The climate governance model of "low carbon community" experiment:
-a comparison between Germany and China

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Major research field

- Ecological planning, environmental management,
- Sustainable and low-carbon cities, counties and communities,
- Urban metabolism

Outline

I. Background of China & Germany' Climate Action

II. Key concepts: Governance, Community and LCC initiatives

III. Comparison of key concepts, collaboration form & historic trajectory

IV. Cases: Essen & Xiamen

V. Primary conclusions/result

1 Background

- >70% CO_2 emissions from urban areas (IPCC, 2015; Gurney et al, 2014);
- The city plays an important role in reducing greenhouse gas (GHG) emissions and influencing climate;
- Micro community-scale individual/household activities are important causes of climate change (Ostrom 2009).

Sustainable development goals:

- 2030 Agenda for global SD with 17 goals (UN,2015);
- New Urban Agenda (UN-Habitat Ⅲ, 2016)

1 Background

China & Germany

- An emerging developing country & Developed industrialized country
- Maintaining sustained economic and industrial development;
- Commitment countries to promote the Paris climate agreement and achieve emission reduction control targets;
- Low-carbon society and economy transition

➢ **A comparison between Germany and China, may probe into the experimental trials on low-carbon community governance, to mirror the key factors and governance route leading to success.**

1 Background of China's Climate Action

- In 2007, world's largest emitter of energy-CO_2
- Rapid urbanization & economic growth -> significant energy consumption & CO_2 emissions
- >80% from its major cities.

Climate pledges:

- By 2020, CO_2/GDP fell by 40-45% from 2005 (Intended Nationally Determined Contribution (INDC), 2009)
- By 2030, CO_2/GDP fell by 60-65% from 2005 and reach peak (Intended Nationally Determined Contribution (INDC), 2015)

1 Background of Germany's Climate Action

- 1980s, nuclear power->lignite->clean energy
- Early climate action: 1990s; EU participation
- Key to achieve EU's commitment to the Kyoto protocol in 1997;
- 40% from 1990 by 2020 (2002)

Climate pledges:

- By 2020, CO_2/GDP fell by 40% from 1990 (Climate Action Plan 2020)
- By 2030, CO_2/GDP fell by 55% from 1990 and reach peak (Climate Action Plan 2050)

Get A Trial!

……Why Experiment?

a. **Method to test hypotheses;**
b. **Test and select working designs;**
c. **Learning by doing;**
d. **Radical novelty creation;**
e. **Foster alternatives in protected spaces;**
f. **Politics to perform reality**

Climate Changes!

"Typically, experiments will be expected to lead to changes, whether these relate to the pursuit of new knowledge, new practices, new solutions, or the enrolment of new actors" (Innovating Climate Governance, 2018, 7).

2. Key concepts: LCC initiatives

“Low-carbon community” initiatives

- **On-going studies of**
  - ***Sustainability Transition***
  - ***Innovation***
  - ***Experiments***

