



D. 3.5 – Discussion paper on China

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Abstract: The discussion paper on China is thought as a semi-confidential document delivered to the European Commission (*DG GROWTH* and *EASME*) to provide policy-makers with inputs for the policy discussion on cluster cooperation and for policy arrangements on clusters with China.

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1. Objective of the report

The purpose of the present document is to provide an overview on the existing European Union (EU) and China cluster cooperation, related good practices and success stories, and highlight opportunities for future cluster-based exchanges, including recommendations for an EU-China cluster policy dialogue.

The paper is thought as a semi-classified document delivered to the European Commission (DG Growth and EASME) to provide policy-makers with inputs for the policy discussion on cluster cooperation and for policy arrangements on clusters with China. The content is based on desk research and selected interviews with relevant local contact points.

A related document, the Preparatory briefing on China, was developed by the European Cluster Collaboration Platform (ECCP) as a deliverable of the project to provide a basis for the analysis and recommendations included in this paper.

2. Existing EU-China cluster cooperation

In 1978, China changed from a centrally-planned to a market-based economy that resulted in a rapidly growing economic that continues to the present days. In recent years, the country has reached a leading position in many sectors prone to have a significant impact on the future global economy, such as: automotive, biotechnology, renewable energy, and information and communication technology (ICT).

These sectors are highly grounded in innovation and knowledge transfer, offering many cluster to cluster cooperation (C2C) opportunities between the EU and China. Based on their strategic position, a solid economic relationship and a common vision on how to innovate and increase the competitiveness of their SMEs, both regions have developed many initiatives and continue to plan new ones to foster joint collaboration in order to materialise and capitalise the existing potential.

2.1. Policy dialogue on cluster cooperation

Since the establishment of diplomatic relations between the EU and China in 1975, the Asian country has undergone significant economic, social and technological development. The shift on its strategy and the consequent results have reaffirmed the importance of promoting a joint cooperation with China, which has been confirmed as a key partner by successive decisions and agreements made by the European Commission (EC) and the Chinese governmental authorities.

The EC set up a High Level Innovation Cooperation Dialogue (ICD, 2012) to raise the level and intensity of research and innovation (R&I) collaborations with China. In the same line, China-EU relations were upgraded to a Comprehensive Strategic Partnership (2013) that expanded the relationship from its initial economic focus to a wide range of areas.

The Comprehensive Strategic Partnership is based on three pillars: political, economic and people-to-people exchanges. A recent policy paper on the EU produced by China addresses creating a China-EU industry alliance focused on emerging industries such as renewable energy,

digital information, advanced manufacturing, nanotechnology, and healthcare industries located in the China-EU High-tech Park¹.

The EU-China 2020 Strategic Agenda for Cooperation, which aims to foster the establishment of synergies to enhance cooperation in strategic fields, constitutes a strong basis for the creation of cluster collaboration initiatives focused on areas such as sustainable growth and urbanisation². The annual China-EU Summit is also part of the China-EU strategy to promote policy dialogue between the two regions. This event takes into account the economic challenges and opportunities that both regions face so as to find joint solutions³.

China is currently enduring an ambitious reform of its national funding system for science, technology and innovation (STI) as well as its institutional setup. The 19th EU-China Summit (2017) reinforced the importance of cooperation in R&I as a driver for economic and social development and a key element of EU-China relations. As a result, a Joint Statement on flagship initiatives and co-funding mechanisms and a Framework Research Arrangement between the European Commission Joint Research Centre and the Chinese Academy of Sciences were signed.

At the 3rd EU-China Innovation Cooperation Dialogue organised at the Summit, the EU and China have agreed to boost their cooperation with a new package of flagship initiatives targeting the areas of food, agriculture and biotechnologies, environment and sustainable urbanisation, surface transport, safer and greener aviation, and biotechnologies for environment and human health.

The EU-China scientific cooperation is governed by a Science & Technology Cooperation Agreement signed in December 1998 and renewed for the third time in December 2014⁴.

