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Inventory of STI Programmes and Analysis of the EU-Japan Cooperation version 1

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EXECUTIVE SUMMARY

As the first deliverable of Work Package 2 – Support to Policy Dialogues - the specific aim of this document is to give a preliminary status report on the on-going STI programmes between the European Union and Japan, and to analyse the nature and intensity of cooperation based on the data of previous works and new surveys.

The analysis will touch upon international research collaboration programmes (bilateral and multilateral programmes alike), international mobility of R&D personnel, and instruments that aim at making R&D activities more attractive, among others excellent university titles, and different support programmes for Japanese researchers.

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1. Status and background of the present document

The present document was created within the frames of the JEUISTE-Japan-EU Partnership in Innovation, Science and Technology Project. This BILAT project aims at further enhancing the level of Europe-Japan cooperation with richer activities, including contribution to the EU-Japan STI policy dialogues, implementation of bilateral information services, active network building through academic/innovation workshops, operation of help desk and organization of training courses.

As the first deliverable of Work Package 2 – Support to Policy Dialogues - the specific aim of this document is to give a preliminary status report on the on-going STI programmes between the European Union and Japan, and to analyse the nature and intensity of cooperation based on the data of previous works and new surveys.

To give an overview of Science Technology and Innovation cooperation between Europe and Japan, this paper will first analyse the current policy framework of the collaboration, then will move on to the discussion of the different aspect of international cooperation. Special emphasis will be laid upon the characteristics of **international research collaboration programmes (bilateral and multilateral programmes alike)**.

Although being an integral part of research collaboration programmes, a separate chapter will be dedicated to the **international mobility of R&D personnel**, as the number of researchers participating in mobility schemes is a strong indicator in itself of R&D cooperation.

In the last part the **instruments that aim at making R&D activities more attractive will be listed**, among excellent university titles among others. Although an obvious indicator to the cooperation in the field of R&D, Japanese participation in European Framework Programmes for Research and Technological Development will not be element of this deliverable (as this analysis will be submitted separately in deliverable D2.2 *Analysis of the EU-Japan Cooperation in FP7/Horizon 2020 and Recommendation*).

The analysis in the case of R&D collaboration programmes and in the case of instruments aiming at making R&D more attractive, will be carried out from a Japanese point of view, on the one hand because JEUISTE as a BILAT programme focussing on EU-Japan policy dialogue should focus on the interaction of Japan and the EU as a unified entity, on the other hand because an overview from all the different perspectives of more EU member states would definitely exceed the frames of the present document.

Being the first version of the inventory and analysis, this document is by no means a conclusive report, but it intends to establish a solid foundation for further research

during the project life cycle. The update of this deliverable is scheduled to month 30 of the project.

2. Working method and sources for compiling the STI inventory

With respect to the limited timeframe for the creation of this deliverable, no extensive survey was carried out among relevant programme owners, this study is pure desk research completed with the help of earlier surveys, programme brochures, and relevant FP7 project deliverables.

The JEUPISTE Project, being not the first programme with the aim of building EU-JPN partnerships and improving policy dialogue, has the opportunity to build upon the results of previous surveys that targeted specifically the cooperation between the EU and Japan. The CONCERT-Japan ERA-NET project before setting up its joint coordinated calls, created a set of deliverables that analysed the different aspects of EU-JPN STI cooperation. The present analysis utilized the following documents to a great extent:

- D1.1 – Inventory of Japanese International STI Cooperation Programme Owners and Managers¹
- D.1.3 – Database of STI Cooperation Programmes between European Countries and Japan²
- D1.4 – Recommendatory Report on the Results of the Mapping of STI Cooperation Programmes³

To collect additional information on international collaboration projects extensive web research was carried out targeting the major STI programme owners related to with international cooperation, namely:

- Ministry for Education, Culture, Sports, Science and Technology (MEXT)
- Japan Society for the Promotion of Science (JSPS)
- Japan Science and Technology Agency (JST)
- New Energy and Industrial Technology Development Organization (NEDO)

Yearly brochures of the respective programme owners supported greatly the collection of data.

