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## Analysis of EU-Japan Cooperation in Horizon 2020

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## Executive Summary

This document provides an analysis on Japanese participation in Horizon 2020 and compares these results with FP7.

The Japanese participation in the EU Framework programmes has increased since 2007 with a slight drop at the start of the Horizon 2020 programme. More than 100 Japanese entities have participated in 189 projects and have received more than EUR 10 million of grant money. 159 projects in FP7 were identified with Japanese participation, while 30 projects have been identified so far in Horizon 2020. Most popular are the Marie Skłodowska-Curie Actions (MSCA) with a total of 55 projects. In particular the *Research Staff Exchange Scheme* has been successful with 48 projects, 34 during FP7 and 15 so far in Horizon 2020.

An analysis was also carried out on the participation in Horizon 2020 of Japanese affiliated companies in Europe as Japanese companies were found to participate largely through their European affiliates. So far, 36 such companies have been participating in 57 projects and more than EUR 35 million has been awarded to these companies. Information and Communication Technologies (ICT) is by far the largest field in which these companies are participating.

## 1. Introduction

This deliverable focuses on the initial results of Japanese participation in Horizon 2020 and compares these results with FP7. It seeks to update the data that was presented in JEUPISTE Deliverable 2.2 on Japanese participation in FP7. The period of analysis is for grants signed before March 2016, which gives information on the first two years of Horizon 2020. However, the reported numbers are not final, especially for 2015, and are likely to rise as more information is recorded in the e-CORDA database.

This report also takes into account the participation of Japanese affiliates in Europe. Details are given regarding the number of participations, the budget that these companies have received and the specific area in Horizon 2020 they participate in.

The data sources used to create this report are the Horizon 2020 monitoring reports by the European Commission (EC), the CORDIS data provided by the European Union Open Data Portal and the e-CORDA and CIRCA databases<sup>1</sup>. It also includes the results of the FP7 and Horizon 2020 EU-Japan Coordinated Calls, as well as projects funded under CONCERT-Japan project<sup>2</sup>.

## 2. General Overview of Japanese participation in Horizon 2020

### 2.1 Japanese participation by year

From 2007 to 2015, FP7 and Horizon 2020 have generated a total of 259 Japanese participations in 189 projects (signed grant agreements) with an EC contribution of a little more than EUR 10 million. About 70% of Japanese entities have participated in FP7 and Horizon 2020 funded projects without receiving EC contribution. In FP7, the number of Japanese participation increased year after year with the exception of 2012, which represented a significant drop of the number of projects funded. Although in the first two years of Horizon 2020 Japanese participation has gone down and does not follow the upward trend of the previous period, the participation level is still higher than the first two years of FP7.

It should be noted that the 2015 data is not yet final and the decline of participation is a common trend in most countries, not only in third countries but also among many European countries.

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<sup>1</sup> E-CORDA (28 February 2016 version) and CIRCA (Workprogrammes Committees).

<sup>2</sup> CONCERT-Japan is an FP7 International Cooperation ERA-NET project (<http://www.concert-japan.eu/>).

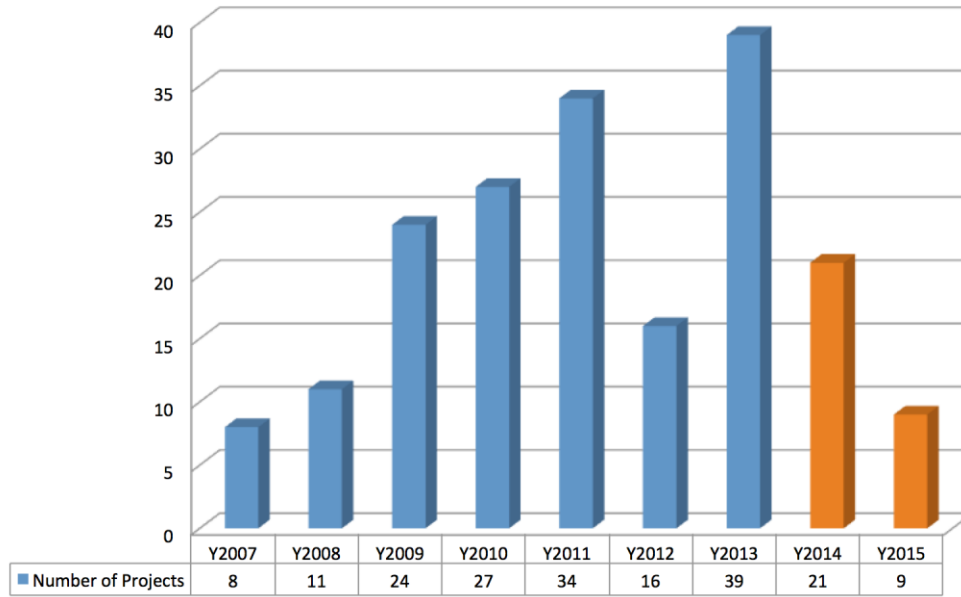


Figure 1. Number of projects with JP participation per year (excludes projects targeting individual researchers such as ERC, includes projects from EU-Japan coordinated calls).

