



Discussion paper on China

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

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1. Objective of the report

This document is intended to provide:

- an overview of the current cooperation activities between European and Chinese clusters, as well as the nature of the collaboration between clusters and other types of research and innovation (R&I) actors;
- examples of good practices to showcase different types of collaboration;
- and finally, an analysis of the potential for cluster cooperation in the future.

This Discussion Paper has been developed to serve as an input and preparatory paper to the policy discussions / meetings between DG Internal Market, Industry, SMEs and Entrepreneurship (DG GROW) of the European Commission (EC) / Executive Agency for Small and Medium-sized Enterprises (EASME) and policy makers from China. The background knowledge and good practices could be used in policy discussions to illustrate the vitality of cluster cooperation, the impact of international inter-clustering actions and the importance of structuring this through new policy initiatives.

2. Existing EU-China cluster cooperation

In 1978, China shifted from a centrally-planned to a market-based economy, which led to rapid economic growth and market openness. Over recent years, China has been experiencing consistent growth rates of around 10%, which is considered the fastest sustained expansion by a major economy in history. In addition, the country reached all the Millennium Development Goals (MDGs) by 2015 and provided a major contribution to the achievement of the MDGs globally¹.

In recent years, China has reached a leading position in many sectors prone to have a significant impact on the global economy, such as automotive, human health, renewable energy, and information and communication technology (ICT) sectors. These sectors are highly grounded on innovation and knowledge transfer, offering many EU-China cluster to cluster (C2C) cooperation opportunities. Thus, both regions have been developing many initiatives to take advantage of the existing potential for EU-China C2C cooperation in these sectors.

2.1. Policy dialogue on cluster cooperation

The EU and China established formal diplomatic relations in 1975. The ties between the EU and China were established based on economic cooperation and, in 2013, evolved to a comprehensive political and economic relationship with the establishment of the Comprehensive Strategic Partnership^{2,3}.

¹ The World Bank, The World Bank In China, www.worldbank.org/en/country/china/overview

² European External Action Service, EU – China Relations, https://eeas.europa.eu/sites/eeas/files/factsheet_eu-china_09_04_2019_0.pdf

³ European Commission, Roadmap for EU-China S&T cooperation, https://ec.europa.eu/research/iscp/pdf/policy/cn_roadmap_2018.pdf

In November 2013, the EU-China Strategic 2020 Agenda for Cooperation was launched with the aim of guiding the EU-China relations until 2020. The Agenda addresses important topics for both parties, such as peace and security, prosperity, sustainable development and people-to-people exchanges. The Agenda also emphasises the importance of EU-China cooperation on R&I⁴.

Moreover, the EU-China 2020 Strategic Agenda for Cooperation established an EU-China cluster cooperation initiative to strengthen collaboration in fields of strategic interest such as sustainable growth and urbanisation. However, this initiative has not been materialised until now since bilateral cluster cooperation is taking place primarily through a bottom-up approach under the EU COSME programme⁵. Additionally, cluster cooperation was considered by both parties as a business win-win approach; nevertheless, high-value activities of strategic potential areas are being looked at cautiously by the EU. Artificial intelligence (AI) in particular is considered as an area in which more caution to bottom-up will be exerted by the EU due to its defence dual-use and potential massive impact on manufacturing systems in global value-chains⁶.

The EU-China relations are also guided by an annual summit and high level dialogues, such as the High-Level Strategic Dialogue, the annual High-Level Economic and Trade Dialogue, the High-Level People-to-People Dialogue, and the High-Level Innovation Cooperation Dialogue (ICD)⁷. According to the European External Action Service (EEAS), until April 2019, the EU and China have over 60 sectorial dialogues in areas such as cybersecurity, transnational crime, economics, high-tech innovation, tourism, energy, and environment⁸.

Furthermore, in December 2014, the EU and China renewed for the third time a Science & Technology Cooperation Agreement, which was first established in December 1998. The implementation of the Agreement is overseen by a Joint Steering Committee, which last met in Beijing on December 13, 2018⁹. During the last meeting of the Joint Steering Committee, the EU and China discussed the framework conditions for cooperation in thematic areas including aviation, food, agriculture and biotechnologies (FAB), biotechnologies and biomaterials,

⁴ European Commission, EU-China 2020 Strategic Agenda for Cooperation, <https://eeas.europa.eu/sites/eeas/files/20131123.pdf>

⁵ Commission Implementing Decision (EU) of 26.10.2018, http://ec.europa.eu/research/participants/data/ref/other_eu_prog/cosme/wp-call/cosme-wp-2018_en.pdf

⁶ Artificial Intelligence, What implications for EU security and defence?, EUISS, <https://www.iss.europa.eu/sites/default/files/EUISSFiles/Brief%2010%20AI.pdf>

⁷ European Commission, Roadmap for EU-China S&T cooperation, https://ec.europa.eu/research/iscp/pdf/policy/cn_roadmap_2018.pdf

⁸ European External Action Service, EU – China Relations, https://eeas.europa.eu/sites/eeas/files/factsheet_eu-china_09_04_2019_0.pdf

⁹ European Commission, Roadmap for EU-China S&T cooperation, https://ec.europa.eu/research/iscp/pdf/policy/cn_roadmap_2018.pdf

environment, sustainable urbanisation and mission innovation. In addition, both parties addressed topics of potential future collaboration, such as water, AI, health, marine, and space¹⁰.