¹ available at:

http://www.concertjapan.eu/system/files/CJ_D1%201_Inventory%20Jap%20Program%20Owners_PU_2011-07-13.pdf

² Searchable online at: <http://www.concertjapan.eu/programs>

³ available at:

http://www.concertjapan.eu/system/files/CJ_D1.4_RecommendatoryReport_ResultsofMappingofSTICooperation.pdf

Information related to research personnel mobility is exclusively based on the yearly reports of JSPS⁴ that provide data on both ways of mobility (Japanese researchers visiting foreign countries and foreign researchers visiting Japan).

As for the analysis of instruments for improving the attractiveness of R&D and promoting scientific excellence, the website, and brochures of Japanese programme owners were consulted.

3. Overview of EU-Japan STI cooperation framework

The past two decades experienced a dynamic upswing of cooperation between the European Union and Japan in the field of R&D. The improvement of cooperation may be due to the interplay of various factors, but it cannot be argued that an ever evolving policy framework was supporting the collaboration to a great extent. The annual EU-Japan summit is the highest level event to address the state of relationship between the EU and Japan. As a high level forum between the President of the European Council, the President of the European Commission and the Japanese Prime Minister, the event gives considerable political impetus to the widening of relationship.

EU–Japan relations have developed steadily since the first EU-Japan summit in 1991 starting with a political milestone called “EU-Japan Joint Declaration”. A decade later in 2001 “An Action Plan for EU–Japan Cooperation” was launched, that set the directions of future cooperation. The document clearly stated the interests and values shared by the EU and Japan and identified specific objectives of future collaboration under the four pillars: peace and security, strengthening economy and trade, addressing global and societal challenges, and bringing together people and cultures.

The history interaction on various fields and the consecutive set of summits led to Japan’s better understanding of the EU and vice versa. As a consequence the Japanese Ministry of Foreign Affairs reorganised itself, and different sections were remodelled to reflect that new understanding, allocating a larger division to European Affairs.⁵ Another consequence of the improving relationship and the common goal setting was the introduction of Japan – EU cooperation into the Framework Programmes for Research and Technological Development of the European Union.

The 20th EU–Japan Summit in 2011 was a turning point, in a sense that leaders agreed to work to upgrade the bilateral relation through a new framework—a package of two legally-binding agreements. A Framework Agreement was initiated to cover political, global and sectoral issues, and a parallel Free Trade Agreement/Economic Partnership Agreement was envisaged. The negotiations for

⁴In this study, the brochure 2013-2014 was most extensively used. available at:

<http://www.jsps.go.jp/english/aboutus/data/brochure13-14.pdf>

⁵<http://www.euinjapan.jp/en/relation/political/>

these agreements were formally launched by the EU and Japan leaders on 25 March 2013.

Cooperation in the field of science and technology was always considered a central element to the EU-Japan relations; this can be easily testified by the fact that one of the major bilateral agreements following the 1991 Joint Declaration and the 2001 Action Plan was focussed on science and technology cooperation. The EU-Japan Agreement on science and technology cooperation⁶ was agreed in 2009, and entered into force in 29 March 2011. The directions of R&D collaboration are largely designed after the guidelines of the Agreement, and by the roadmaps drafted by the Joint S&T Committee – set up as the result of the agreement. The selected priority areas for cooperation were active and healthy ageing, low carbon technologies and new materials.

The future directions of R&D collaboration between Japan and the EU are set by 4 entities/strategical documents:

1. Science and Technology Basic Plans

From the perspective of Japan, the most important documents concerning R&D internationalisation are the Basic Plans created every five year by the Council for Science and Technology Policy (CSTP).⁷ There are two main areas structuring international cooperation in the 4th Science and Technology Basic Plan, decided in August 2011. The first area concerns expanding cooperation with Asian countries; the second area is the opening up of new areas for diplomatic cooperation with scientifically advanced countries.

