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FOR A BETTER URBAN FUTURE

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GREEN URBAN DEVELOPMENT

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Eco Urbanism in China:

Challenges and Progress so far

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University of
Nottingham
UK | CHINA | MALAYSIA



University of Nottingham Ningbo China (UNNC) 宁波诺丁汉大学

- 7,000+ students

- 7000+ 学生

- 89% home; 11% International

- 89%本土，11%国际生

- 700+ employees

- 700+ 名员工



Big Picture: China

An Urbanization Era



- About 53% of China's population is living in cities. It will reach 66% in 2025, which means over 200 millions people will move to cities in the next one decade;
- Cities are sprawling: urban China has increased 220% in size since 1979;
- In 2025, China will have 231 large cities, jumping from 122 in 2007;

Urban Challenges

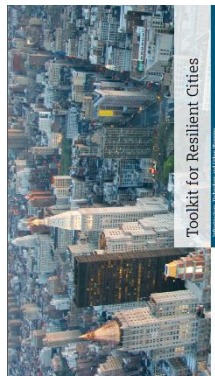
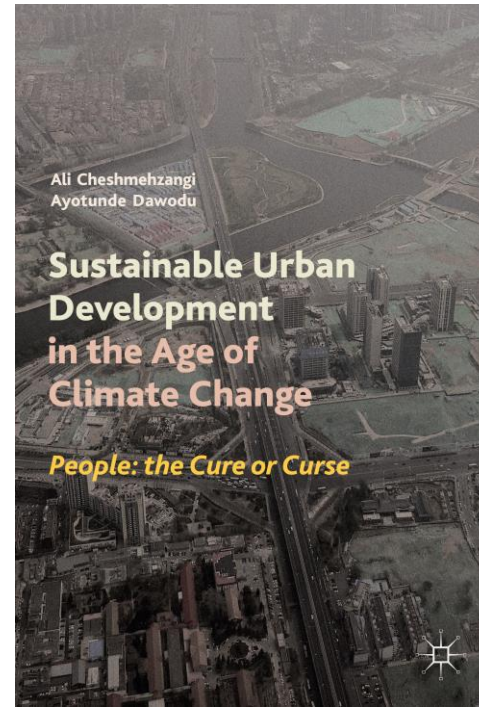
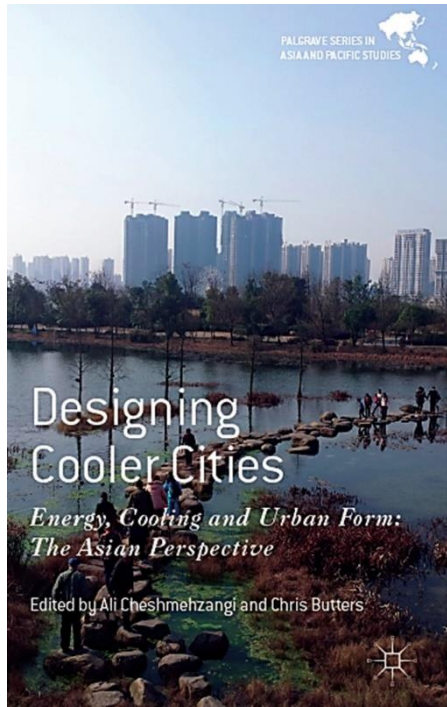


- Chinese cities will consume 20% of the world's energy
- Provision of infrastructure, e.g. 170 cities will go over the threshold of building urban mass transit systems in 2025
- Material consumption, e.g. 20-50 thousands skyscrapers will be built in the next two decades

Climate Is Changing



- After industrial revolution, the global temperature suffered an increment of 1.3 ° C as the consequence of 40% increased CO₂
- China is the biggest carbon producer in the world, Chinese cities have to face the challenges and provide high quality of life to their inhabitants



城市绿色基础设施探讨:
以发展中国家城市为例

Urban Green Infrastructure:
for Cities of Developing Countries

Part of the ELITH Project Report Documents
Ali Cheshmehzangi and Chris Butters



โครงสร้างพื้นฐานสีเขียวของเมือง:
สำหรับเมืองในประเทศกำลังพัฒนา

Urban Green Infrastructure:
for Cities of Developing Countries

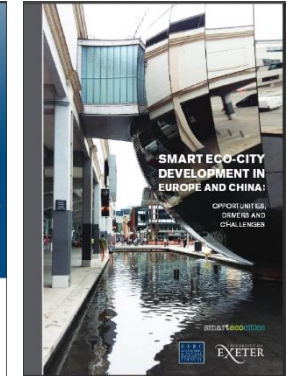
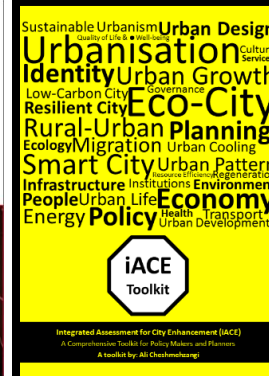
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宁波城市的未来:
绿色、弹性和智慧

Future of Ningbo City:
Green, Resilient and Smart

The University of Nottingham Ningbo China and Arup
Ali Cheshmehzangi and Li Xia Guilan