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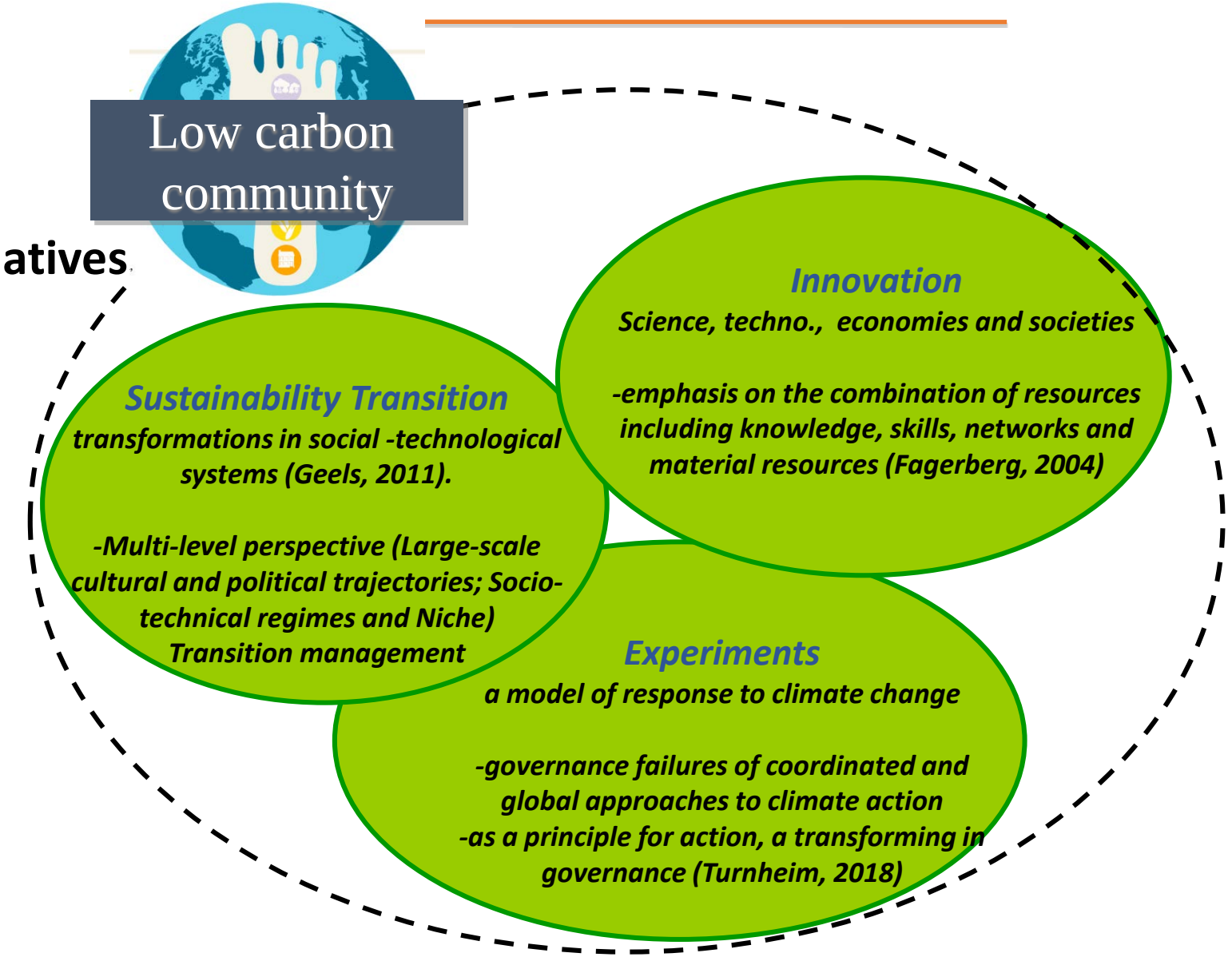
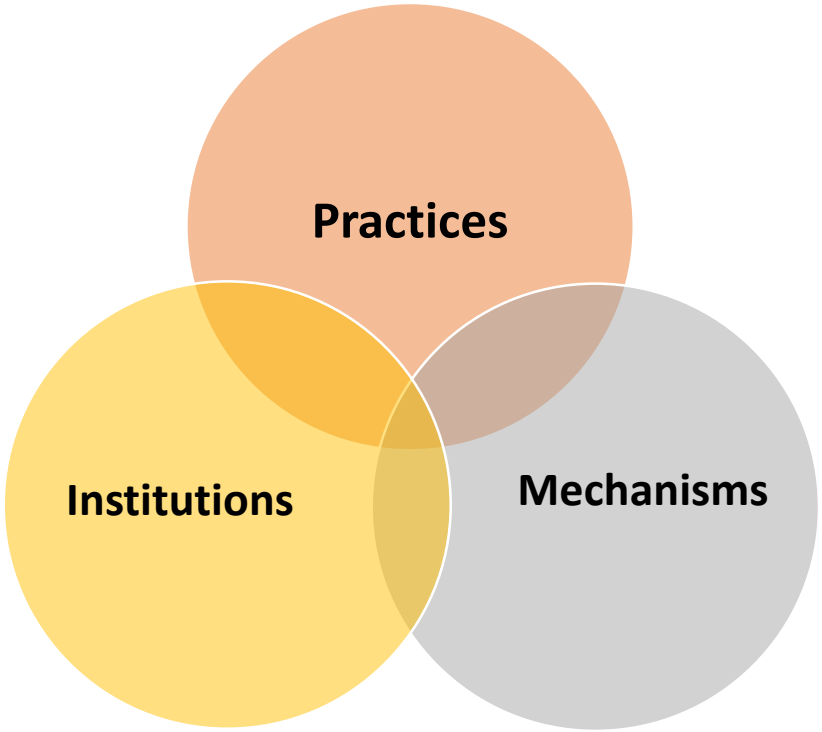


2. Key concepts: Governance?



(Pierre and Peters, 2000; Bevir, M. (Ed.). (2010). *The SAGE handbook of governance*. Sage)

Climate governance:

Under the framework of sustainable development, **core concept of institutions, rules, practices, norms, processes of decision-making, mechanisms, network and stakeholders, etc., and other efforts which respond to the challenges of climate change.**

The climate governance model of "low carbon community" experiment: - a comparison between Germany and China

- ***Concepts***
- ***Practices***
- ***Collaboration form & historic trajectory***
- ***Two Cases***

3. Comparison: Community in Germany

Origins:

- ***Oxford Dictionaries. May 2014.*** The word “community” derives from the Old French comuneté, which comes from the Latin communitas “community”, means “public spirit” (from Latin communis, “shared in common”).
- ***<Gemeinschaft and Gesellschaft>(Ferdinand Tonnies, 1887):*** Gemeinschaft (often translated as community) is a group in which individuals take into account the needs and interests of the group as much as, if not more than, their own self interest. Furthermore, individuals in gemeinschaft are regulated by common moral, or beliefs, about the appropriate behavior and responsibilities of members with respect to each other and to the group at large.

