"十三五"建筑领域控煤目标的实施与去库存研究

Research on Implementation of Coal Consumption Cap Plan and Destocking in Building Sectoer in "13th Five-Year Plan"

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研讨内容 Discussion Contents

"十三五" 建筑领域煤控目标

Coal consumption cap strategic target in building sector in "13th five-year plan"

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1. "十三五"建筑领域煤控目标
Coal consumption cap strategic target in building sector in "13th five-year plan"

总体目标展望

Energy consumption in the building sector outlook to2020

到2020年，民用建筑能耗总量控制在9.5亿吨标煤，煤炭控制在2.30亿吨标煤，煤炭占建筑能耗总量比重降低到25%以下。大气污染重点防治区域的集中供热率达到70%以上。民用建筑总量控制在约700亿平方米。

By 2020, the total energy consumption of civil building should be controlled within 950 million ton standard coal and the coal consumption should be controlled within 23 million ton standard coal. The percent of coals in total building energy consumption should be reduced to be under 25%. The central heat supply rate in the key prevention and governance area for atmospheric pollution should be over 70%. Total civil building area should be controlled to be about 70 billion m2.

	2020年建筑能能耗消费量（亿吨标煤） 2020 Building Energy Consumption(10^9tce)
电力(Power)	5.0
煤炭(Coal)	2.4
天然气(Natrual gas)	1.2
可再生能源(Renewable energy)	0.9
建筑能耗总计(Building energy total)	9.5

2020建筑领域各类能耗消费预测
Forecast of 2020 Building Energies consumption

- 电力(Power) — 53%
- 煤炭(Coal) — 25%
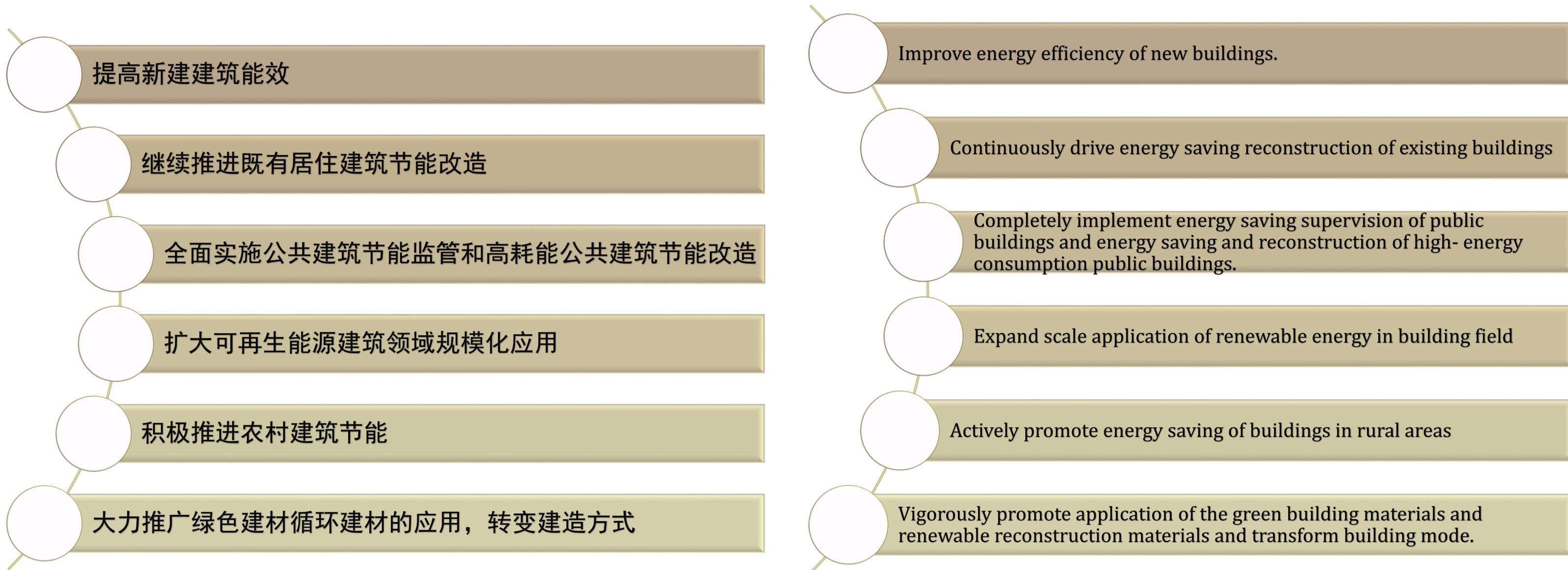- 天然气(Natrual gas) — 13%
- 可再生能源(Renewable energy) — 9%

2. 建筑领域"十三五"煤控（节电）实施方案

Coal consumption cap implementation plan of "13th five-year plan" in building sector
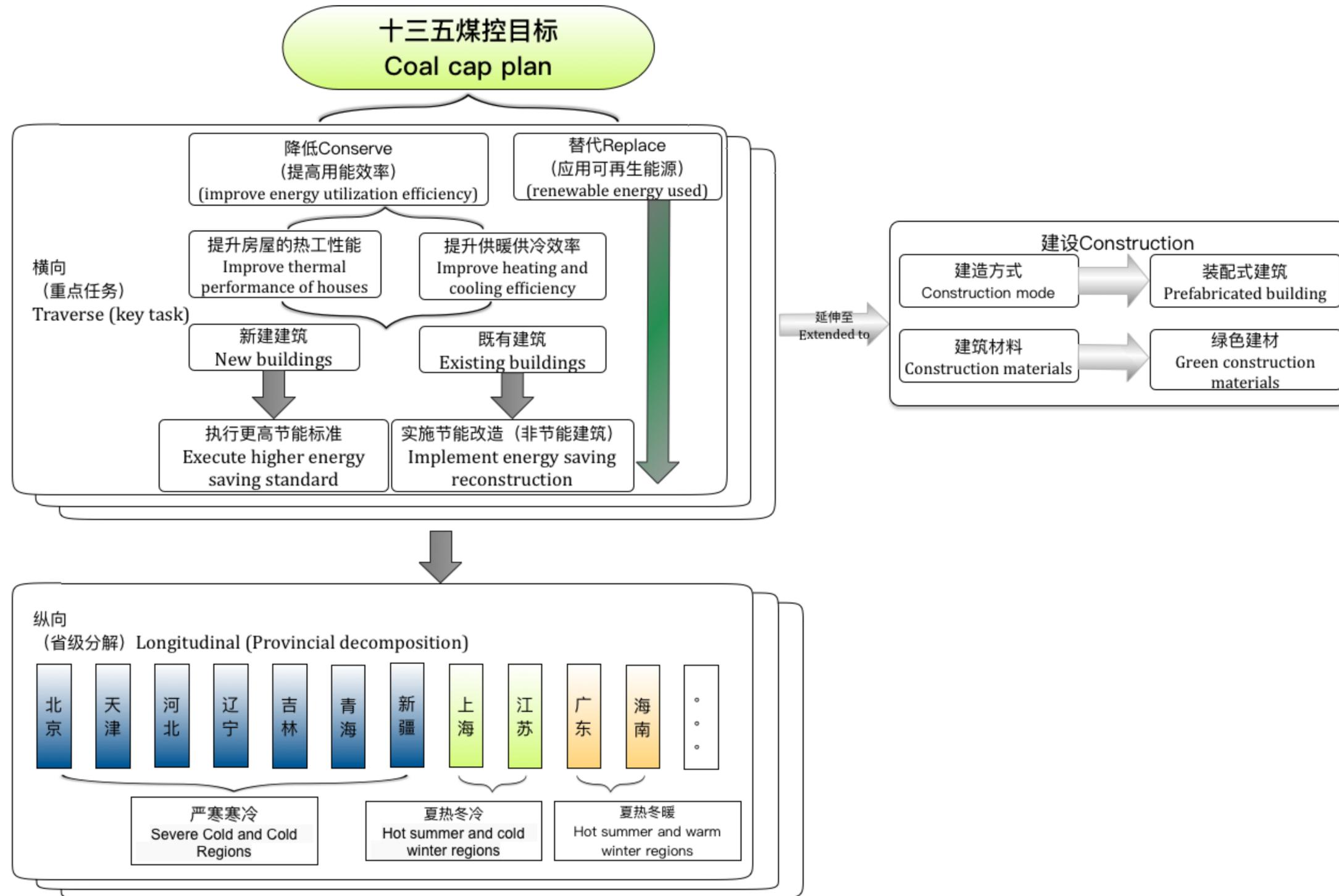
建筑领域控煤（节电）的实施方案–横向重点任务
Coal consumption cap implementation plan in building sector—key tasks(traverse)

- 提高新建建筑能效
- 继续推进既有居住建筑节能改造
- 全面实施公共建筑节能监管和高耗能公共建筑节能改造
- 扩大可再生能源建筑领域规模化应用
- 积极推进农村建筑节能
- 大力推广绿色建材循环建材的应用，转变建造方式

- Improve energy efficiency of new buildings.
- Continuously drive energy saving reconstruction of existing buildings
- Completely implement energy saving supervision of public buildings and energy saving and reconstruction of high- energy consumption public buildings.
- Expand scale application of renewable energy in building field
- Actively promote energy saving of buildings in rural areas
- Vigorously promote application of the green building materials and renewable reconstruction materials and transform building mode.

重点任务实施方案-城镇
Implementation plan of key tasks- urban areas

（1）城镇新建建筑

◦ "十三五"期间严寒、寒冷地区居住建筑执行节能75％标准，夏热冬冷和夏热冬暖地区居住建筑执行65％的节能标准；新建公共建筑严格执行62％节能设计标准，有条件地区执行更高节能标准

◦ 推动超低能耗被动式绿色建筑试点示范

"十三五"期间各气候区年平均城镇新建建筑面积估算（单位：亿平方米）

年均新建面积	22			
按类型分新建面积	其中住宅建筑			其中公共建筑
	14			8
占比	64%			36%
按气候区分新建面积	北方采暖地区	夏热冬冷地区	夏热冬暖及温和地区	——
	4.6	8.1	1.3	——
占比（%）	33	58	9	——
执行节能率	75%	65%	65%	62%

(I) New buildings in urban areas

• During "13th five-year plan", the residential buildings in the severely cold and cold areas will obey 75% energy saving standard and the residential buildings, the residential buildings will obey 65% energy saving standard where the weather is hot in summer and is cold and warm in winter will obey 65% energy saving standard. The new public buildings will strictly obey 62% energy saving design standard. If proper, stricter energy saving standard should be obeyed.

