

Japan-China Policy Research Workshop

On the road to Paris: enhancing common understanding of major emitters' policies

Japan-China Joint Research on Policy Instruments and Low Carbon Technologies Related to Building Sector 2013-14

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This presentation is based on the following research reports:

- “Research on Policies to Reduce Greenhouse Gas Emissions from Building Sector in China” (March 2014)
- “Research on Technology Needs and Policy Instruments for the Development of Low Carbon Urbanization in China” (March 2015)

Japan-China Joint Research Project

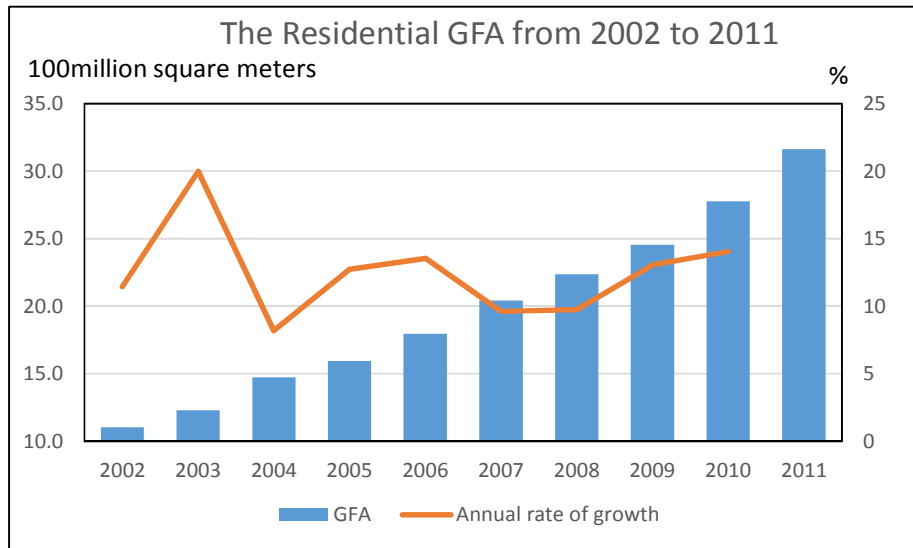
Profile:

- 2-year project (FY2013-14)
- Jointly performed by the Japanese and Chinese researchers
 - Japan team: led by Dr. Yasuko Kameyama (NIES)
 - China team: led by Dr. Liu Qiang (NCSC)
- Sponsored by Ministry of the Environment, Government of Japan
- Results
 - 2013: “Research on Policies to Reduce Greenhouse Gas Emissions from Building Sector in China”
 - 2014: “Research on Technology Needs and Policy Instruments for the Development of Low Carbon Urbanization in China”
- Deloitte as Secretariat