It can mean any area of common life, village, or town, or district, or country, or even wider area, where beings live together resemble on-another (Robert M. MacIver, 1917).

3. Comparison: Low-carbon Community in Germany

Low carbon economy: control urban greenhouse gas emissions, low-carbon transformation and the search for a suitable urban development model (UK, 2003)

A low-carbon community (LCC) in European county:

- **Communities that reducing the amount of GHG emission and carbon-footprint (Carbon Neutral community, 2008)**
- **Forms of co-operation and collaboration that aim to reduce the carbon intensity of their members' lifestyles by providing amenable contexts and mechanisms that encourage behavior change (Middlemiss, 2008)**
- **Community-level development path means transformations that may both dramatically reduce GHG emissions and significantly enhance community resilience, with the governance processes that shape unfolding social–technological–ecological dynamics (Burch et al., 2014)**

3. Comparison: Low-carbon Community in Germany

Collaboration form and historic trajectory in Europe

3. Comparison: Low-carbon Community in Germany

Collaboration form and historic trajectory in Europe

1. Transnational, Environmental activities and Governmental initiatives

- **"Urban CO_2 Reduction Project" (ICLEI, early 1990s)**

First take in European on local climate action to reduce urban CO_2 emission and to promote the local sustainability.

- **Environmental Action Fund in the UK (2006)**

Tackles environmental issues through practical action to support behaviour change in the local community.

- **Low-Carbon Communities of the Americas (LCCA) (2009)**

A program launched to assist countries in Latin America with sustainable energy market transformation initiatives.

3. Comparison: Low-carbon Community in Germany

2. Grassroots initiatives

- **Going Carbon Neutral (Ashton Hayes, 2005),**

A grassroots project that aims to turn Ashton Hayes into England's first carbon neutral village. Since January 2006, the community has cut its carbon dioxide emissions by 20%.

- **Transition Towns Network (2008),**

Aiming to increase grassroots self-sufficiency to reduce the potential effects of peak oil, climate destruction, and economic instability.

Essen, Germany

FOSSIL FUEL METAPHOR

Coal, Oil, Social

Coal: Energy and Industry

- 200 years of coal extraction
- Key driver of economic expansion in the region (with a peak and decline)
- Leaved a legacy of 50,000 tunnels beneath the region
- Environmental challenges translate in the high air pollution levels and high toxicity on the ground
- The bigger challenge is the "Eternity" issues, the funds that need to be left aside for eternity to stabilize the landscape and keep the mines' tunnels from filling with underground water

Oil: Transportation and Mobility

- The transportation infrastructure in the Ruhr area was characterized by its direct connection and distribution of the coal mines and later industries.
- The share of land used for human settlements and the transport infrastructure increased by industrialization, later suburbanization and by the large increase in population: the polycentric Ruhr region arised.
- Due to the individual mass motorization under the zeitgeist of the endless resources and the development of the traffic infrastructure to a very dense road network in Germany, the passenger and movement of goods increased considerably.

Social: Cooperation and democracy

- Coal different from oil extraction needed many hands and cooperation to move the coal from the underground, but most remarkable how influenced politics putting pressure on corporations and the state. Industrialization along with the Democracy that followed was an urban phenomenon based on organized forms of energy.
- The result of de-industrialization was fragmentation - especially social -, tensions between communities, in particular relation to the immigrant communities, and high unemployment.

Important part of German traditional industry and economy

Green Capital Award-Essen (2017)

TRAVEL STATIONS

1. Climate Change
2. Public Transport
3. Green Spaces
4. Nature and Biodiversity
5. Air Quality
6. Quality of Acoustic Environment
7. Waste Management
8. Water Management
9. Wastewater Management
10. Eco-Innovation and Sustainable Employment
11. Energy Efficiency
12. Integrated Environmental System

4. Case: Low-carbon community in Germany, Essen

- **Multi-level climate governance mechanism (Europe-Federal-State-Local)**
- **National level**

➢ Goals and commitments;

Federal laws and regulations, including Energy Saving Act (EnEG), Renewable Energies Heat Act (EEWärmeG), Heat-Power Cogeneration Act (Kraft-Wärme-Kopplungsgesetz), Electricity Tax Act;

➢ Actions under the framework of European Union and non-governmental organizations (ICLEI, Climate Alliances, G40, "Mayor Covenant");

- **State levels**

➢ In 2013, North Rhine-Westphalia became the first federal state to introduce climate protection law in Germany;

➢ State-level Climate Protection Plan (2015)

