上海-RESNET合作
—上海的节能挑战和国际合作机会

Shanghai-RESNET Partnership - Shanghai's Energy Challenge and the International Cooperation Opportunities

上海市房地产科学研究院

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中国建筑节能的形势与现状

Current Situation of China's Building Energy Efficiency

- 节能减排是当前中国的一项重要政策，并且明确提出到**2010**年要实现单位国内生产总值能源消耗比**2005**年降低**20%**，主要污染物排放总量减少**10%**。

In 2010, energy consumption per GDP should be reduced 20% and the discharge amount of key pollution should be reduced 10% to the level of 2005.

中国建筑节能的形势与现状

Current Situation of China's Building Energy Efficiency

- 建筑节能是中国节能减排的重要途径之一。中国拥有13亿人口，既有建筑存量约400亿平方米，其中大部分是未按节能标准建造的非节能建筑。

China has a population of 1.3 billion and 40 billion square meters of existing buildings. Most of them are non-energy efficient buildings.

- 建筑能耗占总的能源消耗的比例约为20～30％。

China's building energy consumption accounts for 20~30% of the total energy consumption of the whole country.

中国建筑节能的形势与现状

Current Situation of China's Building Energy Efficiency

- 上海市既有建筑存量约7亿平方米，居住建筑约4亿平方米，公共建筑约3亿平方米。其中节能建筑的比例约为10％。

Shanghai has 0.7 billion square meters of existing buildings, 0.4 billion are residential buildings and 0.3 billion are public ones. Including these energy efficient buildings account for 10%.

- 上海的建筑能耗约占总能源消耗的13.7%。

The building energy consumption accounts for 13.7% of the total energy consumption of the whole city.

中国建筑节能的形势与现状

Current Situation of China's Building Energy Efficiency

➢上海市建筑节能的任务和目标(***Shanghai's mission and goal***)：

新建建筑(***New Buildings***)：

新建住宅和政府办公建筑强制执行**50**％的节能标准，其它建筑推荐执行。试点执行**65**％的节能标准。

New residential and government buildings must comply the 50% energy standard, and the other buildings is recommended to be built according to these standards. Implement the 65% energy standard in some pilot projects.

中国建筑节能的形势与现状

Current Situation of China's Building Energy Efficiency

➢上海市建筑节能的任务和目标(***Shanghai's mission and goal***)：

既有建筑(***Existing Buildings***)：

到**2010**年，完成既有住宅节能改造**2000**万平方米，完成既有公共建筑节能改造**1000**万平方米。

To 2010, accomplish energy retrofit project of 20 million square meters residential buildings and 10 million square meters public buildings.

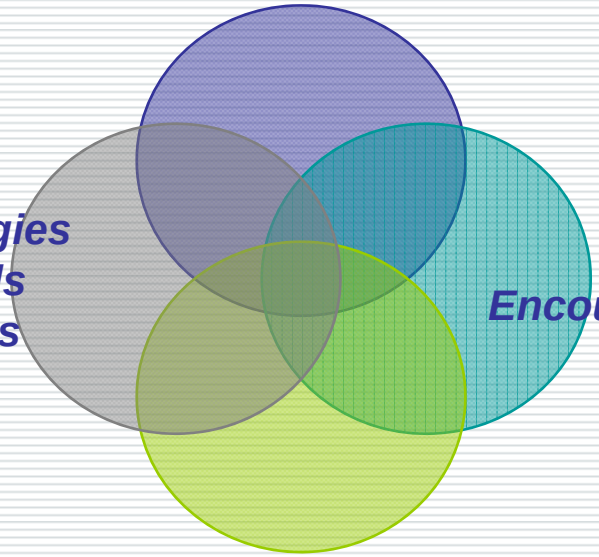
中国建筑节能的形势与现状

Current Situation of China's Building Energy Efficiency

➢实现建筑节能的主要途径:

