POCACITO

european post-carbon cities of tomorrow

REPORT ON ACTIVITIES IN NON-EU CITIES INVOLVED IN POCACITO

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This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 613286.

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Project coordination and editing provided by Ecologic Institute.

Manuscript completed in December 2016

This document is available on the Internet at: [optional]

Document title	REPORT ON ACTIVITIES IN NON-EU CITIES INVOLVED IN THE PROJECT
Work Package	WP6
Document Type	Deliverable
Date	1.12.2106
Document Status	Final

ACKNOWLEDGEMENT & DISCLAIMER

The research leading to these results has received funding from the European Union FP7 SSH.2013.7.1-1: Post-carbon cities in Europe: A long-term outlook under the grant agreement n°613286.

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I EXECUTIVE SUMMARY

Given the socio-economic dynamics in BASIC countries and in order to facilitate a closer exchange of visions and experiences, three BASIC cities were chosen to be partners in the POCACITO project, two cities in China—Guangyuan City in Sichuan Province and Xiamen in the south Fujian Province—and Aracaju in Brazil. Chinese activities were carried out by the Chinese Academy of Social Sciences (CASS) and activities in Brazil by MIND Brazil, a consultancy. We aimed for a mutual exchange of insights between the EU and emerging countries.

Given the dynamics regarding low-carbon development in China, a stronger focus was laid on Chinese cities, and we identified several areas and initiatives where the EU can learn from experience made. In the Chinese case study cities we had meetings with stakeholders not only to share EU experiences but also to carry out vision building and back casting exercises based on the POCACITO method and experiences in EU cities. Our activities in Brazil were rather centred on sharing experiences with Brazilian stakeholders. Insights from Brazil and China entered our strategy paper, while Chinese experiences were also presented in a policy brief, a webinar and an upcoming publication. Insights from China and on technology transfer more generally were also considered in the POCACITO roadmap. Additional activities regarding know-how transfer comprise discussion and exchange of insights and know-how between several EU city indicators and CASS members as well as the participation of a representative member of CASS in the second study tour.

II INTRODUCTION

Given the socio-economic dynamics in BASIC countries, three BASIC cities were chosen as project partners for a closer exchange of visions and experiences: two cities in China, Guangyuan City in Sichuan Province and Xiamen in Fijuan Province, and the Brazilian city of Aracaju. In each city, meetings with city representatives were held. In China, the Chinese Academy for Social Sciences (CASS) facilitated the exchange with Guangyuan and Xiamen as a sub-contractor. For Sao Paulo, a local sub-contractor called MIND Brazil organised the meetings with Sao Paolo city representatives.

In the following, a summary of activities that focused on mutual learning processes between the EU and emerging economies is presented.

II.I TENDERING PROCEDURES

For the Chinese sub-contractor, JR launched a tendering procedure and had at least three offers to select from. Likewise, for the Brazilian sub-contractor, INTELI launched a tendering procedure. JR selected the Chinese sub-contractor according to the following criteria:

- *The sub-contractor should be multidisciplinary by nature to be in line with POCACITO's aim to reach a multitude of stakeholders throughout the project.*
- *The sub-contractor will organise at least two local workshops in two Chinese cities and contribute to the engagement of local Chinese stakeholders. The work will consist of holding local meetings with city officials to promote best practice exchange and discuss the best practices identified during the POCACITO inventory of Urban Sustainability Initiatives and the assessment of case study cities, where innovative approaches for the transition towards post-carbon cities will be identified and existing sustainability initiatives in European cities will be assessed.*
- *In order to further enhance the outreach of POCACITO, the sub-contractor will translate at least two policy briefs into Chinese (Mandarin).*
- *The sub-contractor will contribute to a strategy paper focusing on how experiences from EU cities can contribute to development especially in non-EU emerging cities.*

III BRAZIL

During a POCACITO **workshop in Aracaju** Brazil (see Annex III), good practices exemplified in the POCACITO case study cities as well as more theoretical approaches to assess post-carbon cities were shared with Brazilian municipalities. Over 50 stakeholders took part in the workshop organised by INTELI, Mind Brazil and the Federal Institute of Sergipe.

INTELI's presentation was centred on the integrated assessment of case study cities, based on the environmental, economic and social key performance indicators defined within POCACITO. Moreover, smart and sustainable strategies and plans were discussed, with a specific focus on Lisbon, Barcelona and Copenhagen. The good practices available through the online "marketplace of ideas" were presented, and the audience suggested some innovative projects that are being developed in Brazil to include in the database.

A **one-day study** tour was organised, including a seminar and visits to some entities and organisations.

In the seminar, several Brazilian and European good practices were presented in the area of sustainable and resilient cities. Site visits included the Operations Centre of Rio de Janeiro, Olabi Fab Lab and EDI –European Design Institute Rio.

Operations Centre of Rio de Janeiro is an urban management platform that collects, integrates and analyses real-time information on events, such as weather, natural risks, traffic, etc. in order to support decision- and policy-making processes. This initiative is related to POCACITO because it anticipates and models natural disasters, reinforcing a city's resilience and combating climate change.