- **City level**

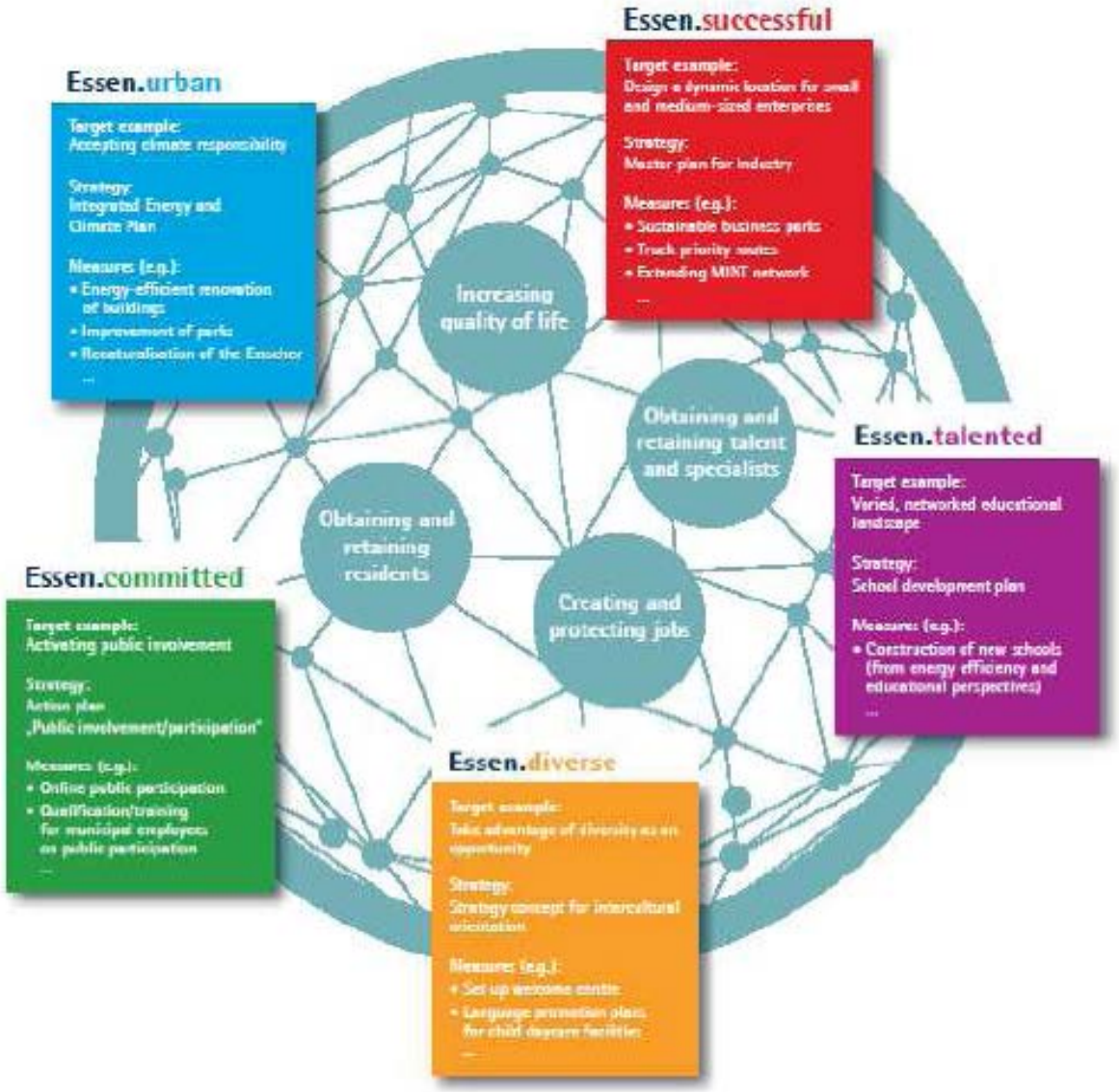
➢ Integrated energy and climate protection plan (IEKK) of Essen city (2009);

➢ Essen climate initiative: - A participatory approach: link technical action with local government services and climate protection stakeholders identified through systematic network analysis

Examples of the cooperation of departmental strategies under

Essen.2030

- **Climate responsibility;**
- **Inspire public participation;**
- **Design a good framework for business participation;**
- **Develop education network;**
- **Increase international diversity of international talent.**



Cooperation of departmental strategies under Essen.2030 (source: City of Essen)

3. Comparison: Community in China

- *Ancient China:* Confucius' theory (551 BC – 479 BC) of the five fundamental social relationships of father and son, elder brother and younger, husband and wife, ruler and subject, friend and friend ties (Community and Society, Ferdinand Tonnies, Charles Price Loomis, 1957).