In parallel to the abovementioned frameworks, the EU has already implemented cooperation projects with China to enhance the Sino-European collaboration. In this respect, Dragon-STAR^{Plus} following its predecessor (DRAGON-STAR)⁵, provides support services to European and Chinese researchers and policy makers, and offers a flexible platform to facilitate policy discussions between European and Chinese stakeholders. Another example is the Europe-China Eco-Cities Link (EC-Link) project⁶, which aims to assist Chinese cities in implementing energy and resource-efficient measures by sharing experiences in sustainable urbanisation with cities in Europe.

2.2. Cluster to cluster cooperation

China is the world's third largest economy after the EU and the US. The country is home to an important cluster community that is distributed across different regions, namely the Pearl River Delta (PRD), Yangtze River Delta (YRD) and Bohai Rim (Beijing - Tianjin - Liaoning). The cluster community's main sectors of activity are agriculture, high-tech industry and manufacturing.

China's public cluster policy is developed by both the central and provincial governments. The national government follows the guidelines established by the National Development and

² http://eeas.europa.eu/archives/docs/china/docs/eu-china_2020_strategic_agenda_en.pdf.

³ www.chinamission.be/eng/zogy/

⁴ <http://ec.europa.eu/research/iscp/index.cfm?pg=china#>

⁵ www.dragon-star.eu

⁶ <http://eclink.org>

Reform Commission (NDRC)⁷, for facilitating the development of industrial clusters. In this context, the most notable initiative is the TORCH Programme (1998), which is based on an initiative to develop China's new and high-tech industries⁸.

The EU-China dialogue has been growing in recent years, especially within the scope of the EU-China 2020 Strategic Agenda for Cooperation, which promotes the collaboration links between European and Chinese clusters by means of several projects and cluster matchmaking missions. As a result, cooperation opportunities have been established that are grounded in key sectors of common interest, which stimulate the creation of *win-win* collaboration scenarios.

The bilateral cooperation aims at managing global challenges like health, climate change, food security and clean energy supply. In the particular case of the ICT industrial sector, cooperation could attain great mutual benefits for the businesses and societies, as China and the EU are considered to be global ICT leaders. In addition, China is one of the top targeted countries for international cooperation according to the current cluster consortiums under the ESCP-4i initiative.

The majority of the sectors regarded as strategic by the European industrial policy are focused on areas that also have an important cluster representation in China. Thus, the convergence of both approaches is leading to the emergence of diverse C2C cooperation opportunities in various areas among which automotive, biotechnology, renewable energy, and information and communication technology (ICT) are identified as the sectors with the highest potential.

There are almost 200 European cluster organisations across several sectors that selected China as a target country for their internationalisation strategy. In addition, there are eight European Strategic Cluster Partnerships-Go International (ESCP-4i, Strand-2), that target China (**Erreur ! Source du renvoi introuvable.**). The ESCP-4i organisations actively pursue agreements or some type of collaboration with Chinese organisations.

There are also initiatives aiming at strengthening the cooperation between the EU and China, which offer a great opportunity for clusters from both regions to cooperate. For example, the SINO-EU Engineering Education Platform (SEEP) intends to foster leading international talents in science, technology, and engineering between European and Chinese higher education institutions⁹. SEEEP was created at the first Sino-EU Engineering Workshop (Shanghai, 2010), where the Ministry of Education of the People's Republic of China (MOE) and the Cluster - Consortium Linking Universities of Science and Technology for Education and Research signed a Memorandum of Understanding (MoU) for cooperation in engineering education. Comprising 13 European cluster member institutions and 18 top Chinese universities selected by MOE; this MoU is focused on student exchange, development of teaching skills and cooperation in specific research programmes.

The organisation of matchmaking events is another strategy to promote cluster cooperation. The EU-China Cluster Matchmaking Event (Chengdu, 2014) organised by the ECCP, is an example of a matchmaking event that fostered collaboration between EU and Chinese clusters by means

⁷ <http://en.ndrc.gov.cn>

⁸ www.clustercollaboration.eu/international-cooperation/china

⁹ <http://cluster.org/wp-content/uploads/2016/09/SESE-Call-for-Application-2016.pdf>

of exploring common visions¹⁰. Similarly, the EU-China Business & Technology Cooperation Fair (2014) held a matchmaking event focused on stimulating C2C cooperation in strategic areas.

