EU-China NGO Twinning Exchange Report

Thorben Jensen,

Wuppertal Institute for Climate, Environment and Energy,

Germany

Dr. Dai Chun Yan,

Innovative Green Development Program

(绿色创新发展中心),

China

Exchange on low-carbon development policies

The focus of the exchange has been on designing policies towards low-carbon development. Tackled aspects have been energy efficiency in the built environment and utilization of renewable energy. Of particular interest has been the assessment of policies that support achieving these aims, as well as their design through use of quantitative modeling. Both organizations are actively working on these topics and thus have been profiting from this exchange. The twinning exchange has already triggered cooperation in a joint contribution to a side event at COP 21. Starting from there, we will continue working towards carrying out of joint projects.

Thorben Jensen, Wuppertal Institute, Germany

Thorben Jensen is a Research Fellow at Wuppertal Institute. He is also a PhD candidate at Delft University of Technology (Netherlands). His work focuses on energy saving innovations and policies, building energy efficiency, effects of feedback devices (e.g. Smart Meters) on energy consumption, and simulation modeling. Thorben Jensen visited iGDP for 6 weeks from the 20th of August 2015 until the 3rd of October 2015.

Objectives

My motivation to participate in the exchange program were the following: (1) opportu-

nities for joint policy design on energy efficiency in buildings, (2) exchange on the use of quantitative modeling to assist policy decisions, (3) the possibility to add the Chinese building stock to the perspective of my personal work and (4) to learn about activities undertaken by the Chinese twinning organization our joint field of work.

Twinning overview

During my stay in China I was mostly based at the iGDP office in Beijing. From there, I took out my journeys to twinning activities in other cities (i.e. Tianjin, Nanjing, Hangzhou and Chongqing). Most important for me was getting to know the low-carbon policy network, which is facilitated by iGDP. Particularly during my visits to Tianjin and Chongqing, I could strengthen my ties with this network. The variety of these interactions allowed me to get a good overview on how low-carbon challenges are tackled by planning of the energy system and urban development in China.

Stay at iGDP in Beijing

iGDP is working on low carbon development, energy economy, carbon trading, green taxation, green investment and financing and other hot issues. It Represents the *Green & Low-Carbon Development Think Tank Partnership (GDTP)* in Beijing, which was initiated on June 10, 2014 by ten Chinese think tanks that focus on low carbon development. GDTP combines research on with the promotion of domestic and overseas policies and practices of green low carbon development. It thus aims to contribute to China's low carbon development.

An important part of my visit was presenting my work to the iGDP group. My initial talk was also attended by members of Energy Foundation Beijing. The Chinese partners were particularly interested in my research on low-carbon solutions for post-industrial regions in Germany. Lessons from Germany are becoming valuable for China on its pathway to a low-carbon economy. A method of my German team that was particularly interesting to the Chinese partners is the use of so-called *living labs*, in which energy-consumption behavior of residents in buildings is observed. It can for instance be used to give evidence on the effectiveness of interventions that promote conservation behavior.

Overall, it was very valuable to get to know Chinese groups that work in the same field, particularly on advising policies in low-carbon urban and energy planning. One concrete output of our exchange in Beijing was a joint contribution to a side event at the COP21. Currently, I am still in contact with the iGDP team on a weekly basis.

Carbon emission peaking workshop in Tianjin

Together with the iGDP team I joined a workshop on the anticipated peaking of carbon emissions in China. Chinese low-carbon pilot regions are obliged to forecast the peaking of their carbon emissions. This task is commonly taken out by using simulation models. The workshop thus had the aim to identify best-practice approaches to this.

This workshop was personally valuable for networking, the sharing of modeling experiences, and the exchange of specific model types:

- It provided a good setting for getting to know important actors in the Chinese community of low-carbon planning on the national level. Some of the attendees, I met again later during my exchange stay, e.g. in Chongqing.
- Experiences on the use of simulation modeling were valuable both on the conceptual and on the specific level. On the conceptual level, there was for instance mutual agreement that modeling is not an end in itself but a means to solve real-world problems.[1] Specifically, an interesting feature of the simulation models used by the Chinese presenters was the inclusion of macro-indicators (e.g. GDP growth and fine dust emissions). These indicators are less emphasized in European energy models.
- A type of simulation modeling for energy planning that is of particular interest to me is *agent-based modeling*. It is a relatively new approach that was used by both Chinese attendees to the workshop as well as the Wuppertal Institute. The workshop was used to start a discussion on how experiences with this approach can be further exchanged.

Attending the Learning Cities project in Nanjing

In Nanjing, I visited the Leaning Cities project, which is taken out by (among others) the Wuppertal Institute. It brings together Chinese municipalities and urban planners to exchange on planning solutions for low-carbon cities. The project engaged students from Europe and China in designing integrated cross-sector solutions for the city of Changzhou (Jiangsu province).