Currently, China is enduring an ambitious reform of its national funding system for science, technology and innovation (STI), which may represent an opportunity to strengthen cooperation with the EU. In this context, the 20th EU-China Summit (2018) reinforced the importance of R&I cooperation as a driver for economic and social development and a key element of EU-China relations¹¹. Moreover, during the 3rd ICD the EU and China agreed on strengthening cooperation through a new package of flagship initiatives targeting the areas of food, agriculture and biotechnologies, environment and sustainable urbanisation, surface transport, safer and greener aviation, biotechnologies for environment, and human health¹².

In addition, in 2016, the European Commission and the Ministry of Science and Technology of the People's Republic of China (MoST) announced the EU-China Co-Funding Mechanism (CFM) in the context of the Horizon 2020 (H2020). This scheme facilitates the development of projects focused on EU-China cooperation, such as the European Network of Research and Innovation of Centres and Hubs, China (ENRICH in China)¹³ (more information about EU-China projects developed under H2020 is included in the updated Preparatory Briefing developed by the ECCP).

2.2. Cluster to cluster cooperation

Since the establishment of the Reform & Open-door Policy in 1978, Chinese clusters have become important drivers of economic growth and international competitiveness. Currently, China's cluster community is composed of different types of clusters, including coastal clusters, clusters focused on taking advantage of abundant natural resources and labour skills, clusters mainly linked to exports, as well as clusters formed around large state enterprises.

The Chinese cluster ecosystem is highly decentralised and includes different entities such as the Special Economic Zones (SEZs), Science and Technology Industrial Parks (STIPs), and High-Tech Zones (HTZs). Over the years, these entities have been contributing to the development of the Chinese national innovation system (NIS) and generating important opportunities for international cooperation.

Considering the importance of the Chinese cluster community, the EU has a strategic interest in stimulating EU-China C2C cooperation. As abovementioned, the EU-China 2020 Strategic Agenda for Cooperation established an EU-China cluster cooperation initiative, which demonstrates the importance of promoting and facilitating the development of linkages between EU and Chinese clusters. In this context, the European Commission has been supporting C2C cooperation

¹⁰ European Commission, 14th EU-China Joint Steering Committee on Science and Technology Cooperation and side events, https://ec.europa.eu/research/iscp/pdf/news/14th_jsc_meeting.pdf

¹¹ European External Action Service, Joint statement of the 20th EU-China Summit, https://eeas.europa.eu/delegations/china_en/48424/Joint%20statement%20of%20the%2020th%20EU-China%20Summit

¹² European Commission, Roadmap for EU-China S&T cooperation, https://ec.europa.eu/research/iscp/pdf/policy/cn_roadmap_2018.pdf

¹³ ENRICH in China, <http://china.enrichcentres.eu/>

initiatives between the EU and China with the aim of bringing together clusters from different sectors to promote the creation of strong international networks.

In this context, the high number of European clusters interested in cooperating with China can also be considered as an important indicator of the potential for EU-China cluster cooperation. Currently, 280 clusters registered on the ECCP target China for the development of international activities. In addition, there are nine second generation European Strategic Cluster Partnerships for Going International (ESCP-4i) targeting China:

- European Digital Industry Alliance (DIA) – ICT sector;
- Europe Leading Blue Energy (ELBE) – Energy sector;
- Food In Eco Network (FoodNet) - Transportation and Logistics sector;
- Green Ict development (GIVE) – Automotive sector; and
- European Strategic Cluster Partnership for Advanced Smart Packaging (AdPack²) - Paper and Packaging sectors;
- European Cleantech Internationalization Initiative (EC2i) - Environmental Services;
- Mobility Goes International - In Action (MobiGoIn-Action) - Transportation and Logistics sector;
- New Frontiers in Food Fast Forward (NF4) – Food sector; and
- Space Clusters International Industrial Diversification (SPACE2IDGO) – ICT sector.

There are several examples of C2C cooperation initiatives between the EU and China. The organisation of matchmaking events supported by the ECCP has been an important strategy to foster cluster cooperation. In October 2014, a delegation of 15 cluster representatives from nine European countries participated in a Cluster Matchmaking Event in Chengdu (China), organised under the scope of the Mission for Growth to China. The Event included participants from the fields of bio-chemicals, bio-pharmacy and bio-technology, environmental protection, ICT and renewable energy. During the Event, the representatives of European clusters had the opportunity to participate in several activities, including an EU-China Cluster Cooperation Seminar, C2C and cluster-to-business (C2B) meetings, and a cluster visit to the Tianfu Software Park. The Event was supported by the DG Enterprise and Industry (DG ENTR)¹⁴.