Background of the project

Annual completed ground floor area (GFA) in China is rapidly increasing

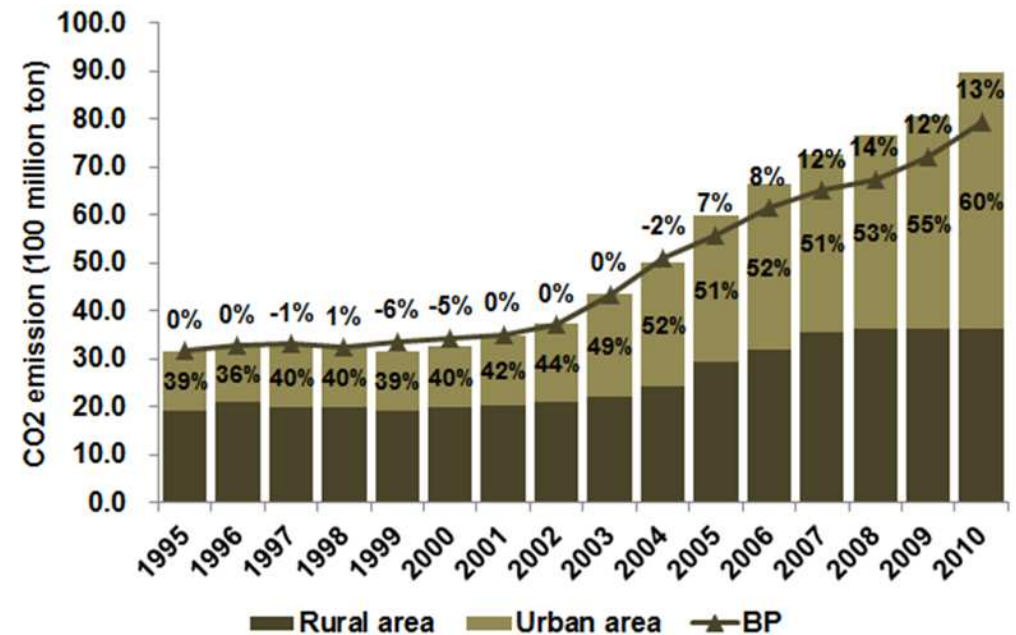
Residential GFA from 2002 to 2011



Source: Tsinghua Building Energy Research Center, 2007-2013

The urban CO2 emissions in China is rapidly growing

CO2 Emissions in Urban and Rural Area since 1995 in China



Source: Lina Meng, Wina Graus et al. (2014) "Estimating CO2(carbon dioxide) emissions at urban scales by DMSP/OLS (Defense Meteorological Satellite Program's Operational Linescan System) nighttime light imagery: Methodological challenges and a case study for China", Energy (71)

Research 2013: Overview

Objectives:

- To seek innovative ways for the Chinese government as well as the people to pursue CO2 emission reduction from building sector.
- To focus especially on policies and measures that stimulate involvement of various stakeholders related to the sector, such as developers, constructors and users.

Approach:

- Case study on policy instruments from Japan, US and EU.
- Evaluate the policy instruments from a Chinese perspective

Classification of Cases:

Policy instruments	Target Stakeholder	
	Developers & Owners	Occupants
Financial Support		
New York Green Building Tax Credit (US)	X	X
KfW Energy-Efficient Refurbishment Program (EU)		X
Property Assessed Clean Energy (US)		X
Demand Response Aggregator (US)		X
Energy Service Company (JP)		X
Information Dissemination		
ENERGY STAR (US)	X	X
DBJ Green Building Certification (JP)	X	X
Tokyo Green Building Program (JP)	X	
Kyoto Environmental Management System (JP)		X
Market-based Mechanism		
Carbon Tax (Global)	X	X
Emissions Trading (Global)	X	X

Research 2013: Policy Evaluation and Recommendations

Evaluation Process

Policy instruments:

1. Fiscal and taxation
2. Standards
3. Labeling
4. EPC
5. Carbon market



Policy Implementation

- Recognition Degree
- Implementation Degree
- Application Degree

Evaluation of Performance

- Low Carbon Effect
- Economic Effect
- Social Effect



Evaluation Results

	Policies	Instruments
Short-term	Fiscal and taxation, standards, labeling	EPC
Medium-term	Standards, labeling	Carbon market, EPC, PPP

Policy Recommendations

- Use planning and standards to drive the private sector's participation
- Complete the relevant legal, regulatory system
- Strengthen the fiscal and taxation policies
- Explore new instruments in building Energy Conservation and Emission Reduction
- Complete the third-party measurement and evaluation system for building energy saving
- Strengthen the important role of government in promoting the private sector's participation
- Strengthen the propaganda to increase the Enthusiasm of the private sector
- Broaden the financing channel for private sector

Research 2014: Overview

Objectives:

- To identify key building related low carbon technologies and key policy instruments that are most effective for introduction of those technologies in the process of urbanization in China.

Approach:

- Categorize CO2 mitigation technology into urban district level, building level, and product level.
- Case study regarding development and research activities aimed at low carbon urban planning.
- Quantitatively analyze how much emission reduction could be achieved if effective technologies and policy instruments are introduced in Chinese cities

Selected technologies and cases:

Sector \ Level	District	Building	Product
Heating / cooling	D1	B1, B2	P1
Hot water supply			D2
Lighting			
Decarbonized energy sources			

