



D. 3.5 – Discussion paper on Brazil

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1. Existing EU-Brazil cluster cooperation

The relevance of the Brazilian economy in Latin America and in the world, the strong economic ties between Brazil and the EU, and the existing national policies supporting cluster development and their internationalisation in Brazil, present significant opportunities to build ties with Brazilian industry clusters.

Diplomatic relations between the EU and Brazil started in 1960 and have continuously developed since then, culminating in 2007 with the establishment of the EU-Brazil Strategic Partnership that covers economic growth, cooperation on key foreign policy issues and global challenges¹. This partnership clearly establishes a foundation for the development of EU-Brazil cluster community cooperation.

Biotechnology, renewable energy and Information and Communication Technology (ICT) are the industry sectors that present the most opportunities for technology, innovation and business cooperation between Brazilian clusters and EU clusters. More information about the three sectors is included in the Preparatory Briefing document by the ECCP, September 2016.

1.1. Policy dialogue on cluster cooperation

The EU and Brazil have focused on improving the framework conditions for cluster cooperation² between the two regions. Therefore, both regions have agreed in establishing a dialogue on cluster policies in order to promote mutual understanding and enhance the exchange of information on clusters.

In this context, to promote SME's competitiveness in the global market through clusters, in 2011, the *Ministério do Desenvolvimento, Indústria e Comércio Exterior* (MDIC - Ministry of Development, Industry and Foreign Trade) of the Federative Republic of Brazil has signed a Memorandum of Understanding (MoU) with the European Commission (EC). To enhance bilateral co-operation, both parties have committed to facilitate the exchange of information on clusters, innovation and SMEs policies through the establishment of communication channels; and to improve the framework conditions of clusters and SMEs policy initiatives by reducing the administrative burden, increasing access to finance, opening access to international market and removing barriers to trade³.

Building on this MoU and still in 2011, the *Arranjo Produtivo Local* Permanent Working Group (GTP-APL) signed a Clusters Cooperation Agenda (CCA) with the European Cluster Collaboration Platform (ECCP)⁴. This initiative aims to strengthen business, research and technological cooperation and to promote SME internalisation by encouraging clusters from Brazil and Europe to collaborate. In

¹ EEAS, Delegation of the European Union to Brazil, Brazil and the EU, 2016.

http://eeas.europa.eu/brazil/index_en.htm

² file:///C:/Users/danielabcoutinho/Downloads/Memorandum%20of%20understanding%20on%20smes-innovation-competitiveness-clusters%20en%2022-12-2011.pdf

³ www.ec.europa.eu/DocsRoom/documents/

⁴ http://portalapl.ibict.br/menu/itens_menu/gtp_apl/gtp_apl.html

December 2013, a new CCA was signed between GTP-APL and the ECCP where emphasis is given to: EU-Brazil cluster internationalisation and collaboration in the field of biotechnology and personalised medicine; and EU-Brazil cluster internationalisation and collaboration through SMEs of other emerging industries such as ICT, bio-economy (green chemicals, biomass, cosmetics, etc.), renewable energy and energy efficiency⁵.

The strategic partnership signed between EU and Brazil will be delivered on a Joint Action Plan currently being worked on, where cluster cooperation is embedded and expected to emerge with some level of ambition.

The biotechnology, renewable energy and ICT sectors have also been recognised as industrial sectors of common interest for both the EU and Brazil in the EU-Brazil Agreement for Scientific and Technological Cooperation (2004) and the Joint Research Centre - *Ministério da Ciência, Tecnologia e Inovação* (MCTI - Brazilian Ministry of Science, Technology and Innovation) Cooperation Arrangement (2013). The EU-Brazil Agreement for Scientific and Technological Cooperation⁶ between the European Community and the Federative Republic of Brazil, established in 2007 and renewed in 2012, aims to encourage, develop and facilitate cooperative activities in areas of common interest by carrying out and supporting scientific and technological research and development activities. Thirteen areas of common interest have been identified: biotechnology; information and communication technologies; bio-informatics; space; micro/nanotechnologies; materials research; clean technologies; sustainable management and use of environmental resources; biosafety; health and medicine; aeronautics; metrology, standardisation and conformity assessment; and human science⁷. The Cooperation Arrangement between the European Commission's JRC and the MCTI was signed in 2013 during the 6th EU-Brazil Summit and aims to strengthen and further structure scientific and other cooperative activities in the areas of: disaster prevention and crisis management; climate change and sustainable management of natural resources and ecosystem services; energy, including bioenergy and smart grids; food security; bio-economy; information and communication technologies (ICT); as well as nanotechnologies⁸.