3. Good practices & success stories related to cluster cooperation



According to the International Monetary Fund (IMF) - World Economic Database¹¹, China is the second largest economy in the world. It is also the world's largest exporter and the second largest importer. The economic importance of the country, as well as its investment in RDTI and the increasing relevance of its cluster community, have prompted several opportunities of C2C cooperation between the EU and China.

This section provides an analysis of three success stories of international cooperation established between Chinese and European clusters, SMEs or research institutes. The success stories include details on the: sector, stakeholders involved, process that led to cooperation, policy support, common activities, and outcomes. The details have been collected through literature review and interviews with the relevant organisations.

¹⁰ www.clustercollaboration.eu/sites/default/files/event_calendar/d3_1_-_china_communication_material_stc_v3_2.pdf

¹¹ www.imf.org/external/pubs/ft/weo/2016/01/weodata/index.aspx

3.1. Success story 1: Natureef and China International Technology Transfer Center

Cooperation between Natureef & China International Technology Transfer Center	
<p>Partners:</p> <ul style="list-style-type: none"> • Natureef¹²: Agrocluster (Portugal); Biomastec (Germany); Crea Hydro&Energy (Czech Republic); Femac (Spain); Green Chemistry (Poland); Green Synergy Cluster (Bulgaria); Inbiom (Denmark); Innoskart (Hungary); Vegepolys (France). • China International Technology Transfer Center – CCTI (Beijing, China) 	
<p>Sectors and subsectors concerned:</p> <ul style="list-style-type: none"> • Natural resources <ul style="list-style-type: none"> ○ Environmental services ○ Sustainable innovation 	
<p>Context:</p> <ul style="list-style-type: none"> • Natureef was an ESCP-4i composed of nine clusters from across the EU that gathered more than 1200 SMEs. Its aim was designing and implementing a joint strategy promoting cross-sectoral cooperation and facilitating the internationalisation of SMEs, considering a new natural efficient resource concept. • The China International Technology Transfer Center is a platform intended to facilitate bridges between overseas universities, research centres, science parks, competitive clusters, public organizations and SMEs, and the Chinese market; while providing business offices in the innovation hub of Beijing, as well as facilitating easy access to the Chinese market and partnering with Chinese organisations. 	
<p>Type of cooperation:</p> <ul style="list-style-type: none"> • MoU signed between Natureef and China International Technology Transfer Center for the creation of a Natureef's sister cluster located in Hui'an's province. 	
<p>Objective:</p> <ul style="list-style-type: none"> • The purpose of the cooperation is to design a mechanism on cross-sectoral, globalized, cluster and business cooperation within the fields of agriculture and natural resource use efficiency, and protection. In line with the Chinese government's "One Belt One Road initiative", the cooperation will connect China and Europe specifically through the exchange of technologies, business opportunities, market access, and policy development. 	

¹² www.natureef.eu

Policy support:

- The Sino-Europe Agro Innovation Business Mission to China was funded through COSME. The delegation was supported by the Innovation Express and the Enterprise Europe Network, which are both supported by COSME. On the Chinese side, the mission was supported by the Beijing Municipal Science and Technology Commission, Government of Hebei Province Ministry of Science and Technology, and the Government of Huai'an Municipality.

Results/outcomes:

- Joint projects under the auspices of the Natureef China node planned for the Huai'an area.
- Within the context of a rebounding global economy, and a renewed commitment to push science and technology to catalyse sustainable and inclusive commercial and economic development, the cooperation is developed as a Sino-European network of clusters focusing on agriculture and resource re-use and efficiency. The cooperation will be a bridge for China and Europe to collaborate on several levels: business to business, cluster to cluster, country to country, and continent to continent.
- From the European perspective, the cooperation will facilitate China market access and the internationalisation of small and medium sized companies (SMEs) through mentoring and dissemination of their innovative technologies. From the Chinese perspective, the cooperation will provide opportunities for Chinese industry, research and policy to work with Europe to develop new and efficient ways to use and protect China's increasingly depleting natural resources. The cooperation will develop and strengthen collaboration among the clusters and SME members.
- Three MoUs were signed, including partnerships between Natureef, Huai'an Municipality and the China International Technology Transfer Center to build Natureef China, as well as two between businesses and the Natureef and Agro Business Park Clusters.