The distribution of Japanese participation over the different programmes is shown in figure 2. 60% of the Japanese participation accounts for Societal Challenges and Industrial Leadership projects<sup>3</sup>, followed by the Excellent Science pillar<sup>4</sup> with 33% of the participation. Cooperation in the framework of the EURATOM fission and fusion programmes is well established with around 6% of the the overall FP7 and Horizon 2020 Japanese participation.

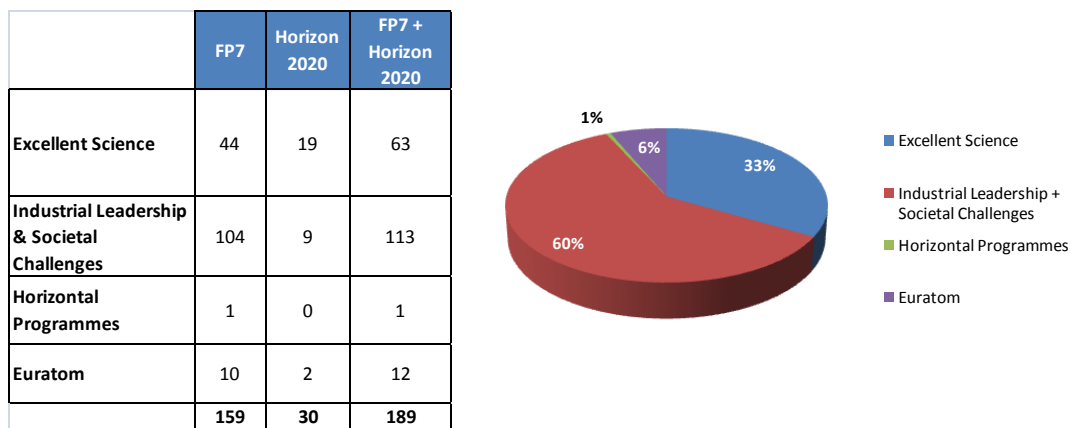


Figure 2. Projects with JP participation in FP7 (over 7 years) and Horizon 2020 (over 2 years).

<sup>3</sup> Corresponding areas selected in FP7

<sup>4</sup> ERC projects have not been included as they involve only European institutions.

Regarding thematic distribution of Japanese participations in FP7 and Horizon 2020 top-down calls, ICT related projects rank first with 45 projects (24% of the total), followed by environment and nanotechnology with 16 projects respectively. Energy, social sciences and humanities are the themes with the lower levels of participation. Figure 3 shows the exact distribution of Japanese participation since 2007 until present.

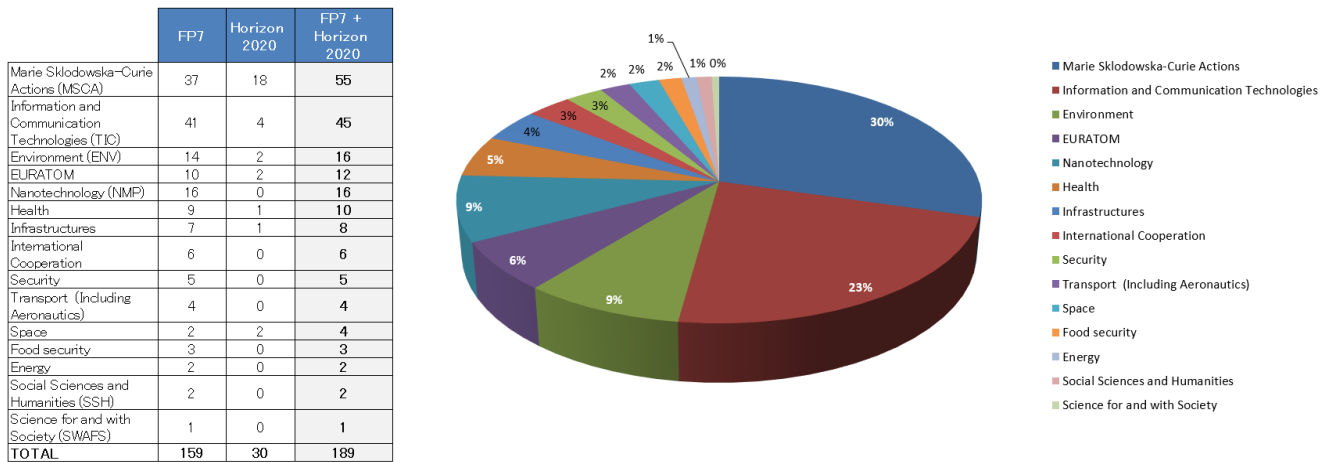


Figure 3. Projects with JP participation in FP7 and Horizon 2020 by thematic areas and programmes.