Eco-Development in China: Cities, Communities & Building

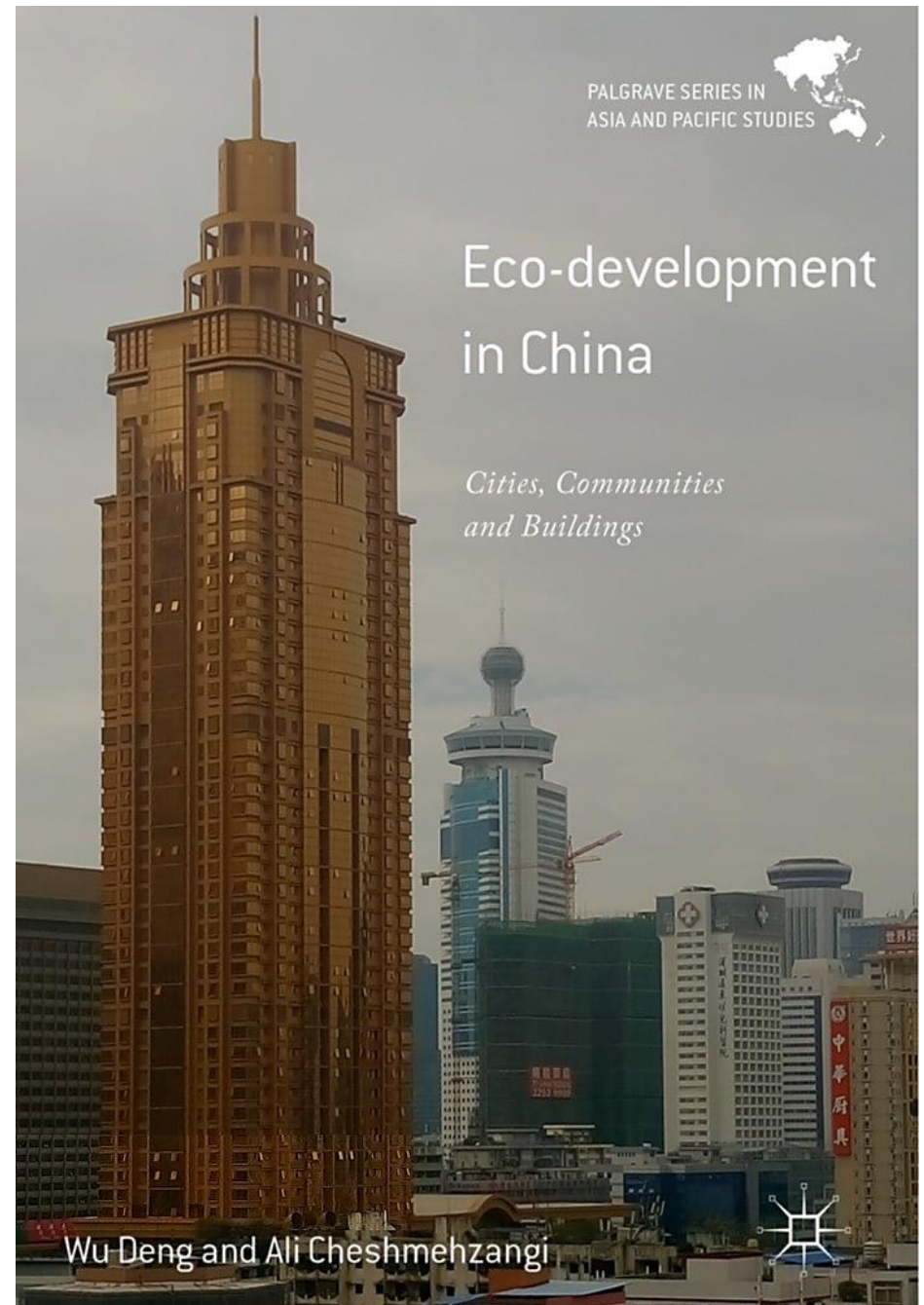
Released in May 2018
(hard copies on 1st of July)

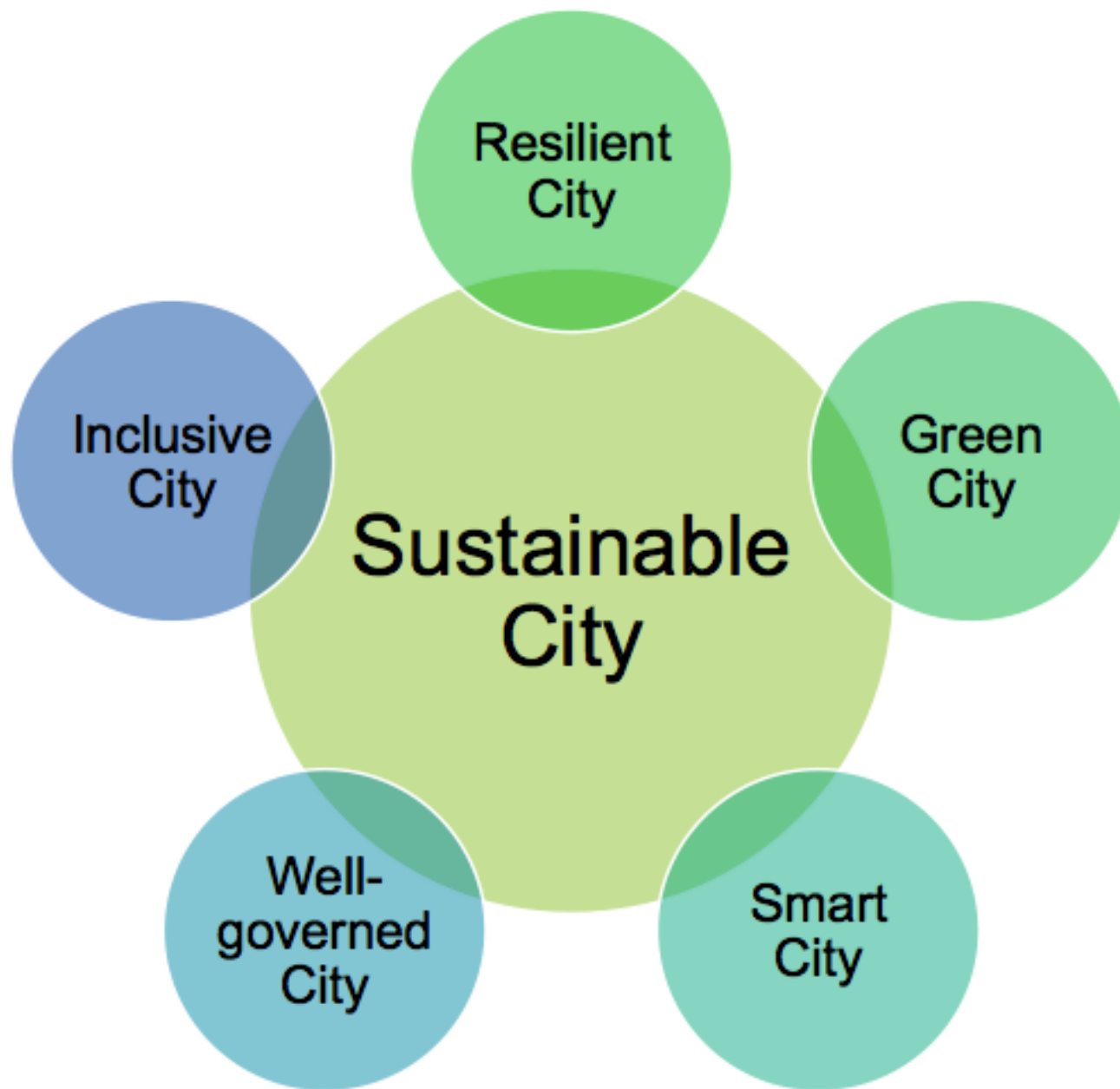
Starts with a global outlook on eco-development and ends with interplay between various spatial levels of the built environment (mainly urban).