District case 1: Inkandar Malaysia

District case 2: Effective use of energy from waste

Building case 1: Building Energy Management System (BEMS) in Japan

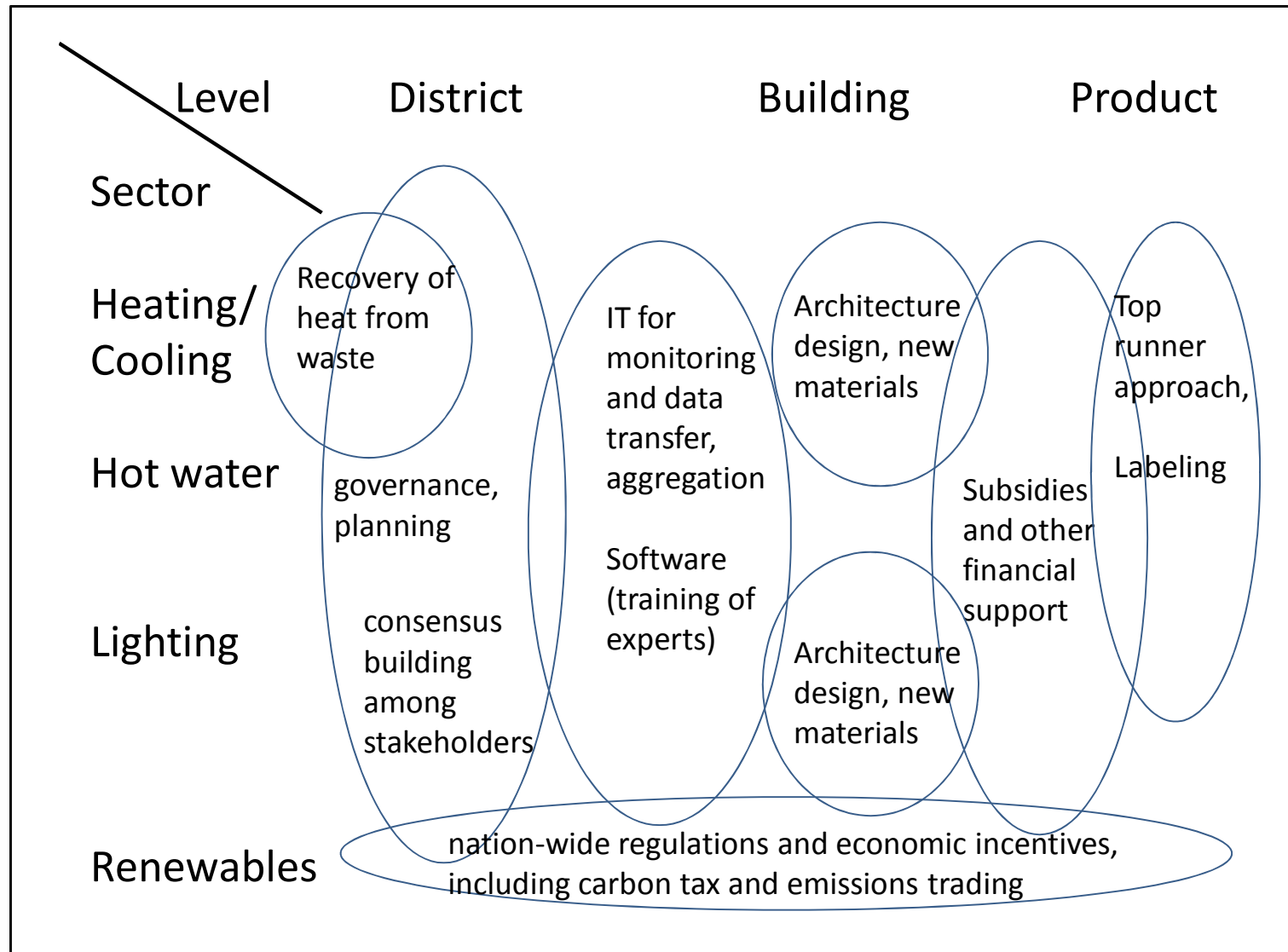
Building case 2: Low carbon buildings in Tokyo metropolitan