Furthermore, the organisation of missions to China has been one of the main tools to promote EU-China C2C cooperation. In this context, in March 2017, the EU Gateway | Business Avenues Programme organised a business mission to China focused on the Clean Technologies sector. During this mission, the participants had the opportunity to showcase their products and technologies to a targeted audience of potential business partners, as well as to receive coaching and support on doing business in China¹⁵.

¹⁴ ECCP, EU-China Cluster Matchmaking Event – Mission for Growth to China, www.clustercollaboration.eu/sites/default/files/event_calendar/d3_1_-_china_communication_material_stc_v3_2.pdf

¹⁵ ECCP, Clean Technologies business mission to CHINA, www.clustercollaboration.eu/event-calendar/clean-technologies-business-mission-china

In recent years, the ESCP-4i have also been developing important missions to China in order to foster C2C cooperation. In May 2017, bioXclusters plus carried out a mission to China focused on precision medicine, which brought clusters and companies together at the Sino European Bio Partnering (SEBP) event. In addition, during the opening of the SEBP, the Fenglin Group and bioXclusters plus signed an agreement that allows European companies to receive a free consultancy package from the Fenglin BioMedical Center to support European life-sciences small and medium-sized enterprises (SMEs) entering the Chinese market or looking for business partners in China¹⁶.

In June 2017, NATUREEF also organised a business mission to Beijing, Shijiazhuang, Hebei, Huai'an, and Jiangsu. The mission included participants from agriculture, clean energy and related sectors, as well as managers from the Spanish (FEMAC), Danish (Agro Business Park), and Bulgarian (Green Synergy) NATUREEF cluster nodes¹⁷. Moreover, in November 2018, EC2i organised a mission to China with the aim of matching European SMEs with Chinese partners to export European clean tech technologies to the Chinese market. This mission was mainly focused on Soil & Groundwater Remediation, Waste to Value, Industrial Wastewater, and Monitoring and Smart Solutions¹⁸.

In October 2018, 30 people representing 16 Transylvanian Furniture Cluster members participated on an economic mission to China, which included participating in the China International Furniture Fair, as well as high level meetings with Chinese entities¹⁹. In addition, in November 2018, AdPack² organised its second Fact Finding Mission to China, which was prepared by the ACCIÓ office in Shanghai. This mission included a collective and individual agenda for six clusters active in the European Active and Intelligent Packaging value chain²⁰. The third mission to China, bringing SMEs that target China will be held in June 2019.

In recent years, the organisation of workshops and business seminars has also been a strategic tool to foster EU-China C2C cooperation. In March 2017, the Sustainable Business Hub (Sweden) and CLEAN (Denmark) organised a Workshop in Sweden to understand and discuss collaboration and project development opportunities with Chinese entities in the field of air cleaning system solutions²¹. In June 2017, the EU-Asia Business Link and the Brussels Chamber of Commerce

¹⁶ ECCP, BioXclusters plus paves the way for precision medicine companies to China Market, www.clustercollaboration.eu/news/bioxclusters-plus-paves-way-precision-medicine-companies-china-market

¹⁷ ECCP, NATUREEF - Sino-Europe AgroInnovation Business Mission to China, www.clustercollaboration.eu/news/natureef-sino-europe-agroinnovation-business-mission-china

¹⁸ ECCP, The European Cleantech Internationalisation Initiative (EC2i) goes international, www.clustercollaboration.eu/news/european-cleantech-internationalisation-initiative-ec2i-goes-international

¹⁹ ECCP, From Cluj to Shanghai - together for Transylvania's furniture industry, www.clustercollaboration.eu/news/cluj-shanghai-together-transylvanias-furniture-industry

²⁰ ECCP, Packaging Cluster returns from China with contacts that can generate opportunities in the smart packaging field, www.clustercollaboration.eu/news/packaging-cluster-returns-china-contacts-can-generate-opportunities-smart

²¹ ECCP, CLEAN Connect China Workshop 30th March 2017 - Commercial air cleaning projects in China, www.clustercollaboration.eu/news/clean-connect-china-workshop-30th-march-2017-commercial-air-cleaning

(BECI) also organised a Business Seminar focused on opportunities in Asia for SMEs, including China²².

As abovementioned, ENRICH in China plays a key role in the internationalisation of European STI organisations. Thus, since October 2017, ENRICH in China organised five missions (October 2017 and May, September, November 2018 and April 2019) in various Chinese cities. These missions represent important opportunities for EU-China C2C cooperation.

Moreover, some European organisations support EU-China cooperation through a wide range of services, such as advocacy, consulting, training, missions, and events. Table 1 provides examples of European organisations that support EU-China cooperation.

