P.I.A.N.O.

Policies, **I**nnovation **A**nd **N**etwork for enhancing **O**pportunities for China-Europe water cooperation

Strenghtening China-Europe international cooperation in water research and innovation

www.project-piano.net

Main achievements

The project PIANO (*Policies, Innovation, And Network for enhancing Opportunities for China-Europe water cooperation*) has developed activities aimed at strengthening the international cooperation in the field of water between Europe and China and promoting the creation of networks of companies, SMEs, entrepreneurs, NGOs, policy makers, regulators and funding agencies to create business and social opportunities.

Its objectives have been:

- **Strengthening and expanding the existing network of the China-Europe Water Platform (CEWP) to cover all actors relevant for cooperation between China and Europe in the water research and innovation domain**
- **Identification of European technological water innovations and areas for joint development of innovative technological solutions that have a potential for their implementation in China**
- **Identification of drivers and barriers concerning this cooperation and elaboration of strategies to overcome such barriers and take advantage of drivers for the implementation and replication of technological water innovations in China**
- **Promotion of knowledge exchange and policy dialogue to build an enabling environment for the uptake of technological water innovations with a great potential for implementation, further replication and market uptake in China**
- **Consolidation of a shared strategic research and innovation agenda (SRIA) between Europe and China water sector**
- **Effective dissemination and mainstreaming of the project results to Chinese, European stakeholders and international target audiences**

PRIORITY RESEARCH AREAS OF THE PROJECT

The international cooperation within the PIANO project has focused on the following water challenges:

- **Agricultural water management**
- **Municipal water management**
- **Industrial water management**
- **River basin management**
- **Water for energy**

THE PARTNERSHIP

The project consortium is composed of nine partners of which eight are located in eight different EU Member States and one is based in China. The consortium encompasses partners from high level academic institutions and experienced research institutes to non for profit organizations, from European umbrella associations to a commercial SME and a large international company. The PIANO partners are supported in their activities by many Chinese institutes and research centres.

A DATABASE OF EU-CHINA PROJECTS

In order to obtain a general overview on some past and current cooperation projects in the water innovation sector set up between China and Member States in both public and private sector information was gathered on the partners of both sides, the main issues and topics covered, the sources of funding. A database helped having a better understanding of the general context in which such projects in the water innovation sector were carried out and supported the elaboration of strategies for overcoming possible barriers able to take advantage of drivers for implementation of technological water innovations and business opportunities.

LANDSCAPING OF TECHNICAL WATER INNOVATIONS

The TWIs investigated encompass products and processes that modify, optimize, support, are part of, or constitute entirely new treatment technologies, water use technologies, water production technologies, water management technologies, and technologies for flood protection or energy production. These TWIs can be innovative by themselves or can constitute a part of an innovation process. Based on this landscaping, the identified TWIs were than assigned to one of the following 5 categories:

In the scoring survey, experts in Europe and China were asked to determine for each TWI – among other assessments – the degree of European technological leadership and of novelty to China, indicative for the relative innovative performance of the two regions. The resulting inventories (ranked TWIs) plus leadership assessments thus serve as an indicator of the strength and scope for technological development in a specific sector.

Category 1 - established (conventional) technology solutions available in both the EU and China

Category 2 - established technology solutions available in Europe, but not in China

Category 3 - similar/joint innovative solutions available in both the EU and China

Category 4 - innovative solutions available in Europe but not China

Category 5 - innovative solutions available in China but not the EU

Table 1 presents the full inventory containing up to 20 European TWIs per sector (shortlisted from a total survey of over 200 TWIs).

Table 1: Overview of TWI numbers in Inventory I for each sector.