4 elements to realize building energy efficiency：

建筑节能标准体系
Energy standard system



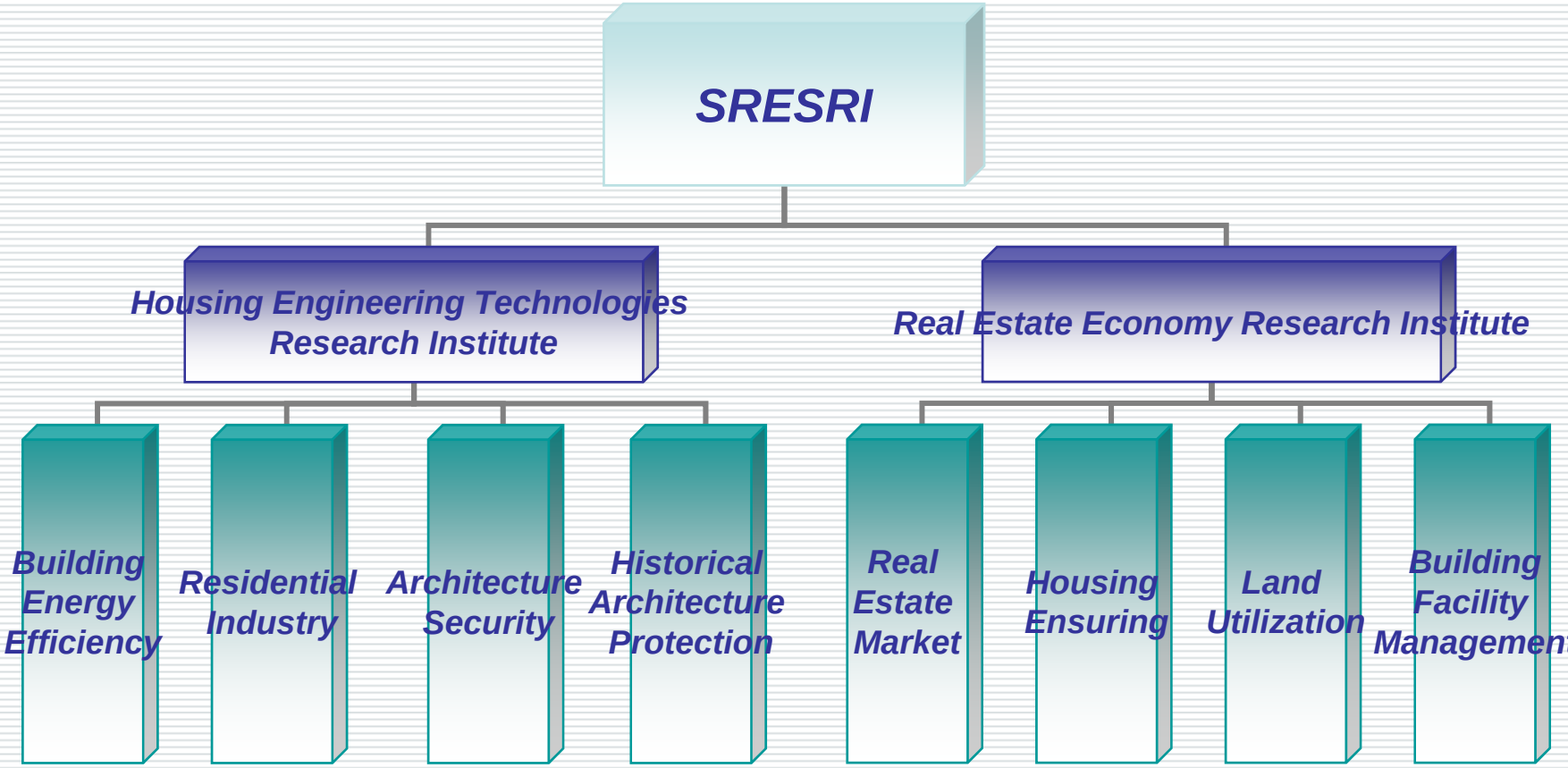
新技术 ***New Technologies***
新材料 ***New Materials***
新产品 ***New Products***

