science, Tohoku University  
Executive Member, Council for Science, Technology and Innovation, Cabinet Office



### Masakazu Tokura

Representative Director & President, Sumitomo Chemical Co., Ltd.  
Vice Chairman, Keidanren (Japan Business Federation)  
Executive Member, Council for Science, Technology and Innovation, Cabinet Office



### Kazuhito Hashimoto

President, National Institute for Materials Science  
Executive Member, Council for Science, Technology and Innovation, Cabinet Office



### Takashi Onishi

President, Science Council of Japan  
President, Toyohashi University of Technology  
Executive Member, Council for Science, Technology and Innovation, Cabinet Office

## SIP Progress

### 2013

<b>August</b>	Request for budgetary appropriation (Science, Technology and Innovation promotion expenditures*1) from Cabinet Office budget reserve
<b>September</b>	Council for Science, Technology and Innovation selects 10 individual program candidates based on national/economic needs Establishment of Governing Board (comprised of the executive members of Council for Science, Technology and Innovation) to provide advice/assessments
<b>October</b>	Cabinet Office calls for Policy Advisors*2 for selected issues
<b>December</b>	Policy Advisors selected Participants take the lead in drawing up research and development plans

### 2014

<b>February</b>	Public workshops
<b>March</b>	Pre-assessments
<b>April</b>	Public comment period for research and development plans
<b>May</b>	Council for Science, Technology and Innovation decides issues, program directors (PD), budget allocation
<b>June</b>	Ten program directors named, budget fund transferred to ministries, call for R&D institution participants
<b>July</b>	Deadline for participants, selection process begins (documentation, interviews)
<b>August</b>	Final determination of issues, R&D institutes; build R&D structure
<b>October</b>	Official launch of R&D activities
<b>December</b>	SIP Symposium 2014

### 2015

<b>March</b>	2014 year-end evaluations
<b>April</b>	2015 initial budget allocation decided
<b>June</b>	Council for Science, Technology and Innovation approves Cyber-security for Critical Infrastructure as a new research program candidate Call for Policy Advisor (program director candidate) for new research program candidate
<b>August</b>	Policy Advisor selected
<b>October</b>	SIP Symposium 2015
<b>November</b>	Council for Science, Technology and Innovation approves Cyber-security for Critical Infrastructure as a new research program

### 2016

<b>January</b>	2015 year-end evaluations
<b>March</b>	2016 initial budget allocation decided
<b>October</b>	SIP Symposium 2016

### 2017

<b>January</b>	2016 year-end evaluations, interim evaluation of SIP management system
<b>March</b>	2017 initial budget allocation decided
<b>September</b>	SIP Symposium 2017

\*1 A total of ¥50 billion set aside in fiscal 2014 budget appropriation bill (35 percent (¥17.5 billion) allocated to medical field R&D as budget reserve funds)

\*2 Part-time Cabinet Office staff. Program directors, after start of program