Product case 1: Air Conditioners in Japan

Product case 2: Energy efficient products in Fukushima region

Research 2014: Findings from case studies

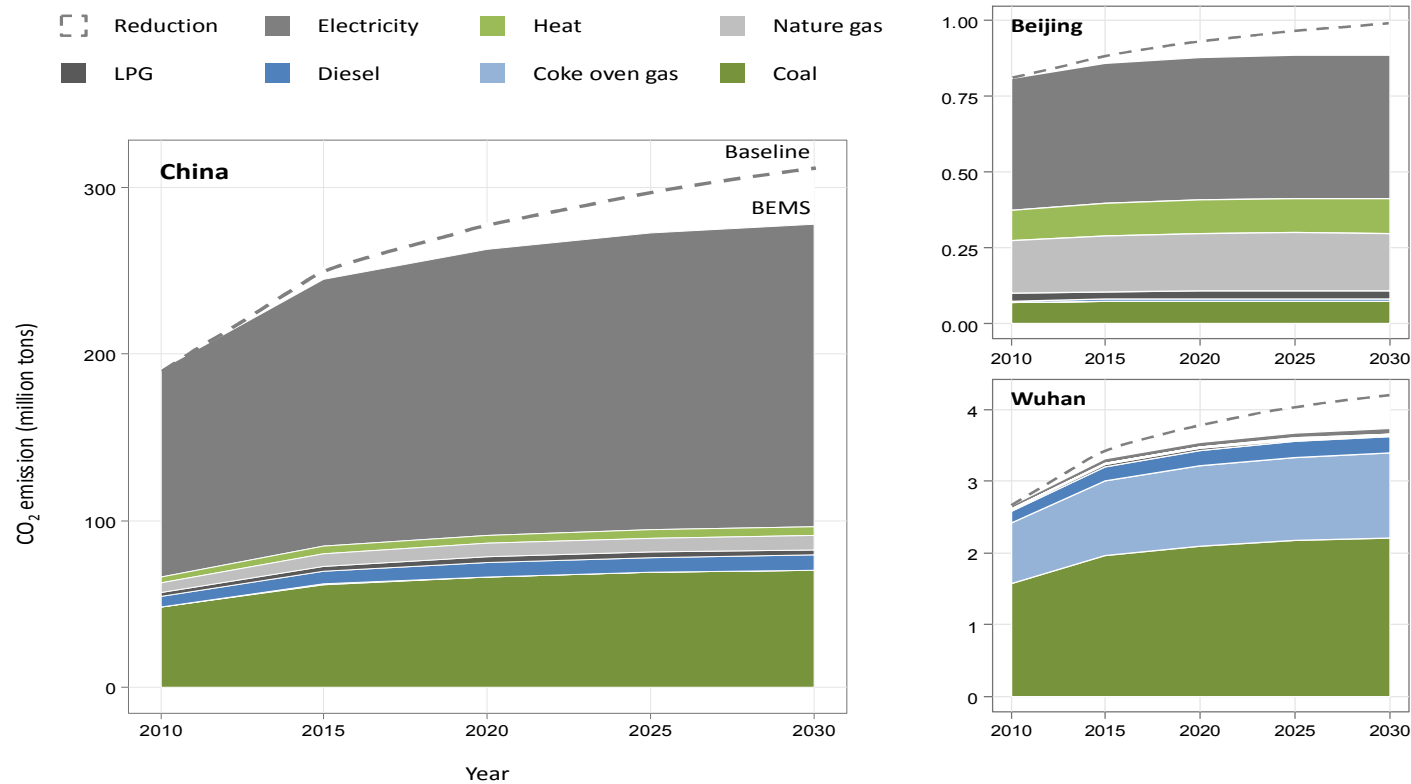
Policy instruments to motivate technology diffusion towards low carbon urbanization



Source: Research 2014

Research 2014: Example of quantitative analysis

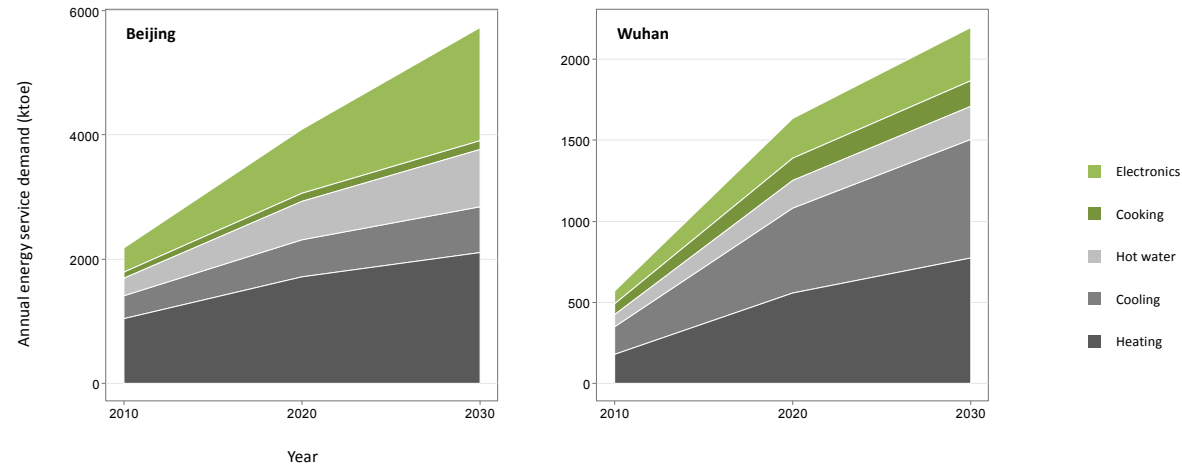
Result of Simulated CO2 Emissions Reduction Potential and Contributors (BEMS)