• Drive demonstration of green building pilot of the ultra-low energy consumption passive green buildings;

Annual average estimated area of new buildings in urban areas with different weathers during "13th five-year plan" (unit: 100 million m^2)

Annual average new building area	22			
New building area by type	Residential buildings			Commercial and service buildings
	14			8
Percent	64%			36%
New building area in different weather areas	Severe cold and cold regions	Hot summer and cold winter regions	Hot summer and warm	——
	4.6	8.1	1.3	——
Percent (%)	33	58	9	——
Executed energy saving efficiency	75%	65%	65%	62%

重点任务实施方案-城镇
Implementation plan of key tasks- urban areas

执行65％节能标准城镇住宅建筑能耗指标

	单位面积采暖耗煤量 (kg/m²年)	单位面积电耗 (kWh/m²年)	其中单位面积空调电耗 (kWh/m²年)
严寒地区	12.1	17.16	——
寒冷地区	8.7	22.77	4.77
夏热冬冷地区	——	46.97	26.09
夏热冬暖地区	——	39.39	22.23

Energy consumption parameters of residential buildings in towns for 65% energy saving standard

	Coal consumption for heat supply in unit area (kg/m² per year)	Power consumption in unit area (kWh/m² per year)	Power consumption of air conditioner in unit area (kWh/m² per year)
Severely cold area	12.1	17.16	——
Cold area	8.7	22.77	4.77
Area where the weather is hot in summer and is cold in winter	——	46.97	26.09
Area where the weather is hot in summer and is warm in winter	——	39.39	22.23

执行75％节能标准城镇住宅建筑能耗指标

	单位面积采暖耗煤量 (kg/m²年)	单位面积电耗 (kWh/m²年)	其中单位面积空调电耗 (kWh/m²年)
严寒地区	8.7	17.16	——
寒冷地区	6.2	21.93	——
夏热冬冷地区	——	39.18	18.3
夏热冬暖地区	——	32.76	15.6

Energy consumption parameters of residential buildings in towns for 75% energy saving standard

	Coal consumption for heat supply in unit area (kg/m² per year)	Power consumption in unit area (kWh/m² per year)	Power consumption of air-conditioner in unit area (kWh/m² per year)
Severely cold area	8.7	17.16	——
Cold area	6.2	21.93	——
Area where the weather is hot in summer and is cold in winter	——	39.18	18.3
Area where the weather is hot in summer and is warm in winter	——	32.76	15.6

重点任务实施方案-城镇
Implementation plan of key tasks- urban areas

"十二五"时期竣工的各类型公共建筑年平均单位面积电耗

功能	办公建筑	商场建筑	宾馆饭店建筑	医疗卫生建筑	学校教育建筑	其它建筑
所占建筑面积比例（%）	25.6	26.8	4.9	3.9	19.3	19.6
年平均单位面积电耗（kwh/m².年）	53.6	46.9	75.9	77.9	31.8	38.3
执行62%节能标准建筑单位面积电耗（kwh/m².年）	40.7	35.6	57.7	59.2	24.2	29.1

Average power consumption of completed public buildings in unit area during "12th five-year plan"

Function	Office buildings	Marketplace buildings	Hotel buildings	Medical and healthy buildings	School education buildings	Other buildings
Percent of occupied building area (%)	25.6	26.8	4.9	3.9	19.3	19.6
Annual average power consumption in unit area（kwh/m². per year）	53.6	46.9	75.9	77.9	31.8	38.3
Power consumption of building area for 62% energy saving（kwh/m². per year）	40.7	35.6	57.7	59.2	24.2	29.1

重点任务实施方案-城镇
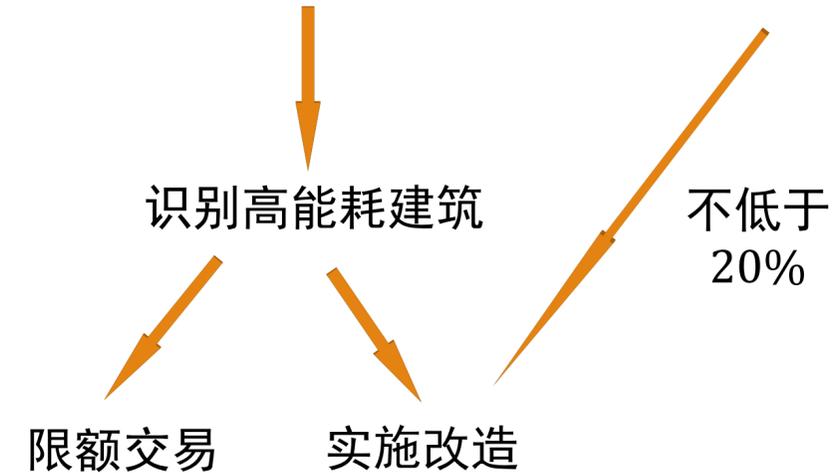# Implementation plan of key tasks- urban areas

（2）城镇既有建筑: 继续实施改造
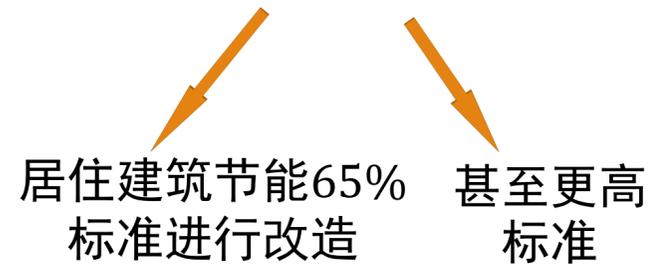
(II)Existing buildings in urban area: Further reconstruction

● 提高改造标准

● Improvement of reconstruction standard

居住建筑节能65% 标准进行改造

甚至更高 标准

Residual buildings reconstructed by 65% standard

Even higher standard

● 公共建筑能耗限额管理、改造节能量核定

● Management of energy consumption limits of public buildings Check of energy saving after reconstruction.

识别高能耗建筑

不低于 20%

Recognition of buildings with higher energy consumption

Not less than 20%

限额交易

实施改造

Limit transaction

reconstruction implementation

可再生能源利用building application of renewable energy (10ktce)

高 2500

低 0

黑龙江
内蒙古
吉林
新疆
甘肃
辽宁
北京
天津
宁夏 山西 河北
青海 陕西 山东
河南
西藏 江苏
安徽 上海
四川 重庆 湖北 浙江
贵州 湖南 江西 福建
云南 广西 广东 台湾
香港
澳门
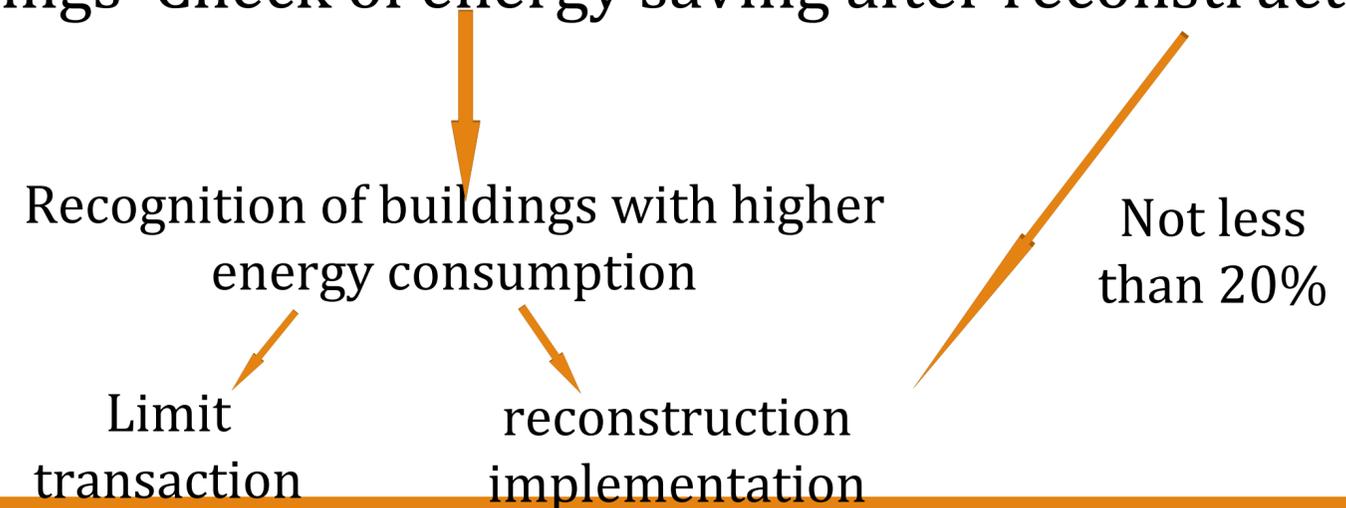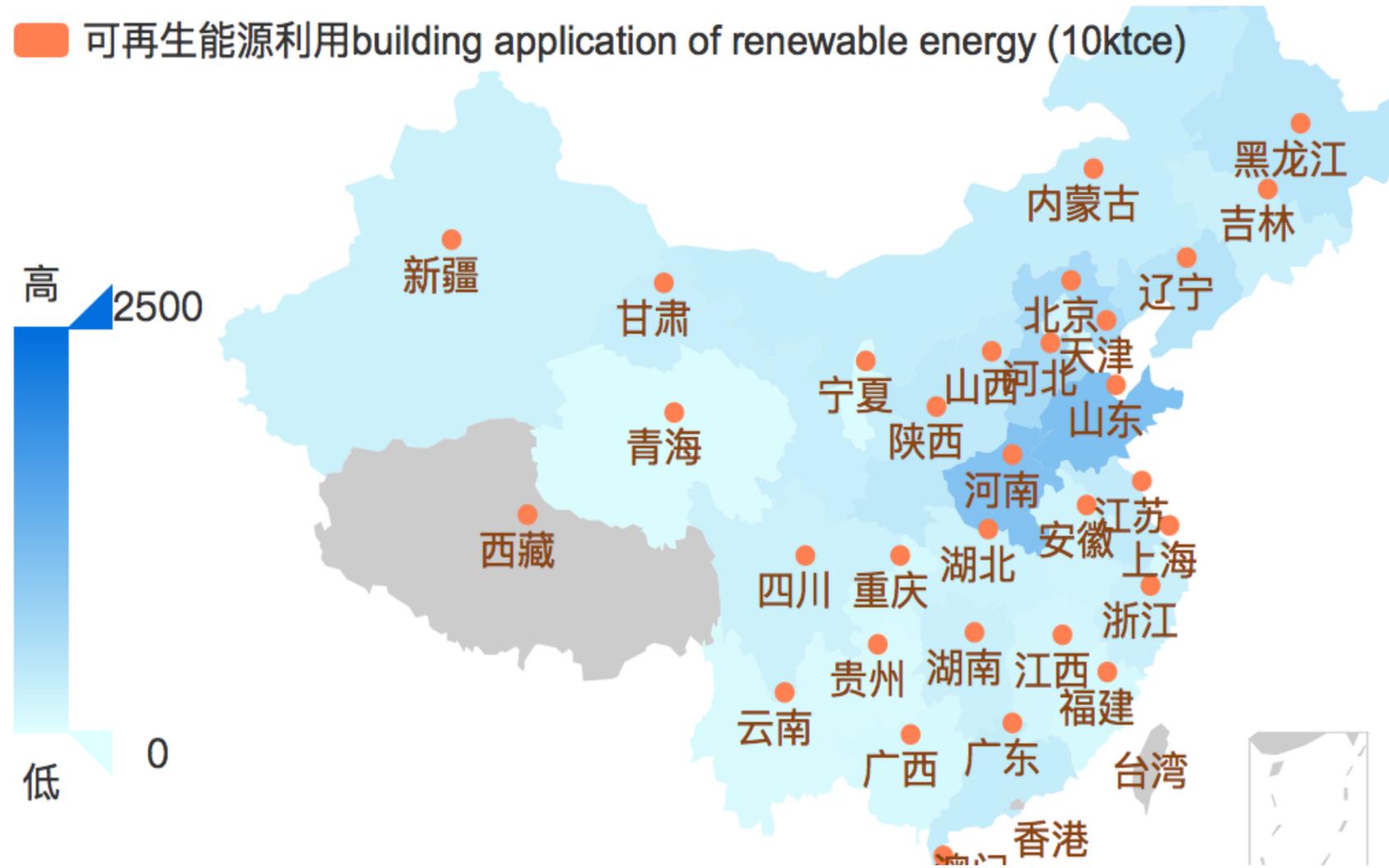
重点任务实施方案-城镇
Implementation plan of key tasks- urban areas