Related to the latter, the basic plan contains 4 sub-themes:

- Drawing on Japan's strength in particular technologies to increase the country's presence on the global market. The technologies include infrastructure, water, transportation and communications
- Promoting international activities for advanced science and technologies – developing new networks in R&D. The emphasis is on networking, the main aim is to share data and cooperation through large scale projects, to develop links between high level research institutions and higher education institutions, and to use international frameworks to structure cooperation. (e.g. G8)
- Addressing key global challenges, including development assistance to overseas countries, and providing opportunities to Asian, African and South American scholars.
- Using bilateral and multilateral means to support collaboration between institutions.

⁶ <http://www.concertjapan.eu/system/files/Text%20of%20the%20Agreement.pdf>

⁷

http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/jp/country?section=InternationalisationOfSTCooperation&subsection=Orientation

2. Proceedings of the Joint S&T Committee Meetings

The findings of the Joint S&T Committee Meetings help to identify joint flagship priorities, the 2nd Meeting on 21 June 2013 focused on three jointly defined focal points: critical raw materials, aeronautics and ICTs.

3. Comprehensive Strategy for Science, Technology and Innovation of Japan

The Comprehensive STI Strategy of Japan is a long term strategy, addressing five main priorities for the period up to 2030. It was agreed upon on 7 June 2013 after a series of discussions and reviews. The strategy intends to play a role in addressing the various challenges facing Japan, and above all, addressing the need for economic recovery. The five challenges are the following:

- Realisation of clean and economical energy system
- Realisation of healthy and active ageing society
- Development of next generation infrastructures
- Regional revitalisation
- Revitalisation from the Great East Japan Earthquake.

It must be mentioned that the Comprehensive Strategy for Science and Technology does not deal expressly with international cooperation, but instead talks of expanding product expansion into international markets.

4. Programmes and areas in Horizon 2020

European policy-making exerts profound influence on the directions of STI cooperation with Japan. To some extent Japanese Strategic documents show similarities with the guiding principles behind Horizon 2020, namely securing global competitiveness, and the need to cope with societal challenges.

The similarities and synergies between the European and Japanese strategies are expected to establish an even more solid fundament for future STI cooperation.

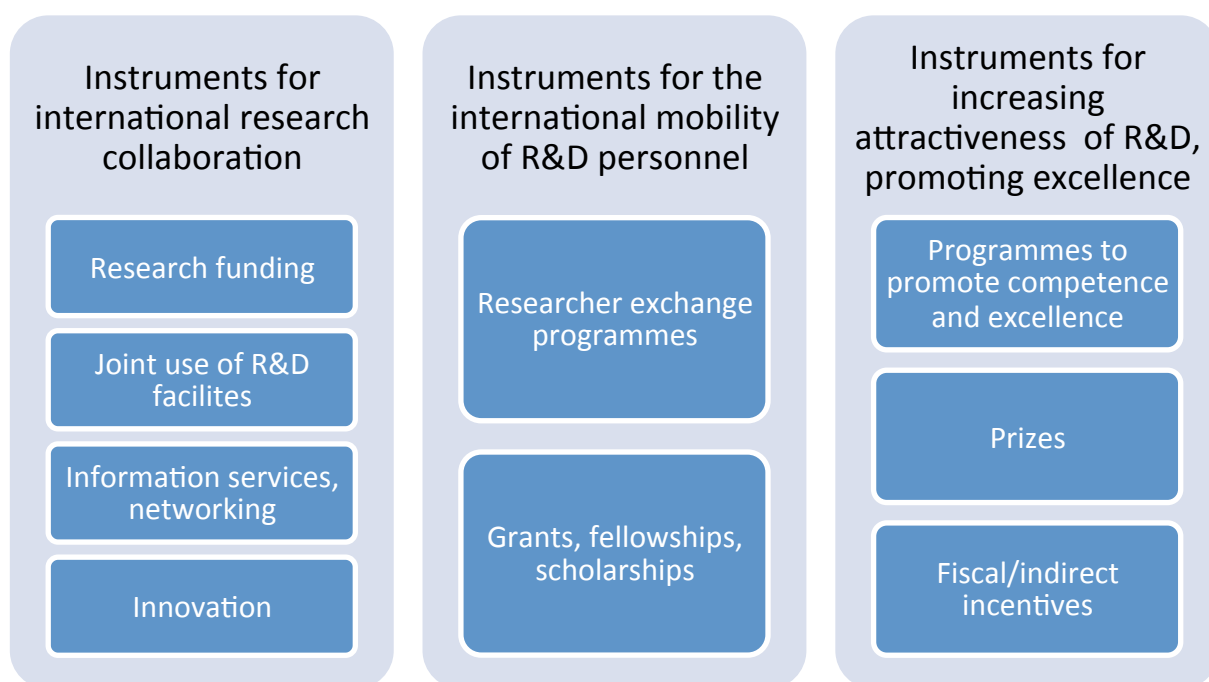
At the 2nd Joint Committee meeting on Scientific and Technological Cooperation between Japan and the EU Ambassador Shin Maruo said: “We both (Japan and the EU) recognise the important role of the Joint Committee to overview the comprehensive picture of cooperation, and to enhance the global partnership base on common values between Japan and the EU. Decision of the Comprehensive STI Strategy on the Japanese side and launching of the Horizon 2020 on the EU side will