Table 1 European organisations that support EU-China cooperation

Entity	Brief description	Available support for EU clusters
Enterprise Europe Network (EEN)	EEN is focused on helping businesses innovate and grow on an international scale.	EEN has seven contact points in China: Beijing, Changsha, Chengdu, Shanghai (two contact points), Wuhan, and Zhengzhou. The EEN contact points help businesses with advice and support the development of international partnerships, which can represent an opportunity for promoting EU-China C2C cooperation.
EU SME Centre	The EU SME Centre is an EU initiative that provides a comprehensive range of hands-on support services to Europe SMEs in order to prepare them to do businesses in China.	The EU SME Centre can support cluster members through business training workshops, B2B matchmaking, exhibition programmes, delegation programme development and support, and joint research.
EURAXESS China	EURAXESS China links researchers in China with Europe.	EURAXESS China promotes cooperation between European and Chinese research organisations by providing free information and events on research funding, research careers and collaboration opportunities.
European Union Chamber of Commerce in China (EUCCC)	The EUCCC aims to represent the European businesses in China.	The EUCCC can support cluster members through advocacy and events.

²² ECCP, Business Seminar: Opportunities in Asia for SMEs, <https://www.clustercollaboration.eu/news/business-seminar-opportunities-asia-smes>

3. Good practices & success stories related to cluster cooperation

Over the last 30 years, China has become the world's second largest economy and the largest if measured in terms of purchasing price parity. Since 2018, the country has been the largest single contributor to world growth²³. Therefore, as mentioned in the previous section, the EU-China C2C cooperation is considered highly strategic for the EU.

Aiming to provide further context on the level and effectiveness of cooperation, two success stories of cooperation between European clusters and Chinese entities 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 was collected through a literature review and interviews with the relevant organisations.

²³ The World Bank, The World Bank In China, www.worldbank.org/en/country/china/overview

3.1. Success story 1: Cancéropôle Lyon Auvergne Rhône-Alpes (CLARA) and Shanghai Jiao Tong University of China

Cooperation between Cancéropôle Lyon Auvergne Rhône-Alpes (CLARA) and Shanghai Jiao Tong University of China	
<p>Partners:</p> <ul style="list-style-type: none"> • Cancéropôle Lyon Auvergne Rhône-Alpes (CLARA) (Auvergne Rhône-Alpes, France); and • Shanghai Jiao Tong University (Shanghai, China) 	 
<p>Sectors and subsectors concerned:</p> <ul style="list-style-type: none"> • Healthcare - Oncology 	
<p>Context:</p> <ul style="list-style-type: none"> • CLARA brings together academic, clinical and industrial researchers from the Auvergne Rhône-Alpes region (France). CLARA's goal is to promote the rapid transfer of discoveries to patients, as well as to foster the economic value of research. • The Shanghai Jiao Tong University is a key university directly under the administration of the Ministry of Education (MOE) of the People's Republic of China. The University has 30 schools/departments, 31 research institutions, 13 affiliated hospitals, two affiliated medical research institute, 12 directly affiliated units and six directly affiliated enterprises²⁴. 	
<p>Type of cooperation: Research cooperation</p> <ul style="list-style-type: none"> • In October 2018, under the framework of CLARA, an oncology convention was signed between the universities of the Auvergne-Rhône-Alpes region, the Faculty of Medicine of France and the Jiao Tong University of Shanghai (China). 	
<p>Objective:</p> <p>The abovementioned oncology convention aims to facilitate and intensify academic and research exchanges between the universities of the Auvergne-Rhône-Alpes region, the Faculty of Medicine of France and the Jiao Tong University of Shanghai through the creation of research and training programmes. The research and training programmes will be available for teachers, researchers, and students²⁵.</p>	
<p>Policy support:</p> <ul style="list-style-type: none"> • CLARA received funding from public authorities, such as the French National Cancer Institute, Local Authorities from the Auvergne-Rhône-Alpes, and the European Regional Development Fund²⁶. 	

²⁴ <http://en.sjtu.edu.cn/about-sjtu/overview>

²⁵ www.canceropole-clara.com/communiqués-de-presse/signature-fondatrice-dune-convention-en-cancerologie-entre-les-universites-de-la-region-auvergne-rhone-alpes-et-la-faculte-de-medecine-de-luniversite-jiao-tong-de-shanghai/

²⁶ www.canceropole-clara.com/presentation-de-clara-canceropole-lyon-auvergne-rhone-alpes/

Cooperation between Cancéropôle Lyon Auvergne Rhône-Alpes (CLARA) and Shanghai Jiao Tong University of China

Results/outcomes:

- This research and academic cooperation is grounded on strong historical links between the Auvergne-Rhône-Alpes region and the municipality of Shanghai.
- In recent years, several students from the Shanghai Jiao Tong University have been welcomed at the Auvergne-Rhône-Alpes Universities.
- In July, the Jiao Tong University of Shanghai established a French-speaking Cancer Master, which reinforced the teaching missions²⁷.
- Six research symposia have already been co-organised by CLARA and the Shanghai Jiao Tong University²⁸. The seventh will take place in October 2019 in Shanghai.
- The first summer and winter schools of the Shanghai Jiao Tong University French-speaking Cancer Master have taken place in July 2018 and January 2019 respectively. The following Summer School will be held in July 2019 and three professors of Auvergne-Rhône-Alpes universities will participate under CLARA coordination.
- After concluding their first year of French Master in Shanghai, several students of the Shanghai Jiao Tong University Faculty of Medicine have conducted their second year of Master in Auvergne-Rhône-Alpes region. The number include: six students in 2017/2018, six in 2019/2018 and seven in 2019/2020.
- In December 2018, CLARA organised its first session of training in clinical research for 28 doctors of Ruijin SJTU affiliated hospital. Following this first successful experience, two additional training sessions will be carried out in 2019: July in Shanghai and December in Lyon.

