D. 3.5 – Discussion paper on Japan

Project name	Supporting international cluster and business network cooperation through the further development of the European Cluster Collaboration Platform
Project acronym	ECCP
Deliverable title and number	D 3.5. (1) – Discussion paper on Japan
Related work package	WP3
Deliverable lead, and partners involved	inno
Validated by	Marc Pattinson, Eva Fadil, inno
Contractual delivery date	M24
Actual delivery date	April 2017; update December 2018
Start date of project	September, 23rd 2015
Duration	2 years
Document version	V1.1

Abstract: The discussion paper on Japan provides inputs for a policy discussion on cluster cooperation and policy arrangements on clusters with Japan. The report contains information on existing EU- Japan cluster collaboration and good practices, which can be good practice examples for other clusters from Europe in their collaboration approach towards Japan.

Contents

1. Objective of the report

This document is intended to provide an overview of the current cooperation activities between European and Japanese clusters, as well as the nature of collaboration between clusters and other types of Research & Innovation actors. This paper provides examples of good practices to showcase different types of collaboration. Furthermore, this document is intended to provide an analysis of the potential for cluster cooperation in the future.

This report builds upon and deepens the analysis and overview provided in the deliverable 3.1 “Japan Preparatory paper”.

This “discussion paper” has been elaborated to serve as an input and preparatory paper to the policy discussions / policy meetings between DG Growth and policy makers from Japan. The background knowledge and good practices could then be used in policy discussions to illustrate the vitality of cluster cooperation, the impact of international interclustering actions and the importance of structuring this through new policy initiatives.

The information of this report is provided through desk research and confirmed with interviews with relevant local and European contact points.

2. Existing EU-Japan cluster cooperation

2.1 Policy dialogue on cluster cooperation

Japan and the EU have developed a solid diplomatic and trading relationship since the 1990's. Negotiations for a **Free Trade Agreement** between the EU and Japan started in 2013, and a **Strategic Partnership Agreement** between the EU and Japan is being negotiated in parallel to the FTA. With respect to industry cooperation, a **Regulatory Cooperation Joint Agreement** was adopted in 2015, and in technology cooperation, an **EU-Japan Science and Technology Cooperation Agreement** was signed in 2009. Japan and the EU also cooperate in research and innovation through a co-funding scheme under **The Japan Science and Technology Agency** and **H2020**.

A number of organisations are dedicated to the economic, industrial and technology cooperation of the EU and Japan, such as the **Delegation of the EU to Japan**, **EU-Japan Centre for Industrial Cooperation**, the **Japan External Trade Organisation (JETRO)**, the **European Business Council in Japan** and the **EU Gateway/Business Avenues**. These organisations often have offices in both the EU and Japan, and their role is to further encourage EU-Japan policy cooperation in common areas of interest.

Compared to other world economies, EU and Japan cluster collaboration has been relatively slow to emerge. In fact, Japan's current policy, "Industrial Cluster project", implemented by the Japanese Ministry of Economy for the 2011-2020 period, Trade and Industry (METI), aims to enhance the industrial competitiveness of Japan. The project aims at connecting SMEs and start-ups to universities and research institutes to establish industrial clusters.

A number of other institutional initiatives and funding opportunities are dedicated to Japanese cluster development and growth. These include the "**regional innovation ecosystem creation programme**" which is supported by the Ministry of Agriculture; the "**regional core business creation support programme**" which is funded by local Japanese Economy, Trade and Industry bureaus; the "**Centre of Innovation programme**", funded by the Ministry of Technology. All three programmes aim at strengthening the innovation potential of the local ecosystem and do not mention internationalisation. As a result, Japanese clusters are rather turned towards R&D than internationalisation, even though, this could change.

Indeed, Japan has one programme supporting internationalisation, the "**regional industry tie-up programme (RIT)**" developed by international Japanese trade organisation JETRO since 2007. The programme supports business networking and meetings between Japanese SME clusters (understood as concentration of SMEs of the same sector in one region) and clusters from overseas regions. The programme has supported 15 projects each year of which 8 are with European clusters.

2.2 EU-Japan cluster to cluster cooperation

As explained above, the Japan External Trade Organisation (JETRO) launched the **Regional Industry Tie-Up (RIT)** programme in 2007 with the aim of promoting the business interaction of SME's between industry clusters in Japan and overseas. The programme is a kind of "match-making" activity, targeting Japanese SMEs looking for partners overseas. The RIT programme assists industry organisations to build relationships with foreign counterparts. The relationship allows companies to meet and start business together. It provides varying levels of support and assistance for one to three years; dispatching an expert from a foreign region to Japan, a delegation from a Japanese region visiting a foreign region, a delegation from a foreign region visiting a Japanese region, and so on. The RIT programme also has a "preparatory research" function: indeed, when an industry organisation in Japan needs to make more specific business plans before starting business matching through the RIT programme, JETRO can support them with the preparatory actions of the RIT programme. JETRO provides the cost to survey the industry and potential companies of the target country, and the cost to send an expert to conduct a field survey. A number of Japanese and European organisations have participated in the RIT programme by JETRO, as we will see later in the document when we turn to current EU-Japan cluster cooperation success stories.

Since 2008, EU-Japan cluster cooperation at the institutional level is established through the **EU-Japan Centre for Industrial Cooperation**, under the joint initiative of the European Commission and the Japanese Ministry of Economy. The EU-Japan Centre for Industrial Cooperation has launched a service for the benefit of European and Japanese clusters, to help them identify potential cooperation partners in the reciprocal regions. The Centre organised regular match-making missions to Japan for EU clusters.