The first comprehensive book on eco development in China.

Focus area: China

Case Studies: 24 in total

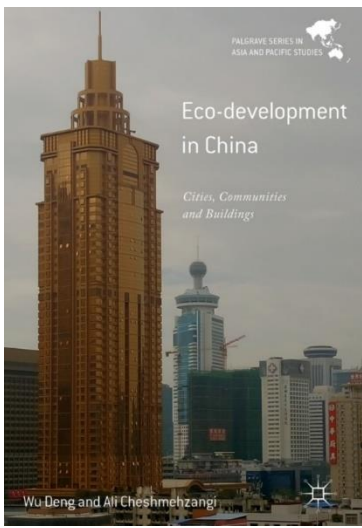




3% 地
+75%
energy c
+50%
waste p
80%

Source: UNEP, 2012

n -

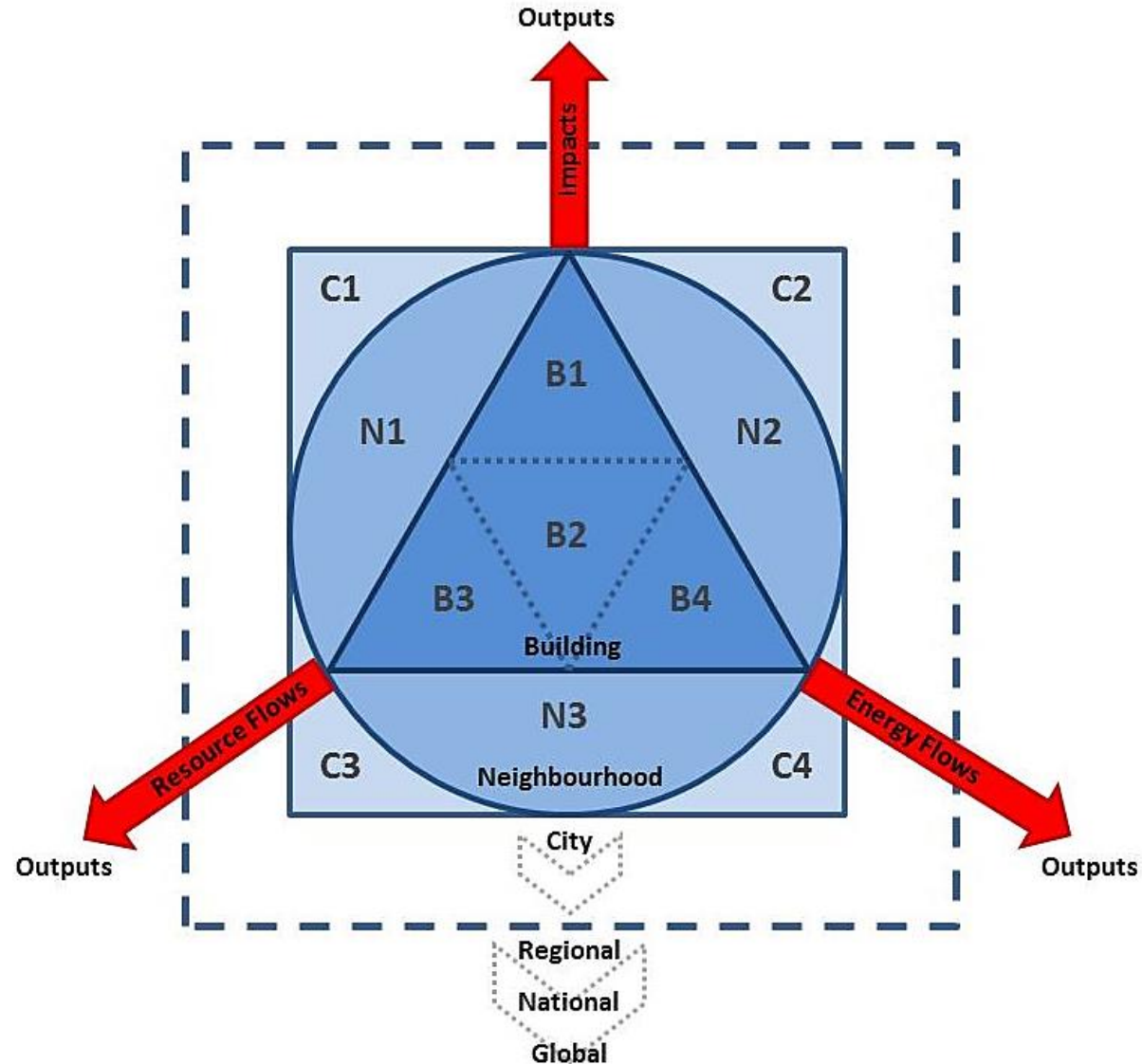


Eco Urbanism in China 2007 – current

Interplay between spatial levels

The interplay between the issues and spatial levels of the built environment, at three levels of 1. Building level (B), 2. Neighbourhood level (N), and 3. City Level (C). The issues are divided into four at the building level (namely: B1. Standards, B2. Technologies, B3. Installations, and B4. Users), three at the neighbourhood/community level (namely: N1. Patterns, N2. Public Open Space, and N3. Social Cohesion), and four dimensions at the city level (namely: C1. Policy, C2. Infrastructure, C3. Governance, and C4. Planning)

(Source: Chapter 2, Eco-Development in China)





Interplay between spatial levels

Spatial Levels	Micro Level (Building Scale)	Meso Level (neighbourhood/Community Scale)	Macro Level (City Scale)
Dimensions			
1. Governance	LOW	MEDIUM	HIGH
1. Social	MEDIUM	HIGH	LOW
1. Environmental	HIGH	HIGH	HIGH
1. Economic	LOW	MEDIUM	HIGH

A matrix to highlight the positioning of sustainability dimensions across the three spatial levels (Source: Chapter 2, Eco-Development in China)



Sustainable Urbanism in China

On-going till Oct/Nov 2019

The concept of Eco Fusion



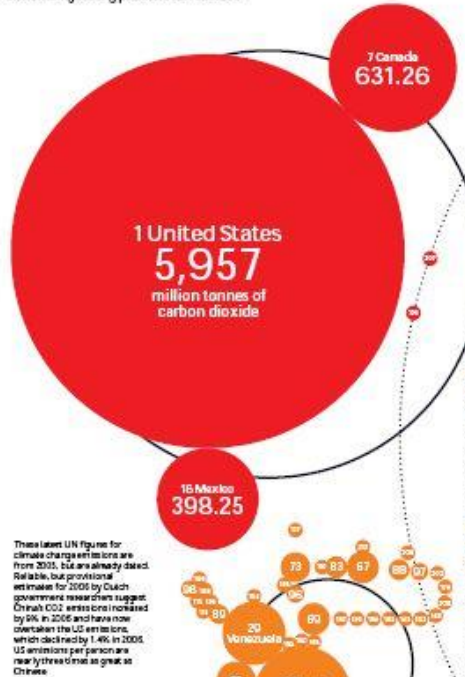
Knowledge areas	Pathways to sustainable built environment