◦ 扩大可再生能源建筑规模化应用

◦ 在传统非采暖区的夏热冬冷地区，积极推广利用空气源、地表水源、污水源热泵技术供暖，建立小区级的城市微采暖系统。

◦ 具备条件的，利用工业余热，建立热电联产的集中供热模式。利用海水源、江水源热泵技术，在末端用能负荷满足要求的情况下，因地制宜地建立区域可再生能源站。

◦ Expand scale application of buildings with renewable energy

◦ Especially promote heat supply from thermal pump technology based on air source, surface water source and polluted water source in an active manner and establish cell-level municipal heat supply system in the traditional non-heat supply area where the weather is hot in summer and is cold in winter.

◦ If proper, establish central heat supply mode based on heat and power combined production based on industrial residual heat, and establish renewable energy station for an area according to local conditions based on thermal pump technology of ocean water source and river water source when the end energy load satisfies the requirements.

重点任务实施方案-农村
Implementation plan of key tasks- rural areas

新建农房采取节能措施
◦ 农村居住建筑采用节能措施的比例超过15%；

既有农房节能改造
◦ 结合农村危房改造工程；

能源结构优化
◦ 到2020年，农村地区可再生能源、生物质能替代商品能在1亿吨标煤以上；

Energy saving measures of new farmhouses
● the percent of the residential buildings in rural area using the energy saving measure is over 15%.

Energy saving reconstruction of existing farmhouses
●be combined with the dangerous building reconstruction work in rural area;

Optimization of energy structure
●by2020, the energy consumption of commodities replaced by the renewable energy and biomass in rural area is over 100 million tons of standard coal.

重点任务实施方案-农村
Implementation plan of key tasks- rural areas

分类	房屋建筑					用能系统					
技术	抗震	保温系统	门窗	气密性	被动式	煤改气（电）	户用热泵系统	节能炉具	生物质炉具	太阳能	村集中沼气
Classification	Housing					Energy consumption system					
Technology	Earthquake resistance	Heat preservation system	Door and window	Airtightness	Passive mode	Coal to gas (power)	Heat pump system for houses	Energy saving stoves	Biomass stove	Solar energy	Methane in villages

重点任务实施方案-建筑产业化
Implementation plan of key tasks-construction industrialization

（1）大力推广绿色建材循环建材的应用，转变建造方式

◦ 钢结构、木结构建筑

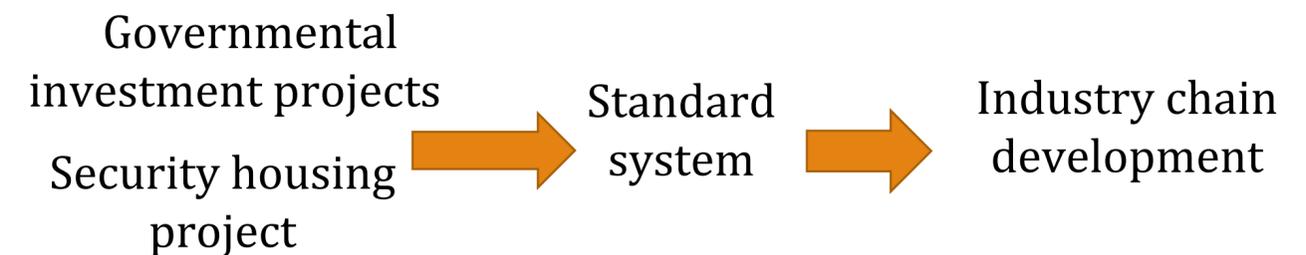◦ 提高建筑领域绿色建材、循环建材的应用比例

（2）大力发展装配式建筑

◦ 进一步推动建筑产业化发展，以城市建筑为主体推进建筑门窗、保温体系升级，推进装配式建筑发展，逐步提高装配式建筑比例。

(1) Vigorously promote application of green building materials and renewable building materials and transform construction mode

◦ Buildings of steel structure and wooden structure

◦ Improve application percent of green building materials and renewable building materials in the building field
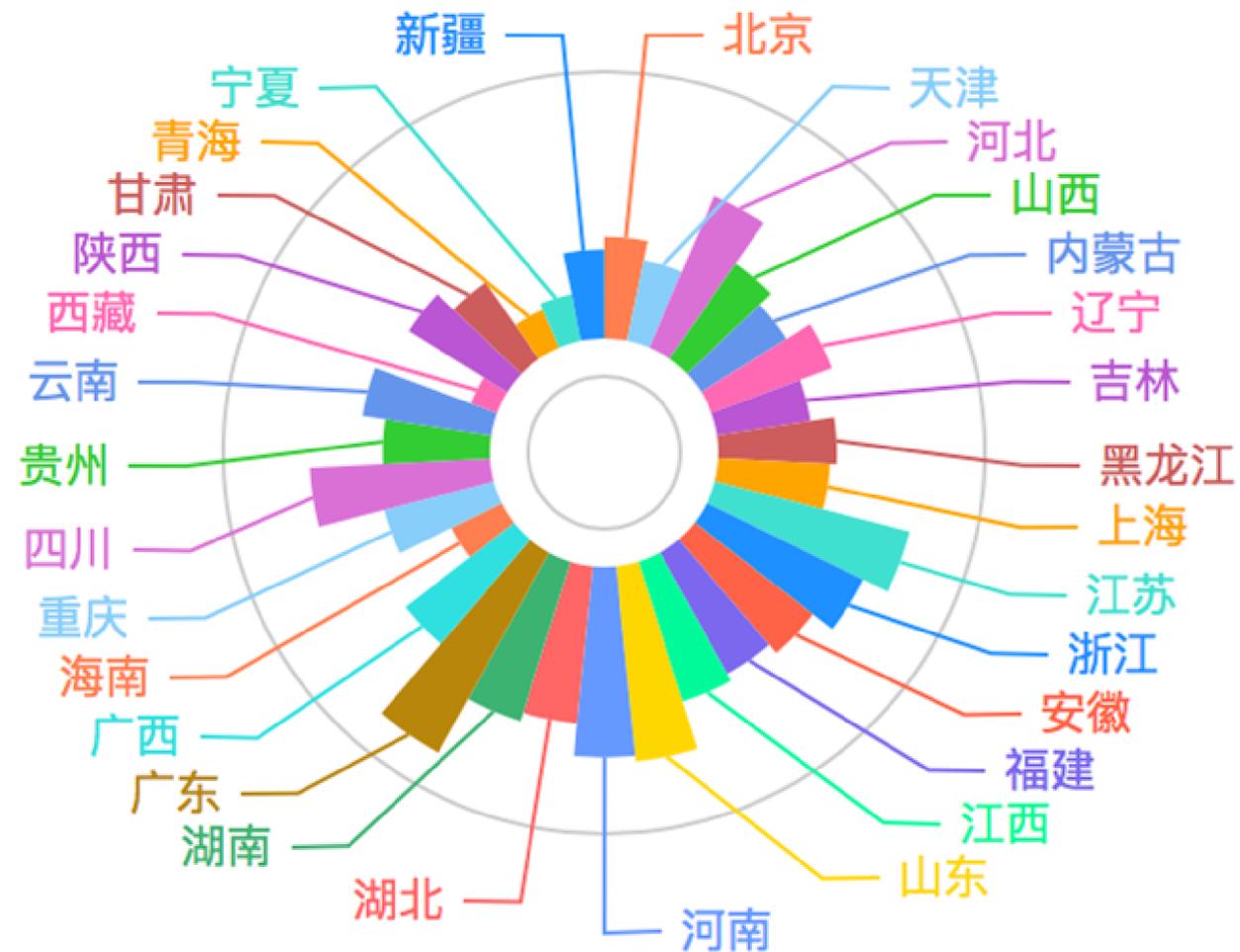
(2) Vigorously develop assembly buildings

◦ Further promote industrialization development of buildings, drive upgrade of building doors and windows and heat preservation system with the urban buildings, promote development of assembly buildings, and gradually improve percent of assembly buildings

政府投资项目
保障房项目 ➡ 标准体系 ➡ 产业链培育

Governmental investment projects
Security housing project ➡ Standard system ➡ Industry chain development

建筑领域控煤（节电）的实施方案-纵向省级任务
Coal consumption cap implementation plan in building sector-provincial-level task(longitudinal)

2020年各省建筑面积比较
## Building area of provinces in 2020

非采暖能耗
采暖能耗

新疆　北京
宁夏　天津
青海　河北
甘肃　山西
陕西　内蒙古
西藏　辽宁
云南　吉林
贵州　黑龙江
四川　上海
重庆　江苏
海南　浙江
广西　安徽
广东　福建
湖南　江西
湖北　山东
河南

Energy consumption of buildings in different provinces in 2020

2020年各省建筑能耗
万吨标煤
10000 tons of standard coal

高　10000

低　0

新疆　黑龙江
甘肃　内蒙古　吉林
宁夏　北京　辽宁
青海　山西河北天津
陕西　山东
河南　江苏
四川　重庆　湖北　安徽　上海
贵州　湖南　江西　浙江
云南　广西　广东　福建
海南　台湾
香港
澳门
南海诸岛