Olabi Fab Lab is a digital fabrication laboratory where low cost sensors and other equipment to measure indicators such as air pollution, temperature, noise, etc. are produced. The lab's activities are related to POCACITO because they enhance the adoption of low-carbon behaviours and sustainable lifestyles by citizens, contributing to the transition towards a post-carbon city.

EDI is Rio's office of the European Design Institute. One of the areas of intervention of the institute is the design of methodologies and techniques to enhance citizens' participation in urban life. In fact, the definition of post-carbon futures requires the collective contribution of the population, companies, local governments and knowledge centres.

IV CHINA

IV.I STAKEHOLDER MEETINGS IN GUANGYANG AND XIAMEN

The two case studies in China were Guangyang and Xiamen. Originally Beijing was planned to be the second case study city, but given that there are already several initiatives ongoing in Beijing and that Xiamen is in a process where it can strongly benefit from EU experiences, Xiamen was chosen.

The case study research team from CASS visited Guangyang in January and June 2015. The city administration of Guangyang and the Municipal Low-carbon Development Bureau helped the research team to arrange stakeholder meetings, field trips and interviews. EU experiences were shared and a vision building and back casting exercise based on the POCACITO method was employed (see Annex I for details). In Xiamen stakeholder meetings, field trips and interviews were held during June 22-24 2016, also here lessons from EU low-carbon cities ware discussed and Chinese experiences were made available to European stakeholders. Also in Xiamen a vision building and back casting exercise was carried out (see Annex II for details). An additional visit to Xiamen was made in November 2016 to support data collection and to do further research related to a final POCACITO publication on China.

IV.II WEBINAR

A POCACITO webinar on urban development in Asia took place on 3 December 2015 from 09:00 to 10:00 CET. In the webinar, Ying Chen, Senior Research Fellow and Deputy Director of Research Centre for Sustainable Development (RCSD), Chinese Academy of Social Sciences (CASS), spoke about "*Low-carbon Pilot Cities in China: Taking Guangyuan as an Example*" and Kathleen Dematera Contreras, Environment Researcher at Clean Air Asia, spoke about "*Low-emission Initiatives in Philippine Cities*". Overall, 23 people from 16 institutions participated in the webinar.

Presentations are available online at the project website (http://pocacito.eu/blog/2015-12-03/pocacito-webinar-low-carbon-urban-developments-asia)

IV.III FACT SHEETS IN CHINESE

Fifteen facts sheet (of the Marketplace for ideas) were translated into Chinese by IVL Beijing and distributed among Chinese stakeholders.


智能城市 - 优秀范例

生物多样性，土地使用，建筑

“生物多样性城市”

- 绿色城市项目

马尔默，瑞典

POCACITO

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“生物多样性城市” - 城市绿地创新解决方案展示

“生物多样性城市”项目在马尔默于 2012-2014 年展开。此项目旨在通过创造新产品，服务和优化城市绿化来增加城市生物多样性。项目的目标是创造永久的绿色城市示范以传播绿色创新解决方案。项目预算为 999.5 万 SEK (~118 万 USD)[1]，由瑞典创新机构 VINNOVA 赞助 [4]。项目包括城市不同地区绿色后院，屋顶和墙体创建，一些包括可食性植物，还有一些专注于植物和生物多样性曾经出现地区的恢复。此项目成功的关键是多学科的融汇，生态学家，景观设计师，科学家，企业家，开发商等等共同合作以实现各自的绿色项目。

国家/ 城市简介

国家		城市	
人口 (2014)	9 74.7 万 [2]	人口 (2013)	313,000 [2]
陆地 & 水 面积 (km²)	528,447 [2]	陆地 & 水 面积(km²)	157 + 177 [2]
人均 GDP (2014, 国际货币$, 购买力水平)	45,143 [8]	人均 GDP (2011, US$)	45,000 [9]
地区	北欧/斯堪的纳维亚	地区	沿海（斯科讷）

城市地理位置

位置	✓ 位于瑞典西南沿海 ✓ 低海拔
气候	✓ 温带气候 (平均温度: 冬季-1 到 -6C°，夏季 11 to 13 C°) [7] ✓ 年降雨量 670 mm (瑞典平均值) [2]

初始背景

马尔默“生物多样性城市”从计划到实施，包括了绿色屋顶，立式花园，移动植被等等的建立，达到城市更健康，更有吸引力的目标。在项目进行过程中，所有新产品，服务，流程都可在市场上出售。

项目介绍

绿色屋顶很流行，但“生物多样性城市”的独特之处在于结合比目前通常所见的更多生物多样性的绿色屋顶。在西部港口“Klippern”公寓屋顶上， 比如，种植了很多当地植物牛舌草和百里香，此举以试图在楼房建造之前重建生物栖息地。这

Figure 1 Factsheet in Chinese

IV.IV SCIENTIFIC COOPERATION AND PUBLICATIONS

During the duration of the project a successful scientific cooperation between JR and CASS was established. CASS together with JR wrote the first POCACITO policy brief on Low-Carbon Urban Development in China: Current Initiatives, Future Plans and First Lesson. See: http://pocacito.eu/blog/2016-07-21/policy-brief-low-carbon-urban-development-china

CASS also contributed to the POCACITO strategy paper: Sharing EU urban solution and technologies with Non-EU cities.