Additionally, a new service of the EU-Japan Centre for Industrial Cooperation called the "**Japan Technology Transfer Helpdesk**" has been established, dedicated at supporting primarily EU SMEs in finding promising technologies originating from Japanese universities and research centres (ongoing survey). An MoU was signed between ECCP and the EU-Japan Centre for Industrial Cooperation in 2012, showing that the EU-Japan cluster cooperation is clearly already well established. New avenue for promoting EU-Japan cooperation are continuously being considered.

3. Good practices / Success stories related to cluster cooperation

As shown in the previous section, there is today a solid institutional framework for cluster cooperation between the EU and Japan. In Japan as in the European Union, a number of tools and organisations are designed to support the development of clusters, and to boost the competitiveness and internationalisation of SME's.

EU-Japan cooperation has been pushed by two main actors: on the Japanese side, JETRO, with its RIT programme is the main stakeholder encouraging cluster cooperation. On the European side, a number of European clusters, using the "Cluster Go International" programme aim at partnering with Japanese organisations and have established contacts already. From these two sources of EU-Japan cooperation, three good practices related to cluster cooperation are detailed below.

3.1 EU-Japan cluster cooperation identified by the JETRO-RIT programme

Currently, cluster cooperation between European and Japanese clusters are most active in the sectors of **life sciences, ICT and electricity production and renewable energy**. JETRO's RIT programme has identified 15 international Japan-Overseas collaboration cluster projects in 2016, all of which are active in one of the above-mentioned sectors. From these 16 projects, nine were started in 2015 and have been renewed in 2016; seven new projects were adopted in 2016.

Within this cooperation scheme, six projects can be counted in Asia and there is one project with North America. In the European region, there are nine projects with Japan, of which eight are related to the European Union (five in Germany, two in France and one in the UK).

The narrow spectrum of EU countries represented can be explained by the partnerships rules enacted by JETRO: only Japanese organisations can apply for support and the cooperation partner's region must have previous contact with the partnering Japanese region. In addition, European regions seeking partnerships must have products and technologies that are either in their final phase of development or already on the market. These rules may hinder less innovative European regions to participate in the programme, but the programme is nevertheless an interesting scheme for Europeans to cooperate with Japanese regions.

Among the eight EU-Japan projects that were identified by JETRO in the RIT programme, a brief presentation of the collaboration projects and what they entail is presented below.

Electronics/Technology

- Joint Committee on New Industry Creation, Yonezawa City, Japan – Organic Electronics Saxony, Sachsen, Germany: this is a cluster collaboration project born in 2013, and active in the domain of organic electronics and related parts. The city of Yonezawa, world leader in the field of organic electronics, has established a Joint Committee on New Industry Creation in Yonezawa

to revive their industrial sector through innovation[1]. In 2013, an MoU was signed between the Yozenawa Joint Committee and the German cluster Organic Electronics Saxony, who gathers 40 companies and 20 research facilities. The MoU aims to expand cooperation for the internationalisation of the organic electronics industry by exchanging information and personnel and organising joint symposia.[2] Information exchange and business expansion occurred in June 2016, when a German delegation visited the Japanese city of Yonewaza and joined a session to exchange opinions at the Frontier Centre for Organic Materials at the Yonewaza Campus, at the Yamagata University.[3]

Health/Medical products/Beauty

- Toyama Pharmaceutical Association, Toyama Prefecture, Japan – Polepharma, Île de France, France : two regional clusters, Polepharma in France and Toyama Pharmaceutical Association, in Japan started a partnership in 2014. The partnership was initiated by the JETRO Paris agency who was actively looking for stakeholders to partner with Japanese industries. In 2014, Toyama pharmaceutical manufacturers visited Paris. In return, A French delegation visited Japan in 2015 to strengthen the partnership. [4] The partnership aims at helping the Toyama Pharmaceutical Association to expand internationally and aims at promoting the Japanese brand abroad, promoting high-quality pharmaceutical manufacturing, encouraging co-development and technology exchange on both medicine as such and manufacturing processes. So far, no MoU has been signed with Polepharma[5].
- Kobe Biomedical Innovation Cluster Hyogo Prefecture, Japan - Life Science Nord, Germany : This collaboration between Life Science Nord and Kobe Foundation for Biomedical Research and Innovation was born in 2015. Through the JETRO programme, the two clusters have been progressively intensifying their dialogue. There have been a number of delegation visits on both sides, covered by the RIT programme. The two clusters have signed an MoU, which aims, beyond the matchmaking events, to support technology transfers and innovation introduction on the market[6];
- Japan Cosmetic Centre (JCC), Saga Prefecture, Japan – Cosmetic Valley, Centre-Val de Loire, France: The Japan Cosmetic Centre (JCC) is an industry-academia collaboration organisation. In 2013, an MoU has been signed with the French Cosmetic Valley, during the Karatsu Cosmetic

[1] Joint Committee about New Industry Creation in Yonezawa, http://y-sansoukyo.jp/english/index.html, consulted on 21/11/2017
[2] Research Centre for Organic Electronics, Yagamata University, https://organic.yz.yamagata-u.ac.jp/en/view.cgi?p=504, consulted on 21/11/2017
[3] Frontier Centre for Organic System Innovations, https://yucoi.yz.yamagata-u.ac.jp/en/view.cgi?p=1648, consulted on 21/11/2017
[4] Polepharma, http://www.polepharma.com/pp_newsletter/newsletter-fevrier-2015/, consulted on 21/11/2017
[5] Toyama Pharmaceutical Association, http://www.toyama-kusuri.jp/en/international/, consulted on 21/11/2017
[6] Life Science Nord, http://www.lifesciencenord.de/netzwerk/news/details/kobe-und-life-science-nord-in-gemeinsamer-mission/ consulted on 21/11/2017

Concept conference held in November 2013. The MoU targeted on the one hand the development of research activities, i.e a collaboration project between Kyushu University and the research stakeholders of the French Cosmetic Valley, as well as a specific research programme on Kyushu island's cosmetic plants. On the other hand, the MoU developed reciprocal economic cooperation between the two clusters and notably Japanese investments in France, as well as support from the Japanese organisation to help the French stakeholders access Asian markets such as Korea, China and Japan). Since 2013, no new projects have been reported on either of the clusters' websites.