省级任务实施方案–煤控目标
Implementation plan of provincial-level coal consumption cap targets

煤控目标

—2.3亿吨标煤

任务如何落实

—how to implement the task of 230 tons of standard coal
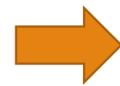
煤炭消耗量省级分解

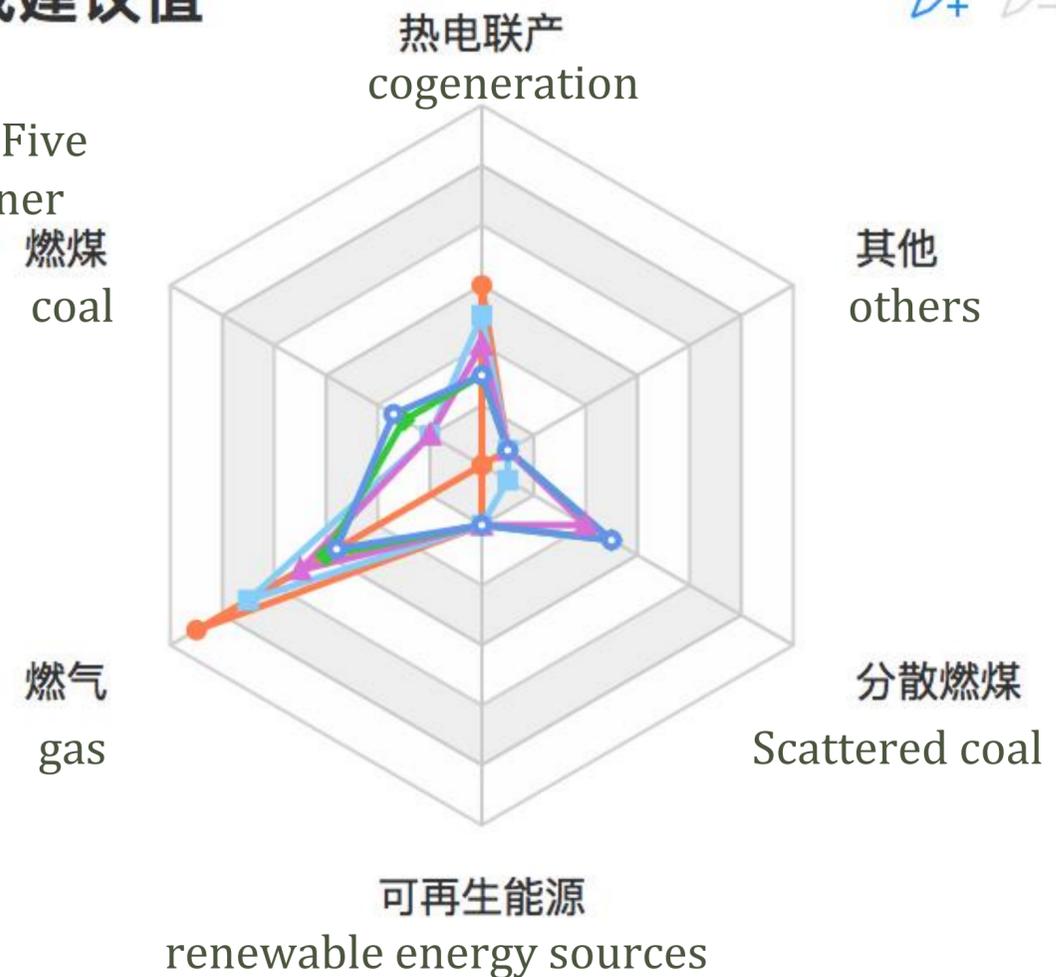Province-level decomposition of coal consumption

北方采暖地区各省市建筑领域的煤控细化措施

Detailed measures for coal control for building fields in provinces and cities of north heat supply areas

根据北方各省的采暖能耗需求，并按照现阶段各种供热形式的单耗水平，我们给出了北方各省的各种供热方式的占比建议值。

We give recommended percent of heat supply modes in north province according to the energy consumption requirement of heat supply in north provinces and single consumption level of different heat supply modes on current phase

5省供热方式构成建议值
各顶点值均为55%

The suggested value of Five province heating manner

热电联产
cogeneration

其他
others

燃煤
coal

分散燃煤
Scattered coal

燃气
gas

可再生能源
renewable energy sources

北京
天津
河北
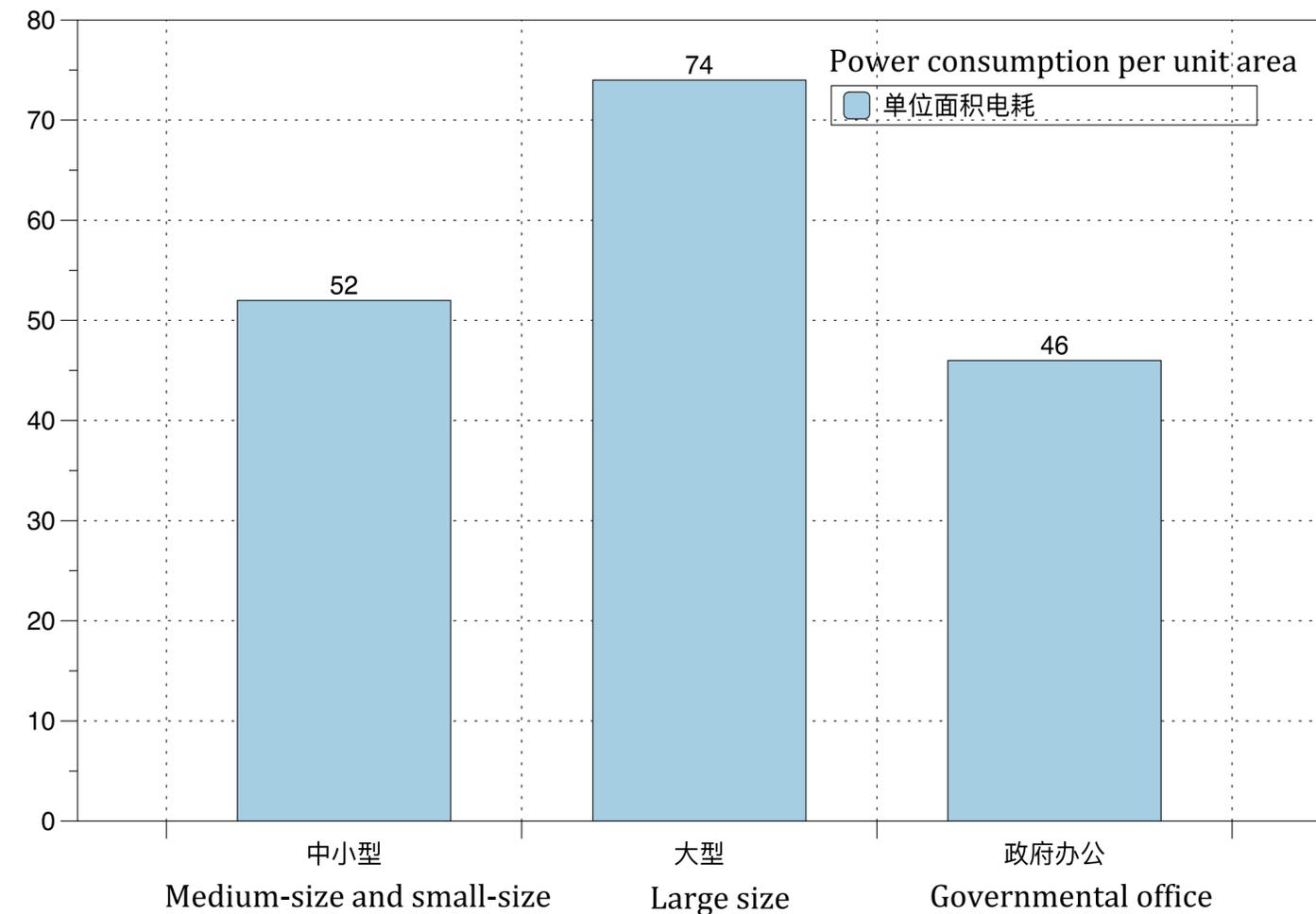山西
内蒙古

省级实施方案—公共建筑能耗限额
Provincial implementation plan—Energy consumption limit of public buildings

中国公共建筑总体情况及能耗特征分析

2015年末，中国实有公共建筑面积约102亿平方米，其中大型公共建筑面积14.4亿平方米，约占14%。中小型公共建筑、大型公共建筑和政府办公建筑单位面积电耗分别为52kWh/m^2，74kWh/m^2，46kWh/m^2。

General information and energy consumption characteristics analysis of public buildings in China

At the end of 2015, the area of real public buildings in China is about 10.2 million m2, including 1.44 billion m2 large-scale public buildings (about 14%) and the power consumption of the medium-scale and small-scale public buildings, large-scale public buildings and 46kWh/m^2 governmental office buildings are 52kWh/m^2, 74kWh/m^2 and 46kWh/m^2 respectively.