Marie Skłodowska-Curie Actions (MSCA) related projects ranks first with 55 projects (individual fellowship projects, except for the global fellowships, are not included), accounting for 30% of the total Japanese participation. The collaborative action with the major number of projects is the *Research Staff Exchange Scheme* with 48 projects, 34 funded during FP7 (IRSES) and 15 in Horizon 2020 (RISE). Only 2 *Initial Training Networks* (ITN) projects have been funded, one for each framework programme and the remaining 5 projects belong to individual global fellowships that allows experienced researchers to gain skills and expertise in Japan with a year of return in an European institution.

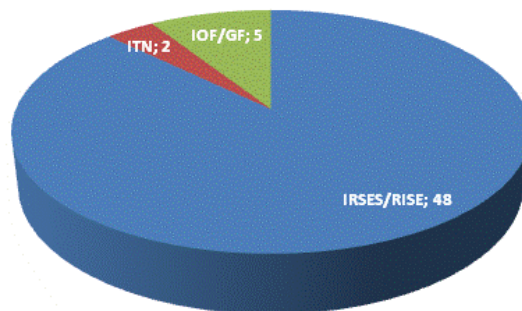


Figure 4. Marie Skłodowska-Curie Projects in FP7 and Horizon 2020 (Collaborative projects and Global Fellowships)

In addition, 22 Japanese researchers have obtained an European Research Council (ERC) grant (14 Starting Grants, 4 Advanced Grants and 4 Consolidator Grants). The host institutions are distributed between 7 EU countries as figure 5 shows. The United Kingdom is by far the EU country that hosts the most ERC grantees, while life sciences is the thematic area with the most participation. 14 researchers were awarded during FP7, 8 have been awarded for Horizon 2020 to date.

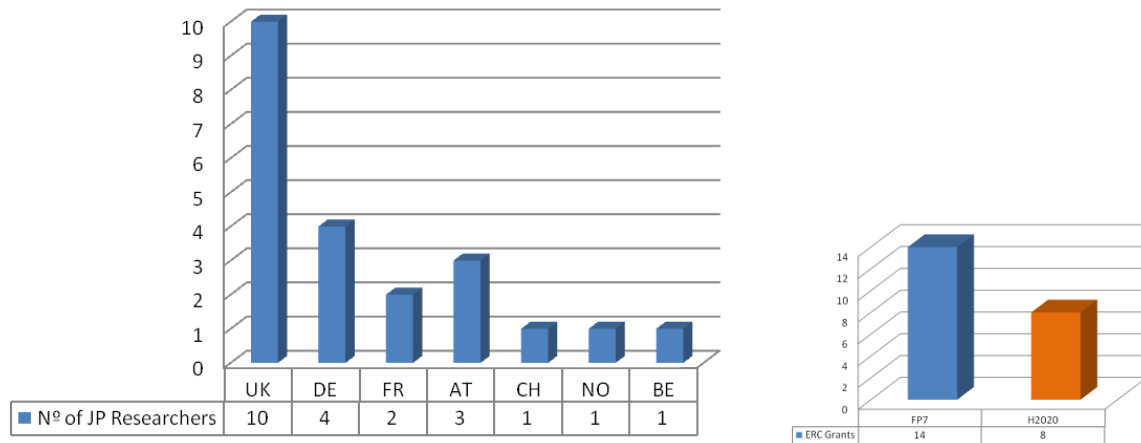


Figure 5. JP Nationals ERC grantees: Per country and host institution; FP7 and Horizon 2020; Thematic area.

## 2.2 Participating Japanese entities

More than 100 Japanese entities participate(d) in FP7 and Horizon 2020 projects. Entities with the largest number of projects include the University of Tokyo, United Nations University, RIKEN and Waseda University. It is noteworthy that the entities with the highest number of participations are universities and public organisations such as the National Institute of Information and Communications Technology (NICT) or the Japan Aerospace Exploration Agency (JAXA). The United Nations University (UNU) must be treated separately, as its institutes are not necessarily located in Japan and is viewed as an international organization with automatic access to FP7/Horizon 2020 funding.



Participant legal name	Number of Projects
University of Tokyo	24
United Nations University	16
RIKEN	10
Waseda University	9
Osaka University	8
National University Corporation, Kyoto University	8
National University Corporation, Hokkaido University	6
National Institute of Information and Communication Technology	5
Japan Aerospace Exploration Agency	5
Keio University	4
Nippon Telegraph and Telephone Corporation	4

*Table 1. Main Japanese entities participating in FP7 and Horizon 2020 projects.*

So far, 39 Japanese entities are participating in Horizon 2020. 6 of them are ranked among the first 10 participants in FP7 (Tokyo University, Japan Aerospace Exploration Agency, RIKEN, Waseda University, Kyoto University and United Nations University) whereas 3 entities participate for the first time in a project funded by the EU (Saitama University, Kinki University and the Maison franco-japonaise - Bureau français). The distribution of organizations among the Japanese participants is similar to the distribution under Horizon 2020 in general. Japanese academia (higher education institutions) are the largest category with 41% of the participation, followed by the Japanese enterprises (private-for-profit organizations) with 26% and by research centers representing 20% of the total participants. Public bodies represent 8%, while 5% of participants cannot be included in the categories used for our analysis shown in figure 6.