City Level	Policies, master planning, ecology, transportation, wastes, air pollution, and etc.
Neighbourhood/Community Level	Education, behavioural patterns, open space, health, neighbourhood pattern, walkability, and etc.
Building Level	Performance, rating tools, architectural design, indoor comfort, IT technologies, renewable energies, and etc.

Community

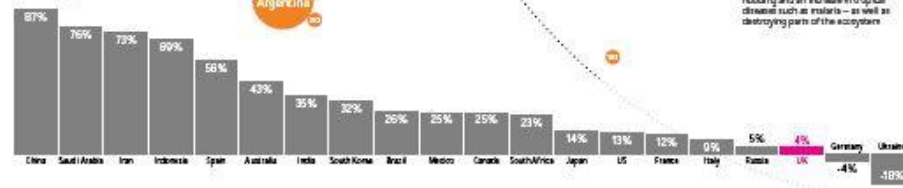
Individual Building

Hot spots - the carbon atlas

This week's Bali meeting highlighted just how difficult it will be to secure an international agreement to reduce greenhouse gas levels by enough to save the earth from catastrophic temperature rises. This map, showing countries according to their emissions, shows why an international deal is needed - and why only one binding the big polluters can succeed



CO₂ emission growth of the highest 20 emitters, 1975 to 2005



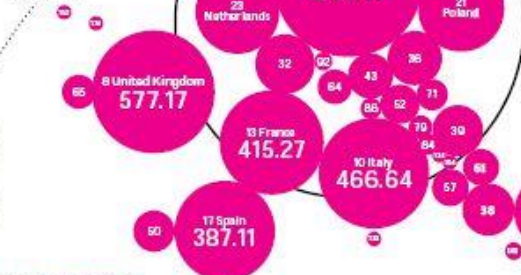
The carbon list

Rank	Country	2005 Emissions (million tonnes)	2004 Emissions (million tonnes)	% Change
1	United States	5,957	5,800	2.7%
2	China	2,850	2,200	29.5%
3	Canada	631.26	631.26	0%
4	Japan	1,300	1,300	0%
5	Germany	844.17	844.17	0%
6	France	415.27	415.27	0%
7	UK	577.17	577.17	0%
8	Italy	466.64	466.64	0%
9	Spain	387.11	387.11	0%
10	India	1,300	1,300	0%
11	Russia	1,300	1,300	0%
12	South Africa	423.81	423.81	0%
13	Iran	1,300	1,300	0%
14	South Korea	499.63	499.63	0%
15	Mexico	398.25	398.25	0%
16	Venezuela	360.57	360.57	0%
17	Argentina	360.57	360.57	0%
18	Brazil	360.57	360.57	0%
19	Indonesia	1,300	1,300	0%
20	Australia	1,300	1,300	0%