Industry

- Hitachi Regional Technical Support Centre, Ibaraki Prefecture, Japan – Automotive, Baden-Württemberg, Germany: in May 2015, the Automotive Baden-Württemberg cluster and the Hitachi Regional Technical Support Centre have signed an MoU to intensify their collaboration on automotive industry.[7] Two trips have been organised to foster match-making in Japan and one in Germany. This partnership has enabled to sensitise the German stakeholders to the Japanese culture and establish 600 direct contacts with Japanese stakeholders.

Environment/Energy

- Kitakyushu City, Kitakuyshu Region, Japan —Baden-Württemberg, Germany: The two cities have been involved in various international collaboration projects. In 2011, the City of Freiburg (Baden-Württemberg region in Germany) participated in an international conference in Kyoto designed to promote low-carbon cities. The aim of the conference was to exchange good practices of domestic and foreign green cities, as well as future city planning.
- Scotland House (UK) – Nagasaki Dejima Incubator (Japan): After the Japanese government pledged £200b in funds to assist the transition to new forms of power to deregulate the Japanese electricity market, an energy hub between the Scotland House and the Nagasaki Dejima Incubator was created in 2015, permitting Scottish companies and stakeholders to build relationships with the Japanese offshore renewal and marine energy sector. The hub was officially launched by the Cabinet Secretary for Culture and External Affairs Fiona Hyslop during a visit to Nagasaki. The testing sites are expected to create 50 jobs and secure regular customers by 2022 and will be based on Goto islands.
- Fukushima Prefecture – North Rhine-Westphalia (Germany): In 2014, Fukushima Prefecture signed an agreement with the German state of North Rhine-Westphalia to work together on promoting the use of renewable energy. The prefecture, which hosts the crippled Fukushima No. 1 nuclear plant, aims to introduce renewable energy technologies from Germany, a leader in the field, to achieve a society not dependent on nuclear power. Fukushima and North Rhine-Westphalia will take turns hosting trade fairs featuring renewable energy businesses and promote joint research among businesses over the next three years.

[7] Automotive Baden Württemberg, http://www.automotive-bw.de/de/aktuelles/meldungen/BWI_Internationalisierung-Kopie.php, consulted on 21/11/17

3.2 EU-Japan cluster cooperation identified by the European Clusters

The European Commission has started to promote EU-Japan cluster collaboration in the 2007-2013 EU Competitiveness and Innovation programme (CIP), which is now replaced by the Programme for the Competitiveness of Enterprises and SMEs (COSME) 2014 – 2020.

The ECCP[8] has identified a number of European clusters with an interest in working with Japan though the EU-COSME Programme "Clusters Go International" which supports the establishment of European Strategic Cluster Partnerships Going International (ESCP-4i). Out of the "ESCP-4i First Generation" (operational 2016-2017), six partnerships had identified Japan as a target country. Eight of the "Second Generation" EU cluster partnerships (operational 2018-2019) have listed Japan as a "targeted third country", among which six partnerships in the "Preparation Phase" (strand 1) and two partnerships in the "Implementation Phase" (strand 2). The partnerships targeting Japan are ALLIANCE, ELBE, FoodNet, FoodPackLab, GeoEnergy Europe, IDEEO (all strand 1) and EU-TEXTIL2030 and LASER-Go Global (strand 2). As the activity of the Second-Generation partnerships has begun only recently, it has been considered of more interest to specify the activities and level of advancement in a cooperation with Japan of a number of ESCP-4i First Generation partnerships (those who undertook concrete activities).

Name of cluster	Sector of activity	EU countries involved	EU Support	State of cooperation with Japan
EU-Textile 2030	Textiles	SP, CZ, IT, DE, FR	ECCP – ESCP4i	The consortium has targeted Japan as potential partner since 2013. They announce an event in January 2019 on their website with no further information.
LaserGo Global	Laser	DE, FR, AT, LIT, SP	ECCP – ESCP4i	The consortium has targeted Japan as potential partner since 2014. They announce to start collaboration with Japan in 2018 but no more information could be found.

Currently, the cluster partnerships **bioXclusters plus,** active in biopharmaceuticals, EACP ABROAD, active in the aerospace sector, **EU4SPORTSCLUSTERSALL,** active in the sports industry, and **WIINTECH 2020,** active in the plastics sector, have established stable contacts with Japanese organisations and organised meetings and delegation visits to Japan. The detailed information is indicated in the table below.

[8] https://www.clustercollaboration.eu/escp-list

Name of cluster	Sector of activity	EU countries involved	ESCP-4i[9] category	State of cooperation with Japan
BioXclusters+	Biopharmaceuticals	IT, ES, DE, FR	Strand 2 – implementation phase	The Osaka Bio Headquarters is officially a key partner of the BioXclusters+ network. In November 2016, a matchmaking event was organised between BioXclusters+ and the Forum for Innovative Regenerative Medicine (FIRM) a Japanese Cluster. FIRM has created a task force in charge of creating links with companies from clusters overseas. It is also preparing the construction of an industrialisation demonstrating site.
EACP ABROAD	Aerospace	FR, NL, ES, IT, TR, DE	Strand 2 – implementation phase	In October 2017, EACP ABROAD organised an official visit to Japan to conduct three activities: A France-Japan Civil Aviation Industry Cooperation workshop; Aeromart Nagoya Business Convention A seminar on international clusters and industry sites visits. This has allowed to make a first contact. Following this meeting they had announced a potential visit in November 2018, but no information about this event could be found online.
EU4SPORTSCLUSTERSALL	Sports and leisure	NL, BE, ES, FR	Strand 2 – implementation phase	The cluster aims at targeting new value chains and internationalisation opportunities for its SMEs. One business mission to Japan will be conducted and one international standard action to Japan expected in 2017in Japan.
WIINTECH 2020	Plastics	PT, IT, FR	Voluntary partnerships	The Nagano Techno Foundation is a member of the clusters network and is a permanent contact point in Japan for this cluster partnership. Cooperation focuses on technology and business on micro and nano technologies.