open the door to a new stage of S&T cooperation.”⁸

5. Categorisation of STI Programmes

Giving an overview of all research collaboration schemes is by not an easy task, as the types of collaboration between countries and institutions can be manifold, and they often overlap.

To give a framework to the description of research collaboration, this analysis will use the following categorisation system:



The elements of the inventory created by the Concert-JAPAN ERA-NET consortium constitute the basis of the present research, new elements were only added in the case of the instruments for increasing attractiveness of R&D and promoting excellence. Elements of the database often overlap according to different categories, as some programmes can be categorized into more than one type.

6. Instruments for International Research Collaboration

If we are to categorise the types of instruments of international research collaboration, 4 types of instruments can be considered: funding of international research, the joint use of R&D facilities and the networking initiatives helping R&D cooperation, and innovation.

⁸ <http://www.mofa.go.jp/mofaj/files/000006904.pdf>

- Research Funding – 28 Programmes
- Joint Facility use – 16 Programmes
- Networking – 27 Programmes
- Innovation – 15 Programmes

Based on the findings of the CONCERT-Japan deliverable D.1.4., the most important finding is that the majority of bi- and multilateral STI cooperation programmes in the sample has no specific thematic focus. Nonetheless, there were some programmes focussing on specific thematic fields which imply that ICT, Health and Food are those areas where more cooperation seems to exist than in other areas such as Energy, Environment, Transport, Security or Space (no bi- or multilateral cooperation programmes at all in the sample).⁹

Concerning the target sectors the results show that basic research is by far the most important category. Target sectors which seem to be relatively neglected, or at least funded to a lower extent, are applied research and innovation activities. Most funded activities are research funding, networking and mobility.

7. Instruments for the international mobility of R&D personnel

A major Japanese funding agency subordinated to the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the Japan Society for the Promotion of Science (JSPS) is responsible for the design and coordination academic and scientific exchange and mobility programmes.¹⁰ The JSPS acting as the Japanese partner for research or mobility funding institutions with its 43 European partners possesses all the data concerning researcher mobility, therefore the present analysis will be built upon this data.¹¹ The scope of the analysis were extended to the short term, and long term invitation fellowships, postdoctoral fellowships and other bilateral/multilateral Programmes.

Foreign researchers visiting Japan

Over the last few years Japan placed gradually more and more emphasis on attracting foreign researchers to the country. Next to large scale initiatives such as the creation of World Premier International Research Centres (discussed later) the programmes of the Japan Society for the Promotion of Science (JSPS) and several

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http://www.concertjapan.eu/system/files/CJ_D1.4_RecommendatoryReport_ResultsofMappingofSTICooperation.pdf

¹⁰ The functions of JSPS also include awarding Grants-in-Aid for scientific research, supporting young researchers, promoting international scientific cooperation, supporting scientific cooperation between the academic community and industry, and collecting and distributing information on scientific research activities.