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3.2. Success story 2: BioXcluster and two Shanghai Biotechnology Parks

Cooperation between BioXclusters and two Shanghai Biotechnology Parks ^{13,14}	
<p>Partners:</p> <ul style="list-style-type: none"> • Biocat (Catalonia, Spain)¹⁵ • BioM (Bavaria, Germany)¹⁶ • bioPmed (Piedmont, Italy)¹⁷ • Lyonbiopole (Rhône-Alpes, France)¹⁸ • Juke Biotech Park (Shanghai, China)¹⁹ • Zhangjiang Biotech & Pharmaceutical Base (Shanghai, China)²⁰ 	
<p>Sectors and subsectors concerned:</p> <ul style="list-style-type: none"> • Biotechnology industrial sector 	
<p>Context:</p> <ul style="list-style-type: none"> • Both Shanghai parks are key large biotech organisations gathering a critical mass of Chinese companies in particular SMEs and academic players. They both provide services to innovative healthcare SMEs and promote R&D projects that can offer international cooperation opportunities. • The bioXclusters initiative was a cluster partnership supported by the European Commission and coordinated by ERAI, under the initial ESCP initiative established in 2012. It united the four European leading biotechnology and healthcare clusters, with the objective of fostering the internationalisation of the wide and innovative network of SMEs in the participating regions. 	
<p>Type of cooperation:</p> <ul style="list-style-type: none"> • The purpose of the cooperation was to stimulate partnerships between EU and Chinese companies, exchange information regarding markets, processes and technical aspects of company landing, project building and specific regulations. • BioXclusters signed two MoU's: the first agreement with Juke Biotech Park and the second one with Zhangjiang Biotech & Pharmaceutical Base. • The MoU's aimed at enhancing new collaboration opportunities between European Life Sciences SMEs and their Chinese counterparts²¹. 	

¹³ www.lyonbiopole.com/eng/develop/China.html

¹⁴ www.lyonbiopole.com/document/communiqués/85-en.pdf

¹⁵ www.biocat.cat

¹⁶ www.biotech-bavaria.de

¹⁷ www.biopmed.eu

¹⁸ <http://www.lyonbiopole.com>

¹⁹ <http://en.jkbp.com/>

²⁰ www.zjbio.org/e/index.asp

²¹ <http://www.lyonbiopole.com/wp/wp-content/uploads/2014/10/CP-Chine-FR.pdf>

Objective:

- The overall objective of the cooperation was to strengthen through resource-sharing the competitiveness of the clusters' SMEs in the EU Life Sciences sector in the Chinese market.

Policy support:

- BioXclusters was an ESCP-4i and as such, it was funded by the European Commission.


Results/outcomes:

- Increased support to EU companies established in the BioXclusters to expand their activities to include the Chinese biotechnology market.
- Establishment of R&D and business partnerships between companies of BioXclusters and companies based in the Juke Biotech and Zhangjiang Biotech & Pharmaceutical Parks.
- Exchange of knowledge and information among the EU and Chinese companies regarding custom rules in the EU and China.

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3.3. Success story 3: The Sophia Antipolis Science and Technology Park and the Chengdu Hi-tech Industrial Development Zone