1.2. Cluster to cluster cooperation

The EU has a strategic interest in stimulating C2C (Cluster to Cluster) cooperation with Brazilian clusters in order to increase the competitiveness of European clusters and their SMEs, and foster important international partnerships. In this context, the EC is supporting cluster to cluster cooperation initiatives between the EU and Brazil⁹, which aim at bringing together clusters from different sectors to promote the creation of strong international networks.

⁵ www.clustercollaboration.eu/sites/default/files/international_cooperation/mou-brazil-english_2013.pdf

⁶ This agreement opened the way for Brazil to participate in the European Union's Framework Programmes for research.

⁷ <http://ec.europa.eu/world/agreements/prepareCreateTreatiesWorkspace/treatiesGeneralData.do?step=0&redirect=true&treatyId=2041>

⁸ <http://ec.europa.eu/research/iscp/index.cfm?amp;pg=brazil>

⁹ <http://ec.europa.eu/transparency/regdoc/rep/3/2014/EN/3-2014-7423-EN-F1-1-ANNEX-7.PDF>

The organisation of matchmaking events supported by the ECCP, as well as the matchmaking missions organised by the Low Carbon Business Action in Brazil (LCBA), have been two of the main tools to foster collaboration between Brazilian and EU clusters. In 2013, the first EU – Brazil matchmaking was organised by the ECCP to promote business, research and technological cooperation between EU and Brazilian clusters within the biotechnology sector (more details available in the ECCP report¹⁰). A Joint Statement was issued by Brazilian Government members and EU officials to take stock of a proposal made by clusters to set up a EU-Brazil Innovation Centre. More recently, several LCBA matchmaking events have been held in Brazil, in addition to the incoming matchmaking mission organised by the ECCP together with the LCBA in November 2016 in the scope of Pollutec Fair (Lyon, France).

Despite these initiatives, it should be considered that the Brazil cluster policy and cluster community is still incipient and the definition of cluster does not always match the European definition. In this regard, there are few examples of cooperation between Europe and Brazil purely involving clusters. Often cluster-related innovation agencies and business associations appear to be a workable fit for clusters. In addition, high-value business and technology cooperation seem a preferential form of cooperation as the primarily approach is focused on innovation and value-chain leadership. Initially it is expected that cooperation materialises in technology sales and cooperation to progressively evolve towards business alliances. Thus, these matchmaking events are a first stage to achieving a higher level of EU-Brazil cluster cooperation and it is only now that some outcomes in this regard can be observed. As an example of what is being achieved, some cluster cooperation results (mainly a result of the EU-Brazil Cluster Matchmaking Event in Lyon) are presented below.

Around 60 clusters and SMEs, both European and Brazilian, took part in the EU – Brazil Cluster Matchmaking Event in Lyon (France). A follow up survey conducted to analyse the results of this matchmaking has shown that some European clusters initiated cooperation with Brazilian counterparts (not all of them clusters).

The Cleantech & Energy Innovation Cluster (CLEVER) from Italy was very active establishing three cooperation agreements with Brazilian clusters: APL Polo Naval e de Energia do Rio Grande, Technology Park Sao José dos Campos, and a Brazilian Institute of Information in Science and Technology (IBICT). The collaborations aimed essentially at sharing knowledge, exchanging information, developing joint R&D activities, promoting technology transfer, and establishing business contacts among members.

CLEVER's initial objective in regard to collaborating with APL Polo Naval e de Energia do Rio Grande was to identify its needs in order to set a technology offer. In the case of Technology Park Sao José dos Campos, the goals were stimulating networking among members and identifying cooperation opportunities through exchanging portfolios of companies; while the cooperation with IBICT (EEN contact point in Brazil) aimed at providing access to information and stakeholders in the logistics and transport sector within the country.