[9] European Strategic Cluster Partnerships Going International supported under EU COSME Programme

3.3 Examples of best Practices of EU-Japan Cluster Cooperation

As seen previously, EU-Japan cluster collaboration is being encouraged both by the EU and Japan. Nevertheless, building productive business relations is a long process and only the most achieved partnerships have been illustrated below as best practices. The following case studies have been selected on three criteria: length and sustainability of the partnership; intensity of the relations and results of the activities.

Cooperation between Direction Générale des Entreprises (France)/METI (Ministry of Economy, Trade and Industry) (Japan), in partnership with Techtera and Japan Chemical Fibre Association (JCFA)

Cooperation between Direction Générale des Entreprises (France)/METI (Ministry of Economy, Trade and Industry) (Japan), in partnership with Techtera cluster and Japan Chemical Fibre Association (JCFA)	
Partners: • Techtera: the leading technical textiles cluster in France counting 130 members (SMEs, technical centres, universities). • Japan Chemical Fibre Association: Japanese trade organisation that regroups the 23 most important chemical players in Japan today • Society of Fibre Science and Technology of Japan: The SFSTJ was founded in 1943 and counts over 1000 members (scientists, engineers, manufacturers) in the textiles science industry in Japan.	techtera Technical Textiles Rhône-Alpes
Sectors and subsectors concerned: • Technical textiles (Agriculture, furniture, construction and building, personal protection equipment, environment, clothing, industry, health, sports…)	

Context:

- Techtera is the leading technical textiles cluster in France. In 2007, Techtera first travelled to Japan to help its SME members from the Auvergne-Rhône-Alpes region insource new technical textiles materials. Together with France and Germany, Japan is one of the leading countries for producing and innovating in the technical textiles sector.
- In 2014, the French and Japanese ministries of economy signed a bilateral memorandum of understanding to increase cooperation in the technical textiles sector. This memorandum was due to last 3 years. A new memorandum of cooperation has been signed in 2018, for another 3 years of mutual cooperation between the two countries. A joint meeting is organised each year, one year in France, one year In Japan. In 2018, the meeting took place in Japan.

- Techtera is now a partner in an ESCP-4i partnership, EU-Textile2030, which indicates Japan among its "target countries" for joint internationalisation activities. Information of this partnership is displayed above as part of the activity on ESCP-4i.

Type of cooperation:

- French-Japanese ministerial bilateral memorandum of cooperation (3-year duration)

Objective:

- Support technological innovation in the technical textiles sector between France and Japan through innovation supply sources: facilitate French-Japanese collaborative projects; increase cooperation between research centres and companies; develop cooperation in the fashion industry

Policy support:

- Direction Générale des Entreprises (France)
- METI (Japan)
- Business France
- European Commission: H2020 innosup

Results/outcomes:

- Ongoing successful ten-year cooperation in the technical textiles sector between France and Japan, which started as a private business initiation (Techtera members) to a state-level cooperation: MoC working groups, fibertonic working groups; Soyeux Destins events; yearly collective R&D and business missions to Japan with Business France ("Fibertonics", January and October 2016), creation of a business development service at the CCI for Japan (2016), etc…
- Techtera members now not only insource from Japan but export their finished products to Japan. Over 90% of members have found Techtera's approach very relevant for identifying new supply sources, achieving a better knowledge of Japan, widening their professional network, etc. In 2016, following a satisfaction survey, Techtera members said that almost all widened their network by 5 to 10 entities.
- Techtera is today an exclusive European entry-point to Japan in the technical textiles sector

- The European technical textiles sector is expected to continue growing by 5% over the next years. France continues to cooperate with Japan as the leading countries in this domain worldwide.

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Cooperation between Life Science Nord – Japanese Foundation for Biomedical Research and Innovation (FBRI)/ Kobe Biomedical Innovation Cluster

Cooperation between Life Science Nord – Japanese Foundation for Biomedical Research and Innovation (FBRI)/ Kobe Biomedical Innovation Cluster	
Partners: • **Life Sciences Nord**: one of the leading science networks in Europe with over 500 biotech/pharma and medical technology companies and numerous research institutes, 20,000 highly qualified professionals develop innovative medicines, medical products and services in Hamburg and Schleswig-Holstein Germany) • (Foundation for Biomedical Research and Innovation - FBRI) • **Kobe Biomedical Innovation Cluster**	
Sectors and subsectors concerned: • Life sciences • Health • Biomedicine	
Context: • Life Sciences Nord is one of the leading science networks in Europe with over 500 biotech/pharma and medical technology companies and numerous research institutes. Life Science Nord is engaged in numerous national and international industry partnerships and works with other clusters in Germany and abroad. • In May 2016, the Schleswig-Holstein and Kobe regions signed an agreement to strengthen collaboration between companies in life science innovations. • To foster the development and market launch of innovations for the health industry, the Japanese Foundation for Biomedical Research and Innovation (FBRI) and Life Science Nord signed a letter of intent in Kobe. The letter deals with cooperation in the RIT programme (Regional Industry Tie-Up) of the Japanese foreign trade organisation JETRO, which supports the exchange of views and collaboration between companies and research institutes. At least one exchange visit per year is planned.	
Type of cooperation: • Cooperation in the JETRO RIT programme • Collaborative project between the Kobe and Schleswig-Holstein regions	