Sector	Category 1	Category 2	Category 3	Category 4	Category 5	Total
Agricultural water management	-	-	15	5	-	20
Municipal water management	2	-	14	15	-	31
Industrial water management	-	-	18	11	-	29
River basin management	-	-	6	12	-	18
Water for energy	-	-	5	13	-	18
Total	2	0	58	56		116

Inventory II is the targeted inventory containing sector-specific category 4 European TWIs (see Table 1). These are considered to have the highest potential for implementation in helping to resolve relevant water challenges in China. In total around 100 European technologies were identified, with 59 belonging to category 4. Hence, Europe offers a number of innovative technologies with a potential for application in China. These technologies encompass the following types:

- Monitoring: Tools that gather data on the state of the environment, infrastructure and processes.
- Modelling/DSS: Tools that interpret monitoring data and integrate with scientific understanding of the behaviour of systems over time to inform decisions on the design and operation of infrastructure and equipment.
- Integrated management systems/controls: Tools that convey the conclusions from the modelling and DSS systems to the infrastructure – communications (e.g. SCADA) and automation (e.g. actuated valves, speed controllers etc).
- Products/Processes: Actual infrastructure and equipment. Either physical structures or process designs.

IDENTIFICATION OF DRIVERS, BARRIERS, STRATEGIES FOR IMPLEMENTATION OF EU TECHNICAL INNOVATION IN CHINA

Successful up-take of technological water innovations has to be seen in the context of a complex system of interactions between different actors in the water sector, often in response to drivers and pressures. Figure 1 illustrates three major actor groups and typical barriers for innovation implementation, replication and market penetration. Typical barriers encompass thereby institutional, social and economic ones. The major actor groups identified for the target networks act together to resolve water issues within the limitations of a larger socio-ecological system.

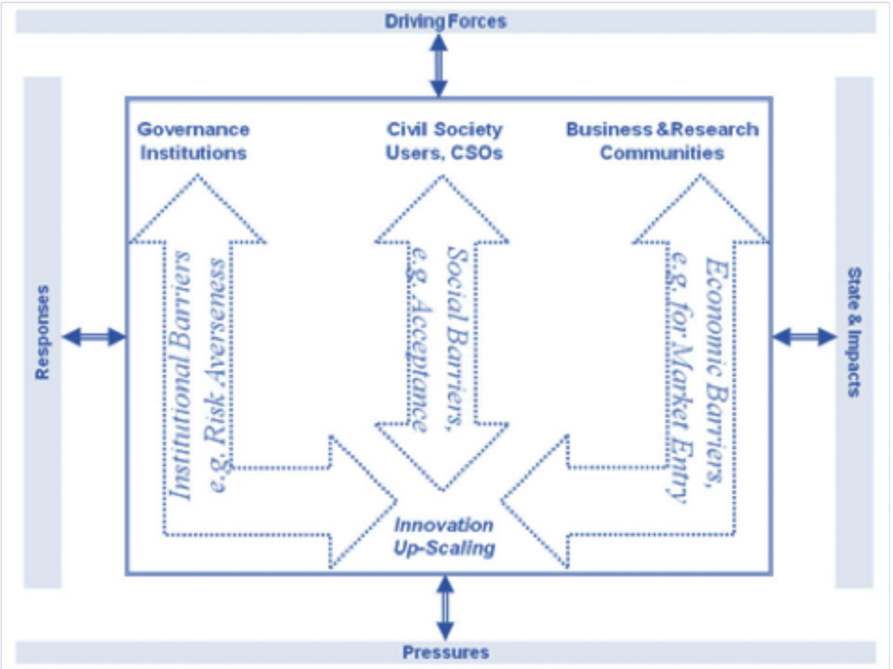
Figure 1 Drivers and barriers for innovation implementation, replication and market penetration

Some examples of identified barriers are shown below:

- Market understanding/language
- Market/public acceptance of new technologies
- Promoted/Closed lists for imports and market access

Localisation of technology

- Certification and approval of technologies
- Identification of clients
- Procurement routes
- Business registration and banking
- Reliable partners for distribution, installation, training and operation.
- IPR protection and copying



SUGGESTED STRATEGIES TO OVERCOME MARKET BARRIERS

The two main strategies for partnering for foreign SMEs are either finding distributors for direct sales and support or finding strategic partners who are involved in the PPP (public procurement procedure) infrastructure projects and will incorporate the European technology to these projects.