Power consumption per unit area
单位面积电耗

	52	74	46

中小型
Medium-size and small-size

大型
Large size

政府办公
Governmental office

省级实施方案—公共建筑能耗限额
Provincial implementation plan—Energy consumption limit of public buildings
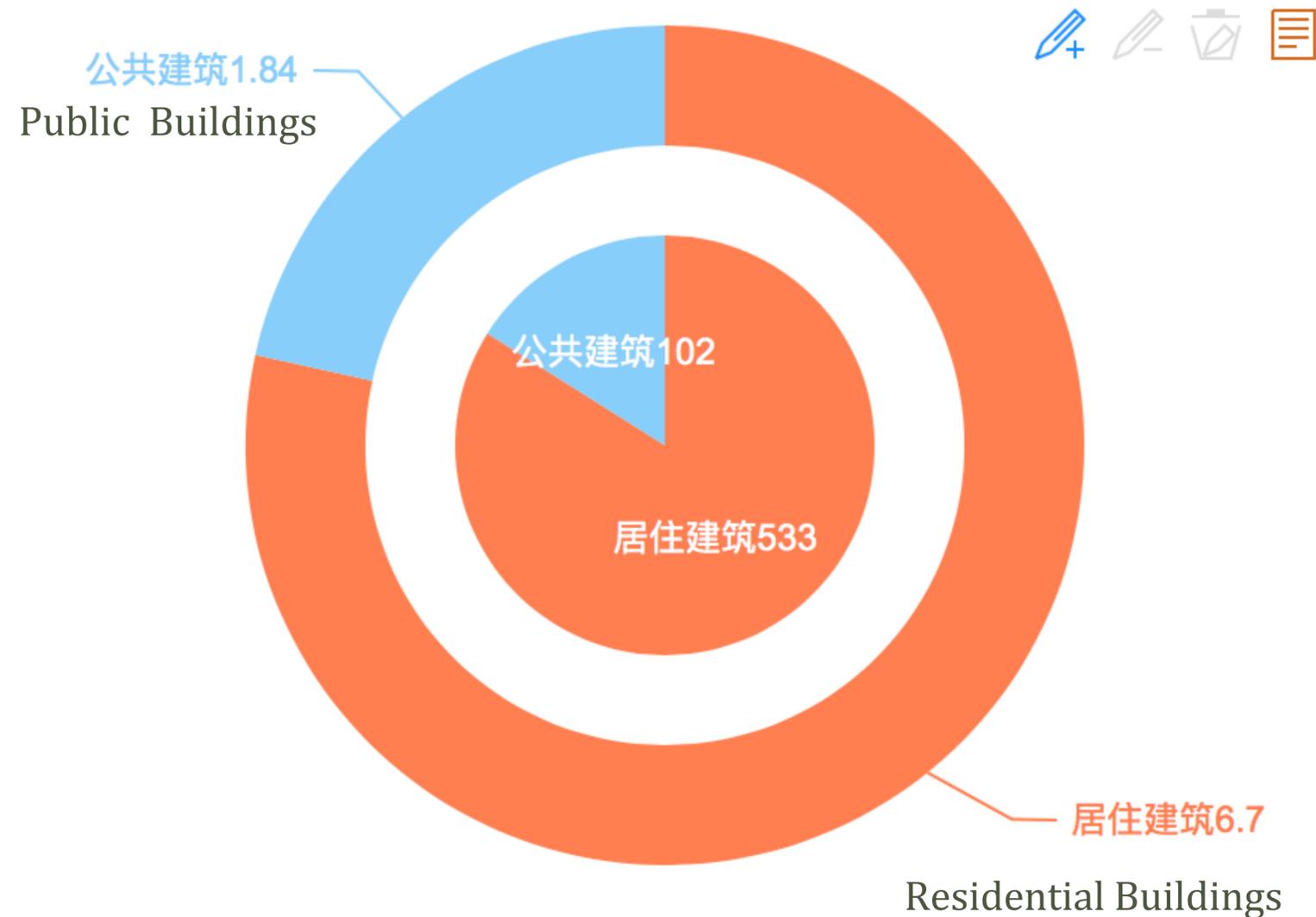
公共建筑单位面积能耗高于居住建筑能耗，因此，一直都是建筑节能的重点领域。

The energy consumption of public buildings per unit area is higher than it of the residential buildings, so it is the key field in building energy saving.

推进指标交易

限额指标交易是确定能耗限额的目的之一

Promote index transaction

One target of limit index transaction is to identify the energy consumption limit.

公共建筑1.84
Public Buildings

公共建筑102

居住建筑533

居住建筑6.7

Residential Buildings

城市	定额对象	指标形式	指标
国家标准	各类民用建筑	单位面积年综合能耗	约束值／目标值
上海	市级机关	单位建筑面积年综合能耗	合理值
	星级饭店	可比单位建筑综合能耗	合理值／先进值
	大型商业	可比单位建筑综合能耗	合理值／先进值
	市级医院	单位建筑面积年综合能耗	合理值／先进值
深圳	旅游饭店	单位建筑面积年综合电耗	限额值
	办公建筑	人均年综合电耗、单位建筑面积年综合电耗	限额值
	商场建筑（指百货店、大型超市、家居建材商店和购物中心）	单位建筑面积年综合电耗	限额值
南京	商场、超市	单位面积电耗、单位面积综合能耗	限额值

Cities	limit objects	Index name	Index value
State standards	Civil buildings	Annual comprehensive energy consumption per unit area	Restraint value Target value
Shanghai	Municipal authorities	Comprehensive energy consumption per unit area	Reasonable values
	Star-class hotels	Comprehensive energy consumption of buildings of comparable units	Reasonable values Advanced values
	Large commerce	Comprehensive energy consumption of buildings of comparable units	
	Colleges	comprehensive energy consumption per unit area, annual average comprehensive energy consumption and power consumption per unit area	Reasonable values
Nanjing	Marketplace and supermarket	Power consumption and comprehensive energy consumption per unit area	limit value
	Administrative authorities	Power consumption and comprehensive energy consumption per unit area, average comprehensive energy consumption per person and average power consumption per person	
	Hotels and restaurants	Comprehensive energy consumption and power consumption per unit area	
	General colleges	Power consumption of comparable organizations	

省级实施方案—公共建筑能耗限额
Provincial implementation scheme—Energy consumption limit of public buildings

以陕西省西安市为例的公共建筑能耗限额研究

Study energy consumption limit of public buildings with Xi'an city, Shanxi province as one example

对西安市5类公共建筑用电进行了统计分析，初步研究了办公、商业、宾馆饭店、医疗卫生、文化教育建筑的限额。

count and analyze energy consumption of five types of buildings in Xi'an city, Shanxi province (including office buildings, marketplace building, hotels, medical and health and culture and education).

能耗限额确定（四分位法）

Identification of energy consumption limit (Quartile method)

能耗限额（kWh/m2.a)	办公建筑	商业建筑	宾馆饭店	医疗卫生	文化教育
目标值	31	48	80	103	12
约束值	47	65	110	146	15
Energy consumption limit（kWh/m2.a)	Office building	Commercial building	Hotels and restaurants	Medical and health	Culture and education
Target value	31	48	80	103	12
Restraint value	47	65	110	146	15

3. 房地产调控政策与建筑煤控目标实现的关系研究
Research on relation between real estate adjustment and control policy and implementation of coal control target in building field

|	
房地产现有库存总量及去库存（调控）政策分析	Analysis on total stock and destocking (control) policies of real estate
基于全寿命周期建筑能耗消耗量分析	Analysis on energy consumption of buildings based on full-life cycle
全寿命周期建筑能源消耗量预测模型	Prediction model of energy consumption of buildings based on whole-life cycle
十三五供给侧改革情景下建筑领域煤控政策建议	Recommendations for coal control policies in building fields under background of supply side reform in the 13th five-year plan

房地产现有库存总量及去库存政策分析
Analysis on total stock and destocking policies of real estate

（1）全国库存总量

截止到2016年4月，我国房地产开发企业住宅库存量为45089万平方米，环比下降1.94%，可见中央调控政策初见成效，但与2011年12月相比，增加了166.74%，全国房地产开发企业住宅库存情况见下图。

(1) Total stock in China

Till Apr, 2016, the house stock of the real estate developers in China is 450.89 million m², which reduces by 1.94% compared to the last month, so the central control policy starts to take effect. Compared to the Dec, 2011, it increases by 166.74%. The house stock of real estate houses in China is shown as follows:

10000m²

万平方米

库存量累计　　同比增长率

Inventory accumulation　　Year-on-year growth rate
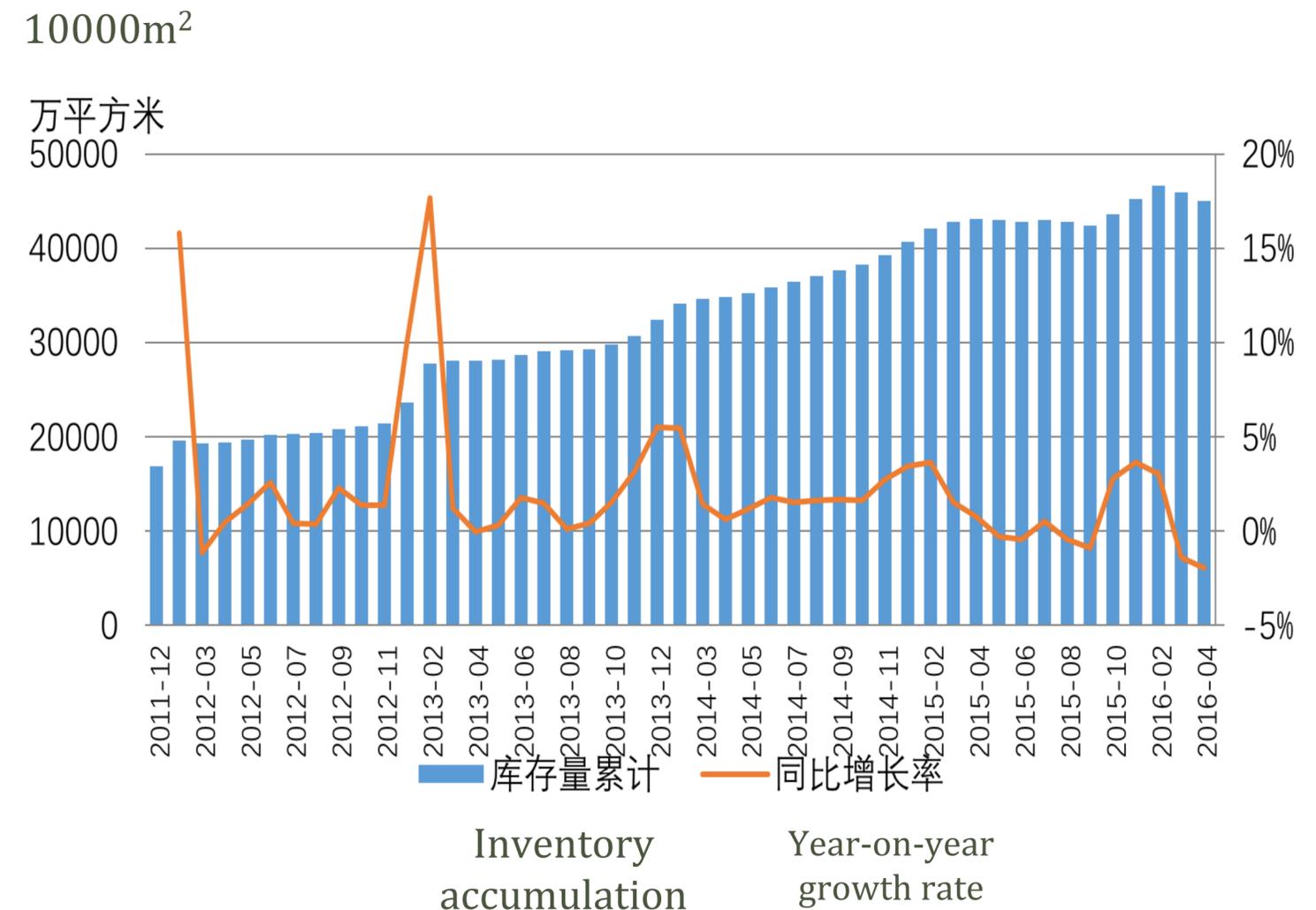
房地产现有库存总量及去库存政策分析
Analysis on total stock and destocking policies of real estate

（2）50个城市情况库存

选取了50座城市进行分析，覆盖全国各级城市。50座城市2016年1月库存总量37005万平方米，环比下降0.40%，同比（与前一年同月份相比）下降3.80%。

（2）Stock in 50 cities

50 cities are selected for analysis, which cover cities at different levels in China. Total stock of 50 cities is 370.05 million m2 in Jan, 2016, which reduces by 0.40% compared to last month and by 0.80 compared to last year (compared to it in Jan, 2015).