¹⁰<http://archive.clustercollaboration.eu/documents/2736637/2945936/Communication-Report+Brazil-VF.pdf/4ce48385-8be2-4716-ade7-d265e6cf4c14;jsessionid=B2FF1F49F461318D972D1BD803E461DF?version=1.0>

Aria Normandy (France) also established cooperation although in this case, with a Brazilian firm ENGPISO for R&D activities. Besides increasing the business contacts in Brazil that might lead to new business in the country, the main objective was to facilitate technology transfer and exchange of information involving waste and recycling as well as biomass.

There are several European Strategic Cluster Partnerships Going International (ESCP-4i), whose target markets also include Brazil. For instance, EACP – ABROAD and Reina Plus (Strand -2) focus on the aerospace and the energy industries respectively and perceive Brazil as a country full of opportunities. As a consequence, both ESCP-4i have developed and participated in various activities devoted to strengthening ties between the EU and the Brazilian organisations.

For instance, EACP – ABROAD¹¹ organised a fact finding mission to visit the aeronautic ecosystem in São José dos Campos, Brazil, where the EU delegation learned about funding mechanisms available to the companies to develop R&D projects and business, encountered different organisations and were introduced to the local activities. With respect to Reina Plus¹², they actively participated in many matchmaking events organised either by the LCBA or the ECCP to widen their network in the country and exploit the many available opportunities.

Along the same line, two additional ESCP-4i (Strand-2) have targeted the Brazilian market: Moving the Future – MOVE¹³ focused on transportation and logistics; and New Frontier in Food¹⁴ focused in food processing and manufacturing. These ESCP-4i took part in study visits and matchmakings among other activities related to the country.

There are also examples of Brazilian clusters with a strong international dimension aiming for cooperating with European clusters. This is the case of the **Trino Polo** cluster, an IT cluster from Caxias do Sul (Southern Brazil), which has several representatives travelling in Europe to promote cooperation with European companies¹⁵.

In summary, common interests between the EU and Brazil are easily identified and the increasing positive results of the matchmaking events and other collaborations prove that both parties are reaching a common point of understanding that can result in a fruitful relationship in several relevant fields in the mid-term.

2. Good practices / Success stories related to cluster cooperation

Brazil is a large country, with a workable business environment compared to other economies in Latin America. It is consequently a vital partner for the European Union in the region.

¹¹ www.clustercollaboration.eu/escp-profiles/abroad

¹² www.clustercollaboration.eu/escp-profiles/reina-plus

¹³ www.clustercollaboration.eu/escp-profiles/move


¹⁴ www.clustercollaboration.eu/escp-profiles/new-frontier-food

¹⁵ www.jedox.com/en/press/brazilian-it-cluster-visits-jedox

As mentioned in the previous section, cluster cooperation is still in a very preliminary stage, although the matchmaking events (organised by the ECCP and LCBA) conducted recently have been helpful to start a process of interaction that should bring interesting results in the mid-term.

Therefore, and aiming to provide further context on the level and effectiveness of cooperation that can be established with Brazilian entities, three success stories of cooperation between Brazilian and EU SMEs/research institutes belonging to clusters are highlighted below. The success stories include information on: the sector and stakeholders concerned; the process that has led to cooperation; the policy support; common activities; and the outcome of the cooperation. The information has been collected through a literature review and interviews with the relevant organisations.

2.1. Success story 1: EMBRAPA, UFRGS and 16 EU partners

Cooperation between the EMBRAPA, the UFRGS and 16 EU partners ¹⁶	
<p>Partners:</p> <ul style="list-style-type: none"> • Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA), food cluster of the South region, Brazil¹⁷ • Federal University of Rio Grande (UFRGS), Health Technology Cluster (Cluster de Tecnologias para Saúde), Brazil¹⁸ • Provimi, Rotterdam's food cluster, Netherlands, EU¹⁹ • FertiPrado, Portugal Foods (agri-food cluster), Portugal, EU²⁰ • 16 EU Research Institutes/Universities, including the Institut National de la Recherche Agronomique (INRA), Pole Mer Bretagne Atlantique, France²¹ • 5 Research Institutes/Universities from Tunisia, Senegal, South Africa, Kenya and New Zealand 	
<p>Sectors and subsectors concerned:</p> <ul style="list-style-type: none"> • Livestock sector <ul style="list-style-type: none"> • Sustainable livestock sub-sector 	