激励与约束
Encouragement & Restriction

检测与评估
Measurement & Evaluation

房科院简介

Brief Introduction of SRESRI

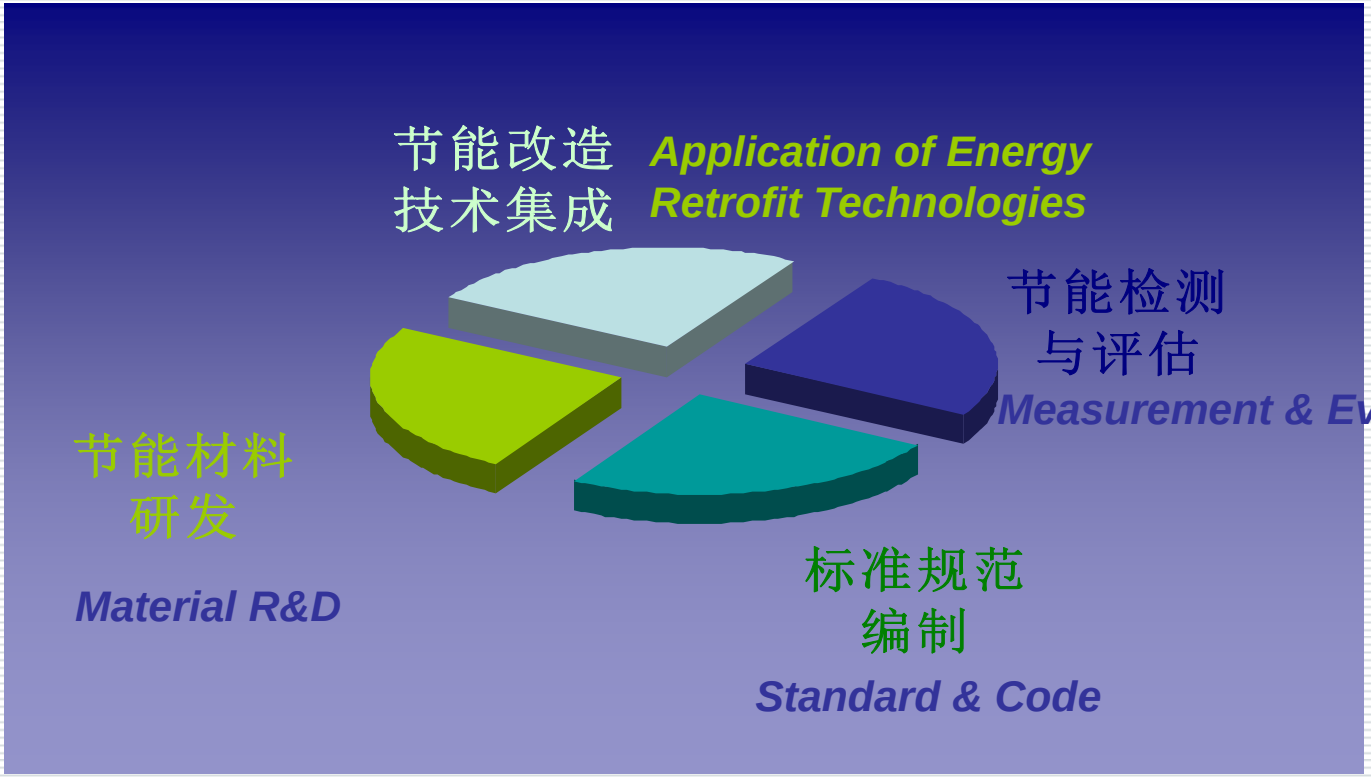


房科院简介

Brief Introduction of SRESRI

建筑节能四大研究板块

4 Research Fields of Building Energy Efficiency



房科 REAL ESTATE SCIENCE

节能材料研发

Heat Insulation Material Research & Development

- **193聚氨酯彩色防水保温系统**

  Polyurethane waterproof & heat insulation system

- **GM矿棉板墙体内保温系统**

  GM mineral wool slab inner heat insulation system

- **GM纤维增强玻壳漂珠外墙保温系统**

  GM fibre enhanced glass-shell microsphere heat insulation system

- 电厂脱硫石膏在建筑墙体保温材料中的综合利用研究

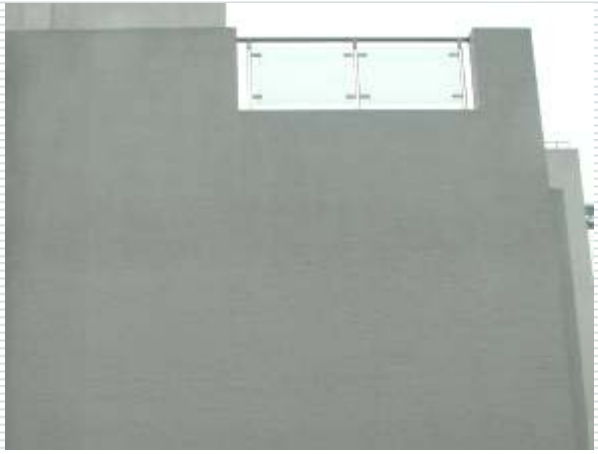
  Power plant flue gas desulfurization gypsum utilization in building heat insulation material

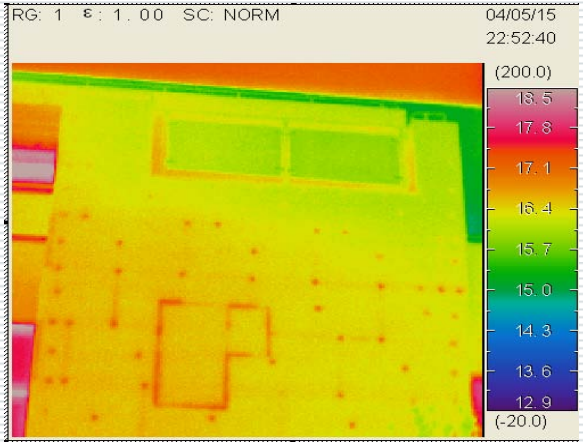
节能现场检测技术

On-site Inspection of Energy Efficiency

- 红外热像法检测围护结构热工缺陷

  Inspecting the thermal irregularities of building envelope with infrared thermography





节能现场检测技术

On-site Inspection of Energy Efficiency

- 平面热源法检测围护结构传热系数

  Inspecting heat transfer coefficient of building envelope by heat source method with constant rate

节能评估

Energy Efficiency Evaluation

- 构件指标的评价(*Component Evaluation*)
- 整体节能性能评估(*Integrated Evaluation*)

1. 与节能设计标准的比较

   compared with energy efficiency standard

2. 与参照建筑的比较

   compared with reference building