¹¹ <https://www.jsps.go.jp/english/aboutus/data/brochure13-14.pdf>

institutional initiatives contributed significantly to increase the number of foreign students and researchers in the country.

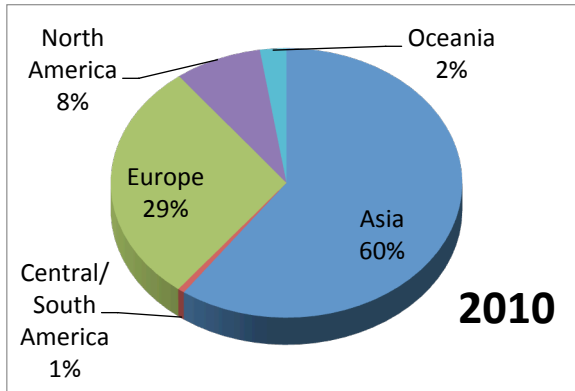


Figure 1.

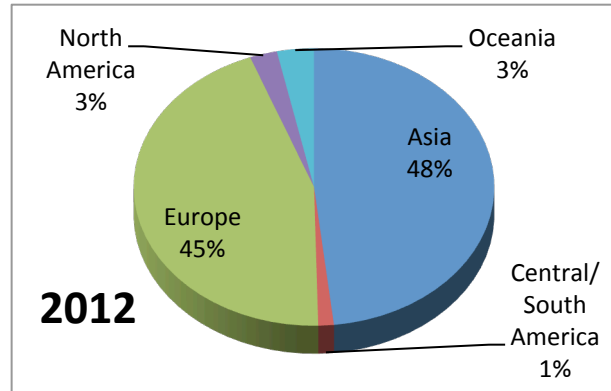


Figure 2.

By looking at the two pie charts above (figure 1. and figure 2.) it can be seen that between a 3-year period the composition of Japan's global inward mobility transformed. Asia became less prominent, and the number of European researchers increased in the percentage of total visiting researchers. It must be seen however that the numbers of foreign researchers visiting Japan is constantly decreasing, in 2010 it was 1511, in 2011 it was 1393, and by 2012 it decreased to 1303.

The chart below (figure 3.) shows the change of visiting researcher numbers between the period of 2010 and 2012 in the case of the 15 most active European sending countries. It can be concluded that the number of researchers visiting Japan is decreasing in almost all sending countries; still France, Germany, the United Kingdom and Italy dominate the scene.