In China there are no officially issued low-carbon city indicators, but some cities developed different kinds of indicators for performance evaluation. The indicators used in POCACITO are of great use for CASS to develop standardised indicators for China.

Currently, an additional paper comprising cooperation and know-how transfer between EU cities and the Chinese city of Xiamen is being prepared by JR and CASS. This paper is aimed first to be a policy brief, then to be submitted in a peer-reviewed journal. Both, JR and CASS are currently discussing future project opportunities to continue the successful scientific cooperation.

V ANNEX I BRIEF REPORT ON STAKEHOLDER WORKSHOPS IN GUANG YUAN

V.I BACKGROUND OF CASE STUDY

China launched low-carbon pilot projects as an important policy instruments to promote low-carbon development. Up to now, Chinese government announced two batches of low-carbon pilot projects in July 2010 and in December 2012. The first batch involves five provinces (Guangdong, Liaoning, Hubei, Shaanxi and Yunnan) and eight cities (Tianjin, Chongqing, Shenzhen, Xiamen, Hangzhou, Nanchang, Guiyang and Baoding). The second batch includes the Hainan province and 28 cities (Beijing, Shanghai, Shijiazhuang, Qinhuangdao, Jincheng, Hunlunbeier, Jinlin, the Great Xingan mountain area, Suzhou, Huaian, Zhenjiang, Ningbo, Wenzhou, Chizhou, Nanping, Jingdezhen, Ganzhou, Qingdao, Jiyuan, Wuhan, Guangzhou, Guilin, **Guangyuan**, Zunyi, Kunming,Yanan, Jinchang and Urumqi).

Guangyuan (GY) is located in north Sichuan Province, south-western China. It consists of 4 counties and 3 districts, covering an area of 16,300 square kilometres with a total population of 3.14 million.

GY belongs to the second batch of low-carbon pilot cities in China, and is the only one in Sichuan Province. The city is also known as an excellent tourist city, national forestry city and national sanitary city. GY was hit hard by an earthquake in 2008 resulting in a large number of casualties and severe economic losses. After the earthquake, GY developed rapidly. The GY mayor paid high attention to low-carbon city pilots and set up the Low-Carbon Bureau as the leading group who is responsible for low-carbon development.

The Institute for Urban and Environmental Studies (IUE) of the Chinese Academy for Social Sciences (CASS) has worked with GY to promote low-carbon development since 2009, with support from WWF and other institutions. Since then, both sides have benefited from the cooperation relationship. IUE plans to continue to work with GY local government in 2016 to make GY's 13th Five Year Plan of Low-carbon Development (2016-2020) a success.

V.II WORKSHOP DATES AND LOCATIONS

GY was selected as one of case studies in China for POCACITO. The stakeholder meetings took place on 17 June 2015 and during the field trips in March and June 2015, where lessons from EU low-carbon cities were discussed and Chinese experiences were shared with European stakeholders.

V.III PARTICIPANTS AND ACTIVITIES

Prof. Dr. Ying Chen from IUE CASS is POCACITO Project China case study project leader. Ms. Fan Bai is her research assistant. Her colleague in IUE Prof. Guiyang Zhuang and his PhD student Mr. Zhenge Zhou also contributed to the case study.

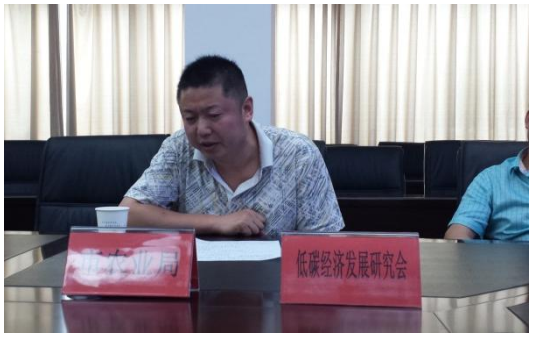
The case study research team visited GY in January and June 2015. GY Municipal Low-carbon Development Bureau helped them to arrange stakeholder meetings, field trips and interviews. Prof. Chen and Zhuang also met Mr. Yong Zhou, the Director of in Beijing for a discussion in August 2015. In 2016, more discussions focused on the 13th Five Year Plan of Low-carbon Development (2016-2020) in GY.

Table 1 Agenda in GY

	Activities
Jan. 28 2015	Wind power generation, biogas utilization and a Lithium-ion battery company
Jan. 29 2015	Modern agricultural park and new style rural community
Jan. 30 2015	Meeting with GY Municipal officials
June 16 2015	Low-carbon and harmonious community, public bicycle and green lane in GY
June 17 2015	Meeting with GY Municipal officials and experts
June 18 2015	Low-carbon tourism in Zengjia Forest Park in GY