3. 改造前后的比较

   comparing between pre-retrofit & post-retrofit

标准与规范
Standard & Code

- 《既有建筑节能改造技术规程》（**DG/TJ08-2010-2006**）

  Technical specification for energy efficiency retrofit of existing buildings
- 《建筑节能现场检测与验证技术规程》（报批）

  Code of applied technique for in-site inspection and validation on energy efficiency for buildings
- 《世博会临时建筑物、构筑物设计标准—建筑节能篇》（报批）

  Standard for energy efficiency design of Shanghai EXPO temporary buildings
- 《既有民用建筑能效评估标准》（报批）

  Evaluation standard of energy efficiency for existing buildings

节能改造技术集成

Application of Energy Retrofit Technologies

□多层住宅(*Low-rise Residential Building*)

节能改造技术集成

Application of Energy Retrofit Technologies

□高层住宅(*High-rise Residential Building*)

节能改造技术集成

Application of Energy Retrofit Technologies

□住宅小区(*Residential Building Area*)

合作进展与前景

Progress & Prospect of Our Cooperation

合作大事记(*Cooperation Memorabilia*)：

- **2007年7月，RESNET与上海市房地产科学研究院进行建筑节能领域的学术交流活动**

  July 2007, First contact & communion

- **2007年9月，签署了开展全面合作的协议**

  September 2007,Signature of cooperation agreement

- **2007年11月，完成既有建筑能效评估试点工程**

  November 2007, Accomplish building energy evaluation pilot project

- **2007年12月，完成上海市《既有民用建筑能效评估标准》**

  December 2007, Accomplish "Evaluation standard of energy efficiency for existing buildings"