Objective:

- Supporting life science companies in North Germany
- Strengthen collaboration between Japanese and German companies in life science innovations

Policy support:

- Kebo Regional Administration
- Schleswig-Holstein Regional Administration
- German Ministry of Economic Affairs, Employment, Transport and Technology
- JETRO Japan

Results/outcomes:

- Extensive exchange of views and ideas between companies and research institutes in both regions. Several participants have already drawn up specific collaboration plans. "*After such a short time, this is a very positive interim result*," says Dr. Hinrich Habeck, Managing Director of Life Science Nord Management GmbH. "*For us, the agreement means continuing and deepening the activities between Life Science Nord and the Kobe Biomedical Innovation Cluster*[10]."
- Life Sciences Nord/ Japanese Foundation for Biomedical Research and Innovation (FBRI) will continue to participate in the JETRO RIT programme 2017.

More information:

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[10] http://www.lifesciencenord.de/en/network/news/details/kobe-und-life-science-nord-in-gemeinsamer-mission/

Cooperation between BioXClusters+ and Osaka Bio Headquarters	
Partners: • BioXClusters+, a meta-cluster constituted of four European clusters: Biocat (Catalonia), BioM (Bavaria), bioPmed (Piedmont) and Lyonbiopole (Auvergne-Rhône-Alpes), gathering 3,300 SMEs; initially funded under the COSME programme "Clusters Go International" • Osaka Bio Headquarters, a cluster based on triple helix-cooperation, gathering the regional pharmaceutical industries, 11 universities and research institutions and the public institutions (Osaka Prefectural Government, Japan agency for medical research for drug discovery and development, pharmaceutical and medical services agency).	bioXclusters+ Osaka Bio Headquarters
Sectors and subsectors concerned: • Life Science and health and more specifically, personalised medicine, oncology, cardiovascular, inflammatory, infectious diseases, the central nervous system, immune therapy and regenerative medicine.	
Context: • Japan and EU have ageing population with increasing demand for personalised health care. In addition, the health care markets and research are heavily supported by the authorities, in both regions. Japan has shown interest in opening business and research cooperation with Europe. This has reinforced the attractiveness of the Japanese markets to European SMEs who wanted to export their medical and pharmaceutical products to Japan. • BioXClusters+ is a meta-cluster, gathering the most important European personalised health clusters of Europe. In this context, it decided to help develop cooperation in the life science and health sector, to foster the export of European SME's products and services. • After successfully opening Chinese, US and Brazilian markets to its members, BioXClusters+ decided to turn to the Japanese market and received a grant from the European Commission to do so, in 2014 (COSME Cluster Go International). • Preliminary contacts occurred during matchmaking events in Europe and led to BioXClusters+ to start a partnership with Osaka Bio Headquarters.	
Type of cooperation: • Matchmaking events (EU-Japan cluster matchmaking event in Bio Europe, in 2014, 2015 and 2016) In 2016, the match-making event gathered 34 EU and global cluster organisations. During the event, three key Japanese organisations presented their assets;	

- Business mission to Japan: in 2017, 26 representatives from European SMEs went to Japan in 2016, to meet with company representatives from Osaka Bio headquarters and attend the Bio Japan Conference, the largest biotech conference in Japan gathering up to 800 companies. During this event BioXClusters+ partners were able to meet with Japanese clusters, in addition to B2B meetings. During the same mission, the SME representatives also attended the European Biotech & Pharma Partnering Conference and the event "Regenerative Medicine Japan" which gathered more than 150 participants from both Japanese and EU companies, including seven European clusters. 289 face-to-face meetings were conducted. The success of the mission was the result of the involvement of BioXClusters+ whom collaboration with Osaka Bio Quarters had enabled to pre-select businesses relevant to the needs of its members.
- Signature of an MoU in 2016.

Objective:

- Allow European SMEs to export their personalised health products and services to Japan by reinforcing market access and foster fast-track business relationships, in the sector of personalised health, and help Japan benefit from an expert gate to the life science and health market in Europe.

Policy support:

- European Commission: COSME Cluster Go International

Results/outcomes:

- Successful intensifications of relations, from a match-making event to business mission to the signature of an MoU;
- Multiplication of individual contacts in spite of very strong differences of business cultures;
- BioXClusters+ is now an exclusive gateway to Europe in the field of personalised health care, whilst successful allowing its members to start business cooperation with Japan.

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4. Opportunities/potential for further EU-Japan cluster cooperation: thematic focus

The findings from the preparatory briefing paper on EU-Japan cluster cooperation elaborated by the ECCP, presenting the cluster landscape prior to conducting the analysis of current practices, indicate that the strongest sectors for cluster collaboration between the EU and Japan are the health, life sciences, ICT, biotechnology and renewable energies sectors today. In the future, the EU Japan Centre and JETRO anticipate a strong sectoral development in the fields of biotechnology, ICT, agriculture/food industries and nanotechnology.

4.1 Life science sector: current and potential opportunities for EU-Japan cluster cooperation

Japan has a 10 percent share in both the global pharmaceutical product and medical equipment markets ("Japan's pharmaceuticals market ranks 3rd globally, and is growing at a compound annual growth rate (CAGR) of 3.4%"[11]),. A number of foreign companies have entered the Japanese market and are operating in various fields as major players.[12]

The Japanese society is facing specific health challenges linked to its demographic trends, similarly to other industrialised countries. This has led authorities to significantly improve the business environment in this domain over the past years. The Cabinet has approved a "Healthcare and Medical Strategy" in July 2014 to make the theme of "life expectancy" a key business sector, through **cutting-edge medical technologies and services**. The strategy notably plans to better connect the different stages of product creation, from the R&D stage to the commercialisation stage. The broader aim is to provide world class medical services, promote the development of new health care services, nursing care, health promotion, disease prevention and everyday life support, and develop efficient and high-quality medical services by utilising ICT.