Modern China (社区-She Qu):

- **A connotation relative to "Government" and "Unit"**
- **Stemmed after the opening-up policy in China (1980s)**
- **Before 1980s: housing allocation**
- **After 1980s: functional residential area**
- **Now: city -> municipal districts -> street -> community committee (main urban management system)**

3. Comparison: Low-carbon Community

A low-carbon community (LCC) in China:

- **The reduction of carbon emissions generated by all activities in the community (Xin & Zhang, 2008).**
- **The reduction of energy and resource consumption and the realization of low-carbon emissions through the construction of a climate-friendly natural environment, housing construction, infrastructure, lifestyle, and management models, urban and rural communities (NDRC, 2015).**

3. Comparison: Low-carbon Community in China

Progress of low-carbon city concept transfer and flourish

In 2000s, foreign practices and successful practices introduced by researchers.

- **China's low-carbon city trial in early 2008, when the National Ministry of Construction and the WWF listed Shanghai and Baoding as first takes of pilot.**
- **Central-governmental lead program for Low-Carbon Pilot Cities and Provinces (The National Department of Reform and Development (NDRC), 2010)**
- **Pilot Construction of Low-carbon Communities (NDRC, 2014), which are municipality-driven governmental movements and trials.**

3. Comparison: Low-carbon Community

Collaboration form and historic trajectory in China

1. Governmental Experimental Initiatives, 1980s-

Motivated by ecological activists (Wang, 1991), “Eco-city” is launched by National Environment Protection Bureau (1994) as a platform to look for green models in the pilot/demonstration projects, which can promote transformation and sustainable development of prefectural-level administrative regions.

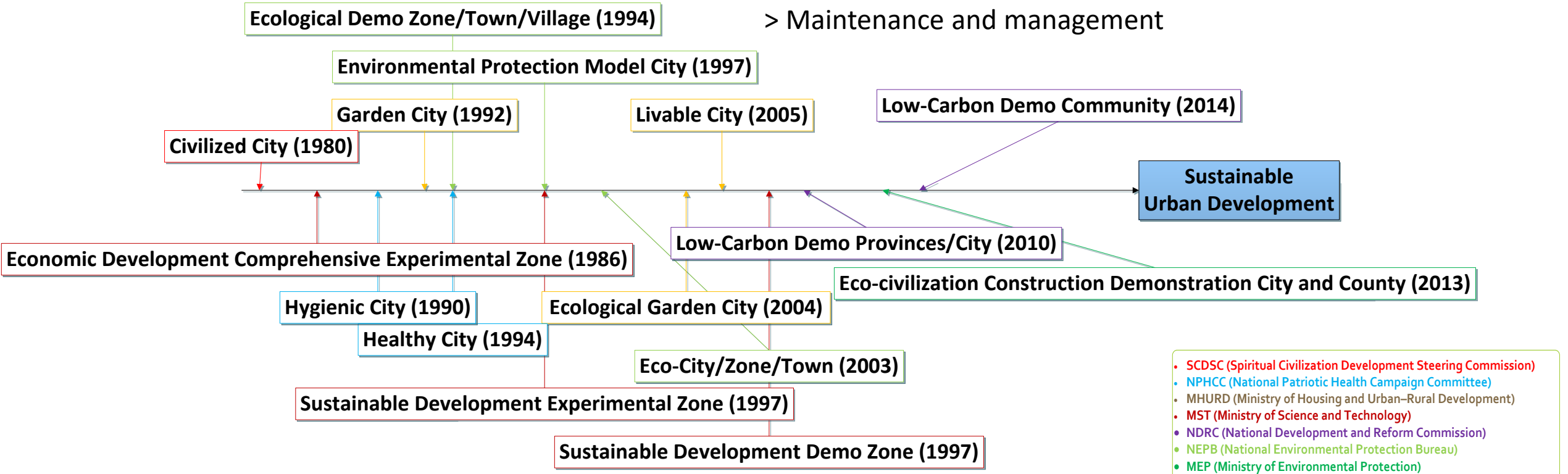
2. International Cooperation Practices, 2000s-

Require to set up a framework under joint working group, established the masterplan and indicators system, usually combining eco-tech transferring (Mauerhofer, 2015; De Jong, 2013, 2016; Flynn et al., 2016).