(1) Low-carbon life initiative poster

(2) Low-carbon and harmonious community



(3) Meeting with GY Municipal officials and experts

(4) Public bicycle service and green lane

(5) Biogas utilization in rural area

(6) New style rural community

Table 2 Stakeholders of low-carbon development in GY

Name	Institution	Government/Expert/Company/NGO
Yong ZHOU	GY Municipal Low-carbon Development Bureau	G
Haiyin XIE	GY Municipal Low-carbon Development Bureau	G
Shiyang PENG	GY Municipal Tourism Bureau	G
Hongfang SUN	GY Municipal Agricultural Development Office	G
Guopei WANG	GY Municipal Transportation Bureau	G
Shouyu ZHANG	GY Municipal Economy and Information Technology Commission	G
Mingqiang SONG	GY Municipal Housing and Construction Bureau	G
Derun LIU	GY Municipal Bureau of Science, Technology and intellectual property	G
Zhiming GONG	GY Municipal Parks Bureau	G
Zhiqin FENG	GY Municipal Environmental Protection Bureau	G
Ronghua WU	GY Economic and Technological Development Zone	C
Liming HUANG	Low-carbon Economy Research Association	E/N
Shiguo GUO	Low-carbon Economy Research Association	E/N

V.IV METHODOLOGY

At the beginning of the stakeholder meeting, Mr. Yong ZHOU, the Director of GY Municipal Low-carbon Development Bureau introduced Prof. Ying Chen and all participants. Prof. Chen gave a presentation to introduce the background and purpose of the workshop as follows:

- climate change negotiations and the coming Paris conference of UNFCCC,
- progress of Low-carbon city at international level, including the ICLEI Congress in Seoul in April 2015 (Prof. Chen attended),
- POCACITO project and European case studies to share some experience of low-carbon city construction,
- considerations to choose GY as one of case studies in China,
- put forward the key questions of vision building and back casting scenarios,
- ask for the possibility to attend the two workshops,
- encourage all the participants to discuss the above questions.

As most of participants were governmental officials, they were very busy and strongly suggested integrating the two workshops. In China, governmental officials are not used to western-style exercises and workshop methods, such as in-group discussion, drawing pictures and so on, in a meeting. In China it is common that the participants speak one by one. This suggestion was accepted in order to make the participants feel comfortable and hence discuss as well as work more efficiently.

Prof. Chen raised the following key questions for discussion:

- How would you like GY to look like and to function in 2050?
- What are the main problems or challenges for GYs low-carbon development?
- Can we establish a common vision for a carbon-free GY in 2050?
- What are the key elements for GY's bright future?
- How should we overcome the difficulties to reach the long term targets in GY?
- What are the milestones of low-carbon development road map for GY?
- How can you or your division contribute to build GY as a pioneer low-carbon city in China?

Most of participants were interested in such discussions and actively express their thoughts. The research team tried to understand and summarise the key points. Other activities such as field trips and interviews also provided useful information to get better understanding on low-carbon development in GY.

V.V RESULTS FOR VISION BUILDING

Although every participant had his own opinions and priorities, the common vision for 2050 was described as beautiful environment and happy life for all.

GY residents were proud of the current relatively good environment resulting in plenty of water resources, high forest coverage, good air quality, etc. They also recognized that GY, being located in western China, is less developed comparing to the eastern China. GY definitely needs economic growth to reduce poverty, improve infrastructure as well as life quality. The great challenge is how to balance both sides, or decouple economic growth and environmental pollution as well as ecologic degradation.

Some important sectors and areas were frequently mentioned:

- Urbanisation: GY is experiencing fast urbanisation. The urbanisation rate is around 40% (1.57 percentage of annual increase in recent years). Fast urbanisation may bring huge demand on city infrastructure and service, social transformation and environmental pressure.
- Agriculture: Agriculture is still an important economic sector. It is important to create more economic productivity with limited land.
- Industry: The share of industrial sector in the economy is about 40%. Industry has the largest potential to reduce carbon emissions. With higher environmental regulation standards, low efficient high pollution plants will be phased out.
- Tourism: GY has a long history and plenty of tourism resources. Tourism has great potential for growth. The conception of low-carbon tourism needs to be developed and implemented.
- Quality of Life: The final purpose of development is the improvement of quality of life. A beautiful environment is an internal and important part of this. Rural areas need more attention from public organisations.
- Environment and Natural Resources: Sustainable development is widely accepted. Efficient use of energy and natural resources, waste management, carbon emissions reduction and renewable energy are important.
- Governance: Governmental representatives recognised their responsibilities in leading low-carbon development. Public participation is an emerging issue.
- International cooperation: GY, as a middle-sized city, welcomes opportunities for international cooperation and would like to learn from European experience but up to now GY has little chance to do so in this area. Capacity building is needed.

V.VI RESULTS FOR BACK CASTING SCENARIOS

Compared with a long term vision for 2050, workshop participants seemed more comfortable discussing the reality and short term targets for the 13th Five Year Plan (2016-2020). The targets in 2020 and 2030 were set up as milestones for vision 2050.

The outline of GY social and economic development in the 13th Five Year Plan was discussed. The average economic growth was about 8%, higher than the national target with around 7%. Following the national target of poverty alleviation, i.e., support the population below poverty line to end extreme poverty by 2020. Thus, GY will make the best efforts to end poverty. By the end of 2020, some projected indicators of high importance will be an urbanisation rate of about 47%, industrial sector 45%, service sector 38%. Regarding the energy conservation and emissions reduction, GY officially committed to meet the national and provincial assigned targets but no concrete numbers have been mentioned. However, GY clearly committed to increase the share of non-fossil fuel in energy mix to 30% by the end of 2020.