¹⁶ www.animalchange.eu/Content/consortium.html

¹⁷ www.embrapa.br

¹⁸ www.ufrgs.br/ufrgs/inicial

¹⁹ www.provimi.nl/en-nl/Home.html

²⁰ www.fertiprado.pt

²¹ www.inra.fr

Cooperation between the EMBRAPA, the UFRGS and 16 EU partners ¹⁶

Context:

- The EMBRAPA is a public research institution tied to the Brazilian Ministry of Agriculture, Livestock and Food Supply (*Ministério da Agricultura, Pecuária e Abastecimento*) aiming at developing technology and creating knowledge for the Agriculture and Livestock sectors. It is part of the food cluster of the South region (*Arranjo Produtivo Local - Alimentos da Região Sul*)²².
- The UFRGS, which belongs to the Health Technology Cluster (*Cluster de Tecnologias para Saúde*)²³, is a public higher education institution in Sao Paulo ranked 4th best Brazilian university by the QS World University Rankings (published by Quacquarelli Symonds from the United Kingdom)²⁴.
- Provimi is considered one of the leaders in the international animal feed industry. The company is based in the Rotterdam's food cluster, Netherlands²⁵.
- FertiPrado is a Portuguese company that belongs to Portugal Foods, a Portuguese Agri-food cluster²⁶. It provides R&D and technical support to agriculture and livestock companies in Portugal.
- Besides the aforementioned partners, the cooperation also consists of 21 academic partners based in the EU, Africa and New Zealand – including the INRA (based in the Pole Mer Bretagne Atlantique, France²⁷), which is the cooperation coordinator.

Type of cooperation: Knowledge sharing and technology development

- The aforementioned partners established a cooperation through the initiative ANIMAL CHANGE, which was created to improve CO2 emissions estimates and emissions reduction methods in livestock systems.
- Some partners worked together on the development of scenarios, models, assessments and policy support tools at the farm and regional level, while other partners have tested the models and findings at 24 case study farms in Europe, Africa and South America.

Objective:

- The overall objective of this cooperation was to explore future scenarios for the livestock sector under baseline and atmospheric CO2 stabilisation scenarios.

Policy support:

- The ANIMAL CHANGE initiative has received nearly €9 million funding from the European Union's Framework Programme 7.

²² www.aplalimentosul.org.br/Pagina/6/Comite-Gestor

²³ www.ufrgs.br/ufrgs/noticias/ufrgs-assina-termo-de-cooperacao-para-implementacao-de-cluster-de-tecnologias-para-a-saude; www.ufrgs.br/ufrgs/noticias/encontro-discute-participacao-da-ufrgs-no-cluster-de-tecnologias-para-a-saude-1

²⁴ www.topuniversities.com/university-rankings/world-university-rankings/2016

²⁵ <https://rotterdampartners.nl/nl/assets/File/2015%20Factsheet%20Agrofood.pdf>

²⁶ www.portugalfoods.org

²⁷ www.pole-mer-bretagne-atlantique.com/fr/annuaire

Cooperation between the EMBRAPA, the UFRGS and 16 EU partners¹⁶

Results/outcomes:

- Reduction of uncertainties in greenhouse gas emissions and assessment of climate change impacts on livestock systems (including grasslands).
- Development of breakthrough technologies for adaptation and mitigation to climate change for both ruminants and monogastrics.
- Design of an integrated and consistent mitigation and adaptation policy framework for the livestock sector.