Cooperation between the Sophia Antipolis Science and Technology Park and the Chengdu Hi-tech Industrial Development Zone ²²	
<p>Partners:</p> <ul style="list-style-type: none"> • Sophia Antipolis Science and Technology Park (France, EU)²³ • Chengdu Hi-tech Industrial Development Zone (CDTH, China)²⁴ 	 <p>The image shows two logos. The top logo is for Sophia Antipolis, with the text 'SOPHIA ANTIPOLIS' in large blue letters and 'PREMIÈRE TECHNOPOLE D'EUROPE' in smaller orange letters below it. The bottom logo is for CDHT (Chengdu Hi-tech Industrial Development Zone), featuring a stylized orange and yellow 'C' shape above the Chinese characters '成都高新' and the acronym 'CDHT' in white on a blue background.</p>
<p>Sectors and subsectors concerned:</p> <ul style="list-style-type: none"> • Machinery and equipment industrial sector <ul style="list-style-type: none"> ○ New materials industrial sub-sector ○ Renewable energy industrial sub-sector 	
<p>Context:</p> <ul style="list-style-type: none"> • Sophia Antipolis is one of Europe's leading science and technology parks, which has served as the model for competitiveness in France. The Park's companies are members of several different clusters in France. It has an annual turnover of €3.5 billion. • Chengdu Hi-tech Zone (CDHT) is one of the earliest state-level hi-tech industrial development zones and one of the six pilot zones established under the project titled "The World's First-class Park Initiatives", sponsored by the Ministry of Science and Technology. There are over 31,000 companies registered in the CDHT and nearly 1,100 foreign invested enterprises, 52 of which are fortune 500 companies, including Microsoft, Motorola, Siemens, Nokia, Sony, Sumitomo, Toyota, Alcatel, and Ubisoft. In 2013, CDHT achieved an industrial added value of ¥104 billion. 	
<p>Type of cooperation:</p> <ul style="list-style-type: none"> • The two high-tech parks cooperate in technological innovation, trade and investment. They also jointly hold forums, seminars and meetings, and arrange exchange visits for technology enterprises based in both parks. • The two high-tech parks signed a cooperation agreement in 2016 to strengthen their collaboration. • The agreement focuses on strategic emerging industries such as energy saving and environmental protection, new energy, new materials and high-end equipment manufacturing. 	

²² www.chinadaily.com.cn/regional/2016-07/23/content_26209821.htm

²³ www.sophia-antipolis.org

²⁴ www.chengduhitech.co.uk/Location/West_Park.asp

Objective:

- The main aim of this cooperation is to exchange information on technological innovation, trade and investment, and to promote the establishment of business collaboration between the two parks focusing on strategic emerging industries such as energy saving and environmental protection, new energy, new materials and high-end equipment manufacturing.

Policy support:

- No information is available regarding direct policy support.

Results/outcomes:

- The establishment of a China Innovation Center in Sophia Antipolis Science in France.
- Exchange of knowledge and information through training programs, including arranging exchange visits between technology enterprise representative delegations from the two parks.
- Business partnerships between companies from both technology parks in several sectors.

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4. Opportunities and potential for further EU-China cluster cooperation: thematic focus

The EU and China have a great potential to cooperate closely and develop joint strategies in specific sectors such as Automotive, Biotechnology, Renewable Energies and ICT. The opportunities discussed in this section are founded on the analysis made in the preparatory brief.

4.1. Automotive sector

China is the world's largest automotive market and automotive manufacturing country since 2009²⁵. This is a fast-growing sector, which is heavily grounded in knowledge transfer and ongoing innovation. The EU is also among the world's biggest automotive producers and the sector represents the largest private investor in R&D²⁶. In this context, to increase the competitiveness of the sector, the EU automotive cluster organisations are focused on cooperating with China clusters. In fact, the Chinese automotive sector has several opportunities for EU cluster organisations to cooperate with Chinese manufacturers of automotive components for premium cars, equipment and technologies.

It is important to highlight that the automotive sector has a key multiplier effect in the economy. Since both China and the EU have a leading position in the automotive sector, the C2C cooperation is a key element to enhance the position of both regions in the global market. As a result, there are several existing cluster cooperation opportunities between China and the EU.

European Automobile Manufacturers' Association (ACEA) is a leading example of a European automotive cluster organisation that cooperates with Chinese clusters. In 2014, ACEA opened an office in Beijing in order to work closely with Chinese authorities to promote cooperation between European and Chinese automotive firms²⁷. In parallel with this, ACEA was one of the co-organisers of the 12th Annual China Automotive Industry Forum, organised in Shanghai by the China Europe International Business School (CEIBS). The Forum was focused on discussions around urban mobility, which is a topic of interest for vehicle manufacturers from both regions²⁸.