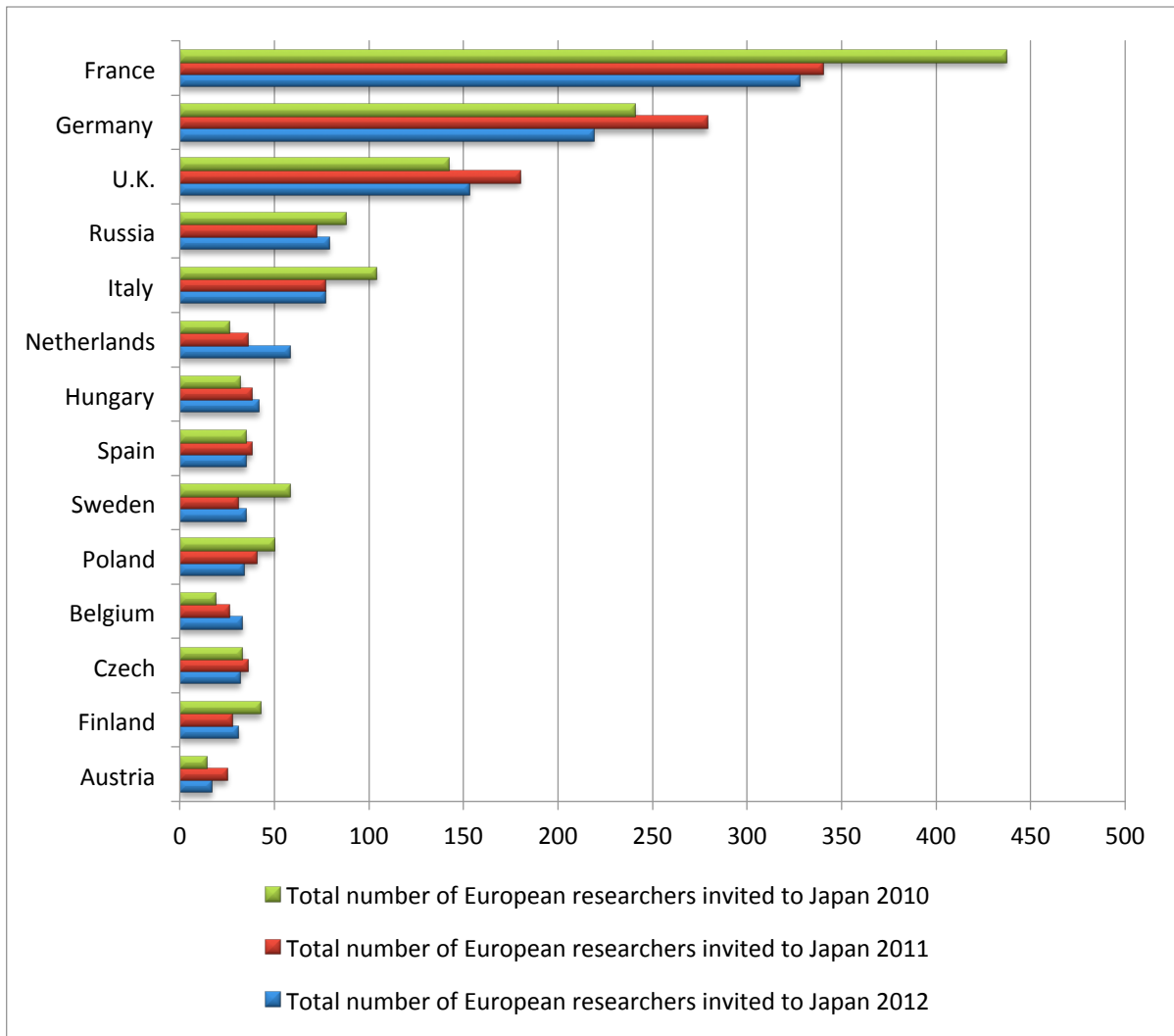


Figure 3.

Japanese researchers visiting foreign countries

The Japanese government is committed to increase outward R&D mobility to foreign countries. This is clearly exemplified by the fact that the number of Japanese researchers visiting foreign countries significantly increased throughout the three year period between 2010 and 2012. In 2010, the number of Japanese researchers sent abroad was 6398, in 2012, the same figure was 7012. The destination countries also changed. The two pie charts below (figure 4. and figure 5.) show, that Europe became more attractive for Japanese researchers in the past years, and Asia is not as popular as it was earlier.

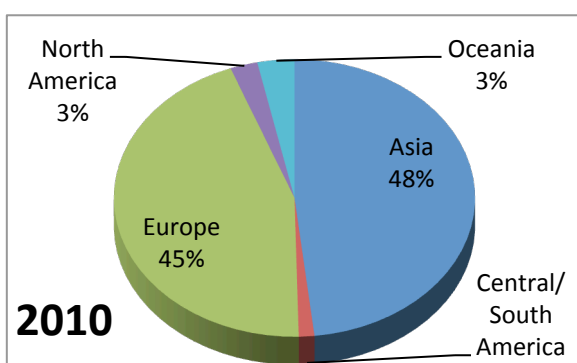


Figure 4.