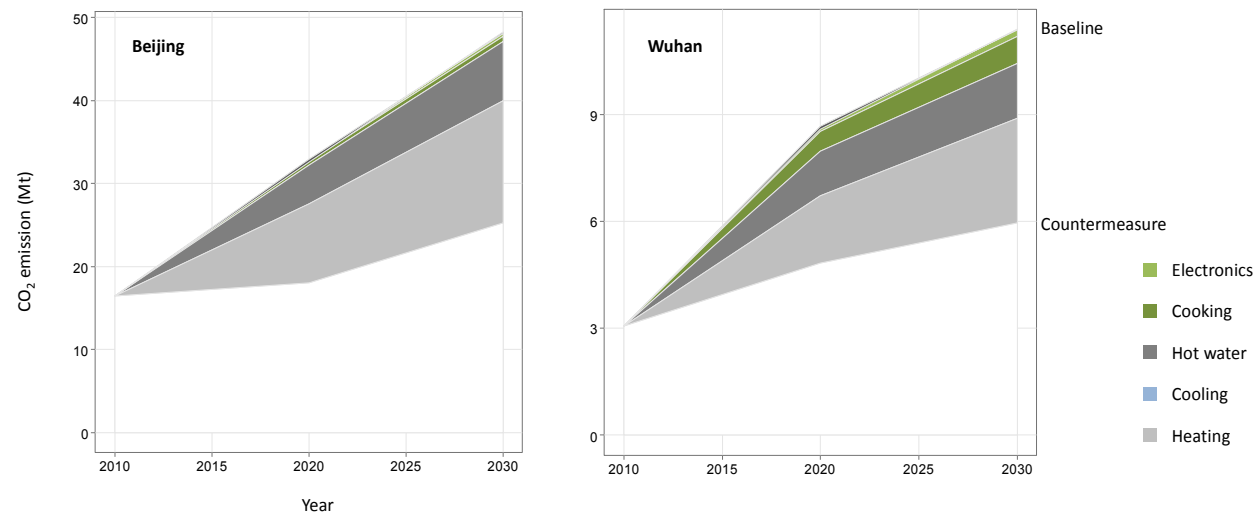
Source: Research 2014

Research 2014: Cases in Beijing and Wuhan

Energy Demand of Urban Residential Sector



Result of Simulated CO₂ Emissions Reduction Potential and Contributors



Research 2014: Low-Carbon Effect of Existing Technologies

Priority technologies

- district level: power generation from municipal waste, recycling of building materials
- building level: distributed energy system
- product level: lighting technologies

Technology level	Category	Technology maturity		Low carbon potential
		Trial stage	Commercial stage	
Technologies at urban district level (Power generation from waste)	landfill gas power plant	X	X	high
	waste incineration power plant	X	X	high
	gasification power generation	X		high
Technologies at urban district level (Recycling materials from buildings)	environmentally friendly bricks	X	X	high
	recycled aggregate	X	X	high
	backfill material	X	X	high
Technologies at building level	Building Energy Management System (BEMS)	X	X	medium
	distributed energy system based on non-renewable energy	X		high
	distributed energy system based on renewable energy	X		high
Technologies at product level (Air conditioning)	electric air conditioning	X	X	low
	solar air conditioning	X		high
	ground source heat pump air conditioning	X		high
	gas air conditioning	X		medium
Technologies at product level (Lighting)	thermal radiation lighting	X	X	none
	gas discharge lighting	X	X	medium
	semiconductor lighting	X	X	high

Research 2014: Policy Recommendations

Application barriers for low-carbon technologies

- There is a lack of specific laws and regulations on building field.
- Low-carbon technologies in building field are still needed to be improved.
- Statistics system for energy consumption and carbon emission in building field is not complete.
- Low-carbon technologies in construction are not recognized widely, and extensive involvement of the public is hard to realize.

Policy suggestions at building level

- Improve relevant policies and systems
- Strengthen low-carbon technologies and product standards
- Strengthen the capacity building
- Strengthen scientific research and international cooperation
- Strengthen corporate and public participation

Thank you for your attention.