These Japanese entities have received EUR 0.91 million over the first two years in Horizon 2020 (annual average: EUR 0.45 million). Two thirds of this funding (EUR 0.62 million) went to organisations in Japan that are eligible for funding such as the United Nations University.

Participant legal name	Number of Projects	Participant legal name	Number of Projects
University of Tokyo	6	Electronic Navigation Research Institute	1
National University Corporation Kyushu University	4	Fujikura Ltd. (Sakura, Chiba)	1
Inter-university Research Institute Corporation, High Energy Accelerator Research Organisation	3	Institute for International Studies and Training	1
National University Corporation Tohoku	3	Japan Research Institute for Social Sciences	1
Riken	3	JIN CO LTD	1
HITACHI	2	JR West Japan Communications	1
Inter-university Research Institute Corporation Research Organization of Information and Systems	2	KDDI LABS	1
Kinki University	2	KDDI RESEARCH INSTITUTE	1
National University Corporation, Kyoto University	2	Knowledge Capital Management Capital	1
Osaka University	2	Koden Techno Info	1
Radioactive Waste Management Funding and Research Center	2	Kokusai Kogyo Co., Ltd.	1
Waseda University	2	Kyoto Sangyo University	1
Japan Aerospace Exploration Agency	1	Maison franco-japonaise - Bureau francais	1
National Institute for Environmental Studies Incorporated Administrative Agency	1	NATIONAL CENTER OF NEUROLOGY AND PSYCHIATRY	1
Research Institute of Innovative Technology for the Earth	1	National University Corporation Kumamoto University	1
Yurikogyo CO LTD	1	NTT Corporation (Yokosuka, Kanagawa)	1
Central Research Institute of Electric Power Industry	1	NTT DOCOMO, INC.	1
Doshisha University	1	Ritsumeikan University	1
		Saitama University	1
		United Nations University	1
		University of Toyama	1

Table 2. Japanese entities participating in Horizon 2020 projects.

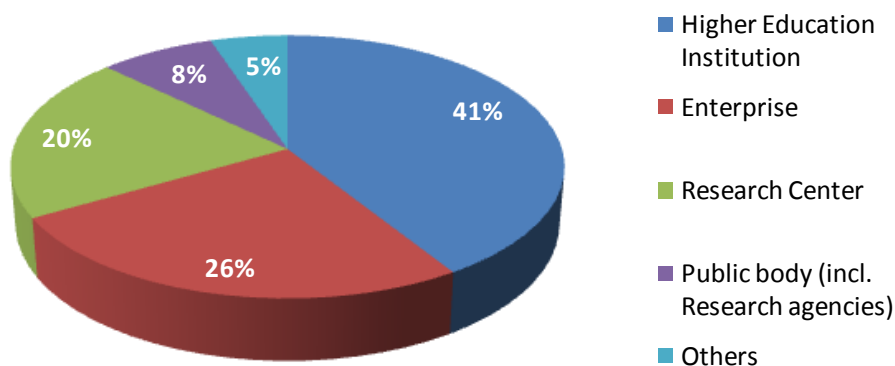


Figure 6. Japanese participation in Horizon 2020 by type of organization.

### 2.3 Cooperation partners in Europe

European organizations from all EU Member States and Associated Countries are involved in the 189 projects involving Japanese participation. The highest number of successful collaborations are from EU Member States (accounting for around 80% of participations), particularly Germany (282) and the United Kingdom (256), followed by France (225), Italy (186), Spain (158) and The Netherlands (110). Table 3 shows the main EU and Associated Countries collaborating with Japan.

European countries / Associated countries	Number of Projects
Germany	282
United Kingdom	256
France	225
Italy	186
Spain	158
The Netherlands	110
Switzerland	83
Belgium	64
Greece	57
Finland	57
Sweden	55
Other	356

*Table 3. Main EU Member States/Associated Countries participating with JP entities in FP7 and Horizon 2020*

The EU-Japan collaboration trends in Horizon 2020 are similar to FP7. The countries with the higher number of collaborations with Japan continue being on the same level as in FP7, although it should be noted that Spain ranks first at the time of this reporting while the Czech Republic is for the first time among the top ten European countries that collaborate with Japan. However, at this moment, the country ranking could change drastically as Horizon 2020 still has a long time to go.