Europe

4.67bn tonnes
9% growth in carbon emissions, 1990-2005

For the first time, there is hard scientific evidence of climate change affecting Europe, said the Intergovernmental Panel on Climate Change recently. Freak weather events, such as the heatwaves of 2003, will become more common



North America

6.99bn tonnes
14% growth in carbon emissions, 1990-2005

The US as a major producer of greenhouse gases has been reluctant to accept that man-made climate change is occurring - and reluctant to accept the Kyoto protocol. Que. freak weather events and an avalanche of scientific evidence have forced it to rethink its position

Central & South America

1.10bn tonnes
29% growth in carbon emissions, 1990-2005

Increased freak weather events mean the IPCC is concerned South America will be hard hit by drought, sea level rise, water supplies and the unique natural habitat could be a victim by a temperature increase of up to 4C by the end of the century

Africa

1.04bn tonnes
28% growth in carbon emissions, 1990-2005

Its carbon emissions may be small but this is the continent most vulnerable to the effects of climate change, hitting food and water supplies, causing coastal flooding and an increase in tropical disease such as malaria - as well as destroying parts of the ecosystem

Asia & Oceania

10.36bn tonnes
58% growth in carbon emissions, 1990-2005

It is the fastest growing region with the greatest number of people and rapidly growing cities has provoked a lag in carbon emissions - with China rapidly moving to become the world's greatest carbon emitter in the next two years - as scientists say this has happened already



Middle East

1.45bn tonnes
62% growth in carbon emissions, 1990-2005

The region is small or even better to global greenhouse gas emissions, though an oil and gas industry which produces over 70 percent of world oil supplies over 40 percent of its gas

Eurasia

2.58bn tonnes
4% growth in carbon emissions, 1990-2005

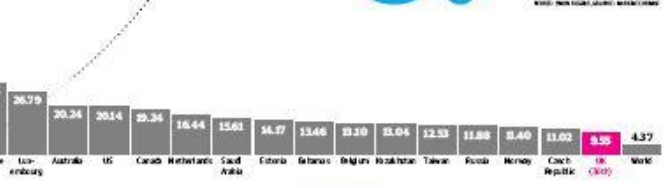
The stark carbon emissions dropped from 300 million metric tonnes of carbon in 1990 to an 80 million metric tonnes in 1995, due to their deteriorating economic situation. Now the energy gap may make them up trading carbon credits

World total

28.19bn tonnes
28% growth in carbon emissions, 1990-2005

World carbon emissions are up from 21.8bn tonnes in 1990 - and with rapid industrialisation in the developing world, these numbers will climb higher. The effect is delayed, which means even if we stopped emitting carbon now, it would go on according to the atmosphere

Highest per person CO₂ emissions, Top twenty plus US, 2005, tonnes



Asia & Oceania

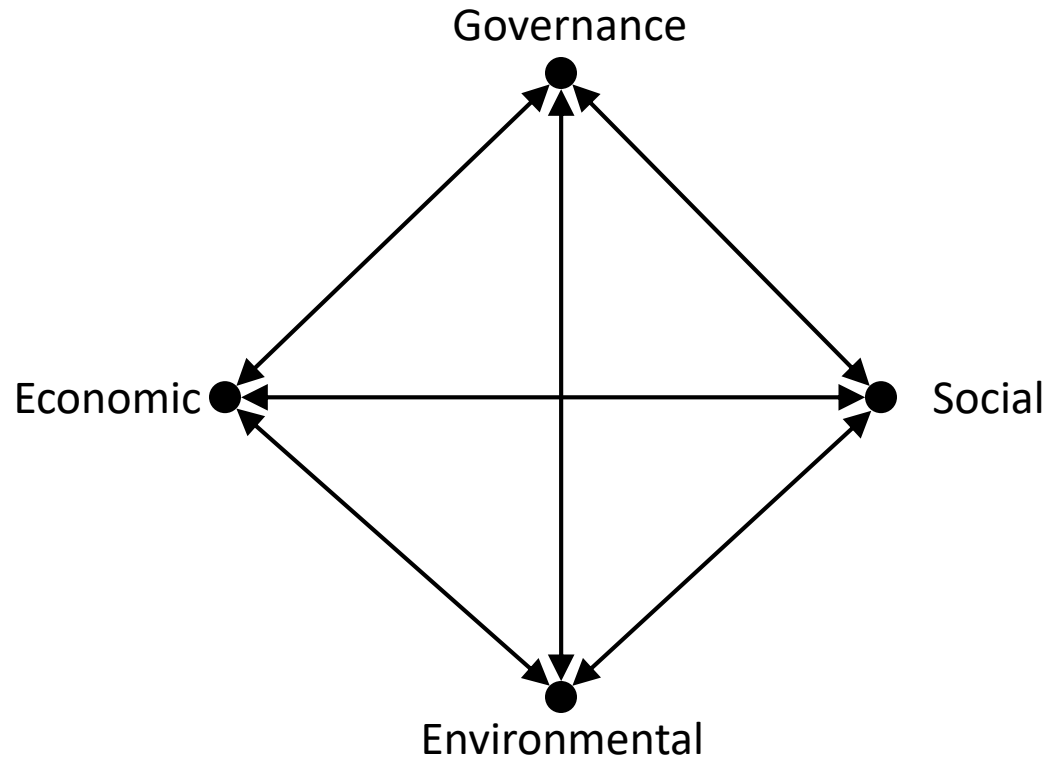
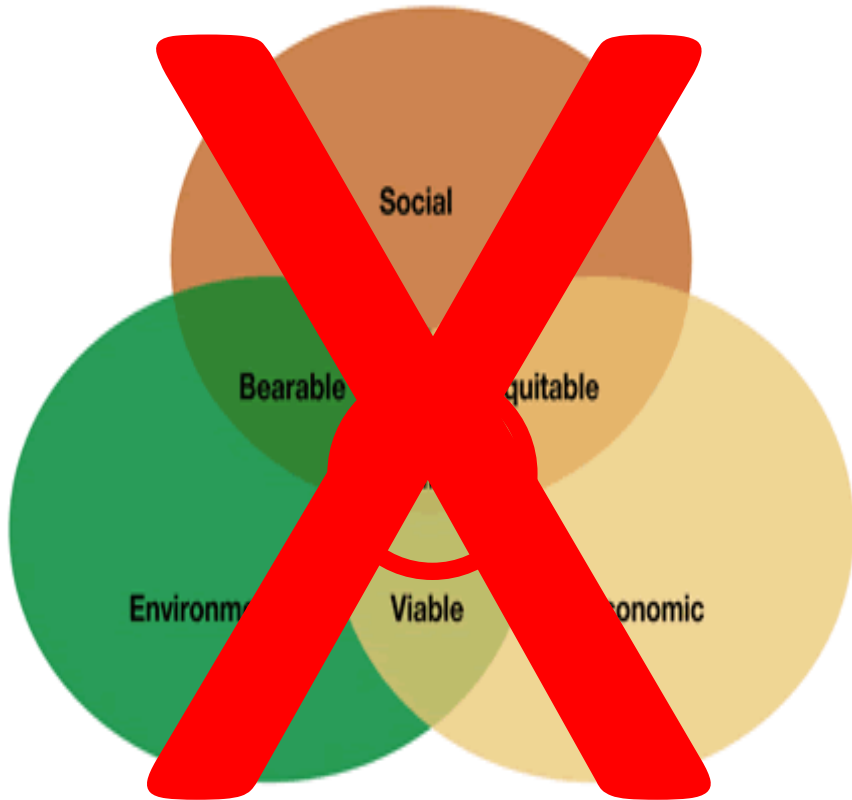
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6	Australia	1,300	1,300	0%
7	Japan	1,300	1,300	0%
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16	Iran	1,300	1,300	0%
17	USA	5,957	5,800	2.7%
18	World	28,190	21,800	28%