10000m²
万平方米
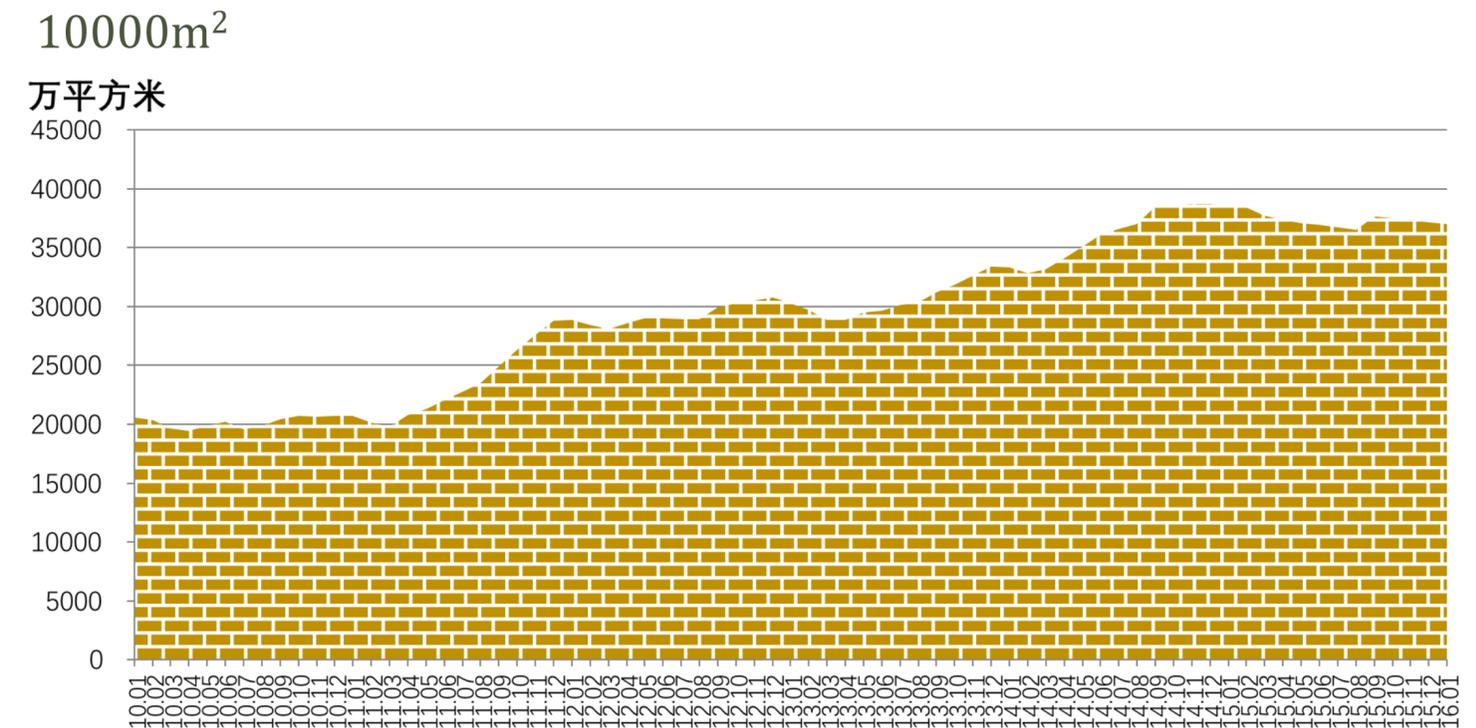
房地产现有库存总量及去库存政策分析
Analysis on total stock and destocking policies of real estate

一线城市4个，北京、上海、广州、深圳，其2016年1月的库存总量共3264万平方米，同比（与2015年1月相比）下降12.90%；二线城市32个，长春、沈阳、天津、太原等，其2016年1月的库存总量共28180万平方米，同比下降2.60%；三线城市14个，淮南、马鞍山、济宁、烟台、常州等，其2016年1月的库存总量共5561万平方米，同比下降3.60%。

万平方米　10000 m²　　　　　　　　　　　　　　　　10000 m²　万平方米

L1 cities (left axis)　　L3 cities (left axis)　　L2 cities (right axis)
一线城市（左轴）　　三线城市（左轴）　　二线城市（右轴）

The L1 cities include Beijing, Shanghai, Guangzhou and Shenzhen. Total stock of four cities is 32.64 million m2 in Jan, 2016, which reduces by 12.90% (compared to Jan, 2015). The L2 cities include Changchun, Shenyang, Tianjin, Taiyuan, etc. Total stock of 32 cities is 281.8 million m2 in Jan, 2016, which reduces by 2.60% compared to Jan, 2015. The L3 cities include Huainan, Ma'anshan, Jining, Yantai, Changzhou, etc. Total stock of 14 cities is 55.61 million m2 in Jan, 2016, which reduces by 3.60% compared to Jan, 2015.
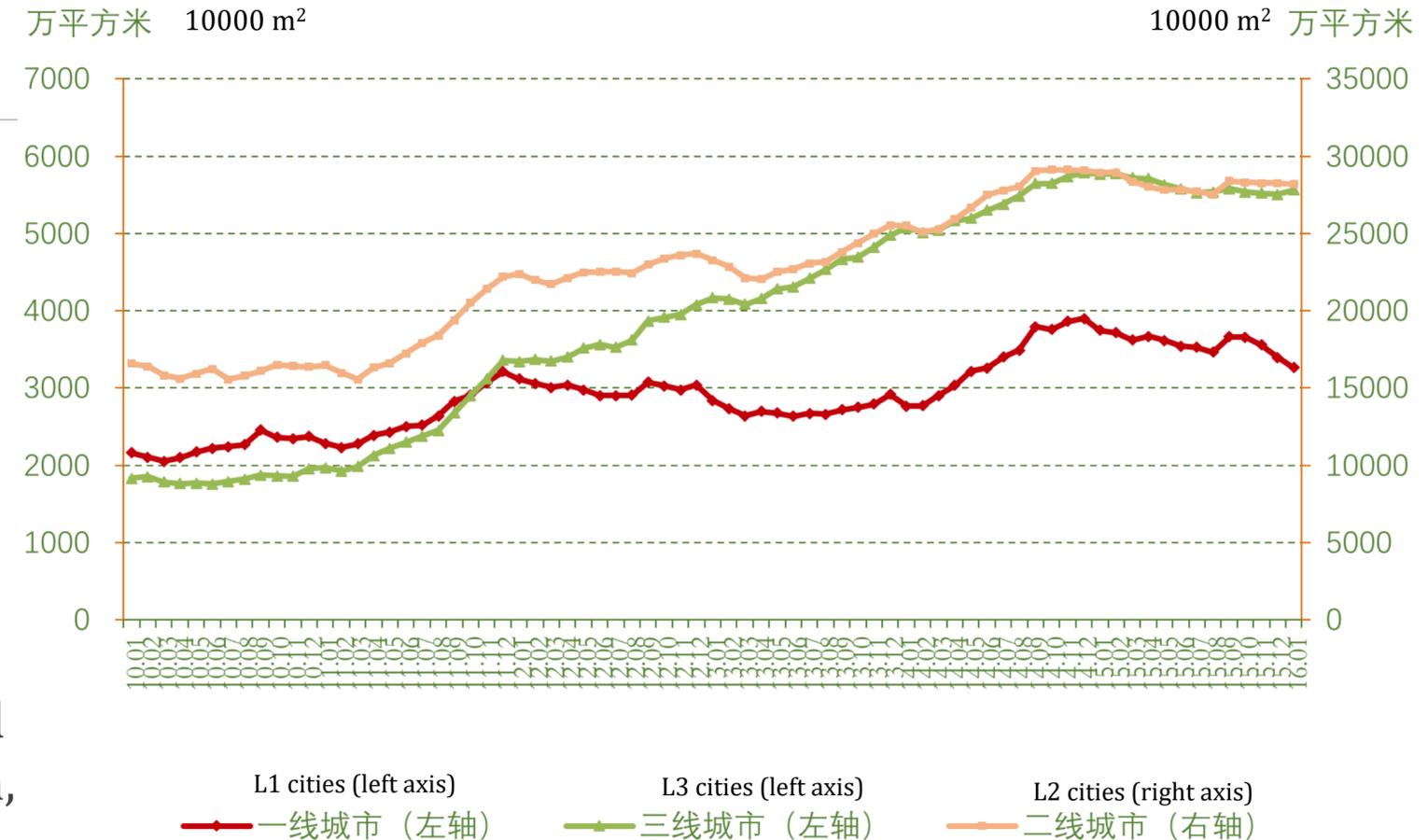
2011年底，一线城市和二三线城市的变化趋势出现分叉点，二三线城市库存总量持续增加，其去库存缓慢，一线城市库存总量出现波动，变化趋势趋缓，出现了阶段性下降的情况。
At the end of 2011, the change trend of L1 cities and L2 and L3 cities include branch points. Total stock of L2 and L3 cities continuously grow and destocking slows down. Total stock of L1 cities fluctuates, change slowly, and show phase decrease.