European countries / Associated countries	Number of Participations
Spain	30
Germany	29
United Kingdom	26
France	25
Italy	21
Belgium	10
Czech Republic	9
The Netherlands	8
Sweden	7
Finland	7
Other	20

*Table 4. Main EU States/Associated Countries participating with JP entities in Horizon 2020 (2014 & 2015)*

## 2.4 Success rate of Japanese entities

The success rate of Japanese participation in FP7 was around 31% for the whole programme (analysis based on Grant Agreements signed). Despite that the success rate varied greatly across different programmes, the success rate of projects including Japanese organisations was higher than the overall FP7 success rate of around 20%. In Horizon 2020, it seems that there has been a decrease in the Japanese success rate as it can be observed in the overall Horizon 2020 programme (around 14%). However, with the current data it is difficult to obtain the precise rate. According to e-CORDA, the success rate would be 6,3% (10 projects out of 161 proposals, most of them in Societal Challenges and Industrial Leadership) but this data is incomplete as it does not include EURATOM, EU-Japan Joint Calls and most of the Excellent Science projects, which usually present higher success rates. Efforts are made to collect all the information on the proposals submitted by Japanese entities in order to calculate the success rate and include it in a future data report.

## 2.5 Japanese participation compared to other third countries

The latest data on participation from 3rd countries comes from the Horizon 2020 Monitoring Report 2014, which looks at grants signed before 1 December 2015. Results from these first calls show a significant drop in participation of international partner countries, from 4.7% in FP7 to 2.0% in Horizon 2020 in terms of participations. No specific number of signed grant agreements is available. However, data on the amount of EC contribution to non-EU countries is available and shows Japan is ranked 19th of non-EU countries (Figure 7). It is

ranked 6th among other 3rd countries (excluding Associated Countries to Horizon 2020 and countries eligible for automatic funding), after the United States, Russian Federation, People’s Republic of China, India and Brazil.

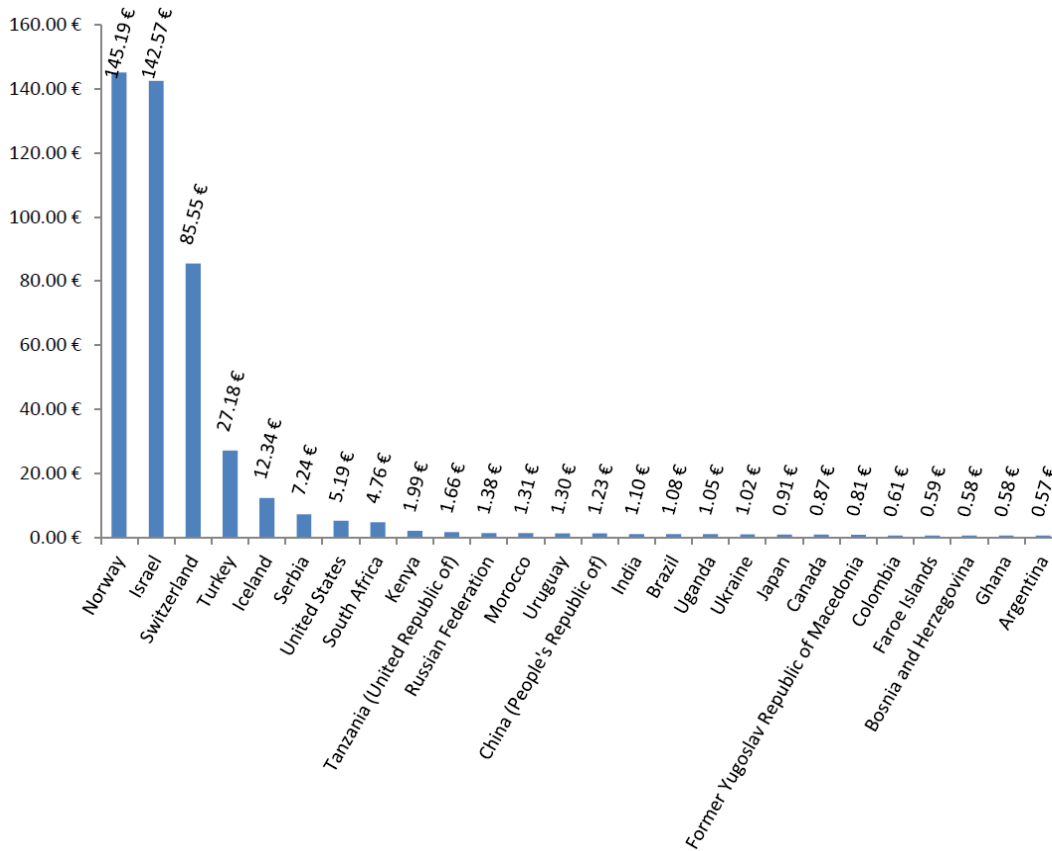


Figure 7. EU Funding to non-EU-28 countries for signed projects in 2014 calls (in EUR million)<sup>5</sup>

Compared to FP7, the number of eligible proposals in Horizon 2020 including Japanese organisations has remained at the same level, while it has dropped significantly for other 3rd countries largely due to the new policy that several of these countries are no longer automatically eligible for funding (Figure 8).

