



Building energy use in China Current status and conservation roadmap

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Content

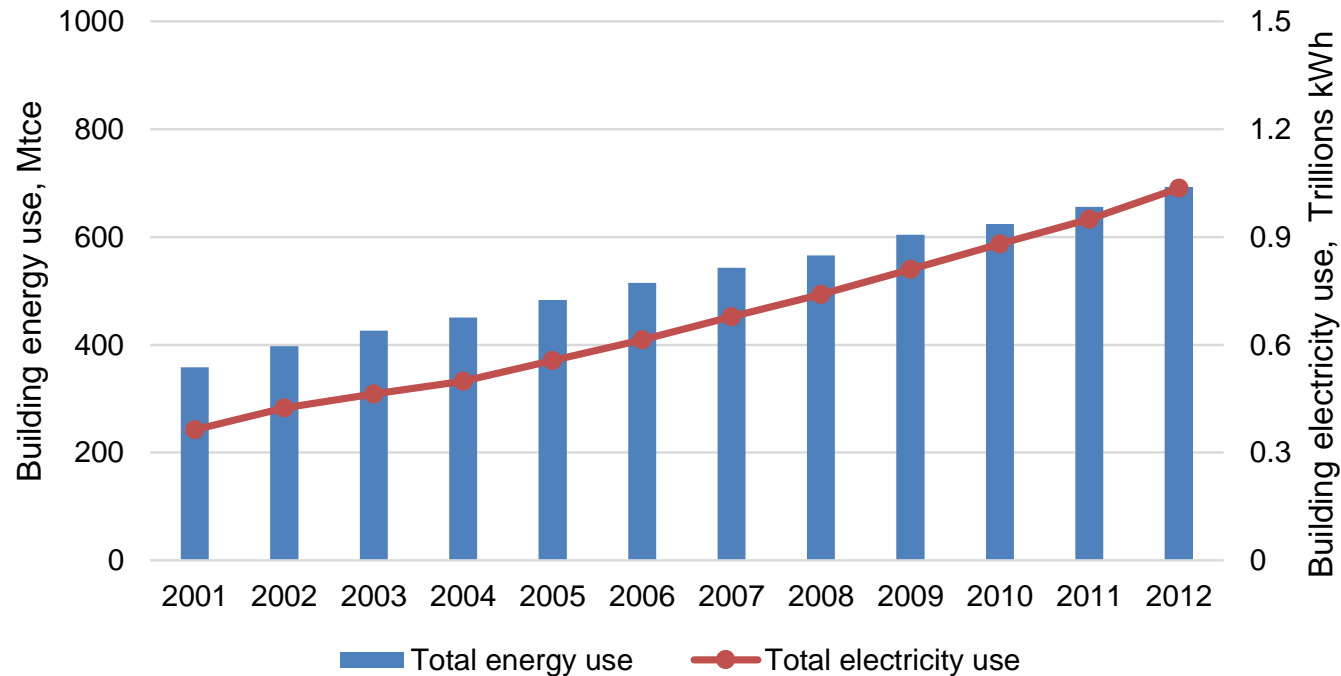


- Status of Building Energy Use
- Roadmap for BEU conservation
- BEU Standard, for total control

Status of Building Energy Use in China



- Total BEU and electricity use keep increasing!