The ever-growing need to go Green/Eco in China (since 2007)

*“We will make our skies **blue** again”*

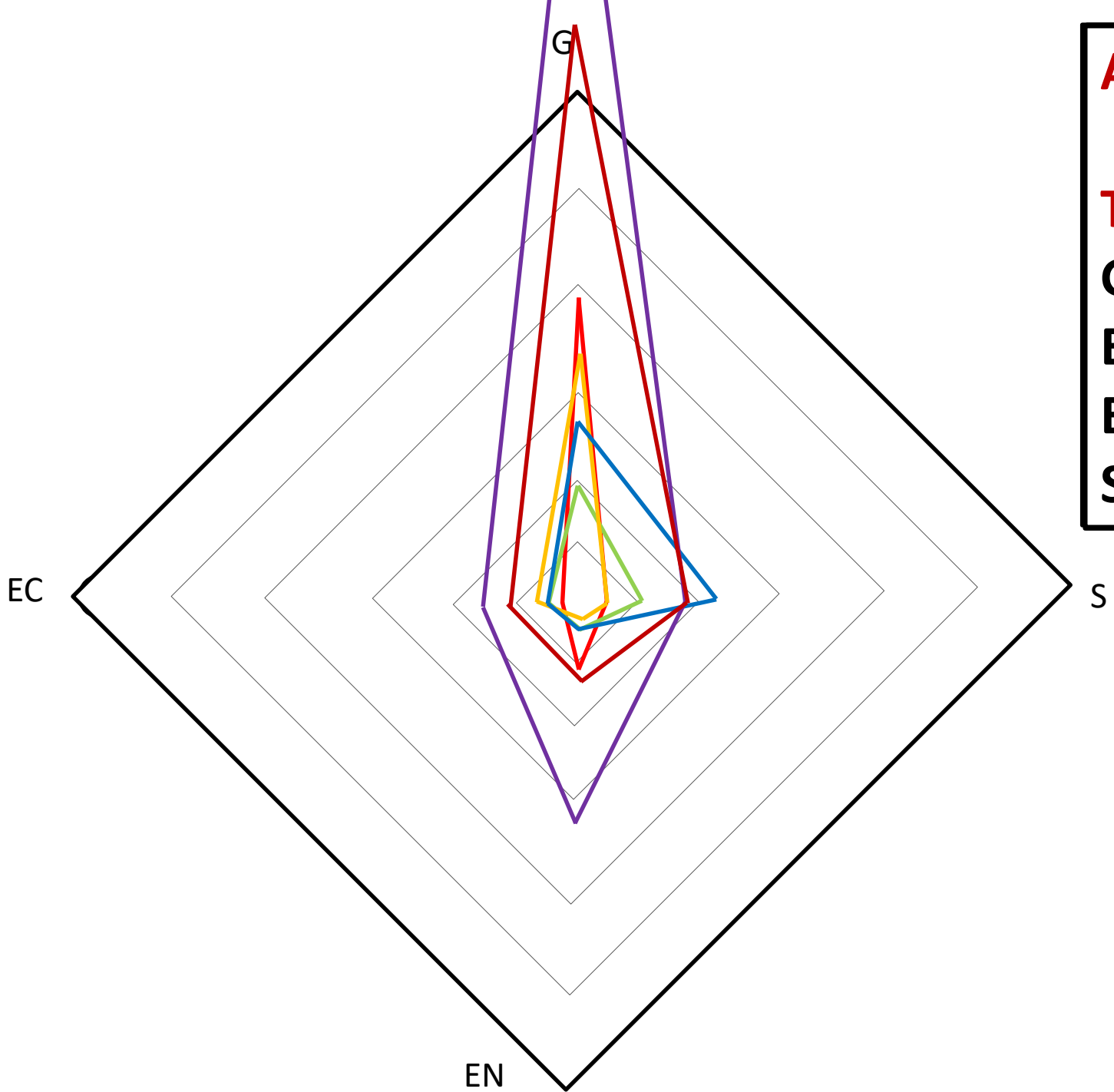


Sustainability Dimensions?



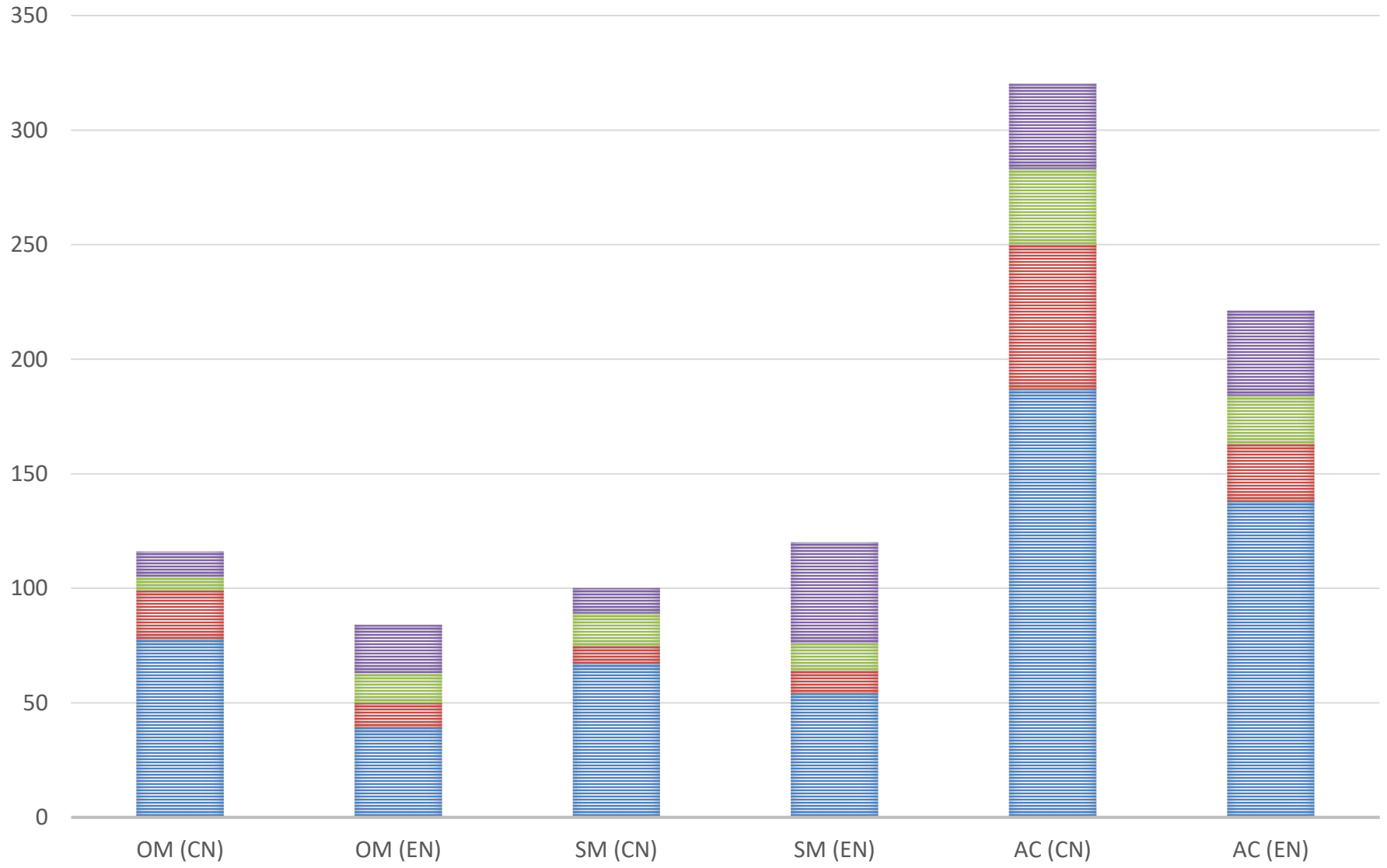
Challenges across 4 dimensions and 6 mediums

Investment...生态城缺乏专业化的大型运营团队 environmental governance...public participation...lack of data...systematic...leadership change... development model/mode... urban expansion...location...growth... sustainable development...infrastructure...生态城市建设规划的编制和管理还有待完善 urban planning...面临气候变化,生态城市向低碳转型的挑战... Climate change...市规模扩张速度快,城市原有的“一城多心”空间格局正逐渐被打破,主城区与组团、城市各组团之间有连片 发展趋势,城市绿地和生态用地面临被蚕食的危机 environmental...pollution...damage...随着城市规模的扩大,原有的部分污染工业被城市建成区包围,业污染问题日愈明显 environmental degradation...城市创新能力不强 ecological impact/loss...development planning...PPP...economic pressure...change of direction... high costs...dependency on technologies...high tech...no assessment...poor evaluation system... modernization... urbanisation... industrialisation...site selection... process... affordability... accessibility... water...消费文化盛行,安全问题突出。垃圾围城的现象日益突出 air quality... soil...很多生态城选址恰恰选择在这些不可替代的生态环境敏感区进行开发建设,采用围海造地、填湖造地、填滩造地、开山造地的做法,对生态带来极大破坏 social capital... inequality... lack of attention...生态城市的功能定位没有特色 lack of implementation...lack of knowledge... impact... replacement...displacement... localization... mistrust... community engagement... enhancement... state...城市生态保护制度体系不健全 ecological protection...到处建大广场,大会议中心,居民没有幸福感... characteristics... humanistic... environmental preservation... resources...奢侈铺张之风却在国内盛行... costs...生态城市内涵模糊不清...