In fact, GY officials felt it would be more and more difficult to finish the assigned targets of the 11th Five Year Plan. The reconstruction after the earthquake in 2008 consumed more energy and hence emitted more CO_2. In recent years, the low hanging fruit, i.e., low cost reduction opportunities are becoming less and less. GY needs to think about innovative approaches to mobilise all aspects of the society.

The most important milestone of low-carbon development is emissions peaking. China's submitted INDC declared that it would reach peak emissions around 2030 and make efforts to achieve this as early as possible. The Alliance of Peaking Pioneer Cities (APPC) was established at the first US-China Climate-Smart/Low-Carbon Cities Summit in 2015. Nine cities and two provinces serve as APPC members committed to achieve an emissions peak before 2030, including Sichuan Province. More low-carbon pilot provinces/cities joined APPC in the Second US-China Climate-Smart/Low-carbon City Summit held in Beijing early June 2016. Up to now, the 23 provinces/cities who are members account for 17% of the population, 28% of GDP and 16% of China's carbon emissions. However, GY is taking it seriously and has not announced the year of emission peak. GY is very likely to set a year of emission peak before 2030.

Governmental representatives discussed their current work and tried to link their work to low-carbon development of GY, such as building code and retrofitting, financial support for economic structure adjustment and industrial advanced technology utilization, etc.

The governmental official evaluation system is part of the governance for low-carbon development. In China it is quite crucial to provide incentives for local officials. In this regard, GY introduced several indicators in annual evaluation, which has been identified as a useful monitoring and incentive tool.

V.VII OVERVIEW EVALUATION

Stakeholder workshops for the GY case study were successfully evaluated. The city representatives imagined that GY would have a brighter future (beautiful environment and happy life for all) by achieving low-carbon development towards 2050. Thus, a new model of development was emphasized to achieve the targets, meaning innovative, harmonious, green, open and inclusive development. The milestones were set for the 13th Five Year Plan (2016-2020) and 2030.

VI ANNEX II BRIEF REPORT ON STAKEHOLDER WORKSHOPS IN XIAMEN

VI.I BACKGROUND OF CASE STUDY

First announced in July 2010, the first batch of low- carbon pilot projects involves five provinces (Guangdong, Liaoning, Hubei, Shaanxi and Yunnan) and eight cities (Tianjin, Chongqing, Shenzhen, **Xiamen**, Hangzhou, Nanchang, Guiyang and Baoding). The second batch announced in December 2012 includes the Hainan province and 28 cities (Beijing, Shanghai, Shijiazhuang, Qinhuangdao, Jincheng, Hunlunbeier, Jinlin, the Great Xingan mountain area, Suzhou, Huaian, Zhenjiang, Ningbo, Wenzhou, Chizhou, Nanping, Jingdezhen, Ganzhou, Qingdao, Jiyuan, Wuhan, Guangzhou, Guilin, Guangyuan, Zunyi, Kunming,Yanan, Jinchang and Urumqi).

Xiamen (XM) is located in the south Fujian Province, in southern China. It consists of 6 districts, covering an area of 1,699 square kilometres land and 390 square kilometres sea with a total population of 3.86 million.

XM belongs to the first batch of low-carbon pilot cities in China and the first one in the Fujian Province. Another city, Nanping joined the second batch in 2012. XM is known in the West as

Amoy, has a long history as a port city and was declared one of China's first batch of Special Economic Zones in the early 1980's. Xiamen Municipal Development Reform Commission (DRC) takes the lead in promoting low-carbon development. An inter-division leading group was established to enhance coordination among governmental divisions in 2011.

XM built up a cooperation framework with the Chinese Academy for Social Sciences (CASS) to promote local social and economic development in 2014. The Institute for Urban and Environmental Studies (IUE) worked with XM to promote and upgrade low-carbon development since 2016.

VI.II WORKSHOP DATES AND LOCATIONS

XM was selected as another case study in China for POCACITO. The stakeholder meetings, field trips and interviews were held from June 22-24 2016, where lessons from EU low-carbon cities are discussed and Chinese experiences were made available to European stakeholders.