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2.2. Success story 2: SEARA, FURG and 20 EU partners

Cooperation between the SEARA, the FURG and 19 EU partners²⁸

Partners:

- The Seara Alimentos S.A (SEARA), Agro-industrial Cluster of the west region of Santa Catarina, Brazil²⁹
- Federal University of Rio Grande (FURG), Rio Grande, Brazil³⁰
- Ttz Bremerhaven (Germany, EU)³¹
- Additional 19 EU-based partners and two partners from China³²

Sectors and subsectors concerned:

- ICT sector
 - Food safety sub-sector



²⁸ www.chill-on.com

²⁹ www.seara.com.br

³⁰ www.ufrgs.br/english/home

³¹ www.ttz-bremerhaven.de/en/

³² www.chill-on.com/partners.html

Cooperation between the SEARA, the FURG and 19 EU partners²⁸

Context:

- The SEARA is a Brazilian food processing company specialised in the development and distribution of meat products. The company became the largest exporter of chicken in the country, exporting meat and poultry products to other continents like Europe, Asia, Middle East and the Far East. The SEARA company belongs to the Agro-industrial Cluster of the west region of Santa Catarina (*Aglomerado Agro-industrial do Oeste Catarinense*³³).
- The FURG is one of the largest federal universities in Brazil. It is among the most highly rated Brazilian universities and has one of the highest numbers of scientific publications in Brazil.
- Ttz Bremerhaven is an innovative provider of research services and operates in the field of application-oriented research and development. It is comprised of a Food Technology Lab (Lebensmitteltechnologie), a Sensor Lab (Sensoriklabor) and a Water, Energy and Landscape Management Institute (Wasser, Energie und Landschaftsmanagement)..
- Besides Ttz Bremerhaven, there are 19 partners based in the EU as well as two partners from China.

Type of cooperation: Interdisciplinary Research and Development

- The focus of this cooperation project, named CHILL-ON, is to provide for the first time ever an integrated solution for the entire frozen and chilled food supply chain.
- This has been accomplished through the implementation of an interdisciplinary research and development work programme that included a very wide spectrum of disciplines: biochemistry; genetics and microbiology; chilling, packaging, smart labels (eChillOn); logistics; and information technologies such as active and passive RFID, GPS, GIS, electronic Supply Chain Management (eSCM) and a Decision Support System (DSS).

Objective:

- The overall aim of the cooperation is to develop and integrate novel technologies to improve safety, transparency and quality assurance of the chilled/frozen food supply chain.

Policy support:

- The Chill-on project has received €10.1 million funding from the European Union's Framework Programme 6.

Results/outcomes:

- Risk assessment of the chilled/frozen food supply chain and development of a quantitative microbial risk model transport and storage supporting technologies to extend shelf life; this includes optimisation of a liquid ice technology, based on the patented Wiped Surface Crystalliser System, and a comparative study of existing cooling techniques.
- Research, development and validation of a new generation of so-called "eChillOn – Smart Labels", a combination of Time-Temperature-Indicator and Radio Frequency Identification technologies.
- Development and implementation of a new, complex IT system (software and hardware) for data handling and transfer to ensure traceability, called TRACECHILL-System.

³³ www.anpad.org.br/admin/pdf/3es2005-102.pdf

Cooperation between the SEARA, the FURG and 19 EU partners²⁸

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2.3. Success story 3: IPT and 27 EU partners

Cooperation between the IPT, the UCC and other 26 EU partners³⁴

Partners:

- The University College Cork (UCC), Energy Cork Cluster, Ireland, EU³⁵
- The Institute for Technological Research (IPT) Technology Park of São João de Campos, Brazil³⁶
- Additional 26 EU-based partners³⁷



Sectors and subsectors concerned:

- Energy sector
 - Marine renewable energy sub-sector

Context:

- The UCC was established to provide access to higher education in the Irish province of Munster. The University was named Irish University of the Year by the *Sunday Times* on four occasions (most recently in 2015/2016). It belongs to the Energy Cork Cluster, which aims to strengthen enterprise and employment within the energy sector in the Cork region³⁸.
- The IPT is one of Brazil's largest research institutes, with state-of-the-art laboratories and a highly qualified team of researchers and technicians working basically in four major areas: innovation, R&D, technological services and metrological support, and information and education in technology. The IPT is based in the Technology Park, which is home to over 60 technology companies³⁹.
- Besides the UCC (coordinator of the cooperation) and the IPT, there are an additional 26 partners based in the EU.