3. Comparison: collaboration forms and historic trajectories

1. Governmental Experimental Initiatives, 1980s–

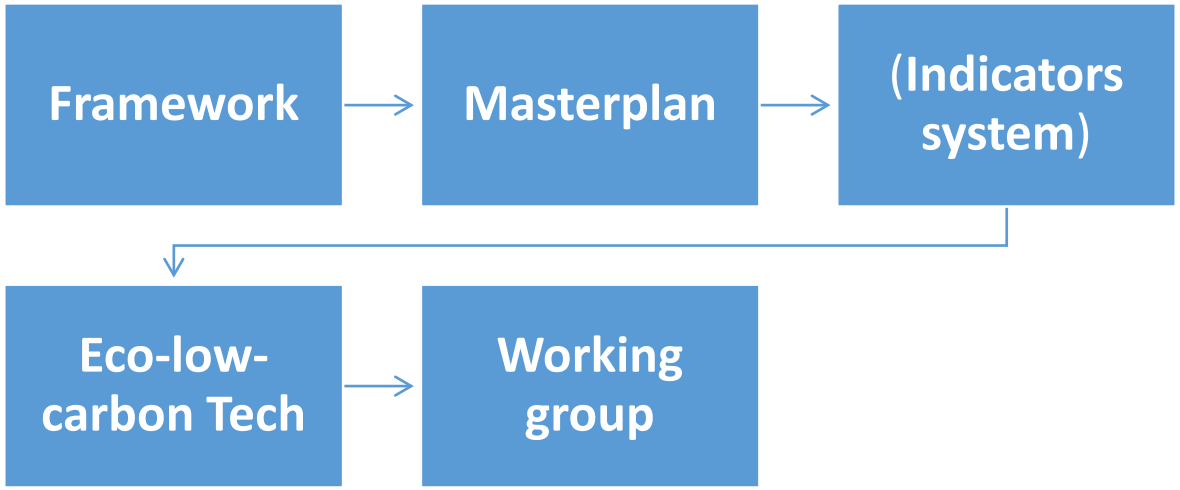
Nomination procedure:
Application -> Conduct a plan -> Assessment indicator system -> Implement/Key Project -> Amend -> Official nomination -> Review -> Maintenance and management



(Renewed based on the Research Group of Sustainable City. 2011. Towards Sustainable Cities in China. Analysis and Assessment of Chinese Cities in 2008. Springer)

2. International cooperation projects, 2000s–

- Sino-British Shanghai Dongtan Eco-City, 2005-2008, suspended.
- Sino-Singapore Tianjin Eco-City, SSTEC, 2008-
- Wuxi Sino-Swedish Low-carbon Eco-City, 2010-2012
- Sino-Dutch Low-carbon Eco-2-Zone in Shenzhen, 2011
- Europe-China Eco Cities Link, EC-LINK 2013-2017



Normal procedure for international cooperation initiatives

Existing problems of LCC construction in China

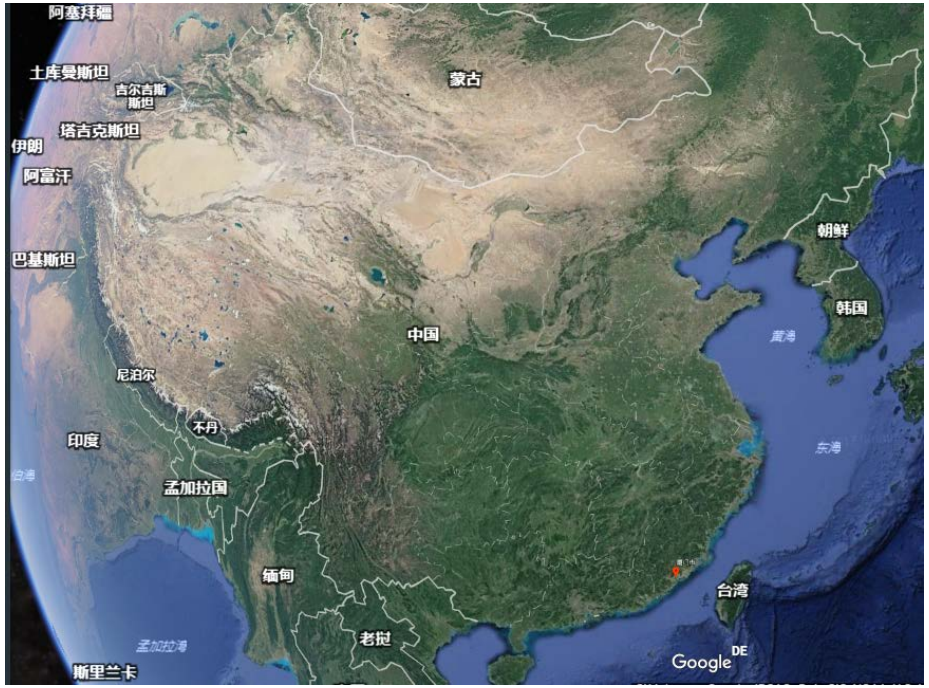
Jiang 2013; Khanna et al, 2014; Heijden 2016

- Despite the wide range of low-carbon plans, there are still no clear definition and assessment tool guidance, which result in difficulties for application.
- Too much socio-technology with the transnational , lacks supportive policies and market-based tools to promote the policies and practices implementation.
- Lack of public participation for the whole progress: top-down approach and multiple plans were implemented in parallel and the focus is insufficient to the opinions of stakeholders and the public.

SO, how can we understand and address these problems?

Xiamen, China

4. Case: Low-carbon Community in China



- Location: Southeastern Fujian, China
- Administrative divisions: Special Economic Zone on 1980
- Population: 3.92 million residents (the end of 2016)
- Area: 1699.39 km^2 land area and >390 km^2 sea area
- Six administrative districts: Siming, Huli, Jimei, Haicang, Tong'an, and Xiang'an.
- Economic growth: In 2016, Xiamen's GDP reached RMB 378.425 billion, posting a 7.9% annual increase, with a per capita GDP of RMB 96,536/ $15000.