[1] This agreement was expressed in statements such as *"Modeling is a tool, but curing a disease still depends on a Doctor. And modeling is just a device that helps the doctor"* or *"modeling is a sword, but more important is to have Wrongful (i.e. inner capabilities)"*.

During my visit to the project studio, I learned about the students' project proposals. In return, I gave input to their work by presenting an urban low-carbon case from Germany.

Key-note lecture at conference in Chongqing

In Chongqing, I gave a key-lecture at the conference 'New Urbanization and Low-Carbon Development'. At this opportunity, I presented the work that my team is taking out at the Wuppertal Institute. With important scholars from the field of low-carbon development being present, this was an ideal setting to discuss possible applications of our work in China. At the same time, I learned about software tools that could be integrated to support European municipalities at low-carbon planning.

During the week following the conference, I had the opportunity to visit the Chongqing Technology & Business University, at which my twinning partner holds a teaching position.

Visit to site of ETS implementation in Chongqing

Together with my twinning partner and other members of the GDTP community, I visited the site of implementation of the Chongqing carbon emission trading system. We were able to get first hand insights into the implemented mechanisms. The trading system managers were so kind to provide the carbon emissions data they manage as an input to the discussion.

Dai Chun Yan, iGDP, China

Dai Chun Yan is a member of the Innovative Green Development Program (iGDP). She is an associate professor at the Institute of Management, at the Chongqing Technology and Business University. Her research interests are low-carbon development, renewable energy policy, project management, and investment decision making.

Dai Chun Yan visited Europe for 11 weeks from the 12th of October 2015 to the 31st of December 2015.

Twinning overview

During my stay in German I was mostly at the Wuppertal Institute. From there, I traveled

to twinning activities in many other cities: Essen, Dortmund, Bonn, Würzburg, Münster, Brussels, Delft, and Paris. Through studying, observation and discussions, I have deepened my understanding of the low-carbon transformation of post-industrial regions in Germany. I have also deepened my understanding on how working groups in Germany do their research. During the program, there emerged an opportunity for me to continue my work in Europe for about one year and to research low-carbon development in more detail. Overall, my stay has laid the foundation for future cooperation in the field of the energy saving in building and low-carbon development.

Objectives

My main reasons to participate in the exchange are to deepen the cooperation between Chinese and European civil society organizations, and to establish a long-term partnership to jointly design projects in the field of energy-efficiency in buildings and low-carbon development.

Stay at Wuppertal Institute

The Wuppertal Institute has the mission to design transitions to a sustainable development. It researches for politics, economy and society. It thus acts as an intermediary and transfers knowledge. The Wuppertal Institute's clients come from government (ranging from local authorities to ministries at both Land and national level and, at international level, from the European Commission to the United Nations), business and industry (ranging from mediumsized companies to corporate groups and industrial associations), and civil society (ranging from environmental associations to trade unions, churches and foundations).The Wuppertal Institute employs approximately 200 staff members.

An important part of my visit was reading books and reports in the library, and to discuss research problems and methods with the research staff. I also had the opportunity to attend meetings and reunions held at the institute. This revealed to me the key problems that low-carbon research in Germany cares about. I further got to know some key projects taken out at the Wuppertal Institute. Experience and lessons from Germany are becoming valuable for China on its path to low-carbon development. It will thus be helpful to cooperate more in the future.

Meeting Prof. Andreas Löschel

Prof. Andreas Löschel is a leading ETS economist at Münster University. He is also a Research Associate at the Center for Economic Research (ZEW). His research areas include: energy economics and policy, environmental economics, climate change, technological

progress, applications of micro economics, and general equilibrium modeling. He has numerous publications in PNAS, European Economic Review, Resource and Energy Economics, Environmental and Resource Economics, Energy Economics, Ecological Economics, The Energy Journal, and Applied Energy.

Thorben and I met with him in Münster. We discussed Prof. Löschel's research projects on emissions trading systems. For instance, in 2009 he stated a yearly survey among companies under the EU ETS in Germany. We also talked about the main ideas in the two last reports from 2013 and 2014. He also provided me with more materials on his work, e.g. from a special issue on ETS in China, EU, China, Korea and Australia (2014 EP Editorial, 2014 EP China 2030, 2013 EnePol Hübler & Löschel). I further invited him to visit me in Chongqing next year to continue the cooperation on ETS questions.

Attending the Learning Cities Project in Essen and Dortmund

Together with researchers from the Wuppertal Institute, I attended the Learning Cities Program in Essen and Dortmund. This program is part of the "Low Carbon Future Cities" project, which addresses mitigation potential in an integrated and participatory approach. It brings together the concepts of low-carbon, circular economy and adaptation to climate change. Combining different approaches for tackling climate change, the Low Carbon Future Cities project is a first-of-its-kind activity and highly innovative. The project lead is at Wuppertal Institute, in close co-operation with stakeholders in two cities: Changzhou and Essen. The project is sponsored by Stiftung Mercator.