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²⁷ <https://www.canceropole-clara.com/communiqués-de-presse/signature-fondatrice-dune-convention-en-cancerologie-entre-les-universites-de-la-region-auvergne-rhone-alpes-et-la-faculte-de-medecine-de-luniversite-jiao-tong-de-shanghai/>

²⁸ www.canceropole-clara.com/communiqués-de-presse/signature-fondatrice-dune-convention-en-cancerologie-entre-les-universites-de-la-region-auvergne-rhone-alpes-et-la-faculte-de-medecine-de-luniversite-jiao-tong-de-shanghai/

3.2. Success story 2: Venetian Cluster and Chinese Entities

Cooperation between Venetian Cluster and Chinese Entities

Partners:

- Venetian Cluster (Italy);
- Academy of Dazu Rock Carvings (China);
- Academy of Sciences of Pechino (China);
- Museum of Nanchino (China);
- Museum of Shanghai (China);
- Capital Museum (China);
- Provincial Bureau of Hunan (China);
- Museum of Chengdu (China); and
- Museum of Xi'An (China)

Sectors and subsectors concerned:

- Environmental and cultural heritage sector



Context:

- The Venetian Cluster coordinates and supports multidisciplinary public-private partnerships (PPP), enterprises, professionals, associations, public and private bodies, research institutes and all subjects interested in carrying out and promoting innovation projects, technological transfer and actions for the development of the Italian and international productive supply chain for the conservation, restoration and valorisation of the Cultural and Environmental Heritage²⁹.
- For more than ten years, the Venetian Cluster works in China for the promotion of Italian products and innovative competencies in the field of cultural heritage. Thus, the Venetian Cluster has established relationships with Chinese local and national institutions, such as the Academy of Sciences of Pechino, the Museum of Nanchino, the Museum of Shanghai, Capital Museum, Provincial Bureau of Hunan, Accademy of Dazu Rock Carving, the Museum of Chengdu, and the Museum of Xi'An³⁰.

Type of cooperation:

- Over the years, the Venetian Cluster has established different cooperation initiatives with Chinese entities, including the (i) establishment of cooperation agreements, (ii) development of projects, and (iii) organisation of events.

Objective:

The Venetian Cluster aims to promote the Italian competences for the restoration and conservation of Cultural Heritage, as well as to create opportunities for its members to cooperate with Chinese entities.

Policy support:

- The Venetian Cluster is a new legal entity representing the network contract "Cluster Management Network".

²⁹ www.clustercollaboration.eu/cluster-organisations/venetian-heritage-cluster

³⁰ www.venetiancluster.eu/en/china-a-rising-interest-for-the-italian-competencies/

Cooperation between Venetian Cluster and Chinese Entities

Results/outcomes:

- Number of Chinese institutions involved - 18 (Beijing Scientific Restoration Academy, Capital Museum, Shanghai Museum, Xi'An Museum, Dazu Site, etc. ...)
- Number of Chinese Provinces and Municipalities involved – 9;
- Number of Chinese companies of provincial or national importance involved - 36;
- Number of UNESCO sites involved in China - 9 (eg Xi'An, Dazu, Qufu, Longmen, etc.);
- Number of Italian and Chinese technicians involved - over 160;
- Number Italian companies involved – over 40;
- Number of Italian Regions involved from North to South of the Country - 11;
- 43 missions and reverse missions of Chinese buyers / experts; and
- Agreement underway for pilot restoration project on Dazu UNESCO site;

Specific examples:

- The Venetian Cluster and the Academy of Dazu Rock Carvings have been cooperating for the restoration of the UNESCO site of CHONGQING, China. The restoration of the UNESCO site of CHONGQING is a fundamental starting point for new technical collaborations and for the promotion of the Italian competences in China.
- In March 2018, the Venetian Cluster organised the “Sino - Italian workshop for the innovative technologies for Cultural Heritage” in collaboration with Chongqing Bureau for Cultural Relics, Chongqing University, Italian Trade Agency, and the Italian General Consulate in Chongqing. This workshop was organised with the aim of creating a bridge between Italy and China in terms of cultural heritage³¹.
- The Venetian Cluster has been collaborating with Chinese entities for the development of the HBTown project in Changsha, China. The project involves the construction of 36 buildings in Venice and Assisi styles to establish Italian companies and promote their exports to China. The Venetian Cluster is the supervisor of construction of buildings and architectural details and collaborates with Italian companies for the settlement³².
- In October 2018, a delegation of the Laboratory of Restoration of the Museum of Nanchino (China) was a guest of the Venetian Cluster. During two days both entities had various meetings to discuss and share insights about cooperation on restoration and conservation of art works in China. In fact, the Venetian Cluster has been cooperating with the Museum of Nanchino for many years with the main aim of starting projects on Chinese cultural heritage, with a particular attention to the Nanchino Walls³³.