VI.III PARTICIPANTS AND ACTIVITIES

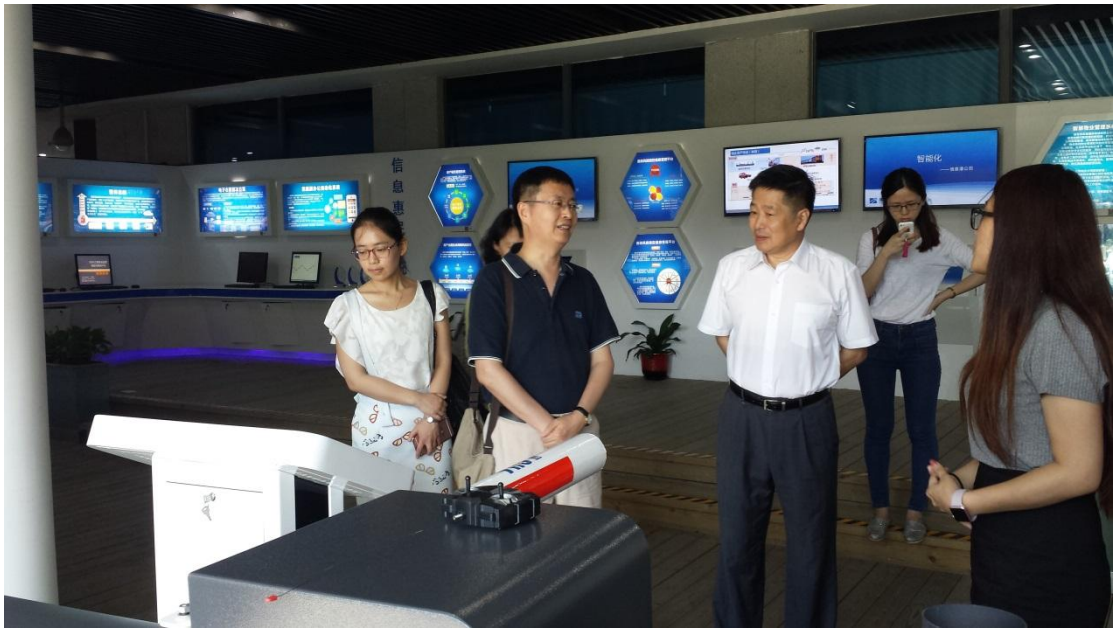
Prof. Dr. Ying Chen from IUE CASS was the POCACITO Project China Case Study project leader. Ms. Fan Bai is her research assistant. Her colleague in IUE Prof. Guiyang Zhuang and Post-doctor researcher Mr. Dongsheng Luo also contributed to the case study.

The case study research team visited XM on June 22-24 2016. Xiamen DRC helped them to arrange interesting stakeholder meetings, field trips and interviews.

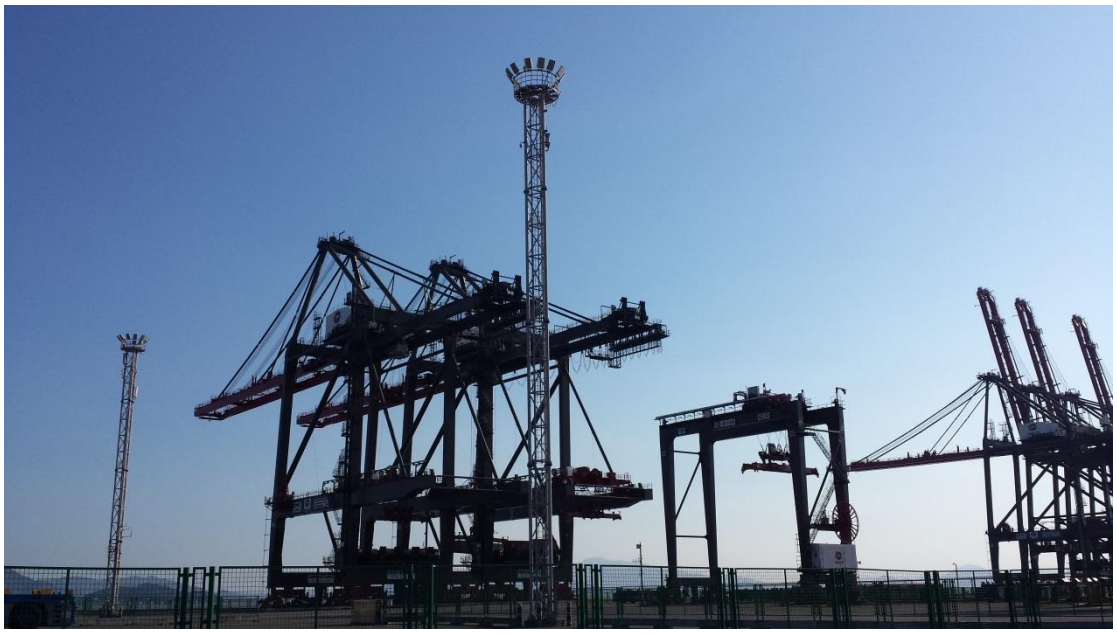
Table 3 Agenda in XM

	Activities
June 22, 2016	Low-carbon community in Gulangyu Island (a famous tourism spot), Xiamen
June 23, 2016	Low-carbon port, Xiamen Software Park Administration Board and some companies
June 24, 2016	Meetings with Xiamen Municipal officials and experts

(1) Visiting Xiamen Software Park Administration Board



(2) The Deputy Director of Administration Board introduced the history and achievements of Software Park



(3) Visiting Xiamen Port for low-carbon port construction

(4) Volunteers from Ciji Green Room introduce principles of low-carbon life.

(5) Visiting Luhui Residential Community in Gulangyu Island. Younger in yellow T-shirt are environmental protection volunteers

(6) Public bicycle service. Users can easily check the map of public bicycle stations and bicycle available.