JETRO has identified the most attractive markets in Japan in the Life Science sector as the following:

[11] JETRO, Market Report on Japan's Biopharmaceutical & Biosimilars Industry, https://www.jetro.go.jp/usa/topics/market-report-japan-biopharmaceutical-biosimilars-industry.html, consulted on 18/12/2018

[12] JETRO, Attractive markets, Life science. July 2016., https://www.jetro.go.jp/ext_images/en/invest/attract/pdf/en_2016_life.pdf , consulted on 21/11/2017

- **The medical devices market:** The domestic market size of medical devices in 2013 was 2.6757 trillion yen, up to 103.2% from that of the previous year. The value includes imports of 1.3008 trillion yen from foreign companies, accounting for 48.6% of the total. The market is expected to continue to expand partly due to the Amendment of Pharmaceutical Affairs Law (PAL) in 2014 (which became the so called "PMD Act") which eased the regulation on medical devices.

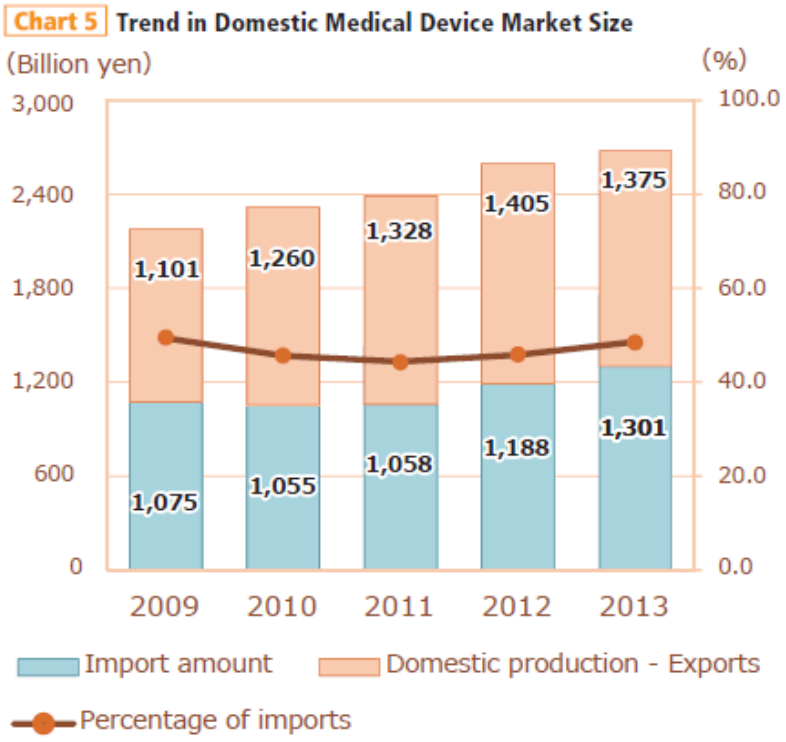

FIGURE 1 - TREND IN DOMESTIC MEDICAL DEVICE MARKET SIZE[13]

Markets that are expected to expand are notably those for endoscopic surgery, surgical support robots, and image diagnosis systems (MRI equipment). Companies that participate in the market include Olympus Medical Systems, MC Medical, Stryker Japan, Da Vinci (developed by the US company Intuitive Surgical, Inc.) leader in surgical support robots, Hitachi Medical, Toshiba Medical Systems, GE Healthcare Japan, Philips, and Siemens Japan.

- **The pharmaceutical products market:** imports of foreign drugs is expanding in Japan, facilitated by new regulation. The size of the domestic market for pharmaceutical products in 2013 was 9.8416 trillion yen, 101.9% of the previous year's total. The value includes imports

[13] https://www.jetro.go.jp/france/documentation/en-ligne.html

of 3.0773 trillion yen from foreign companies. The percentage of imports has increased year on year, from 24.2% in 2009 to 31.3% in 2013, marking a 7.1% increase over a four-year period. The market has been evolving more slowly recently, as sales of generic drugs particularly spread.

- **The regenerative medicine market:** the market is expected to grow, facilitated by the law and regulations in force, and the framework for speeding up commercialisation (Act on the Safety of Regenerative Medicine). In parallel, with the help of the government, the industry has founded an industrial association, the Forum for Innovative Regenerative Medicine (FIRM), a general incorporated association for developing the regenerative medicine industry in Japan, which 185 Japanese and foreign companies in the field have joined (as of January 2016).
- **Healthcare services:** given the characteristics of the Japanese population, medical expenses that have grown year on year and are expected to continue to increase more rapidly than the growth of GDP in the future. The healthcare fields with high potential include **nursing care ICT, personalised medicine, and self-care health promotion devices**.
    - The Ministry of Economy, Trade and Industry and the Ministry of Health, Labour and Welfare have implemented a "five-year plan for the development of robotic devices for nursing care" since 2014, with the aim of encouraging the rapid and widespread use of robotic devices for nursing care. According to the "Result of Survey on Robot Industry Market Trend," compiled by the Ministry of Economy, Trade and Industry, the market size of robotic devices for nursing care is projected to expand from 16.7 billion yen in 2015 to 404.3 billion yen in 2035. Domestic companies such as Kikuchiseisakusho, CYBERDYNE, Fuji Machine MFG, and Panasonic are active in this domain.
    - The core of the tailor-made medicine market consists in molecular-targeted drugs, and is accompanied by diagnostic agents, contract laboratory tests as well as DNA chips. Due to the expansion of molecular-targeted drugs, the market is growing and is expected to increase from 710.8 billion yen in 2014 to 914.3 billion yen in 2018 (projection by Yano Research Institute).
    - The health promotion equipment and service markets for maintaining and improving health on people's self-initiative have been expanding. The market is composed of health monitoring equipment. The main players in these markets include Omron Healthcare, Terumo, and Panasonic.