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³¹ www.venetiancluster.eu/wp-content/uploads/2018/02/Program-workshop_for-Chinese-Partner_09_02_2018-eng-ultimo-da-SC.pdf

³² www.venetiancluster.eu/en/hbtown-project/

³³ www.venetiancluster.eu/en/a-delegation-from-the-museum-of-nanchino-china-visiting-the-veneto-enterprises/

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

The EU and China have great potential to cooperate closely and develop joint initiatives in areas that are considered strategic for both parties. Therefore, opportunities and potential for cooperation are most likely in the areas that are highlighted as priorities in the 13th Five Year Plan (2016-2020). The following section highlights opportunities for potential EU-China cluster cooperation in the four sectors identified by the Preparatory Briefing as the sectors with considerable opportunities for EU-China C2C cooperation.

4.1. Automotive sector

China is the world's largest automotive market and automotive manufacturing country. Considering China is the world's most populated country, its automotive market has an impressive growth potential, especially in the subsector of new-energy vehicles (NEVs). Thus, in 2020, China is expected to sell around 35 million vehicles due to a strong demand from China's second and third tier cities³⁴.

Currently, the EU is the biggest exporter of passenger cars to China, accounting for around 53% of the total Chinese car imports by value. On the other hand, China is the second main destination for EU-built passenger cars, representing 17.5% of the total value of EU car exports to China. In addition, in 2017, the EU was the world's largest research and development (R&D) investor in the automotive sector; while China registered the highest annual percentage increase in R&D investment (18.9%)³⁵.

In this context, considering the potential of China's automotive sector, the EU automotive clusters have been focused on cooperating with Chinese automotive organisations. The main opportunities for EU-China C2C cooperation are related to the subsectors of automotive components for premium cars, equipment and technologies.

The European Automobile Manufacturers' Association (ACEA) is a leading example of a European automotive association that cooperates with Chinese organisations. The ACEA represents the 15 major Europe-based car, van, truck and bus makers³⁶ and is highly focused on promoting a dialogue on international issues with automobile associations around the world, including the Chinese Association of Automobile Manufacturers (CAAM). Thus, in 2004, ACEA opened an office

³⁴ The Statistics Portal, Largest automobile markets worldwide between January and December 2018, based on new car registrations (in 1,000s), www.statista.com/statistics/269872/largest-automobile-markets-worldwide-based-on-new-car-registrations/

³⁵ European Automobile Manufacturers Association, EU-China Automobile Trade: Facts and Figures, www.acea.be/uploads/press_releases_files/EU-China_automobile_trade-facts_figures.pdf

³⁶ ACEA members: BMW Group, CNH Industrial, DAF Trucks, Daimler, Fiat Chrysler Automobiles, Ford of Europe, Honda Motor Europe, Hyundai Motor Europe, Jaguar Land Rover, PSA Group, Renault Group, Toyota Motor Europe, Volkswagen Group, Volvo Cars, and Volvo Group.

in Beijing in order to work closely with Chinese authorities to promote cooperation between European and Chinese automotive firms³⁷. In addition, in February 2019, ACEA and CAAM signed a cooperation agreement focused on strengthening their collaboration in the automotive sector, which may represent an opportunity to foster EU-China C2C cooperation³⁸.

GIVE is a second generation ESCP-4i focused on the automotive sector and interested in developing cooperation activities with China. GIVE aims to build cross-sectoral strategic partnerships and internationalisation opportunities in the green smart technologies, automotive and transport sectors. In this context, GIVE is focused on promoting the development of international activities in China, which can lead to further EU-China C2C cooperation opportunities³⁹.

Moreover, MobiGoIn-Action is a second generation ESCP-4i that aims to create sustainable, smart and safe mobility in metropolitan areas, 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. MobiGoIn-Action is highly interested in developing cooperation activities with China and, therefore, in March 2019 launched a call for expressions of interest for an acceleration programme and participation in a mission to China and Singapore. The acceleration activities will last for about four months and will end with a European matchmaking event in July 2019 in Heidelberg, Germany. The 15 highest ranked selected companies will participate in an International Mission to China (Ningbo and Shanghai) and Singapore in September 2019. It represents an important opportunity for EU clusters to learn how to approach the automotive and smart city markets in China⁴⁰.

4.2. Human health sector

In recent years, the Chinese Government has been highly focused on including health in most policies. Thus, in 2018, Healthy China 2030 was launched to foster China's health STI and improve the quality and level of the health services delivered across the country⁴¹. In this context, the EU has been focused on fostering dialogues with Chinese organisations related with human health sectors, which may represent an opportunity for future cooperation.