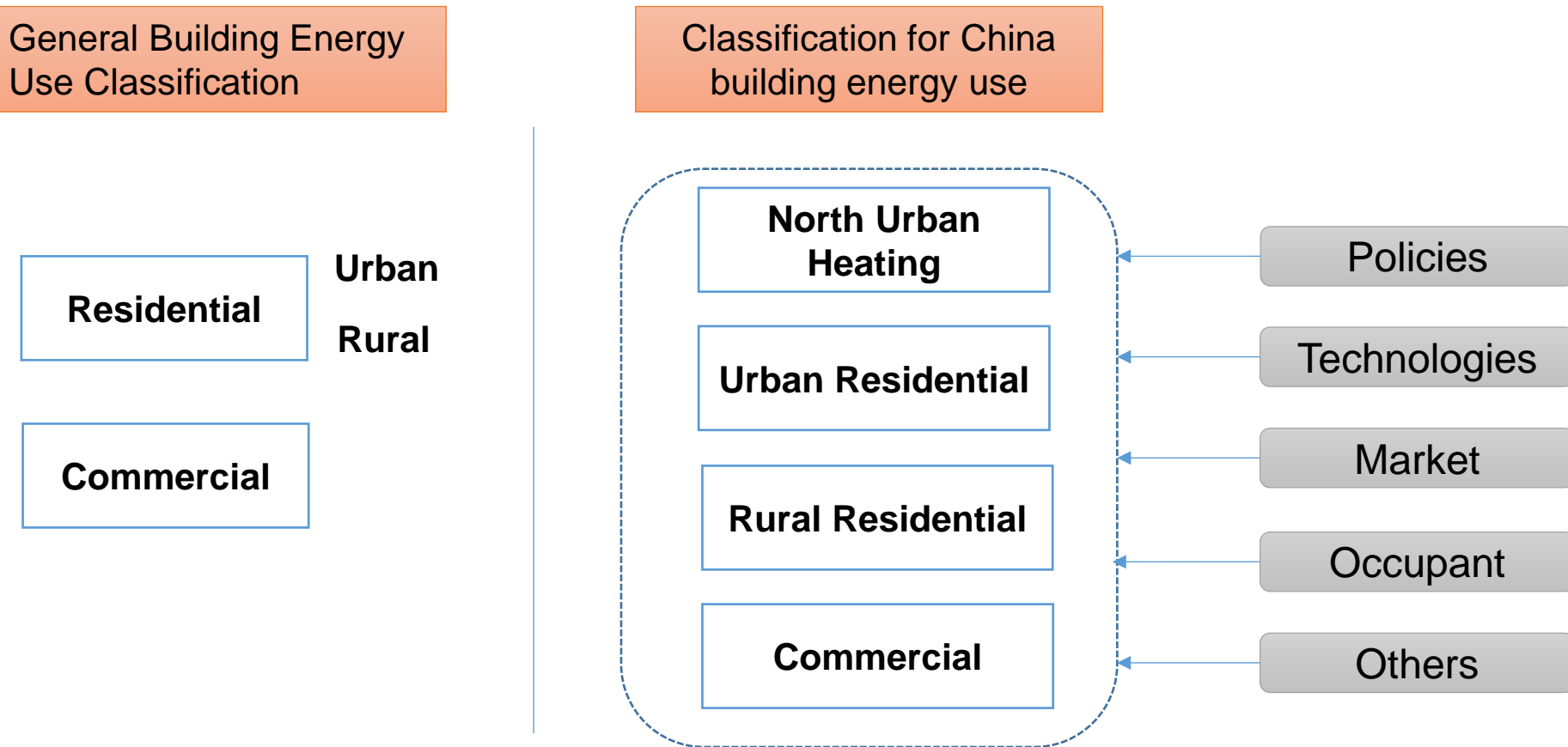


Based on CBEM Developed by Tsinghua University

Status of building energy use



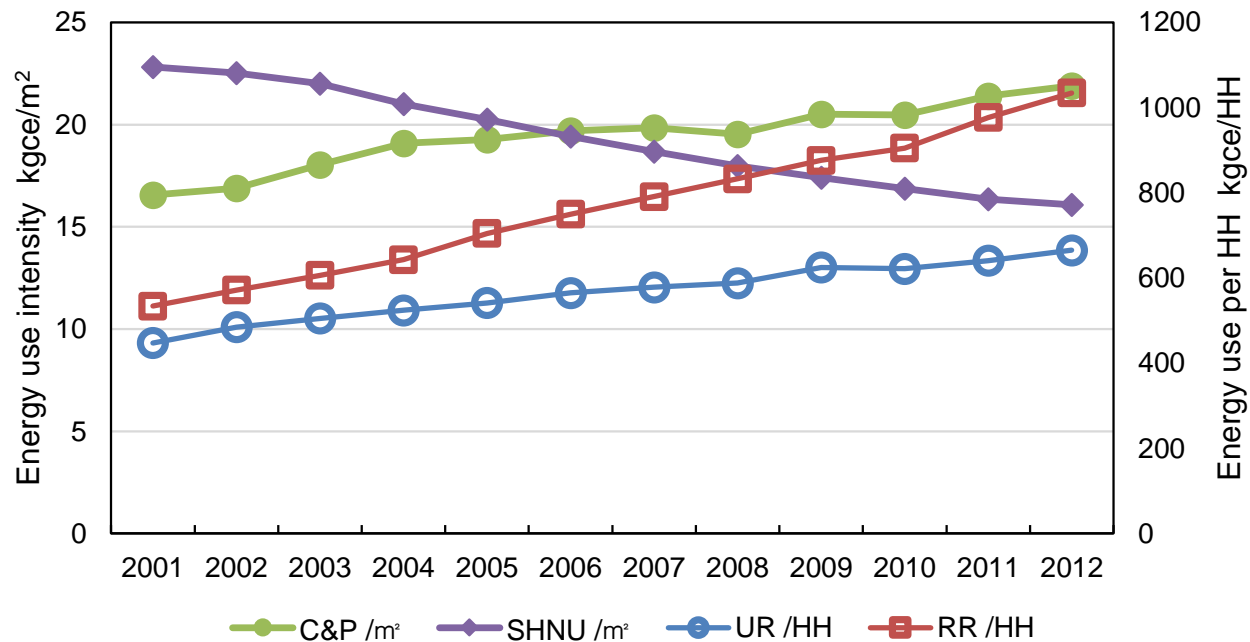
- **Considering the features of energy use**, China building energy use could be divided into **Four sub-sectors**