The policy driven solutions will most likely be implemented through demonstrations and pilots at local and regional levels delivered to local government tenders by PPP contractors. For innovative technologies that will challenge standards or require integration of different departments and industries the foreign company may want to also build close relations with relevant Government research or technical institutes.

Before fully engaging with any partners the foreign SME should take action to register any intellectual property in China, in accordance with guidance from the EU IPR helpdesk. Even if registered internationally IP and trademarks should be separately filed in China.

When engaging with potential commercial partners consideration will need to be given to the localization of the technology to meet local standards and documentation in Chinese. In all cases the provider of the technology must be able to demonstrate the business case for customers to adopt their solution rather than the status quo or cheaper local alternatives by quantifying the added value provided either through innovation or quality, reliability, and efficiency.

KNOWLEDGE EXCHANGE AND POLICY DIALOGUE

The Strategic Research and Innovation Agenda (SRIA) of the PIANO project is conceived to be a forward-looking document that sets out the direction of future collaborative EU-China research and innovation activities in the water sector, with a special and specific attention to the thematic areas identified and focused by this H2020 project.

The PIANO SRIA aims to support the activities of the China-Europe Water Platform in its research pillar being the reference document for the implementation of further initiatives of joint international cooperation between Europe and China in water innovation, a sector which offers increasing opportunities to all interested actors, in particular European small and medium enterprises able to produce advanced technological solutions. The document is addressed to researchers, governmental agencies, innovative enterprises and private stakeholders who should combine synergies to strengthen innovation capacity and promote social and economic cooperation in both areas of the world. By identifying needs and priorities in the EU-China cooperation in water innovation, the PIANO SRIA intends to highlight the main opportunities for the development of further collaborative actions engaging public and private partnerships based on the sharing of knowledge and good practices and also contribute to the achievement of the United Nations' Sustainable Development Goals.

KEY POLICY MESSAGES

Consider water as a formal component of future EU-China RIA (research and innovation action) agenda

There is significant existing scientific cooperation in the field of water, through the China Europe Water Platform (CEWP). Potential focus on the domain areas outlined in the PIANO SRIA should be considered, as it is based upon mutual challenge areas in China and Europe that are also aligned with priorities set out in existing European and Chinese SRIAs.

Better exploit existing RIA (research and innovation action) infrastructure

This can be built through existing support mechanisms for EU-China cooperation on water and integration into other EU-China collaboration platforms, such as the multi-actor partnership programs financed by the European Partnership Instrument in connection with the EU-China Water Platform, but also including DragonSTAR, ASEM Water and the EU-China SME Center EU Gateway to China: Environmental and Water Technologies; and EURAXESS (among others). Improving links to other major flagship EU-China SRIA initiatives relevant to water innovation should also be a priority. The dialogues on food, agriculture and bioeconomy as well as on environment, climate and sustainable urbanization are potentially most relevant.

Coordinate EU water innovation support systems with Chinese counterparts

There are several existing hubs in China to support procurement of water technology solutions from Eu-

rope and internationally. Generally, these are fragmented and face challenges to properly sort/ access sufficient information on which technological solutions exist, their quality, and their fit to local conditions. Increased focus on matchmaking led at city or province level may hold greater opportunities than the national hubs solely led by Chinese government authorities.

Align visions with the Global Goals, and consider future collaborations on global water innovation challenges

Europe and China represent two largest markets and RIA investors in water in the world, should focus on developing innovation and uptake of innovations that can address global and development challenges beyond their markets. A proposed PIANO Strategic Research and Innovation Agenda works to this end, by aligning mutual innovation challenge areas with relevant SDG targets they contribute to.