³⁴ www.fp7-marinet.eu

³⁵ www.ucc.ie/en/

³⁶ www.ipt.br

³⁷ http://cordis.europa.eu/project/rcn/98372_en.html

³⁸ www.energycork.ie/index.php/about/

³⁹ www.pqtec.org.br/quem-esta-no-parque/centros-empresariais.php

Cooperation between the IPT, the UCC and other 26 EU partners³⁴

Type of cooperation: Infrastructure sharing and technology development

- The establishment of the consortium Marine Renewables Infrastructure Network for Emerging Energy Technologies (MARINET) allowed the sharing of 45 infrastructures that are operated by 30 research centres around Europe.
- By leveraging the knowledge of energy experts from Brazil and from 13 EU Member States, several techniques to obtain energy from marine resources have been developed.

Objective:

- The aim of this cooperation was to support the acceleration and development of marine renewable energy by harnessing the full capabilities of these infrastructures.

Policy support:

- €9 million of EU funding enabled the network to offer both academic and industry groups periods of free-of-charge access to the network's infrastructures, to improve the infrastructures by conducting research, to standardise the testing methods and to promote training and networking.
- A cornerstone of this cooperation was to provide transnational access to world-class facilities for researchers and developers of marine energy systems.
- Researchers and developers have been granted access to supported facilities that would not necessarily be available in their home state, or might be too expensive for SMEs to access normally.

Results/outcomes:

- New approaches to obtain energy from marine resources
- New approaches for offshore wave climate / tidal current / wind site

(the results have been presented at many EU offshore renewable energy conferences and published in over 60 scientific papers and conference presentations, including seven key articles published in a special issue of the International Journal on Marine Energy)

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3. Opportunities/potential for further EU-Brazil cluster cooperation: thematic focus

Despite the economic recession and legal barriers to investment in Brazil, it is still one of the most favoured countries in Latin America for investment, which is an indication of the opportunities and potential for EU-Brazil cooperation. The greatest opportunities and potential for cooperation are most likely within the more innovative sectors of Brazil. The following section provides insight on opportunities and potential for cooperation related to three sectors as identified by the preparatory briefing developed by the ECCP (September 2016).

3.1. Biotechnology sector

In recent years, Brazil has grown into the most sophisticated and diversified science, technology and innovation system in Latin America⁴⁰. The biotechnology sector is one of the most sophisticated sectors in Brazil, and one that offers promising opportunities for cooperation with EU clusters (as concluded in the Preparatory Briefing on Brazil)⁴¹. The main areas of interest in biotechnology are human health, environment and bioenergy, animal health and agriculture.

There are several opportunities for cluster to cluster cooperation among the EU and Brazil in the biotechnology sector. The **Personalised Healthcare ESCP-4i** is an example of a consortium of EU biotechnology clusters with the objective of addressing the next-decade European challenges related to healthcare and SMEs growth through the establishment of cooperation between some EU Member States (Italy, Germany, France and Spain) and Brazil.⁴² The “EU-Brasil Cluster Matchmaking Event – Biotechnology Dedicated to Human Health and Personalised Medicine”, held in Rio de Janeiro in 2013, also illustrates the potential and interest of both regions in establishing cooperation in the said field⁴³.

The **EURAXESS Brazil** is another initiative which offers an opportunity for the EU and Brazil to cooperate in the biotechnology sector. SME members of EU and Brazilian biotechnology clusters could benefit from this initiative since it has the objective of promoting researcher mobility and cooperation, serving researchers of all nationalities, all disciplines, and at all career stages. EURAXESS Brazil has been serving researchers in all fields interested in collaborating with and/or pursuing a research career in Europe since 2013. This initiative includes programmes to promote the

⁴⁰ <http://archive.clustercollaboration.eu/documents/2736637/2815630/Report-market+analysis.pdf/c363fed6-2b46-45e8-8659-9cb743bbee1d?version=1.0>

⁴¹ <http://archive.clustercollaboration.eu/web/guest/brasil>

⁴² www.clustercollaboration.eu/escp-profiles/bioxclusters

⁴³ “EU-Brasil Cluster Matchmaking Event – Biotechnology Dedicated to Human Health and Personalised Medicine” (2013)

www.clustercollaboration.eu/sites/default/files/event_calendar/communication-report_brazil-vf_0.pdf

cooperation and mobility between the EU and Brazil in the Biological and Medical Sciences⁴⁴ with the aim to enhance cooperation between businesses of this field.