I attended the best-practice tour of this project to learn about the case of post-industrial low-carbon development of the German Ruhr Area. Topics of the tour were *"The City of Essen: Structural Change and Challenges from a Planning Perspective"*, *"Objectives, Challenges and Opportunities of Regional Planning in the Ruhr Region"*, *"Challenges and opportunities deriving from the structural change in the Ruhr Region"*. *"The Transformation of the Ruhr Region and its Planning Dimension Input" etc*. We also visited hot-spots of urban transformation in the cities of Essen, Bottrop, and Dortmund, and the World Cultural Heritage "Zeche Zollverein" in Essen. Lessons from these locations could be a good reference to guide low-carbon transformation of Chongqing.

Joint visit to Delft University of Technology

Thorben and I visited his working group *Energy and Industry* of the faculty of Technology, Policy and Management at Delft University of Technology. During the visit, we attended

the lecture "Engineering Social Technologies for a Responsible Digital Future", given by Prof. Dirk Helbing. We also attended a working group meeting on the application of agent-based modeling in the energy system. What impressed me the most were the discussions with Prof. Émile Chappin and the PhD candidate Li Ying. They analyze the energy systems by using methods such as agent-based modeling, systems analysis and serious gaming. Agent-based modeling may be a good tool to simulate the effects of low-carbon policies in China.

ASC Conference at Würzburg University, Germany

I attended the Joint International Conference "Research Network 'Governance in China' and Association for Social Science Research on China (ASC)" from the 20th to the 21st of November. The conference was organized by Prof. Doris Fischer, who works at the China Business and Economics Institute at Würzburg University. About 50 researchers form different countries attended the conference. It had five tracks:

(1) Urbanizing for Modernity: Framing China's Next Rural Transformation

(2) Political Consequences of Social Stratification in Contemporary China

(3) Green Industrial Policies and Standards

(4) Changing State-Society Relations I: Environmental Protection

(5) Changing State-Society Relations II: Social Protection

I mostly attended the session on Rural Transformation and Environmental Protection. It was very useful to me being able to communicate my research in the session. Prof. Fischer and her co-worker Dr. Bu spend almost an entire day to discuss with me in detail my work plan for the next year. We agreed that I will be a visiting scholar at Würzburg University from the 12th of February 2016 to the 31st of August 2016. In this position, I will work on low-carbon urban and energy planning.

Attending the COP21 in Paris

I attended the COP21 from the 30th of November to the 12th of December 2015 as an observer. I feel fortunate to have witnessed the negotiations. My personal conclustions on the COP21 are the following:

First, the main issue that the Paris accord will solve is how to carry out the international

cooperation in accordance with the principle of common but differentiated responsibilities. The final outcome shows that the developed countries should continue to take the lead. The developing countries should gradually take responsibility, too. The core elements of the Paris Accord are mitigation, efforts, transparency, and funding. These are mainly based on the resent China-US, China-France and China-EU joint declaration series.

Second, the Paris Accord needed to be accepted by all parties. But this required to make compromises. Because human survival requires protection of the environment and sustainable development, protecting the environment also means protecting ourselves.

Third, the USA, EU and China made great efforts towards this accord. Whether it's Good or bad for the different countries in the future beyond the countries how to game each other and cope with each other.

Fourth, the support from China does not only come from international pressure, but also from the need for economic transition in Chinese to low carbon development. That is the main reason that China support the win-win cooperation to face the challenge of the climate change.

Fifth, it can not be ignored that the time frame of the Paris Accord is on a long-term transformation. Investor and researcher in the respective fields should monitor the performance and dynamics of this transformation.

Finally, information technology has significant potential to promote low-carbon development, and environmental protection.

Ideas for future collaborations of Wuppertal Institute and Innovative Green Development Program

Dr. Dai Chun Yan & Thorben Jensen

Formatiert: Deutsch (Deutschland)

Aim of our mutual visits has been the explorative search for possible future collaborations. This was particularly motivated by the fact that our organizations are working in the same fields and on the same questions. During our exchange we therefore collected ideas for future collaborations, which we are presenting in the following.

We believe these collaborations should be between our organizations – not only between the two of us. We therefore list relevant staff together with the idea for collaboration. We encourage our colleagues to contact each other to further discuss and substantiate these ideas.