In recent years, business missions to China have been one of the main tools used to promote EU-China C2C cooperation in the human health sector. In this context, the EU Gateway to China Programme has been focused on helping European companies establish long-term business collaborations in China. The Programme organises business missions that enable European companies to meet with potential Chinese partners in strategic sectors, such as healthcare and medical technologies. Therefore, in 2018, the 3rd EU Gateway to China Business Mission targeted

³⁷ European Automobile Manufacturers Association, ACEA marks 10 successful years in China, www.acea.be/press-releases/article/acea-marks-10-years-of-successful-presence-in-china

³⁸ European Automobile Manufacturers Association, European and Chinese auto makers commit to working more closely together, www.acea.be/press-releases/article/european-and-chinese-auto-makers-commit-to-working-more-closely-together

³⁹ GIVE, www.clustercollaboration.eu/escp-profiles/give-0

⁴⁰ MobiGoIn-Action, Open China and Singapore, www.mobigo.in.eu/open-call-china-singapore/

⁴¹ World Health Organization, Healthy China 2030 (from vision to action), www.who.int/healthpromotion/conferences/9gchp/healthy-china/en/

the healthcare and medical technologies sectors. The mission included a two-day business exhibition, as well as a one-on-one matchmaking event in Shanghai. During the mission, 42 European companies from 16 EU member states held over 500 business meetings with over 360 Chinese visitors⁴². This mission represented a platform for EU cluster members to meet with Chinese organisations from the healthcare and medical technologies sectors.

Furthermore, in April 2019, ENRICH in China organised a Matchmaking Tour to China focused on the healthcare sector. The delegation was comprised of 18 European organisations from different EU Member States and Associated Countries. During the tour, participants attended multi-sessions, visited Science Parks and Research facilities in Beijing and Wuxi, and met with relevant Chinese counterparts from the healthcare sector⁴³. The tour also provided an avenue for EU organisations to identify cooperation opportunities with Chinese organisations from the healthcare sector.

NF4, a second generation ESCP-4i focused on the food sector interested in developing cooperation activities with China, is a fast track internationalisation accelerator for innovation-intensive food SMEs. In this context, in May 2019, NF4 organised an innovation tour to China to jointly explore and facilitate entry to the Chinese food and beverage markets. This innovation tour was mainly focused on the processed foods value chain, in which European SMEs dealing with processed foods or ingredients can learn about the possibilities and challenges of cooperating with Chinese organisations. The tour also included a visit to SIAL China 2019⁴⁴.

4.3. Renewable energy sector

China is a global leader in new wind and solar installations and aims to be the largest renewable energy user by 2020⁴⁵. Thus, in recent years, the Chinese Government has been implementing numerous national programmes and policies to stimulate the development of the country's renewable energy sector⁴⁶. In addition, the 13th FYP defines detailed guidelines to build a clean, low-carbon, safe and efficient energy system⁴⁷.

Considering China's leading role in the energy industry, since 1994, EU and Chinese officials have been meeting for an annual Energy Dialogue to cooperate on energy issues. Thus, during the 2019's Energy Dialogue, the EU and Chinese officials identified four priority areas for cooperation with the aim of further advancing the clean energy transition, namely: energy efficiency, renewable energy sources, design and transformation of the energy system, and the role of

⁴² European External Action Service, The third EU Gateway to China Business Mission in the Healthcare and Medical Technologies sectors successfully concluded,

https://eeas.europa.eu/delegations/zimbabwe/43017/third-eu-gateway-china-business-mission-healthcare-and-medical-technologies-sectors_en

⁴³ ENRICH in China, ENRICH in China Matchmaking Tour – April 2019,

<http://china.enrichcentres.eu/news/enrich-in-china-matchmaking-tour-april-2019-1>

⁴⁴ NF4, Innovation Tour to China during SIAL Shanghai, <https://newfrontiersinfood.eu/events/>

⁴⁵ www.theclimategroup.org/sites/default/files/archive/files/RE100-China-analysis.pdf

⁴⁶ <https://cleantechnica.com/2016/09/15/latest-trends-chinas-continuing-renewable-energy-revolution/>

⁴⁷ China Renewable Energy Outlook 2018, http://boostre.cnrec.org.cn/wp-content/uploads/2018/11/China-Renewable-Energy-Outlook-2018-Folder_ENG.pdf

innovative actors⁴⁸. The establishment of renewable energy sources as a priority area for EU-China clean energy transition emphasises its importance for EU-China C2C cooperation.

Currently, there are numerous cooperation opportunities in the renewable energy sector. The Norwegian Energy and Environment Consortium (NEEC) is a leading example of a European platform focused on promoting and coordinating collaboration projects between its members and Chinese partners. Thus, the Consortium activities include technical workshops, roundtable discussions, pavilions, as well as market research and project identification⁴⁹. The Sino-Norwegian Offshore Wind Workshop, which was held during the 2017 China Wind Power Exhibition and Conference, is a leading example of an event organised by NEEC in collaboration with the Norwegian Energy Partners (NORWEP), China Renewable Energy Industries Association (CREIA) and China Wind Energy Association (CWEA)⁵⁰.