On the other hand, the “**Feeding the planet – European Bio Food Clusters on the world stage**” event, also aims at fostering cooperation between European clusters with a view to internationalisation strategies outside Europe, namely in Brazil. This action involves three different types of stakeholders: research and training organisations, innovative companies (in agriculture, agro-food and agro-biotechnologies sectors) and local authorities⁴⁵.

Taking into account the interest of the EU cluster community as shown by the ESCP-4i and other existing initiatives that promote cooperation between European and Brazilian organisations, European clusters can find it highly rewarding to cooperate with Brazilian clusters in order to open the Brazilian market to European products, technologies and services in the fields of human health, animal health and agriculture.

3.2. Renewable energy sector

In the last decade, Brazil has focused in developing the renewable energy sector in order to increase energy consumption deriving from renewable sources. In fact, the Brazilian government aims to increase renewable energy consumption by at least 10% by 2020. As a result, several measures have been developed by the government to stimulate wind-power, biomass and small hydro sub-sectors⁴⁶.

Considering Brazil’s leading position in the renewable energy sector, many of the EU Member States have also developed strategic partnerships with Brazil. These partnerships are focused in trade and investment, research and science and increased collaboration on key energy issues⁴⁷.

Taking into account the importance of the renewable energy sector for both for the EU and Brazil, there are several opportunities for cluster to cluster cooperation among these regions. The **REINA PLUS ESCP-4i** is an example of a consortium of European clusters with similar international interests with similar target countries, such as Brazil, with the aim to intensify cluster collaboration across borders and sectoral boundaries. This ESCP-4i recognises Brazil as a market with high growth potential in the sector of renewable energy and, therefore, aims to foster collaboration between Brazilian organisations and European Energy Clusters⁴⁸.

The wide range of opportunities in this sector also led to the organisation of the **EU-Brazil Cluster & Business Matchmaking Event**, which took place in Lyon with the aim of fostering cooperation

⁴⁴ <https://euraxess.ec.europa.eu/worldwide/brazil>

⁴⁵ www.fondazionepolitecnico.it/en/events/events/feeding-the-planet-european-bio-food-clusters-on-the-world-stage-final-event#.WHZQ1vmLTIU

⁴⁶ <http://archive.clustercollaboration.eu/documents/2736637/2815630/Report-market+analysis.pdf/c363fed6-2b46-45e8-8659-9cb743bbee1d?version=1.0>

⁴⁷ <file:///C:/Users/danielabcoutinho/Downloads/Brazil+Low+CarbonToR.pdf>

⁴⁸ www.clustercollaboration.eu/escp-profiles/reina-plus

between European and Brazilian clusters and companies⁴⁹. The event was co-organized by the ECCP and the **Low Carbon Business Action (LCBA)** in Brazil.

The launch of the LCBA in Brazil, a European Union-funded-initiative that aims to contribute to sustainable development and greening of Brazilian industries through the adoption of low emission technology, is also a cooperation initiative that needs to be highlighted. This is an opportunity for European clusters' SME members to establish cooperation activities in the country, since this action is expected to engage 720 small and medium-sized enterprises (SMEs) from Brazil and from the 28 Member States of the EU through a series of business matchmaking missions being held between August 2016 and December 2017. These business missions promote the exchange of innovative experiences, support companies in their transition to low carbon technologies and resource efficient processes in 8 target sectors⁵⁰. As of January 2017, a total of 366 SMEs cooperation agreements had been signed between EU and Brazilian companies.

3.3. Information and Communication Technology

Currently, Brazil's innovation ecosystem is regularly appearing in the global ICT news. Cities like São Paulo, Belo Horizonte, Florianopolis and Rio de Janeiro are developing into the new tech hubs of Latin America⁵¹.