Use Living Labs to design new heating policy south of the Yangtze

Currently, China is well known for its restrictive heating policy for buildings south of the Yangtze river. With the aim of conserving energy, it is not allowed to install a central heating system in these buildings. However, heating is still possible. Foremost, heating with air-conditioning systems is a common practice. On the one hand, this way of heating has relatively low energy-efficiency, so that it might increase energy demand and heating bills compared to central heating. On the other hand, the inconvenience of heating via air-conditioning might incentive more moderate intensity of heating and might thus, overall, conserve energy.

The Living Lab approach taken out by the Wuppertal Institute could be used to give insight into the behavioral variables of the impacts of this policy. Further, this approach could give insights into how households change their heating behavior at a change of heating infrastructure (e.g. from A/C to central heating)

Staff at iGDP / GDTP: Zheng Huan,Liu Meng

Staff Wuppertal Institute: Chun Xia-Bauer, Carolin Baedeker, Dietmar Schüwer

Using ABM in energy demand modeling

During the exchange it was found that Wuppertal Institute and GDTP partners both use agent-based modeling to give policy advice by applying the same type of simulation

models on energy demand. We suggest a close exchange on experiences with these models. From this, we would expect potential for mutual learning. There might, on the long run, even be the opportunity to apply each-others' models.

Staff at iGDP / GDTP: Chai Qimin (National Center for Climate Change Strategy and international Cooperation)

Staff at Wuppertal Institute: Georg Holtz, Jonas Friege, Thorben Jensen

Policies for urban low-carbon development in Chongqing

Chongqing comprises urban areas, countryside, reservoir areas and mountains. It is one of the three economic belts defined in the *Yangtze River Economic Belt Development Strategy*. In addition, it is an important ecological shield for the Yangtze River Basin, one of China's key ecological functional areas and an important zone for biodiversity conservation. Therefore, it is charged with two important missions: economic growth and ecological protection. As China is making efforts to curb the total amount of carbon emissions, Chongqing has developed the Five Functional Areas development strategy, making "ecological civilization" one of the top priorities. In this context, it is of great significance on this path to identify key fields of emission reduction in separated functional areas, to design differentiated emission reduction pathways by analyzing the GHG emissions from economic and social activities in the five functional areas, and to look at the main ways and features of energy consumption. To that end, we analyzed the industries and resource endowment in the five functional areas and designed a manageable and controllable GHG-oriented accounting system that is aligned with the specificity of Chongqing. Building on such a system, we made efforts to explore differentiated emission reduction paths and supportive measures in line with future development priorities of the five functional areas.

Staff at iGDP / GDTP: Chun Yan Dai; Min Tang Chong Ju Wang; Lu Yun Wang

Staff at Wuppertal Institute: Chun Xia-Bauer

Study on the evaluation index system of low carbon campus and the pilot project of Chongqing

As a starting point, this study will build a list of greenhouse gas emissions accounting, to

clarify the key points of the control of greenhouse gas emissions, building a low carbon campus construction and evaluation system. Through the creation of Low Carbon Campus hardware, social low carbon transformation play a demonstration and leading role, through the campus of low-carbon education system, cultivate students' life and work integration of low carbon concept, enhance the students all-round low carbon literacy, to control the campus greenhouse gas emissions, enhance the whole social citizens low carbon awareness and literacy, promote the campus and social synergy low carbon transformation development goal. The project research results will provide a decision-making basis and reference for Chongqing local level planning regulations and technical guidelines. This will allow further improvement of management capabilities of Chongqing's response to climate change, and it will promote construction the construction of low-carbon campuses.

It will also generate a demonstration effect and promotion to other Chinese provinces and cities, whose planning actions in response to climate change can thus be supported. Further it will provide implementation experience for the national level, to scale up the construction of low-carbon campuses.

Staff at iGDP / GDTP: Dai Chun Yan; Tang Min; He Ji Jiang

Staff at Wuppertal Institute: Peter Viebahn

Co-Benefit Analysis of Power Generation from Municipal Solid Waste

The first aim of the project is to establish full life cycle co-benefit analysis model (MSWE-Co-B) for power generation from Municipal Solid Waste (MSW).

Second, analyses and calculation the different policy scenarios and their impacts on economic, environmental, social factors, and other aspects in the chain of garbage collection, transportation, waste disposal, power plant equipment, equipment, transportation, power plant construction and operation. This will provide a knowledge base for the government to plan the MSW power generation.

The Wuppertal Institute would investigate material flows – from the extraction of raw materials to their final disposal, taking account of the global "ecological rucksack" model, as well as the involved land-use. They would develop the concepts, strategies and instruments to improve resource productivity and sustainable resource management from the regional and sector levels to the international level. They will further advise the model building and analysis, which will be taken out by the Chinese counterpart.

Staff at GDP / GDTP:Dai Chun Yan; Chang Shi Yian

Staff at Wuppertual Institute: Henning Wilts, Beethoven Jensen