合作进展与前景

Progress & Prospect of Our Cooperation

➢总体思路(*General Approach*)：

在**RESNET**建筑能效评价体系的基础上，结合上海地区气候条件以及上海市建筑节能工作的具体推进要求，对**RESNET**的建筑能效评价方法作了适当调整和改进，提出了适用于上海地区的建筑能效评估方法和评价标准。

On the basis of RESNET System, establish a new building energy efficiency evaluation method and standard of Shanghai considering the Shanghai climate characters and building energy efficiency standards and policies.

合作进展与前景

Progress & Prospect of Our Cooperation

➢建筑能效评估方法(***Building Energy Evaluation Method***)：

将现场实测的建筑性能参数与计算机模拟技术相结合，以标准使用条件下被评估建筑物的能耗值为基础，通过与构建的“节能基准建筑”的能耗值相比较，计算出建筑物的“能效指数”，进而确定建筑物的“能效等级”，实现建筑能效评估的目的。

Based on the on-site measuring parameters and computer simulation, the “energy efficiency index (EEI)” and “energy efficiency grade” can be worked out under a standard operating condition through comparing the energy consumption of evaluated building and benchmark building.

合作进展与前景

Progress & Prospect of Our Cooperation

➢建筑能效等级划分方法(*energy efficiency grade scale*)：

能效等级 *energy efficiency grade*	能效指数*EEI* 范围 *EEI range*
未达标V级(*non EEB Ⅴ*)	200＜EEI
未达标IV级(*non EEB Ⅳ*)	175＜EEI≤200
未达标III级(*non EEB Ⅲ*)	150＜EEI≤175
未达标II级(*non EEB Ⅱ*)	125＜EEI≤150
未达标I级(*non EEB Ⅰ*)	100＜EEI≤125
★	90＜EEI≤100
★★	80＜EEI≤90
★★★	70＜EEI≤80
★★★★	60＜EEI≤70
★★★★★	0≤EEI≤60

Note:EEB means "Energy Efficiency Building"

合作进展与前景

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★	90＜EEI≤100
★★	80＜EEI≤90
★★★	70＜EEI≤80
★★★★	60＜EEI≤70
★★★★★	0≤EEI≤60

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★★★★★	0≤EEI≤60

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合作进展与前景

Progress & Prospect of Our Cooperation

建筑能效证书样张

Sample of Building Energy Efficiency Certification

房科 REAL ESTATE SCIENCE

合作进展与前景

Progress & Prospect of Our Cooperation

➢试点工程应用情况(*Pilot Projects*)：

◆节能改造项目(*Energy Retrofit Projects*)：

漕北大楼*Cao Bei High-rise Residential Buildings* (76,000 m^2)

合作进展与前景

Progress & Prospect of Our Cooperation

➢试点工程应用情况(***Pilot Projects***)：

◆节能改造项目(***Energy Retrofit Projects***)：

龙华西路多层住宅

West Longhua Road Residential Area **(71,000 m^2)**

合作进展与前景

Progress & Prospect of Our Cooperation

➢试点工程应用情况(***Pilot Projects***)：

◆新建项目(***New Buildings***)：

万科新里程 ***Everest Town of VANKE*** **(14,000 m²)**

合作进展与前景

Progress & Prospect of Our Cooperation

➢合作前景与展望(*Prospect & Expectation*)：

◆建立更加完善的建筑能效评价标准，涵盖更多建筑类型、能源种类、节能技术和节能材料

Perfect energy evaluation standard, containing more types of building and energy source, more technologies and materials

◆发展更加快捷、简便、准确的检测技术

Develop rapid and simple on-site testing technique

◆开发更加实用的评估工具

Develop exact and applied evaluation tools

THANK YOU

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