<sup>5</sup> Source: Horizon 2020 Monitoring Report 2014 (European Commission, 2016)

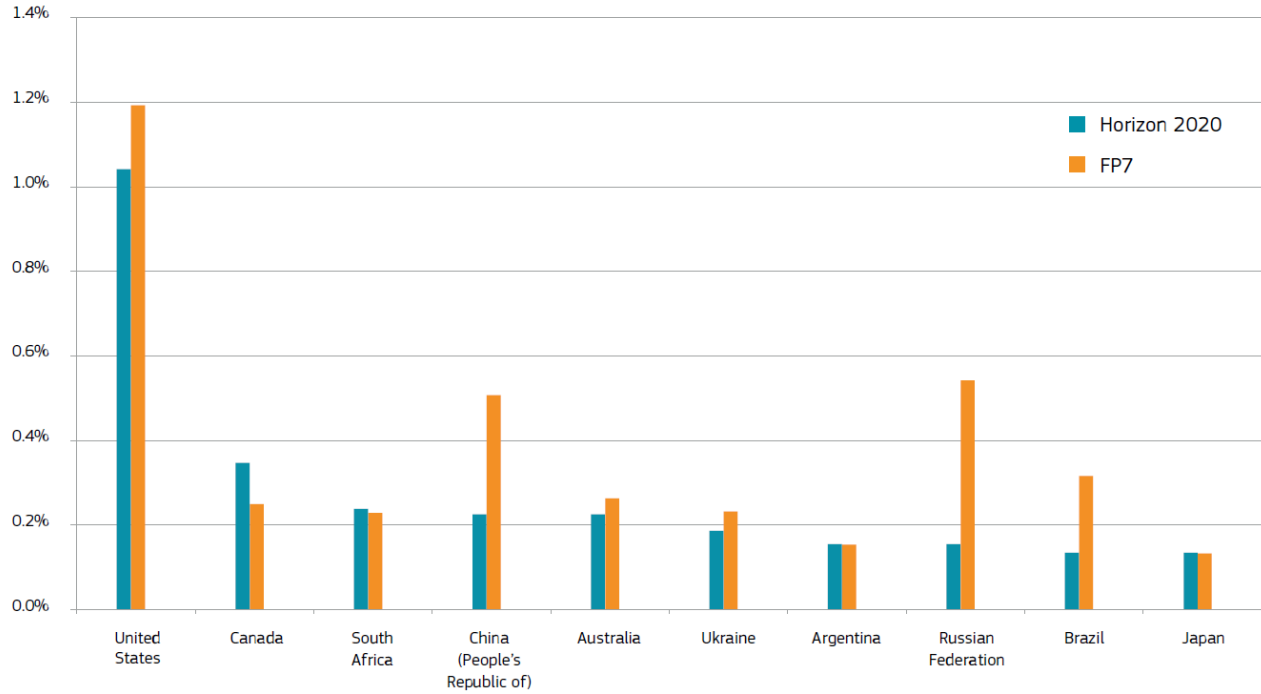


Figure 8. Top ten Third countries in terms of share of eligible applications: Horizon 2020 compared with FP7 <sup>6</sup>

### 3. Japanese participation in Horizon 2020 by area

Excellent Science is the pillar with the highest number of projects funded, followed by Industrial Leadership and Societal Challenges with respectively 6 and 3 projects. The following figures and tables show the Japanese participation in Horizon 2020 by pillars.

	Projects	Participants	ERC
Excellent Science	19	24	8
Industrial Leadership	6	22	
Societal Challenges	3	5	
EURATOM	2	2	
	<b>30</b>	<b>53</b>	

Table 5. Japanese participation in Horizon 2020 by pillars and programmes.

<sup>6</sup> Source: Horizon 2020 First Results (European Commission, 2015)

### 3.1 Excellent Science

24 Japanese entities are participating in 19 projects under the Excellent Science Pillar, with Marie Skłodowska-Curie Actions (MSCA) having the highest participation (64%) and FET the lowest without any project funded. Additionally, there have been 8 Japanese nationals who received an ERC grant (4 Starting Grants, 2 Advanced Grants and 2 Consolidator Grants) to carry out their research in the United Kingdom (5), Germany (2) and Austria (1).

Excellent Science		
	All	Without ERC
Projects	27	19
Participants	32	24
Sub-programmes		
Infrastructures	Project	1
	Participants	1
Marie Skłodowska-Curie Actions	Project	18
	Participants	23
FET	Project	0
	Participants	0
European Research Council	Project	8
	JP Nationals	8

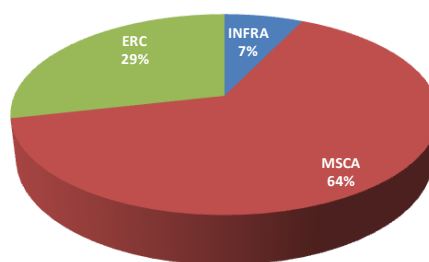


Figure 9. Japanese participation in Pillar 1: Excellent Science.