Status of building energy use



- The increase of energy use intensity is a main reason for total BEU's increase;
- Each kind of building energy use intensity increase except space heating in north urban area.



What's the target?



Improving energy efficiency

Reducing energy use

- Energy use intensity of some energy-saving demonstration buildings(in China) is higher than the average level in China.
- Energy use intensity of newly-built commercial buildings which have high efficiency technologies is higher than the existing buildings' average level.
- Energy use is different due to **the use mode, operation mode and services level.**

“Energy Efficiency” + “Building Use Mode” → “BEU”

Total amount control



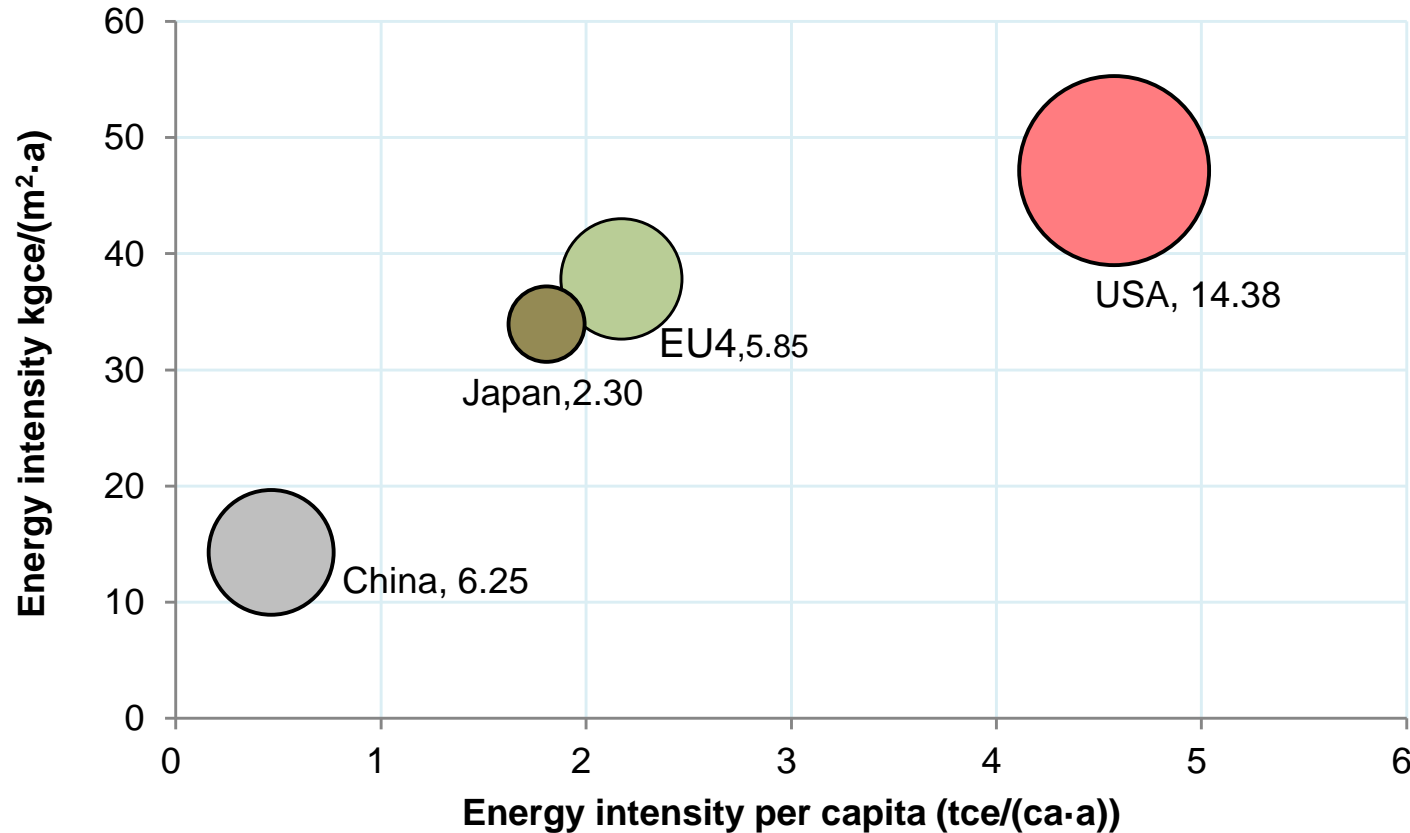
The national route of energy conservation is changed to “total amount control”