In 2010, one of the “Low-Carbon Pilot Cities and Provinces” by China’s National Development Reform Commission (NDRC) by featuring:

- Advisory group & special planning
- CDM projects
- Low-carbon industrial park enterprise requirements
- Technological innovation and structural adjustment
- Resource use
- Public awareness and promotions

Table 3
Comparison of main supporting measures in low carbon city plans.

Measure	TJ	BD	HZ	CQ	NC	GY	XM	SZ
Administrative								
Advisory group	X	X	X	X	X	X	X	X
Performance evaluation system	X	X	X		X			X
GHG emission statistics, verification and management	X	X	X	X	X			
Energy audit and label	X		X	X	X			
Low-carbon industrial park enterprise requirements							X	
Planning and legal framework								
Special planning	X	X	X	X	X	X	X	X
Regulation				X				X
Preferential policies (land, fiscal, procurement policies)			X	X	X			X
Financial and tax-based								
Low-carbon fund	X			X	X			
Financial incentives			X					
Financial funding	X		X	X	X			
Consumption tax						X		
Energy price	X							
Market								
CDM				X	X		X	
Energy and carbon trading market	X		X	X		X	X	X
Industry and technology trading center								X
Scientific research								
Low carbon research center	X	X		X	X			
Low carbon service center					X			X
Talent introduction			X	X	X			
Other								
Information disclosure	X		X	X	X			
International collaboration	X	X	X	X	X	X	X	X
Public awareness and promotion	X	X	X	X			X	

Notes: TJ, Tianjin; BD, Baoding; HZ, Hangzhou; CQ, Chongqing; NC, Nanchang; GY, Guiyang.

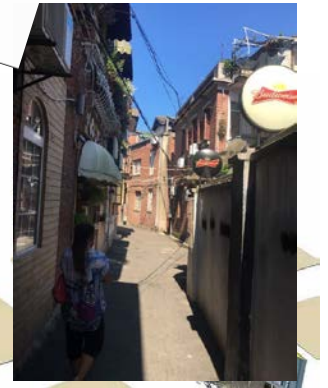
Source: (Khanna et al., 2014)

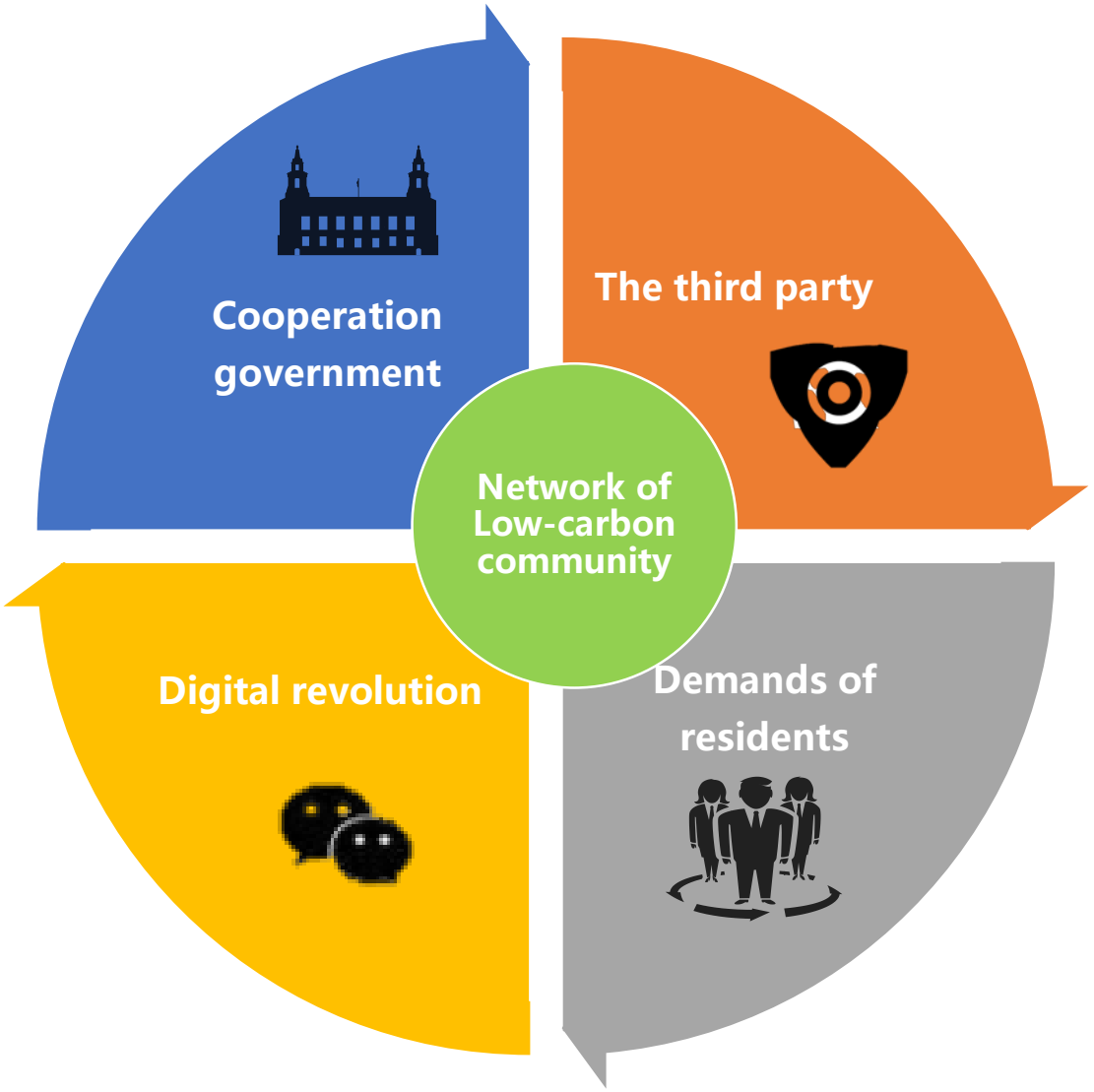
New trend of Low-carbon community initiatives