The MSCA area with the highest number of projects and participants is RISE (Research and Innovation Staff Exchange) which provides support to organizations to establish and reinforce long-term research co-operation through staff exchanges and networking activities. Since 2007, there has been an increase in the number of projects funded, with engineering and physics as the thematic areas with highest participation, and economy and humanities as the thematic areas with the lowest participation. The 3 Global Fellowship projects are carried out by Tokyo University (2 projects) and Waseda University (1 project). They do this together with 2 German and 1 British entity.

Marie Skłodowska-Curie Actions	N° of Project	18	
	Participants	23	
<b>Type of project</b>	<b>N° of projects</b>		<b>N° of participations</b>
ITN (Initial Training)	1		1
RISE (Research and innovation Staff)	14		19
GF (Global Fellowships)	3		3

Table 6. Japanese participation in Horizon 2020 by Marie Skłodowska-Curie actions.

### 3.2 Industrial Leadership

6 projects have been funded under Space and ICT thematic areas, with most of the participations coming from the 2014 EU-Japan Joint Call on research and development cooperation in net futures. The Space projects are related to Galileo and the competitiveness of the European space sector.

In comparison to FP7, participation of Japanese organisations has been greatly reduced in most of the regular calls (non coordinated actions), in particular the ICT area. In Horizon 2020, only the coordinated calls mechanism with the Japanese government seems to be a viable option to set up cooperation in ICT.

Industrial Leadership		
	Excluding Eu-Japan Joint Call	Including Eu-Japan Joint Call
Projects	2	6
Participants	2	22
Subprogramme - N° of Projects		
LEIT Space	2	0
LEIT ICT	0	4
LEIT NMBP	0	0
..etc	0	0

Table 7. Japanese participation in Horizon 2020 Industrial Leadership Pillar.

### 3.3 Societal Challenges

5 Japanese entities are participating in 3 projects related to climate (urban mine and mining waste; climate policies) and health (active and healthy ageing).



Societal Challenges	
Projects	3
Participants	5
Subprogramme	
SC5 Climate,..	2
SC1 Health,..	1
Other SC	0

Table 8. Japanese participation in Horizon 2020 Societal Challenge Pillar.

### 3.4 Other areas in Horizon 2020

Apart from the 3 main pillars of Horizon 2020, Japanese participation has been limited to EURATOM. Traditionally, cooperation in the framework of the European fission and fusion programmes has been well established and in FP7 represented 6% of the total Japanese participation (10 projects). The Japanese participation in this programme remains constant.

EURATOM (Fission)	
Projects	2
Participants	2

Table 9. Japanese participation in Horizon 2020 – EURATOM Programme.

## 4. Japanese affiliated companies in Europe participating in Horizon 2020

### 4.1 Overview

In order to identify Japanese affiliate companies in Europe, a list has been made of the Japanese affiliated companies in Europe (from Toyo Keizai, 2015 edition). This list has been cross-referenced with the CORDIS data provided by the European Union Open Data Portal. This data includes projects with a start date from the beginning of Horizon 2020 until April 2016. However, in particular the data from the last year could be not yet complete.

There have been so far 57 projects with a Japanese affiliated company in Horizon 2020, with a total of 36 different companies that have been participating. This compares to 241 projects in FP7 with 70 different companies that participated. More than EUR 35 million (over 2 years) was awarded to the 36 Japanese affiliated companies in Horizon 2020, this compares to EUR 91 million EC contribution in FP7 (over 7 years).

While most Japanese affiliated companies had a majority ownership from Japan, there was one large exception, namely Renault SAS, which is owned 15% by Nissan. Renault SAS was included in the Toyo Keizai list and was also included in the previous analysis in FP7 in JEUIPSTE Deliverable 2.2. It needs to be noted that Renault SAS alone

participates in 8 projects and removing this company would significantly lower the number of projects reported in this analysis.

	Horizon 2020	FP7
Total number of projects	57	241
Total number of participating companies	36	70

Table 10. Main results Horizon 2020 participation of Japanese affiliated companies in Europe (first two years in Horizon 2020).

### 4.2 Thematic breakdown in Horizon 2020

Most of the participation is to be found in the Industrial Leadership pillar, with most of the participation in the ICT programme. However, the Japanese affiliated companies in Europe are participating to all areas in Horizon 2020.