In this context, Brazil's leading position in the ICT sector has led to the increase of C2C cooperation opportunities between Brazilian and EU clusters. Thus, there are several examples of initiatives where European clusters cooperate with Brazil, such as the cooperation between the bioXclusters (ESCP-4i) and the **Foundation of Health of Ribeirão Preto (FIPASE)** in Brazil. The partnership is a two-year agreement that aims to increase collaboration opportunities between European SMEs and their Brazilian counterparts. This agreement is focused in biotechnology and information technology sectors⁵².

Considering the importance of the cooperation between Brazilian and EU clusters in ICT, in September 2016, the Brazilian Ministry of Science, Technology, Innovation and Communications (Ministério da Ciência, Tecnologia, Inovações e Comunicações – MCTIC) organised the “**ICT Week**” in Brasilia, Brazil. The “**ICT Week**” aimed at fostering cluster exchanges and discussion on digital technologies. The event gathered researchers, policy makers and information communications technology (ICT) enterprises from both Brazil and the EU to discuss cyber security, internet of things (IoT), over the top (OTT) services and 5G technologies. At the event, the MCTIC referred that an IoT Action Plan will be developed based on the outputs of a working group dedicated on IoT. The main

⁴⁹ www.b2match.eu/eu-brazil-2016

⁵⁰ www.lowcarbonbrazil.com/project.html

⁵¹ www.thenextsiliconvalley.com/2015/08/20/3350-brazil-nurtures-its-own-mini-silicon-valley-like-clusters/

⁵² <https://bioclusters.eu/2013/04/22/bioclusters-partners-sign-mou-with-brazilian-fipase/>

aim of the plan will be to promote and strengthen EU-Brazil academic and business cooperation in the field⁵³.

In addition, joint calls for collaborative projects in fields such as Cloud Computing⁵⁴, Internet of Things Pilots⁵⁵ and 5G Networks⁵⁶ also aim to foster EU-Brazil cluster collaboration in the Information and Communication Technology field.

4. ESCP initiatives enhancing cluster cooperation with Brazil

A few cluster matchmaking missions have been conducted to facilitate cooperation between European and Brazilian clusters. The EU-Brazil Cluster & Business Matchmaking Event held in France in November 2016, for instance, allowed 18 clusters and 6 SMEs from EU Member States to meet 34 clusters, associations, businesses and government bodies from Brazil⁵⁷. Since Brazil is a target destination for R&D and business cooperation for seven ESCP-4i's, representing 30 EU clusters and 6,140 EU SMEs, more ESCP-4i activities are planned for the near future. Table 1 below includes future ESCP-4i activities dedicated to promote and strengthen cooperation between EU clusters/SMEs and Brazilian clusters/SMEs⁵⁸.

Table 1 - ESCP-4is interested in strengthening cooperation with Brazil⁵³

ESCP-4i	Sector	Number of EU clusters	Number of EU SMEs	Planned activities
EACP ABROAD	Aerospace	10	36	<ul style="list-style-type: none"> • Development of a cluster-level frame of collaborations with Brazil
MobiGoIn	ICT	4	1100	<ul style="list-style-type: none"> • Information is not available
REINApus	Energy	4	704	<ul style="list-style-type: none"> • Target Market Group Meetings and Exploratory trips in Brazil
MOVE	Transportation	4	300	<ul style="list-style-type: none"> • Analysis of the Brazil market • Organisation of brokerage events targeting Brazilian clusters and SMEs
New Frontier in Food	Food	4	700	<ul style="list-style-type: none"> • Possible study visits to Brazil
BioXclusters plus	Biotechnology	4	3300	<ul style="list-style-type: none"> • Possible signature of MoUs and gateways agreements with Brazil

⁵³ <https://eubrasilcloudforum.eu/en/blog/outcomes-ict-week-2016-brasilia-brazil>

⁵⁴ www.incobra.eu/en/object/call/44

⁵⁵ www.incobra.eu/en/object/call/44

⁵⁶ www.incobra.eu/en/object/call/44

⁵⁷ www.clustercollaboration.eu/event-calendar/eu-brazil-cluster-business-matchmaking-event

⁵⁸ www.clustercollaboration.eu/sites/default/files/escp-4i_survey_analysis.pdf