(6) Meeting with Xiamen Municipal officials

(7) Meeting with energy conservation and low-carbon development experts

Table 4 Stakeholders of low-carbon development in XM

Name	Institution	Government/Expert/Company/NGO
Bilian LI	Xiamen Municipal Development Reform Commission	G
Lixin ZHANG	Xiamen Municipal Tourism Bureau	G
Zhi GUAN	Xiamen Municipal Energy Conservation Center	G
Linlin LIN	Xiamen Municipal Transportation Bureau	G
LianYANG	Xiamen Municipal Parks Bureau	G
Xurong ZHANG	Xiamen Municipal Bureau of Oceanic administration and Fishing	G
Bai LI	Xiamen Municipal Planning Bureau	G
Haiyang JIANG	Xiamen Municipal Science and Technology Bureau	G
Guoqing WU	Xiamen Office of Banking Regulatory Bureau	G
Zhihong CHEN	Xiamen Municipal Environmental Protection Bureau	G
Jiandi HUNAG	Xiamen Municipal Housing and Construction Bureau	G
Haibin HUNAG	Xiamen Municipal Bureau of Port Management	G
Yao ZHANG	State Key Lab of Marine Environmental science, Xiamen University	E
Shenghui CUI	Institute of Urban Environment, Chinese Academy of Sciences (CAS)	E
Qiang XU	Chinese Center of Energy Economy Research (CCEER), Xiamen University	E
Qingxian GUO	Xiamen Software Park Administration Broad	G/C
Danlei CHU	Optimal Process Control Technologies Co.,Ltd.	C

Name	Institution	Government/Expert/Company/NGO
Yun YANG	Ingol Technology Company	C
Xiaoqin WANG	Yilanzhong IT Company	C
volunteers	Luhui Residential Community in Gulangyu Island	N
volunteers	Ciji Green Room	N

VI.IV METHODOLOGY

Ms. Bilian LI, Division Director of Resources and Environment, Xiamen Municipal Development Reform Commission hosted the two meetings, one for Xiamen Municipal officials, and another for energy conservation and low-carbon development experts in Xiamen. At the beginning of the stakeholder meetings, Ms. Li introduced Prof. Ying Chen, Prof. Zhuang and all the participants. Then Prof. Chen gave a presentation to introduce the background and purpose of the workshop as follows:

- The recent assessment of all 42 low-carbon pilot province and city (Prof. Zhuang attended)
- POCACITO project and European case studies to share some experience of low-carbon city construction
- Considerations to choose XM as another case study in China
- Raising key questions of vision building and back casting scenarios,
- Ask for the possibility to attend the two workshops
- Encourage all the participants to discuss the above questions, but how to proceed?

Almost all participants were very busy and strongly suggested to integrate the two workshops. Their suggestion was accepted in order to make them feel comfortable and work more efficiently. The meeting with governmental officials was held in Chinese style, i.e., abstracting from interactive workshop methods and the participants speak one by one. The other meeting with experts seemed more active.

Prof. Chen put forth some key questions for discussions:

- How would you like XM to look like and to function in 2050?
- What are the main problems or challenges for XM's low-carbon development?
- Can we establish a common vision for a carbon-free XM in 2050?

- What are the key elements for XM's bright future?
- How should we overcome the difficulties to reach the long term targets in XM?
- What are the milestones of low-carbon development road map for XM?
- How can you or your division contribute to build XM as a pioneer low-carbon city in China?

Most of participants were interested in the discussions and actively expressed their thoughts. The research team tried to understand and summarise the key points. Other activities such as a field trip to a low-carbon community on Gulangyu Island and interviews with representatives from the low-carbon port, Software Park Administration Board and some companies also provided useful information to gain a better understanding of low-carbon development in XM.

VI.V RESULTS FOR VISION BUILDING

Although every person had his or her own opinions and priorities, the common vision for 2050 can be described as "Beautiful XM Strategy", which refers to not only to a beautiful environment but also to economic prosperity and social advancement.

XM is located in coastal area of south eastern China. The GDP per capita in 2015 was about $14,000. The development level in XM, especially XM Island, the core area of XM, is relatively high in eastern China, and obviously higher than in other cities in middle and western China. XM is already well known for liveability with good conditions of natural resources and environment.

In 2015, the energy consumption and carbon emission per unit of GDP are 0.437 tce/10000 yuan and 0.776 tCO_2/10000 yuan, relatively low compared to other large and medium size cities. The share of coal in preliminary energy mix is only 24%. The service sector in economic structure is 55.8%. The great challenge for XM is how to achieve green and low-carbon development to improve life quality for all residents while reaching an emissions peak as soon as possible.