NETWORKING DISSEMINATION AND EXPLOITATION ACTIVITIES

A periodical newsletter was issued and circulated to contacts in European countries and in China. Presentations of the PIANO project aims and activities were held during the following international and national water-related events →

28 April 2015	*workshop of the project Dragon Star*	*Bruxelles*
12 May 2015	*CEWP Annual High Level Conference*	*Copenhagen*
24-26 June 2015	*Water Innovation Europe "The role of water in circular economy"*	*Brussels*
August 2015	*World Water Week*	*Stockholm*
21-22 September 2015	*Water EXPO*	*Venice*
22 October 2015	*CEWP biannual meeting*	*Brussels*
29 October 2015	*workshop at EUCCC with European water companies*	*Beijing*
30 October 2015	*meeting at the Chinese Ministry of Water Resources*	*Beijing*
3- 6 November 2015	*dissemination of PIANo flyers at Ecomondo exhibition*	*Rimini*
25 November 2015	*Water Industry Supplier Conference*	*Birmingham*
10 February 2016	*EIP water annual conference*	*Leeuwarden*
29 February 2016	*CEWP European coordination meeting*	*Brussels*
7-9 March 2016	*Portuguese Water Congress*	*Lisbon*
19 May 2016	*poster at Water JPI first international conference*	*Rome*
26 May 2016	*presentation at the CEWP meeting*	*Brussels*
30 May - 3 June 2016	*IFAT exhibition*	*Munich*
7-8 June 2016	*Global Clean Tech&Green Summit and 3iPET First Annual Meeting*	*Beijing*
7-9 June 2016	*Conference of the citizens observatories on water management*	*Venice*
21-23 June 2016	*Water Innovation Europe*	*Brussels*
7 July 2016	*16th International Schumpeter Society Conference*	*Montreal*
13 July 2016	*presentation to the UK Water Partnership*	*London*
August 2016	*World Water Week*	*Stockholm*
12 October 2016	*Financial Water Summit*	*London*
19-21 October 2016	*Accadueo fair and exhibition*	*Bologna*
21 October 2016	*presentation at conference WaterIdeas 2016 organized by IWA*	*Bologna*
19-21 October 2016	*ASEMwater annual event*	*Changsha*
8-9 November 2016	*EWA Days*	*Brussels*
29-30 November 2016	*DRAGON STAR workshop*	*Ningbo*
March 2017	*presentation in UK at Isle Utilities Group event*	*London*
26-28 April 2017	*MWR DRC,CAEP meetings with EUCCC and EU SME Centre*	*Beijing*
2 May 2017	*MEP FECO 3 IPET*	*Beijing*
3-4 May 2017	*CEWP Joint Steering Committee*	*Evora*
4- 6 May 2017	*networking activities with IE Expo participating companies*	*Shanghai*
10 May 2017	*presentation at bilateral meeting of the TWEES project*	*Tongzhou*
26 May 2017	*visit tour to ISPRA of Chinese researchers of Tianjin*	*Rome*
14-15 June 2017	*Water Innovation Europe*	*Brussels*
27-29 June 2017	*International Water Congress*	*Quingdao*
10 July 2017	*presentation to the UK Water Partnership*	*London*
30 August 2017	*PIANO side event at WWW*	*Stockholm*
21 September 2017	*presentation at CEWP Annual high level conference*	*Turku*
26 September 2017	*side event during the EIP Water annual conference*	*Porto*
6 November 2017	*presentation of the PIANO SRIA at EWA annual conference*	*Brussels*
13-16 November 2017	*presentation at IWA congress*	*BuenosAires*
22 November 2017	*guest lecture at Nottingham NingboUniversity*	*Ningbo*
16 January 2018	*poster at Water International Summit*	*Abu-Dhabi*
12 February 2018	*presentation to teams involved in the Thames water 2100 plan*	*London*
7-9 March 2018	*paper and presentatiom at the 14th Portoguese Water Congress*	*Evora*
13 March 2018	*meeting with CEWP representatives to discuss the PIANO SRIA*	*Stockholm*
27 March 2018	*meeting with Chinese partners and EU SMEs at EUCCC*	*Beijing*
11 April 2018	*presentation of the PIANO SRIA at CEWP meeting*	*Paris*
25 April 2018	*Industry workshop on market of sludge treatment in China*	*Beijing*
4 May 2018	*PIANO event at IFAT- IE EXPO*	*Shanghai*
15 May 2018	*Presentation of the project results*	*Brussels*

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