房地产已有的调控政策分析
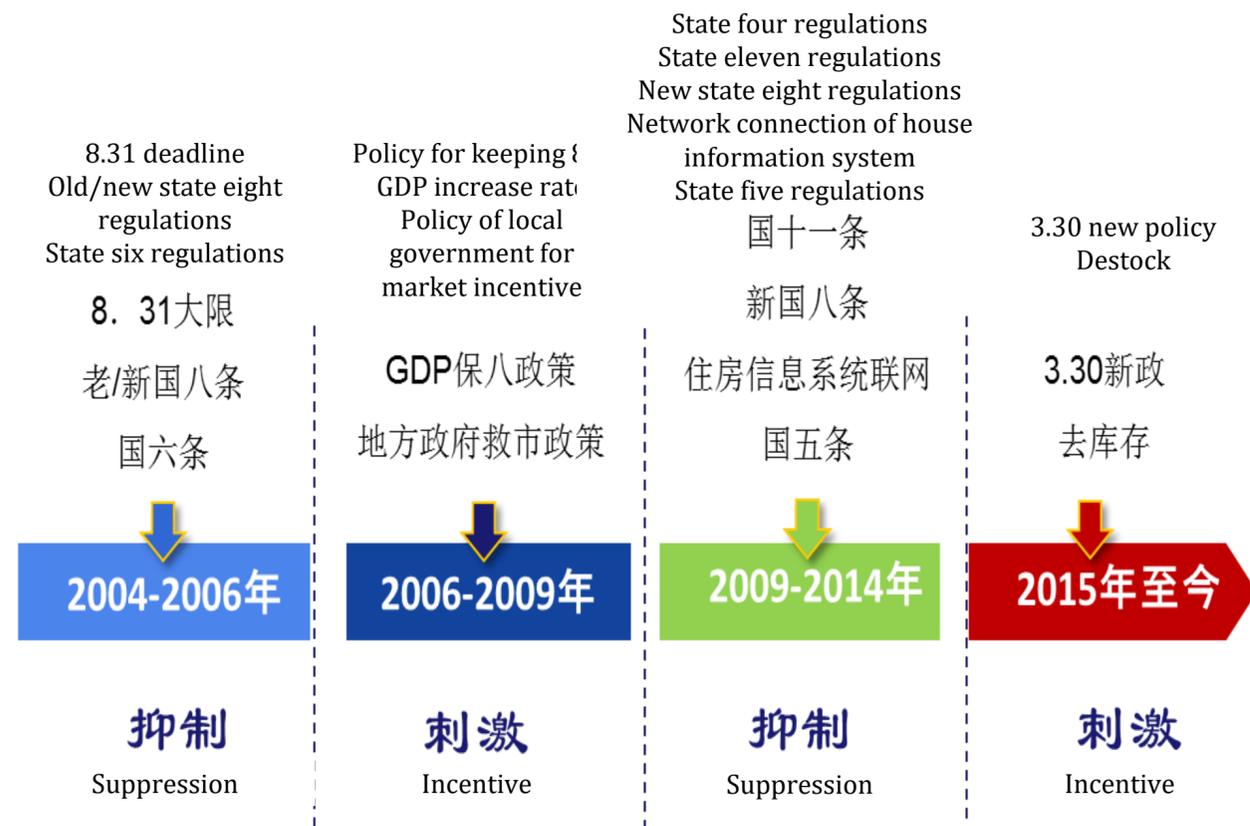# Analysis on existing control policies in real estate

State four regulations
State eleven regulations
New state eight regulations
Network connection of house
information system
State five regulations

国十一条

新国八条

住房信息系统联网

国五条

8.31 deadline
Old/new state eight
regulations
State six regulations

8．31大限

老/新国八条

国六条

Policy for keeping 8
GDP increase rat
Policy of local
government for
market incentive

GDP保八政策

地方政府救市政策

3.30 new policy
Destock

3.30新政

去库存

2004-2006年	2006-2009年	2009-2014年	2015年至今

抑制
Suppression

刺激
Incentive

抑制
Suppression

刺激
Incentive

图　房地产调控政策轴向图

Figure Axial diagram of control policies of real estate

Land policies
security housing policy
Energy saving building
policy
Building material price
adjustment
Industry design
standard

Ratio of down
payment of house

household register
policy and public
reserve fund policy

土地政策、
保障房政策、
节能建筑政策、
建材价格调整、
行业设计标准

购房首付款
比例

Home buying
restriction and price
restriction policy

限购、限价
政策

户籍政策、
公积金政策

供
Supply

信贷政策
（利率）、
税收政策、
货币政策

需
Demand

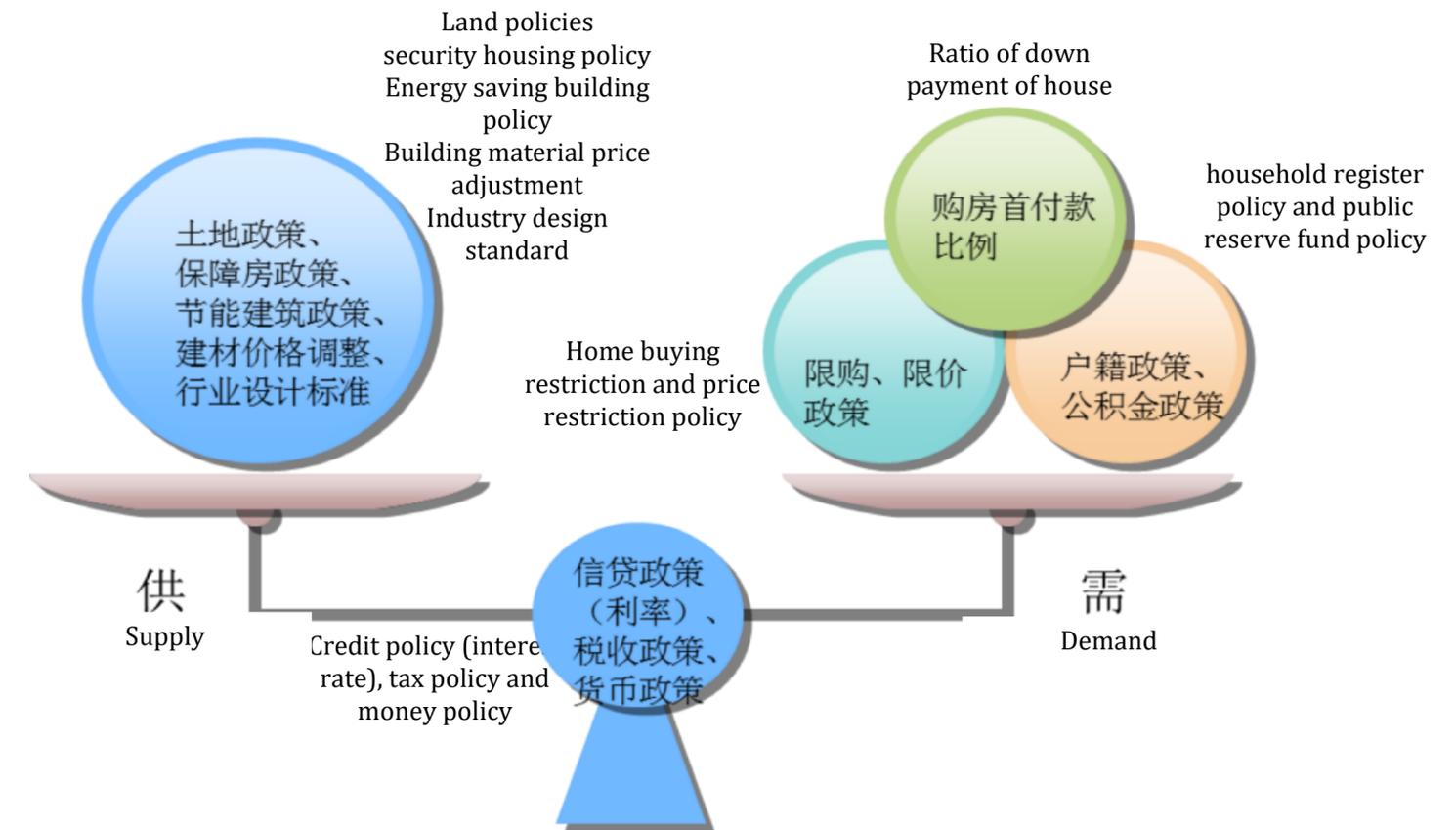Credit policy (intere
rate), tax policy and
money policy

图 房地产供需均衡"杠杆"图

Figure Supply and demand balance "lever" of real estate

基于全寿命周期理论建筑能源消耗量分析
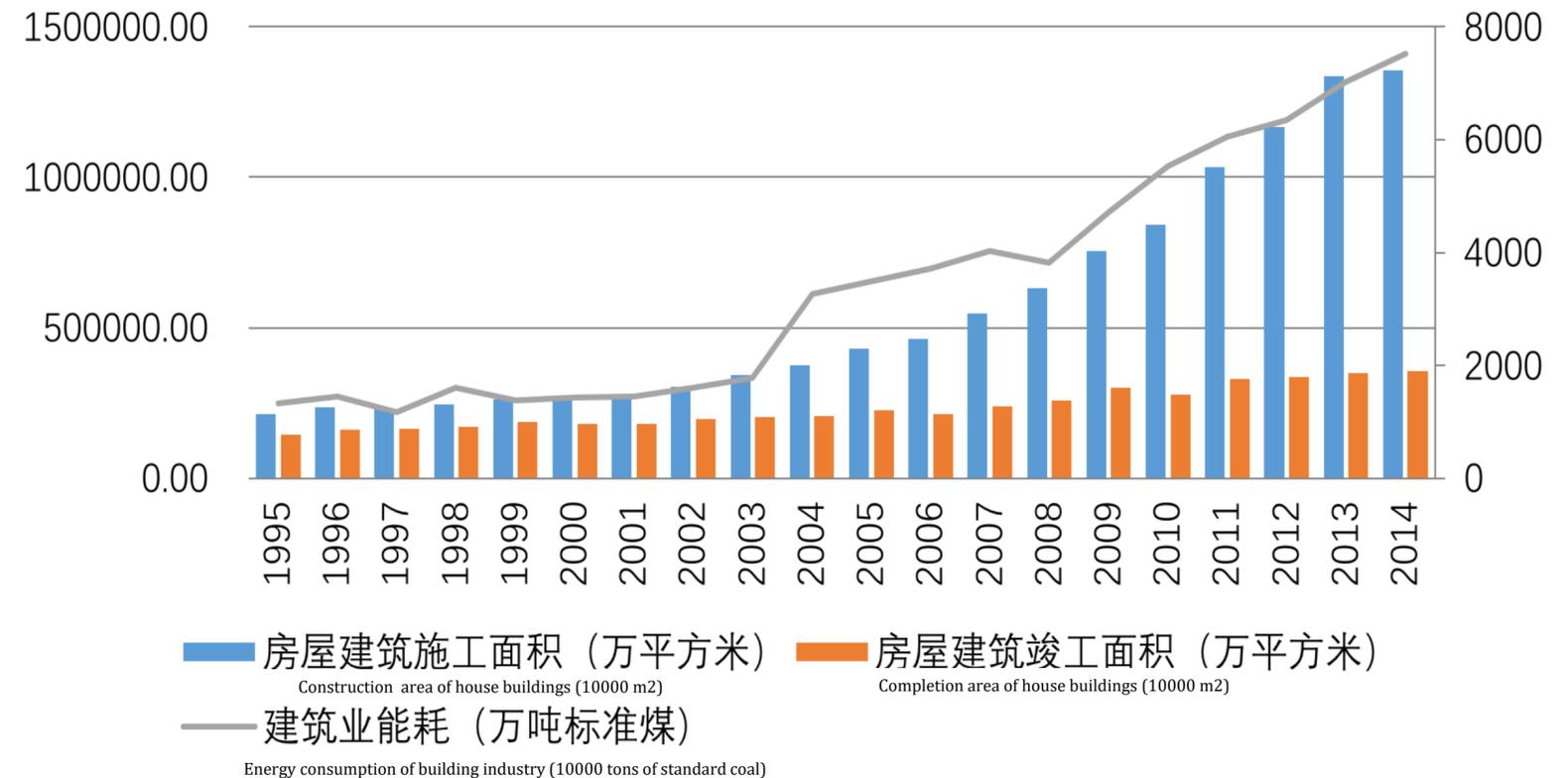# Analysis on energy consumption of buildings based on full-life cycle