- “construction of **ecological civilization** in Hu’s Report at 18th party congress
 - “We must give high priority to **making ecological progress** and incorporate it into all aspects and the whole process of advancing economic, political, cultural, and social progress...”
 - “We should launch a revolution in energy production and consumption, **impose a ceiling on total energy consumption, save energy and reduce its consumption**. We should support the development of energy-efficient and low-carbon industries, new energy sources and renewable energy sources and ensure China's energy security.”
 - *Building energy conservation is an important part of ecological civilization construction*
- “the 12th five year” Energy Development Plan
 - **The total energy and electricity consumption** should be controlled around 4 billion tce and 6.15 trillion kWh until 2015.
- “the 12th five year” energy-saving and emission-reduction
 - Building energy use intensity should be reduced from 23.9kgce/m² to 21 kgce/m² in public institution, and from 447.4 kgce/capita to 380kgce/capita.

Building energy use comparison



- Energy intensity has large difference between different countries(2010).

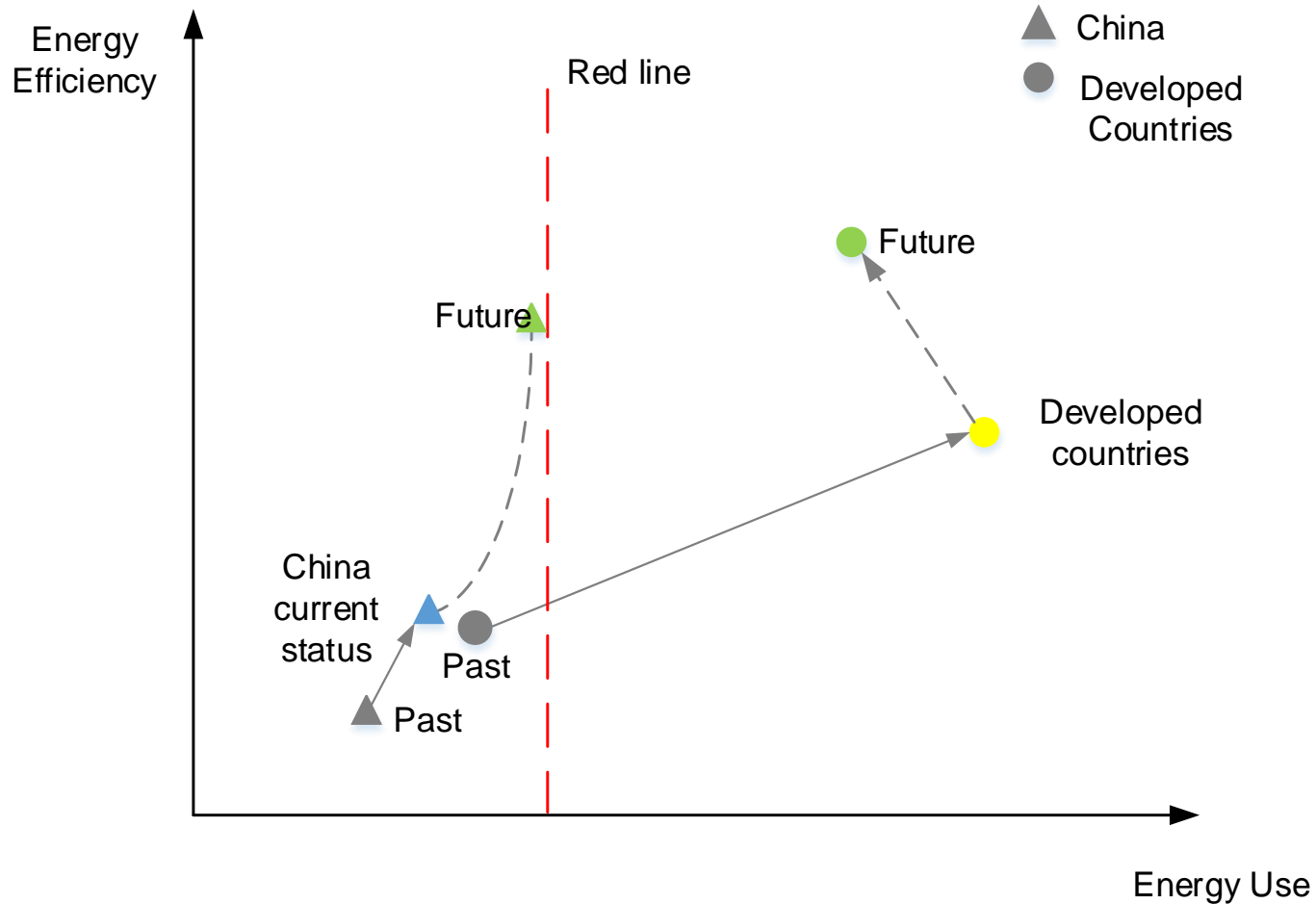


Data source: EIA(USA), IEEJ(Japan), IEA(EU4)

Roadmap for BEU conservaion



- Different with developed countries



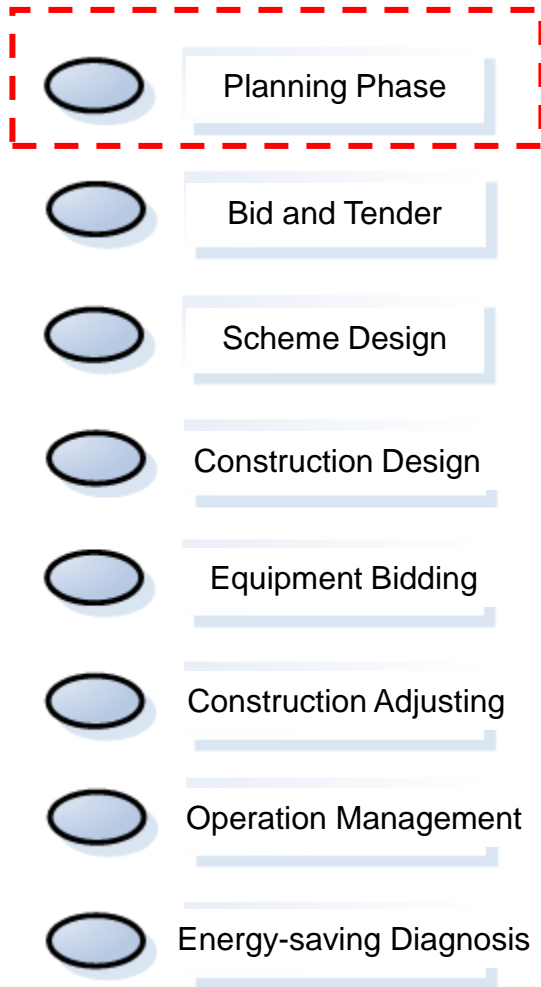
BUES, for the total control



- For different building energy use, there are two kinds of indicators:
Binding indicators and **Leading indicators**.

Type	Indicators	Unit	Difference
SH EU	Heat energy use	kgce/(m ² ·a)	location, scale