Some important sectors and areas were frequently mentioned:

- Potentials and costs: some participants worried that XM's performance in energy efficiency and low-carbon emission has already been better than other large and medium size cities. There will be less "low hanging fruits" left (opportunities to reduce emissions with low costs). XM has to make more efforts to find innovative approaches for low-carbon development.
- Transportation: Consisting of core XM Island and several districts outside, XM has bridges to connect them. Mobility is a major challenge for many young migrants who may work in XM Island but live outside due to high costs of living. The first subway line is under construction. A new express bicycle road of 7.6 kilometres will be built soon (see figures 1 and 2 below)

- Ports: XM has 4 port areas close to the urban centre. Transportation to and from ports is an important energy intensive sector (also with high pollution), where more attention for energy conservation and emission reduction is needed.
- Tourism: XM has beautiful beaches as well as historical and cultural heritages such as Gulangyu Island. Tourism gives great potential for economic growth. The local community is actively advocating environmental protection, especially waste sorting and treatment system. The conception of low-carbon tourism needs to be developed and put into operation.
- Governance: Government representatives fully recognized their responsibilities in leading low-carbon development. NGOs are active in advocating environmental protection. Government can cooperate with NGOs to raise public awareness and promote low-carbon development.
- International cooperation: Being one of the earliest Special Economic Zones, XM is quite open and actively engaging in international cooperation. XM has more similarities to European cities and would like to learn from European experience. XM asked for specific examples and concrete information of policies and best practices of post carbon cities in EU.

In addition, visiting Xiamen Software Park and talking with several representatives of companies, the research team was deeply impressed by IT and application in smart city construction in XM, such as the smart transportation and security system. XM has great potential to develop IT industry and apply IT to improve energy efficiency and reduce emissions.

VI.VI RESULTS FOR BACK CASTING SCENARIOS

China is developing quickly since opening and reforming in the 1980s. Participants found it difficult to imagine a long term vision for 2050. They were more comfortable to discuss the reality, short term targets for the 13th Five Year Plan (2016-2020) and medium term targets for 2030 as well as setting up targets as milestones for vision 2050.

An outline of XM's social and economic development in the 13th Five Year Plan was ratified by XM People's Congress in January 2016. The average economic growth was 8.5%, substantially higher than the national target of around 7%. Participants highlighted that besides GDP, XM is the first city in China to set up HDI as an important target for social and economic development, increasing HDI from 0.856 in 2015 to 0.89 in 2020, reaching medium level of developed countries.

Based on the development level in 2015, about 30 targets were set up for 2020 including economic development, innovation driven, welfare and ecological civilization. For example, XM plans to increase urbanisation from 44% to 52%, keep the annual growth of import and export trade by 6%, increase R&D expenditure from 3% to 4%, internet access 85%, etc. Regarding the

energy conservation and emissions reduction, XM committed to finishing the national and provincial assigned targets, but no concrete numbers were mentioned.

The most important milestone of low-carbon development is emissions peak. China's submitted INDC declared that it will reach emission peak around 2030 and make efforts to achieve this as early as possible. Following the national target of emissions peak, up to now 23 Chinese cities and provinces have agreed to peak their emissions by or before 2030, and 8 by or before 2020. For example, Beijing and Guangzhou have agreed to peak by 2020.

With great efforts, XM successfully finished the 17% target for emission reduction assigned by Fujian Province. But up to now, XM as one of the first batch low-carbon pilot cities has not set up target year for emission peak. Ms. Bilian Li from XM municipal DRC felt pressure but she said that more research is needed to decide XM's target year of emissions peak and make concrete road map to achieve the target. XM government has invited experts to do research on it. Other participants also hesitated to project XM's peak year. Several experts said that emission curve will stay relatively flat after peak for some time.

Governmental representatives discussed their current work and tried to link their work to low-carbon development of XM. Experts from research institutions and universities talked about city governance, monitoring and assessment indicators, etc. Representatives from companies talked about the potentials of their technologies and application to promote low-carbon development. NGOs talked about public awareness and participation.

VI.VII OVERVIEW EVALUATION

Stakeholder workshops for the XM case study were successfully evaluated. The city representatives imagine XM will be a pioneer city to achieve the "Dream of China" in 2050. At that time, not only GDP per capita but also carbon emissions per unit of GDP will reach the similar level of developed countries. Definitely low-carbon development is an important target. XM will be a liveable, sustainable, beautiful city with charm of history and culture. Thus, new model of development was emphasized to achieve the targets, which means innovative, harmonious, green, open and inclusive development. The milestones were set for the 13th Five Year Plan (2016-2020) and 2030.

VII ANNEX III BRIEF REPORT ON A STAKEHOLDER WORKSHOP IN ARACAJU

During a workshop in Aracaju, Brazil in March 2016, good practices exemplified in the POCACITO case study cities as well as more theoretical approaches to assess post-carbon cities were shared with Brazilian municipalities. Over 50 stakeholders took part in the workshop organised by INTELI, Mind Brazil and the Federal Institute of Sergipe.

INTELI's presentation was centred on the integrated assessment of case study cities, based on the environmental, economic and social key performance indicators defined within POCACITO. Moreover, some smart and sustainable strategies and plans were discussed, with a specific focus on Lisbon, Barcelona and Copenhagen. The good practices available on the POCACITO online "marketplace of ideas" were presented, and the audience suggested some innovative projects that are being developed in Brazil to include in the database.

The Dean of the Federal Institute of Sergipe presented the institution and some of the projects that are being carried out in the region, namely the "sustainable university campus". The objective is to transform the campus in a development and experimentation space of new low-carbon technologies and solutions.

Finally future collaboration opportunities in the area of post-carbon cities were explored.

Workshop: Urban transition towards a Post-carbon future