建筑业全寿命周期各阶段能源消耗分析
Analysis on energy consumption on phases in full-life cycle of building industry

| 建筑材料生产耗能	建筑建造能耗	建筑运行能耗	建筑拆除处置能耗
建筑材料、构件在生产、制造、加工、搬运过程中所消耗的能源	建造过程中机器设备安装施工所消耗的能源	建筑采暖空调、照明、炊事、家用电器等方面的能源消耗	建筑物拆除，建筑废弃物处理等方面所消耗的能源
Production energy consumption of building materials	Energy consumption of building construction	Energy consumption of building operation	Energy consumption of building demolishing and treatment
Power consumption of building materials and components in production, manufacturing, processing and conveying	Energy consumption of machine equipment installation and construction in construction	Energy consumption of heat supply air-conditioner, lighting, cooking and home electric appliances inside buildings	Energy consumption for building demolishing and building waste treatment

建筑业房屋建筑面积及能源消耗情况
Building area and energy consumption of houses in building field

房屋建筑施工面积（万平方米）
Construction area of house buildings (10000 m2)

房屋建筑竣工面积（万平方米）
Completion area of house buildings (10000 m2)

建筑业能耗（万吨标准煤）
Energy consumption of building industry (10000 tons of standard coal)

基于全寿命周期理论建筑能源消耗量分析
Analysis on energy consumption of buildings based on full-life cycle

全寿命周期建筑能耗Full-life cycle energy consumption of buildings

全寿命期建筑能耗
Full-life energy consumption of buildings

全社会能源消费总量
Total energy consumption of whole society
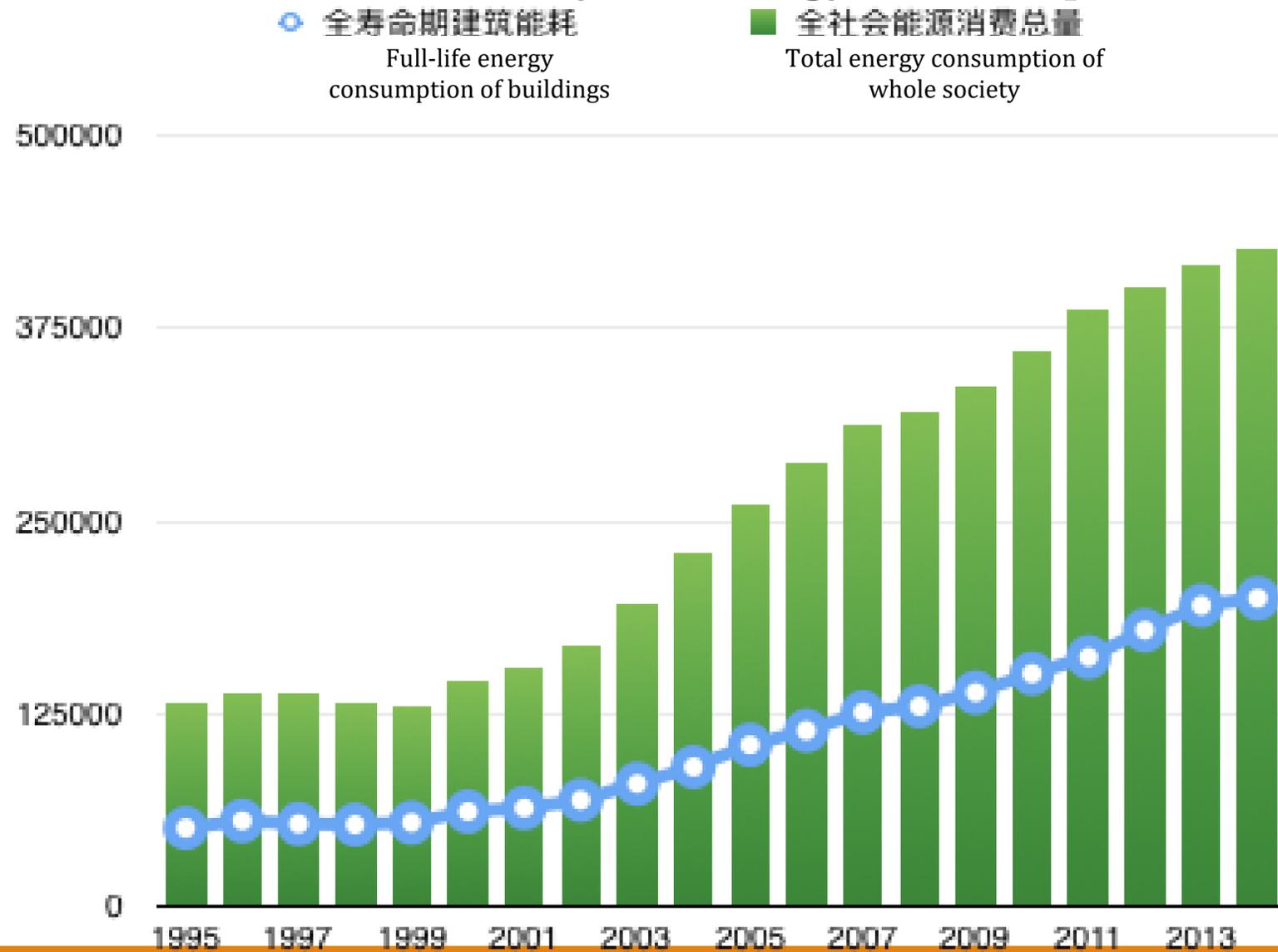
年份	建筑全寿命周期能耗	全国能源消费总量	建筑占全国能源消费总量比重
Year	Full-life cycle energy consumption of buildings	Total energy consumption in China	Ratio of building energy consumption to total energy consumption in China
1995	50969	131176	38.86%
1996	55709	138948	40.09%
1997	53690	137798	38.96%
1998	53179	132214	40.22%
1999	54577	130119	41.94%
2000	61643	146964	41.94%
2001	63967	155547	41.12%
2002	69118	169577	40.76%
2003	79710	197083	40.44%
2004	90545	230281	39.32%
2005	104826	261369	40.11%
2006	114111	286467	39.83%
2007	125962	311442	40.44%
2008	129952	320611	40.53%
2009	138871	336126	41.32%
2010	151090	360648	41.89%
2011	161776	387043	41.80%
2012	179171	402138	44.55%
2013	195166	416913	46.81%
2014	199945	425806	46.96%

全寿命期建筑能源消耗量预测模型
Prediction model of energy consumption of buildings based on whole-life cycle

建立建筑全寿命周期能耗与8个影响因素间关系的协整预测模型

人均国内生产总值、第三产业增加值占GDP比重、终端能耗、存款利率、贷款利率等

$$y = f（x_3, x_5, x_7, x_9, x_{10}, x_{12}, x_{14}, x_{17}）$$

Establish collaborative prediction model for relation among full-life cycle energy consumption of buildings and 8 influence factors

per capita gross domestic product, percent of added value of third industry in GDP, terminal power consumption, deposit rate and loan rate.

$$y=f(x_{3,}x_5,x_7,x_9,x_{10},x_{12},x_{14},x_{17})$$

通过设定发展情景，预测2020年全寿命期建筑能耗，24亿吨标煤

The predicted full-life cycle energy consumption of buildings in 2020 is 2.4 billion tons of standard coal based on the setting development scenario.

全寿命期建筑能源消耗量预测模型
Prediction model of energy consumption of buildings based on whole-life cycle

2014年基准	人均国内生产总值（元）	第三产业增加值占GDP比重	终端能耗消耗总量（万吨标煤）	1年期存款利率
	46612	48.09%	413162	2.98%
	1年期贷款利率	城乡居民家庭家用电器量（万台）	二套房首付比例	建筑节能标准
	5.97%	390253	70%	50%
2014年建筑能耗实际值（万吨标煤）	199944.79			
2020年预测	人均国内生产总值（元）	第三产业增加值占GDP比重	终端能耗消耗总量（万吨标煤）	1年期存款利率
	61134	51.72%	410095	2.73%
	1年期贷款利率	城乡居民家庭家用电器量（万台）	二套房首付比例	建筑节能标准
	5.72%	457566	60%	65%
2020年建筑能耗预测值（万吨标煤）	239593.74			

Benchmark in 2014	Per capita gross domestic product (yuan)	Percent of added value of third industry in GDP	Total power consumption of terminals (10000 tons of standard coal)	Deposit rate for 1 year
	46612	48.09%	413162	2.98%
	Loan rate for 1 year	Quantity of home electric appliances of residential families in cities and towns (10000 sets)	Percent of down payment of second house	Energy saving standard of buildings
	5.97%	390253	70%	50%
Real energy consumption of buildings in 2014 (10000 tons of standard coal)	199944.79			
Predicted value in 2020	Per capita gross domestic product (yuan)	Percent of added value of third industry in GDP	Total power consumption of terminals (10000 tons of standard coal)	Deposit rate for 1 year
	61134	51.72%	410095	2.73%
	Loan rate for 1 year	Quantity of home electric appliances of residential families in cities and towns (10000 sets)	Percent of down payment of second house	Energy saving standard of buildings
	5.72%	457566	60%	65%
Predicted energy consumption of buildings in 2020 (10000 tons of standard coal)	239593.74			

供给侧改革情景下建筑领域煤控政策建议
Recommendations for coal control policies in building fields under background of supply side reform in the 13th five-year plan

构建财政协同联动机制，导向资源集约与环境保护

Construct collaborative mechanism of financial authorities and direct to resource intensification and environmental protection.

推进绿色建材产业化发展，创造并引导市场新需求

Promote development of green building industry and create and guide new market requirements

实施差异化碳税政策，完善碳交易运作机制

Implement differential carbon tax policies and perfect operation mechanism of carbon transaction

采取区域性去库存政策，依据地区特点差别化调控

Adopt regional destocking policies and perform differential control according to the regional features

加快建筑工业化进程，促进生产方式转型升级

Speed up building industrialization and promote transformation and upgrade of production mode

谢谢各位

Thank you