	Heat demand	GJ/m ²	location
	Overheating rate	%	scale
	Pipe loss rate	%	scale
	Heat generation use heat distribution	kgce/GJ kWh/(m ² ·a)	scale heating period
C&P EU	Integrated electricity use intensity	kWh/(m ² ·a)	Climate zone, function and type
UR EU	Electricity use per household	kWh/(HH·a)	Climate zone
	Gas use per household	m ³ /(HH·a)	Climate zone

Application – Whole process energy saving



In this phase, it is not necessary to decide which technologies should be used. Instead, the total energy use should be planned by program branch and the building's owner.

	Unit	An office building
HVAC's energy use	MWh/a	820
Lighting's energy use	MWh/a	480
Appliance's energy use	MWh/a	700
Lift's energy use	MWh/a	60
Water supply and drainage's energy use	MWh/a	20
Total electricity's energy use	MWh/a	2480
Heating demand	GJ/a	5000

Relationship with the existing standards



Energy Efficiency Design standards The Building Energy Use Standard

For the buildings' and systems' design the target of building operation

Constraint the buildings' and systems' performance the real energy use

Related to design, construction quality and adjusting Also, the operation mode and management

Used as Guide standards, for building construction process. Effect standard, for building operation and management.

If meeting the EEDS, the building energy use would meet the requirement of BEUS when operated and managed in a proper mode

√ —————> √ or X

If not, the service level can hardly meet the demand when the energy use is limited.

X —————> X



Thank you for your attention!

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