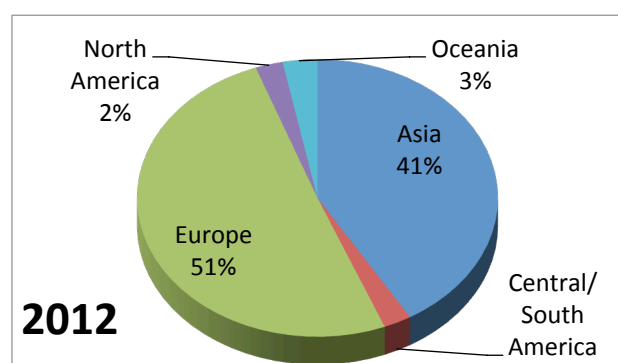


Figure 5.

Europe as a destination is becoming really attractive for Japanese researchers, the number of visiting researchers increased from 2854 to 3542 in between 2010 and 2012.

Figure 6. shows the 15 most important destination countries for Japanese researchers. It is clearly seen that numbers are growing in almost all is growing in almost all countries, the increase in numbers is exceptionally strong in Germany. A remarkable increase is also to be seen in the case of Austria and Norway. Although it is not shown on the chart, Portugal gradually becomes an interesting destination for Japanese researchers.

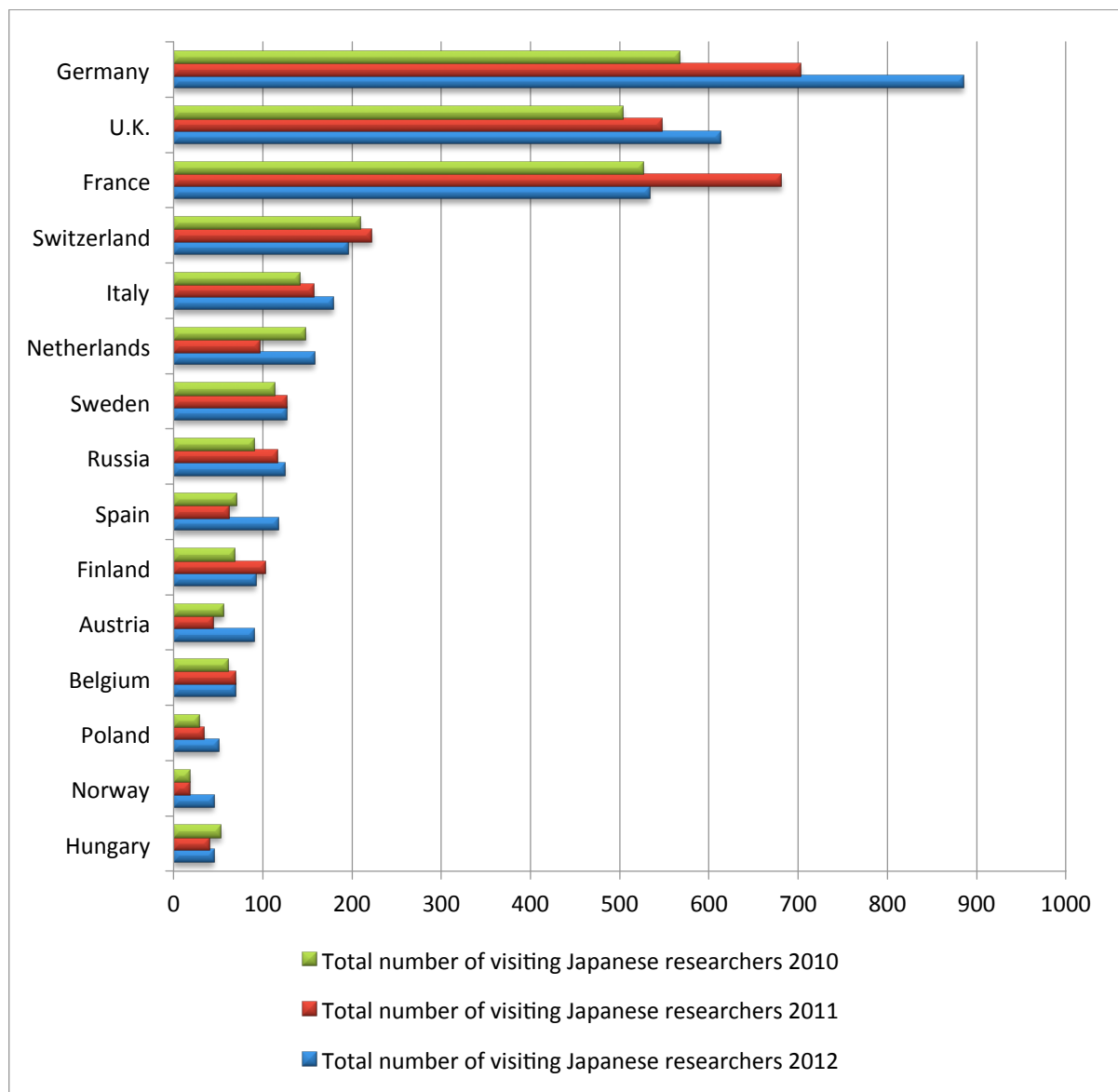


Figure 6.

8. Instruments for increasing attractiveness of R&D promoting excellence

In recent years, the Japanese government gradually placed stronger emphasis on the promotion of R&D, increasing the attractiveness of R&D careers and endeavoured to nurture a culture of excellence in research and higher education. To give some examples, a list will follow with the most important initiatives that contributed to the increase of researchers in the country. These programmes are mainly unilateral, they are only open for the Japanese research community. So far no unilateral programme in Japan open for European researchers were identified.

World Premier International Research Centre Initiative

Following the principles laid down in the Japanese government's third S&T Basic Plan, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) inaugurated the program in the 2007 fiscal year.

Based on the logic of strengthening strengths the program provides both supplementary and concentrated support for research in scientific fields in which Japan has already reached a high global level. By introducing system level reforms and measures to promote the taking of autonomous initiatives by universities, the program seeks to elevate even higher the level of research in these fields. At the same time it focuses on international visibility, it supports the creation of "globally visible" centers of excellence that boast an excellent research environment, one of a high enough standard to readily attract frontline researchers from around the world.