This sector was also previously identified by the US as an attractive sector for US businesses in Japan[14].

JETRO provides a map of the geographical concentration of industrial clusters in the life science sector in Japan.

[14] U.S. Department of Commerce, International Trade Administration, Japan's Manufacturing Competitiveness Strategy: Challenges for Japan, Opportunities for the United States, 2009.

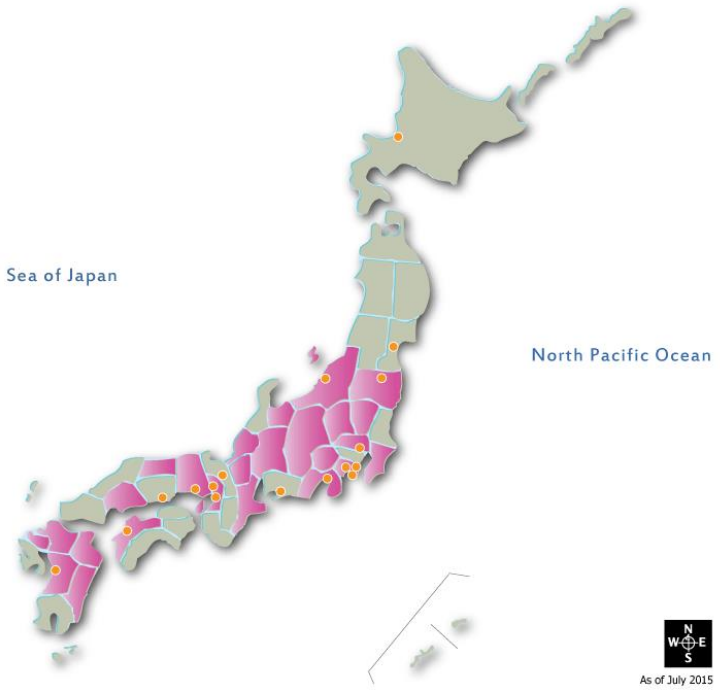

FIGURE 2 - INDUSTRIAL CLUSTERS IN THE LIFE SCIENCE SECTOR IN JAPAN - JETRO, 2015[15]

The areas identified in pink are the areas corresponding to the concentration of life sciences cluster activities in Japan. The identified orange dots correspond to the location of Japanese industrial clusters in the life sciences domain in Japan.

From the three previously identified EU-Japan cluster partnerships in the medical domains, **Toyama Pharmaceutical Association**, and **Polepharma**, the **Life Science Nord** and **Kobe Biomedical Innovation cluster** and **the Japan Cosmetic Centre (JCC)** and **Cosmetic Valley** collaboration present the strongest potential.

4.2 Electricity and renewable energy sector: current and potential opportunities for EU-Japan cluster cooperation

The energy environment in Japan has significantly evolved over the last ten years. Japan has experienced a decline in energy self-sufficiency due to its fuel conversion from coal to petroleum as well as the Great East Japan Earthquake in 2011 which caused a series of power plant shutdowns, notably nuclear plants, (Japan energy self-sufficiency has declined from 19.9% in 2010 to 6% in 2013). Imports of fossil fuels have thus significantly increased to face this shortage. The energy environment in Japan has penalised the local industrial sector, including SMEs, and also undermined the commitment of Japan in terms of environmental matters (such as CO2 emissions). Given these circumstances, the Agency for Natural Resources and Energy (affiliated to the METI) compiled a "**Long-term Energy Supply and Demand Outlook (Energy Mix)**" in July 2015 as the **new energy policy toward**

[15] https://www.jetro.go.jp/france/documentation/en-ligne.html

2030. The Japanese government's objective is to reduce dependency on Middle East petroleum by promoting smart and finely-tuned energy conservation and multilateral energy procurement in Japan. The focus of the energy policy for **energy mix** is to ensure stable supply ("Energy Security"), secure low-cost energy supply ("Economic Efficiency"), and pursue environmental suitability ("Environment") on the premise of "Safety." According to the energy supply-demand forecast in 2030, **renewable energy power generation** will expand to a range of about 22% to 24% of the total energy supply. The government aims to push each individual power source to the maximum of its potential: photovoltaic, hydraulic, wind, biomass, and geothermal power generation. The **FIT (feed-in tariff) scheme** started in July 2012 to promote the spread of renewable energy involving higher costs compared to those of nuclear and thermal power generation, and was reviewed annually since then to balance the renewable energy mix. In addition to developing the energy mix towards renewable energy, Japan can also be considered on track towards focusing on the "Liberalisation of Electricity Systems and the Gas Market" in the future (Policy on Electricity System Reform decided April 2013 and ongoing since 2015, and gas system liberalisation planned for 2017).

Three attractive markets for foreign businesses, notably European, have been identified by JETRO in the electricity and renewable energy sector:

- **Electricity retail market:** the scope of the electricity retail liberalisation market has gradually expanded since 2000, and was fully liberalised in 2016. It is now possible for new entrants or new electric power suppliers to sign a power contract of 50kW or less for general households and shops formerly provided only by the regional General Electric Utilities. Following the full liberalisation of the electricity retail sector, the number of pre-registered retail electricity suppliers, or business operators allowed to sell electricity to all consumers reached 310 corporations in June 2016. Such companies include electric power companies, gas companies, oil companies, trading firms, finance/real estate/developers, telecommunications companies, manufacturers, engineering companies, and energy management companies – most of them Japanese but international companies are expected to enter the market in the near future.
- **Renewable energy market, divided into:**
    - **Photovoltaic:** the market is dominated by public/industrial use (75%). It has been decreasing since 2015, and is expected to decrease until 2020, when the tendency should reverse positively (although the market of the PV system for residential use should remain stable). The leading players in the market include Japanese companies such as Panasonic, Sharp, Kyocera, Toshiba, Mitsubishi Electric, and Solar Frontier, as well as foreign companies such as Hanwha Q Sells Japan (Korea), Canadian Solar Japan (Canada), JA Solar Japan (China), Yingli Green Energy Japan (China) and Trina Solar Japan (China).
    - **Wind:** In the wind power generation system market, the focus is placed on offshore wind power generation in addition to the traditional land-based variety. Offshore wind development in the private sector is showing gradual progress, however it takes time for starting up new fields, especially due to the necessity to establish new infrastructure such as port facilities. The wind power generation system market is marked by a high share of foreign manufacturers. Major entrants include international

companies such as Vestas Wind Technology Japan (Denmark), Japan GE (US), ENERCON Services Japan (Germany), and Japanese companies such as Mitsubishi Heavy Industries, Japan Steel Works, Ltd., and Hitachi, Ltd.

- **Others:** further development is expected in the future in the fields of hydraulic and biomass power generation facilitated by the FIT system. Besides, Japan is believed to have the world's third-largest potential for geothermal power resources, which are currently not effectively utilised due to the long lead time it takes to bring on line power plants.

- **Smart meter market:** The number of smart meters introduced to Japan was 3.66 million units in 2014 and 7.5 million units in 2015. In the three years from 2016, more than 12 million units are planned to be installed each year. According to the METI Smart Meter System Study Group, on the whole, smart meter installation for electricity across Japan is scheduled to be completed by 2024. Gas liberalisation is also scheduled for 2017, thus demand for smart meters is also expected in this regard. Players in the market include Japanese companies such as Osaki Electric Co., Ltd., Mitsubishi Electric Corp., and Toko Toshiba Meter Systems, and non-Japanese companies such as GE Fuji Electric Meter and Itron Japan.

JETRO provides the following map of the geographical concentration of activities (or industrial clusters) in the environment and energy sector in Japan.

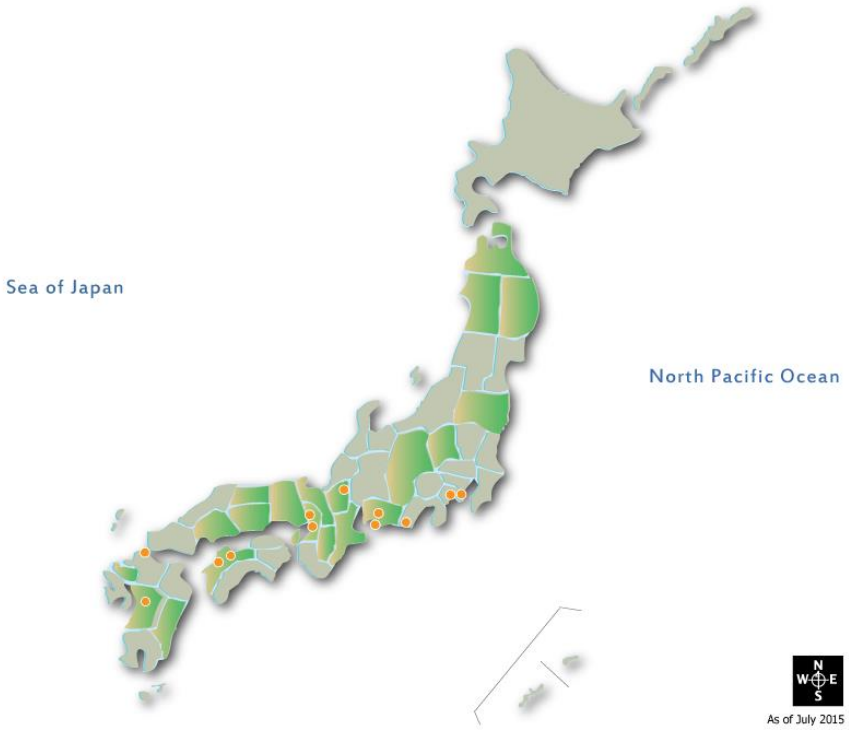

FIGURE 3 - INDUSTRIAL CLUSTERS IN THE ENVIRONMENT AND ENERGY SECTOR IN JAPAN - JETRO, 2015[16]

The areas identified in green are the areas corresponding to the concentration of environment and energy cluster activities in Japan. The identified orange dots correspond to the location of Japanese industrial clusters in the environment and energy domains in Japan.

In the environment / renewable energy sector, two partnerships have been initiated under the JETRO RIT programme: the **Scotland House/Nagasaki Dejima Incubator** and **Fukushima Prefecture/North Rhine-Westphalia** clusters. They represent a development potential.

Both partnerships have largely cooperated under regional delegation events and the JETRO RIT programme. These are cooperation projects that are at an advanced stage of development: indeed, an energy hub has been created between the Scotland House and the Nagasaki Dejima Incubator. The testing sites are expected to create 50 jobs and secure regular customers by 2022. If this project continues to develop, it would be a great success story to disseminate to other international clusters, specifically those active in the renewable energy areas.

Similarly, the Fukushima Prefecture signed an agreement with the German State of North Rhine-Westphalia. Fukushima and North Rhine-Westphalia will take turns hosting trade fairs featuring renewable energy businesses and promote joint research among businesses over the next three years. This is an excellent example of academia-industry international collaboration and could also serve as an important success story to SMEs and research institutions in the field. Currently, the Fukushima

[16] https://www.jetro.go.jp/france/documentation/en-ligne.html

Prefecture/North Rhine Westphalia collaboration is more of a regional agreement than a cluster organisation under the European definition of a cluster.