AC (EN)	
T	41
G	138
EN	25
EC	21
S	37

GOV EN EC S



	OM (CN)	OM (EN)	SM (CN)	SM (EN)	AC (CH)	AC (EN)
G	Development Model	Definition/ concept	Implementa tion	Development Model	Development Model	Development Model
EN	Ecological Issues	Ecological Issues	Ecological Issues	Environmental Damage	Resources	Ecological Issues
EC	Costs	Costs	Costs	Costs	Industrial Structure	Costs
S	Public Participation	Local Demand	Education/ Awareness	Lack of Human Dimension	Public Participation	Public Participation

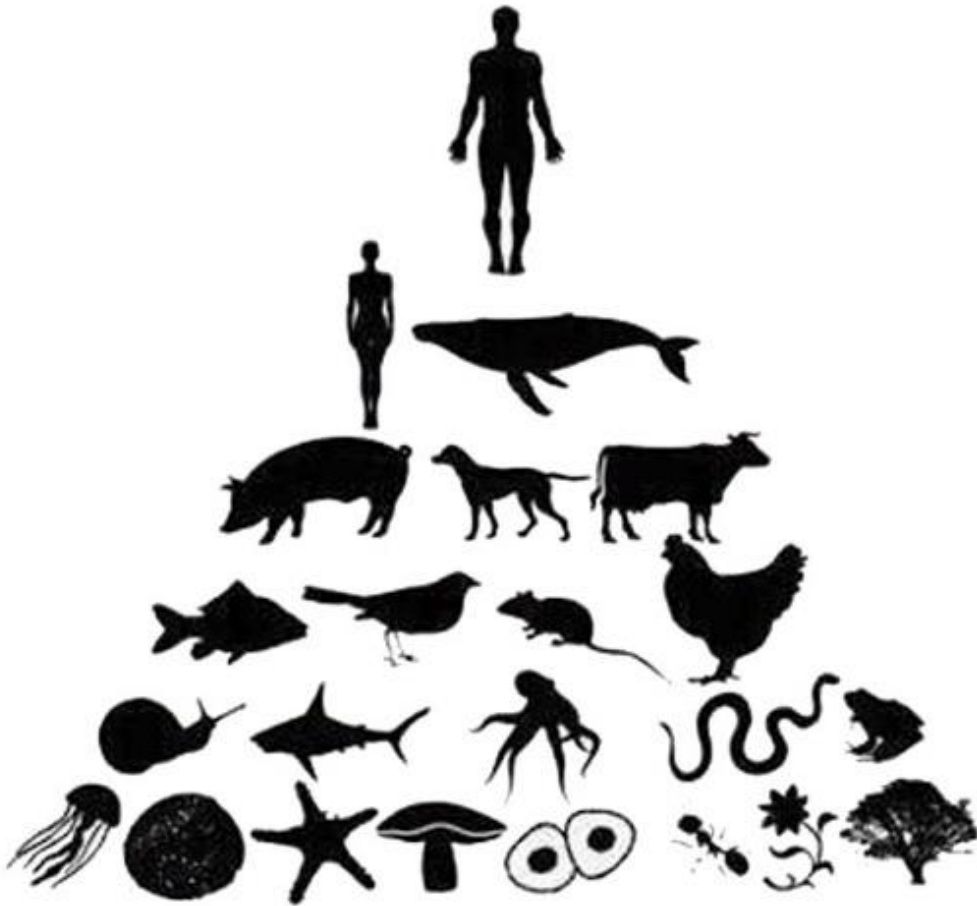
	OM (CN)	OM (EN)	SM (CN)	SM (EN)	AC (CH)	AC (EN)
G	Planning (Spatial)	Mistrust	Life Cycle of Planning	Leadership Change	Environmental Governance	Corruption
EN	Uncoordinated Development	Sprawl Effect	Climate Change	Impact of Surrounding Environments	Waste Treatment	Increase of Energy Consumption
EC	Imbalance	Low Job Creation	Operational Patterns	Branding	Resource-based Economy	Stakeholder Network
S	Social Harmony	Not Human Friendly	Inconvenience for Residents	Operational	Consumer Culture	Socio-economic pressures

What this study offers

(not a typical conclusion)

- Understanding the gaps between multiple actors/interests/stakeholders/...
- Finding similarities and disparities between various mediums/sources
- Providing an up-to-date analysis of challenges of Eco Cities in China
- To avoid any future speculations and assumptions!

EGO



ECO



Our message is clear / *simply to make a difference!*

谢谢

Thank You



<> سپاس <> Danke <> poděkovat <> mulţumi <> 谢谢 <> terima kasih <> gracias <> धन्यवाद <> tak <> Благодарю <> podziękować <> תודה <> grazie <> thanks <> ευχαριστιες <> tänu <> diolch <> teşekkürler <> شكرا <> obrigado <> kiitos <> merci <> おかげで <> paldies <> მადლობა <> 감사 <> Mwebale..

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