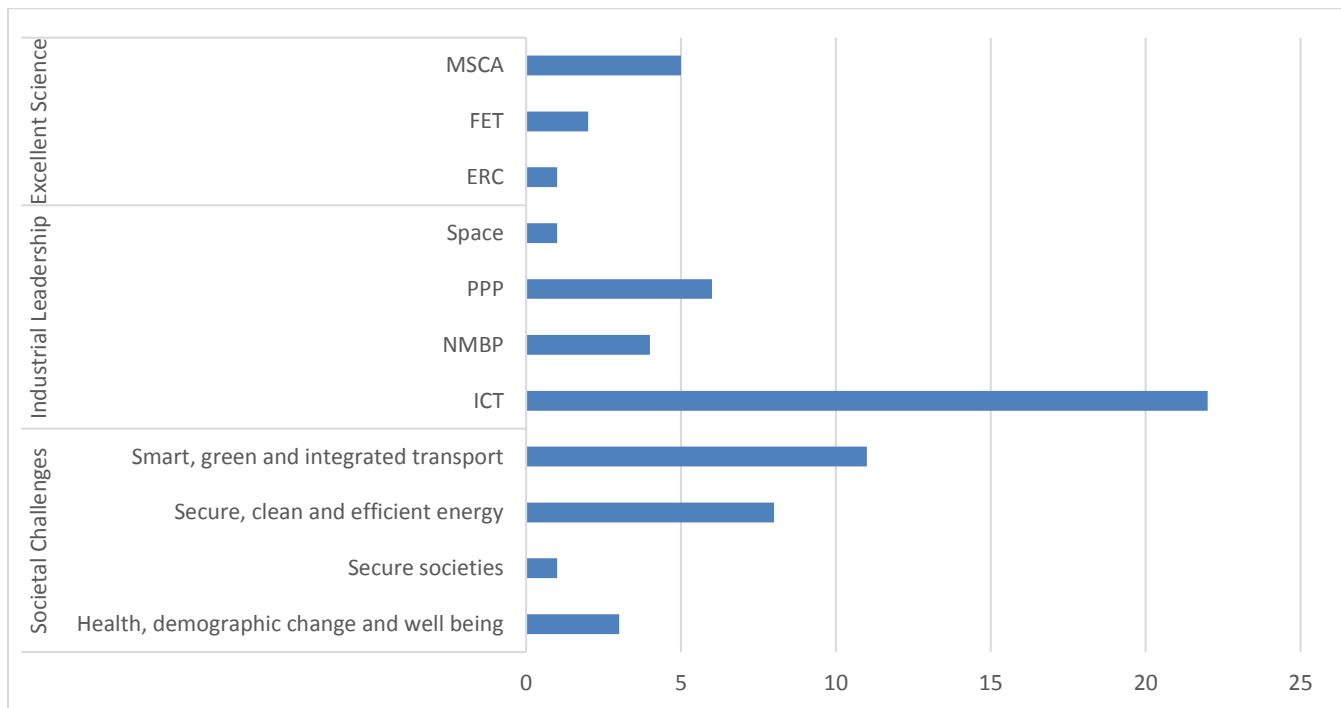


Figure 10. Japanese affiliated companies in Europe: participation by area in Horizon 2020 (number of projects).

### 4.3 Top 10 of Japanese affiliated companies in Europe participating in Horizon 2020

As in the previous analysis in FP7, NEC Europe participated in the largest number of projects and received the largest amount of EC contribution.

	Affiliate Company Name	Number of Projects	EU host country
1	NEC EUROPE LTD	14	United Kingdom
2	RENAULT SAS <sup>7</sup>	8	France
3	FUJITSU TECHNOLOGY SOLUTIONS GmbH	2	Germany
4	Nissan West Europe SAS	1	France
5	MITSUBISHI HITACHI POWER SYSTEMS EUROPE GMBH	2	Germany
6	TURBODEN SRL	1	Italy
7	FUJITSU LABORATORIES OF EUROPE LIMITED	3	United Kingdom
8	TERUMO BCT EUROPE NV	2	Belgium
9	HORIBA JOBIN YVON S.A.S.	2	France
10	NOESIS SOLUTIONS NV	2	Belgium

Table 11. Main Japanese affiliated companies in Europe (first two years in Horizon 2020)

## 5. Conclusion

Japanese participation has gone down compared to the last year of FP7 (2013). This is in line with the decreased participation of other 3rd countries in Horizon 2020. However, the participation level is higher than the first two years of FP7.

At the same time, the direct financial support from the European Commission has also gone down dramatically for Japanese organisations. While they received EUR 10 million in FP7 (annual average: EUR 1.40 million), they have received just EUR 0.91 million over the first two years in Horizon 2020 (annual average: EUR 0.45 million). It needs to be pointed out that two thirds of this funding (EUR 0.62 million) went to organisations in Japan that are eligible for funding such as the United Nations University.

For regular joint research projects, coordinated calls with the Japanese government have become relatively more important than participation through regular Horizon 2020 calls. Certain fields in which Japan is strong have completely vanished when it comes to participation of Japanese entities in regular Horizon 2020 calls, such as ICT.

<sup>7</sup> Owned 15% by Nissan

Participation from Japanese affiliated companies in Europe also has gone down as compared to FP7, from 241 projects over 7 years in FP7 to 57 projects in Horizon 2020. However, the financial contribution from the European Commission has remained steady, from EUR 91 million in FP7 (over 7 years) to EUR 35 million in Horizon 2020 (over 2 years).

However, it is too soon to draw a definite conclusion as the data for Horizon 2020 participation is still incomplete. In particular the data for 2015 is not yet final and is subject to change.