At the community level, there's no administration authority but rather the loose structure of committee, and lack of financial and tax and directly support.

Therefore, by the form of "Governmental purchasing third party services", the participation and collaboration of different stakeholders such as the government, private, residents and NGOs are integrated in the management and governance of LCC.

- Investigation of public participation in constructing Low-carbon communities





- Encourage public participation in constructing Low-carbon communities through **NGO** and Instant Messenger tool: **Wechat**
- Digital and smart city?

5. Primary conclusions/result

Climate Governance		Europe-Germany-Essen	China-Xiamen
Definitions	Community	Common moral, beliefs, behavior and responsibilities.	Basic social relationships and ties ✕ unit, government, municipal management
	Low-carbon Community	Action, co-operation, collaboration, transformations	Trials, indicators, actions
Scale		Neighborhood, village, town, district, or country, or even wider area	Community, neighborhood
Historic trajectory		In the SD frameworks, highly mixed	Relatively parallel, but mixed at local scale->new trend of integration
Collaboration type and modes		1.Transnational, Environmental activists and Governmental initiatives 2.Grassroots initiatives	1.Governmental Experimental Initiatives, 1980s- 2.International Cooperation Practices, 2000s-
		Bottom-up and Top-down, integrated approach	Top-down and bottom-up approach, enrolling new agents (NGOs, Corporation)
New Trend		Digitalization	

5 Primary conclusions/result

In European's experience,

- **Rationale, Planning and design at the beginning of construction.**
- **In terms of project support, the design has a clear process and model, and track the implementation of the target, through accounting or indicators.**
- **Often combined with the revitalizing the brownfields, or infilling development inner city.**
- **The low-carbon-technology usually works on reducing the building energy consumption, use of renewable, clean energy, water resources recycling and utilization, green mobility infrastructures and supports, waste treatment system.**

Focus of low-carbon community in Essen, Germany

➢ *Collaboration and participation of stakeholders*

emphasizing multi-measures for key issues and action areas in terms of governance, innovation, supervision and collaboration;

➢ *Integrating the urban spatial planning*

emphasizing spatial and temporal heterogeneity and closely integrating with the specific refinement and improvement of urban planning;

➢ *Standardization process*

The corresponding standards have been formulated in terms of energy, resources, waste management, transportation, construction, and species diversity.

5. Primary conclusions/result

In China's experience of setting up eco/low-carbon communities:

- **Master Planning and design at the beginning of construction.**
- **majorly governmental practices and through International cooperation.**
- **Usually has a set of indicators.**
- **The eco-low-carbon technology usually works on reducing the building energy consumption, use of renewable, clean energy, water resources recycling and utilization, green mobility infrastructures and supports, waste treatment system.**
- **Powerful managing and usually establish an named office/working group to coordinate various sectors, functions, coordinate monitoring and feedbacks.**

Focus of low-carbon community in Xiamen, China

1. State council level

➢ *Institutional reforms and structural change*

Reshapes ministries to better protect environment, improve climate actions

2. Local level

➢ *Pilot projects*

“We still don’t know if the restructuring at the ministry level reforms will be mirrored at the local level”-researchers at the State Council’s Development Research Centre.

Provincial pilot projects should help guide what happens next. Eg. in Zhejiang province a “tiered ownership” scheme was devised to assess and allocate ownership of natural resources to different levels. (-China dialog, 14/03/2018)

➢ *Enroll new agents*

Promoting different kinds of international cooperation; Public participation: promoting based on digital tools and perform alternative modes and method of governing

“Wisdom requires time and experience” (Confucius)

Get A Trial!

Thank you for listening!