Over the last few years Japan placed gradually more and more emphasis on attracting foreign researchers to the country. To mention the most notable initiatives, the creation of World Premier International Research Centres, the launch of the G30 Programme, the programmes of the Japan Society for the Promotion of Science (JSPS) and several institutional initiatives contributed significantly to increase the number of foreign students and researchers in the country.

Topic Setting Program to Advance Cutting-Edge Humanities and Social Sciences Research

This program has been established to contribute to advancing the Humanities and Social Sciences in three areas: (1) Joint research that will yield breakthroughs through close linkages with other fields of science; (2) joint research aimed at making societal contributions; and (3) international joint research that contributes to advancing the Humanities and Social Sciences. The research itself is recruited in two categories: Topic-setting research on themes related to the research areas selected

by the Program Committee, and openly recruited research on themes proposed by researchers themselves. This dual structure is established to advance joint research in the most cutting-edge fields and cross-fields of the humanities and social sciences.¹²

Funding Program for World-Leading Innovative R&D on Science and Technology (FIRST Program)

The Funding Program for World-Leading Innovative R&D on Science and Technology, or “FIRST Program” for short, was established with funding allocated from the Japanese government’s FY2009 supplemental budget. Its objective is to advance cutting-edge research that will strengthen Japan’s international competitiveness while feeding the fruits of the program’s research activities into society for the benefit of its people, at the same time it will increase the visibility of Japanese research. JSPS manages and operates the Fund that finances research under this program and administers the program’s implementation once the projects have been selected.¹³

Funding Program for Next Generation World-Leading Researchers (NEXT Program)

Aimed at advancing cutting-edge R&D of high policy and societal significance, the programme provides a system of research support for young researchers with expected potential to become world leaders in their respective field of science and technology.

¹² <https://www.jsps.go.jp/english/aboutus/data/brochure13-14.pdf>

¹³ *ibid.*