The shared concern of urban mobility also led to the creation of MobiGoIn – Mobility Goes International. MobiGoIn is an ESCP-4i with an internationalisation strategy towards targeted third countries, such as China. MobigoIn aims to foster a cross-sectoral approach regarding a sustainable, smart and safe mobility in metropolitan areas. This will be achieved through the implementation of solutions and systems for intelligent and cooperative transport, intermodal and sustainable mobility for the citizens, and sustainable urban freight logistics. In this context,

²⁵ www.ccilc.pt/sites/default/files/eu_sme_centre_sector_report_-_the_automotive_market_in_china_update_-_may_2015_1.pdf

²⁶ https://ec.europa.eu/growth/sectors/automotive_pt

²⁷ www.acea.be/news/article/message-from-the-secretary-general-november-2014

²⁸ www.licon.com/en/news/news-archive/12th-china-automotive-industry-forum/view

MobiGoln brings together EU Member States with targeted countries, such as China, which can contribute to achieving the cluster members' goals²⁹.

The European clusters in the automotive sector are recommended to establish collaborations with Chinese clusters with the aim to search for more sustainable technologies and improve urban mobility.

4.2. Biotechnology sector

The Chinese biotechnology sector has grown into one of the top national priorities. Currently, the biotechnology sector plays a key role in China's economy due to the importance of biotech product development³⁰. Therefore, the Chinese Government has focused on promoting policies that foster the growth of the sector and enhance its competitiveness³¹. Moreover, the biotechnology sector is also a key sector for the EU Member States due to its potential for growth and the impact that it has on the economy.

The biotechnology sector is heavily grounded in knowledge sharing and technology transfer. Therefore, the establishment of cluster partnerships is extremely important to foster innovation. Currently, the global competition in the sector is increasing since new players are emerging. This enhances the need to stimulate cooperation between EU and China biotechnology clusters.

In this context, there are several examples of partnerships between the EU and China, such as the New Frontiers for Emerging Industries in Food (ESCP-4i), which is a leading European cluster partnership that has an internationalisation strategy regarding China. China and the EU are the two largest food producers in the world and share the common goal of joining forces to address the challenges related to this issue. Thus, New Frontier in Food aims to develop a joint internationalisation strategy for the member clusters, a smart strategy based on a combination of various interconnected specialisations related to the food industry. This cluster initiative brings together EU Member States (Netherlands, France and Belgium) with targeted third countries, such as China³².

Another example of a leading European cluster partnership that has a shared internationalisation strategy towards China in the biotechnology sector is bioXcluster (ESCP-4i), already presented in the success stories. The consortium aims to address the next-decade European challenges related to healthcare and SME growth, thanks to a common vision of personalised healthcare as the paradigm for future global healthcare solutions³³.

Another initiative to foster cluster cooperation between the EU and China is the Sino-Euro BioPartnering which is a platform for European innovative SMEs who are seeking partners in the

²⁹ www.clustercollaboration.eu/escp-profiles/mobigoln

³⁰ www.bio.org/articles/biotech-china

³¹ www.ncbi.nlm.nih.gov/pmc/articles/PMC2435562/

³² www.clustercollaboration.eu/escp-profiles/new-frontier-food

³³ www.clustercollaboration.eu/escp-profiles/bioxclusters

Chinese market. This initiative aims to strengthen cluster cooperation between EU and Chinese biotechnology clusters³⁴.

EU clusters are recommended to cooperate with Chinese clusters on issues related to food industry, healthcare and biotechnology innovation as highlighted by the preparatory briefing developed by the ECCP.

4.3. Renewable Energy sector

China is the world's leading investor in the renewable energy sector. Currently, China leads the world in new wind and solar installations and has the ambition to be the largest renewable energy user by 2020³⁵. Thus, this has led the Chinese Government to implement several national programmes and policies to stimulate the development of the Chinese renewable energy sector³⁶. In recent years, China has focused on diminishing its coal dependence and boosting its position in the global renewable energy sector.