Furthermore, the EU Gateway to China has been focused on promoting Business Missions to China in fields related with renewable energies. Thus, in March 2017, a Clean Technologies Business Mission was held in Beijing⁵¹; while the Environment & Water Technologies Business Mission took place in the same city in June 2018⁵². These missions represent important opportunities for EU cluster members to identify cooperation opportunities in the Chinese renewable energy sector.

Currently, there are two second generation ESCP-4i focused on promoting cooperation activities with China in the renewable energy sector, namely ELBE and EC2i. ELBE aims to contribute to positioning Europe as a technological and industrial leader in the blue energy field. In parallel, EC2i aims to support European cleantech SMEs through the organisation of matchmaking missions to China in 2018 and 2019 in order to stimulate growth and job creation. In this context, in November 2018, EC2i organised a tailor-made matchmaking mission to Nanjing (China) in order to help European companies export their cleantech technology to the Chinese market⁵³.

4.4. Information and Communication Technology sector

ICT is one of China's most dynamic sectors. Currently, the country is the world's second largest ICT market due to internal competition, as well as to the quality of its hardware, software, and services. In addition, the integration of ICT technologies in the traditional industries drives the application and development of specific ICT fields, such as mobile Internet, cloud computing, Big

⁴⁸ European Commission, <https://ec.europa.eu/energy/en/topics/international-cooperation/eu-cooperation-other-countries/china>

⁴⁹ Norwegian Energy and Environment Consortium, <http://neec.no/about/about-neec/>

⁵⁰ Norwegian Energy and Environment Consortium, NEEC organized the Sino-Norwegian Offshore Wind Workshop in Beijing, <http://neec.no/sino-norwegian-offshore-wind-workshop/>

⁵¹ EU Gateway to China, <http://eu-gateway.cn/en/node/19>

⁵² EU Gateway to China, <http://eu-gateway.cn/en/node/425>

⁵³ EC2i, Matchmaking Mission in China – November 2018, www.ec2i.eu/coming-event-matchmaking-mission-in-china-november-2018/

Data, Internet of Things (IoT), and AI⁵⁴. Thus, these fields may represent important areas for EU-China cooperation.

There are several examples of ICT C2C cooperation between the EU and China. DIA is a second generation ESCP-4i that aims to foster cross-sectorial and international cooperation among SMEs and to enhance innovation in the field of digital technologies and smart manufacturing. Thus, DIA has identified China as a priority market to be further explored and approached by its six clusters members⁵⁵ and their SMEs. In this context, DIA aims to develop international cooperation activities focused on generating cooperation opportunities for EU and China cluster members⁵⁶.

Furthermore, SPACE2IDGO is a second generation ESCP-4i that is focused on implementing the international business development action plan defined during the Space Clusters International Industrial Diversification (SPACE2ID) project. Therefore, SPACE2IDGO identified five countries as market priorities for the development of international cooperation activities, namely China, the United Arab Emirates, Canada, Colombia and Chile. SPACE2IDGO plans to enter each market with customized actions. Thus, in China, mobility, logistics and creative industries sectors will be targeted through the export efforts of the partnership.

The European Commission has also been focused on stimulating EU-China C2C cooperation on ICT through international cooperation projects, such as ENRICH in China. The Centre organises missions and matchmaking/innovation tours to various Chinese cities with the objective of creating an environment for face-to-face interactions between EU and Chinese organisations. Until now, ENRICH in China has organised five missions to China (October 2017, May 2018, September 2018, November 2018, and April 2019) related to ICT⁵⁷.

In addition, China-owned organisations based in Europe have been participating actively in the ICT actions under H2020. In the current ICT work programme (2018-2020), cooperation with China on 5G is promoted by project twinning to enable close collaboration with the "5G Major Project", which was funded by China⁵⁸. From the EU side, the 5G Harmonised Research and Trials for service Evolution between EU and China (5G-DRIVE) project has been approved with the aim of increasing harmonisation and R&I cooperation between the EU and China in 5G⁵⁹.

⁵⁴ Export.gov, China - Technology and ICT, www.export.gov/article?id=China-Technology-and-ICT

⁵⁵ DIA cluster members: MITC - Malardalen Industrial Technology Center, GAIA.-Association of Knowledge and Applied Technologies industries in the Basque Country, MESAP Innovation Cluster - Smart Products and Manufacturing, Associação para o Pólo das Tecnologias de Informação, Comunicação e Electronica TICE.PT, BalticNet-PlasmaTec e.V., and Secured Communicating Solutions cluster.

⁵⁶ DIA, <https://digitalindustryalliance.eu/>

⁵⁷ ENRICH in China, <http://china.enrichcentres.eu/>

⁵⁸ European Commission, Roadmap for EU-China S&T cooperation, https://ec.europa.eu/research/iscp/pdf/policy/cn_roadmap_2018.pdf

⁵⁹ 5G – DRIVE, <https://5g-drive.eu/>