Similar to China, the renewable energy sector has also grown significantly in the EU in recent years. The renewable energy sector is a key sector for the EU Member States, which also have a leading position in the global scene³⁷. In this context, the Renewable Energy Directive establishes an overall policy for the production and promotion of energy from renewable sources in the EU and stimulates the facilitation of cooperation initiatives³⁸. Since the EU and China are both leading economies in renewable energy, there are several opportunities for C2C cooperation between these regions.

In fact, there are numerous cooperation opportunities in the renewable energy sector. The Norwegian Energy and Environment Consortium (NEEC) is a leading example of a European cluster that cooperates with China. Norway is a pioneer within the renewable energy and environmental technology fields and it has established cooperation with China in the field of clean energy and environmental protection industry³⁹. The NEEC and China co-organized a Chinese water and waste delegation visit to Norway together with The Royal Norwegian Consulate General in Guangzhou. The delegation included directors from the Guangdong provincial environmental protection industrial association and CEOs and experts from eight environmental related companies and university⁴⁰.

The Delivering Cluster International Strategies into Overseas Networks (ESCP-4i) is an example of a European cluster partnership with a common internationalisation strategy towards third countries, such as China. The aim of this partnership is to intensify cluster and business networks to enable SMEs to compete globally and build international cluster collaboration in support of emerging industries in the field of energy waste⁴¹.

³⁴ <https://bioclusters.eu/2013/06/11/bioclusters-partners-co-organise-sino-european-bio-partnering-in-shanghai/>

³⁵ www.theclimategroup.org/sites/default/files/archive/files/RE100-China-analysis.pdf

³⁶ <https://cleantechnica.com/2016/09/15/latest-trends-chinas-continuing-renewable-energy-revolution/>

³⁷ <https://ec.europa.eu/energy/en/topics/renew>

³⁸ <https://ec.europa.eu/energy/en/topics/renewable-energy/renewable-energy-directive>

³⁹ www.linkedin.com/company/neec---norwegian-energy-and-environment-consortium

⁴⁰ <http://neec.no/chinese-water-and-waste-delegation-in-norway/>

⁴¹ www.clustercollaboration.eu/escp-profiles/decision

EU clusters are recommended to cooperate with Chinese clusters in the sector of renewable energy in general without limitations to specific areas, since there are opportunities across the spectrum of energy sources.

4.4. Information and Communication Technology sector

In recent years, China's ICT sector has grown quickly due to the support of the Chinese Government's plans and policies⁴². In China, ICT is used policy-wise to address different social and environmental problems, such as demographic change, rapidly increased urbanisation, and greenhouse-gas emissions control. Therefore, ICT is considered a key sector for the Chinese economy. For the EU, ICT is also a key sector since it has a wide impact on economic growth and innovation. In this context, ICT is an example of a sector highly suitable for C2C cooperation between the EU and China.

ICT is grounded in innovation and technology exchange, so the establishment of cluster cooperation activities is crucial to enhance competitiveness. The Zhongguancun Science Park cluster is a successful example of an ICT cluster that brings together EU and Chinese organisations. Over the last two decades, Zhongguancun has gathered nearly 20,000 high-tech and new-tech enterprises in order to foster the exchange of information and strategic cooperation⁴³.

The Space Clusters International Industrial Diversification cluster consortium (ESCP-4i) is an example of a leading European cluster partnership that has a common internationalisation strategy towards third targeted countries, such as China. In this context, the Space Clusters International Industrial Diversification aims to be the first structured action for Space Service Providers and Application Developers to directly address the huge economic potential of several industrial sectors⁴⁴.

Due to the wide-range of opportunities in ICT and its high rate of innovation, there are no specific areas that should be recommended as high opportunity areas for cooperation with China. Nevertheless, it is important to point out that the policy dialogue has raised a few areas of common interest such as smart cities, telecommunications, nano electronics and distributed systems.

⁴² www.eusmecentre.org.cn/report/ict-market-china

⁴³ www.ukspa.org

⁴⁴ www.clustercollaboration.eu/escp-profiles/space2aid