

**4th U.S.-China
Energy Efficiency Forum
September 25, 2013**

Compiled Presentations from Track 3, Breakout
Session 1/Morning

**Energy Efficiency Financing and
Energy Service Companies**

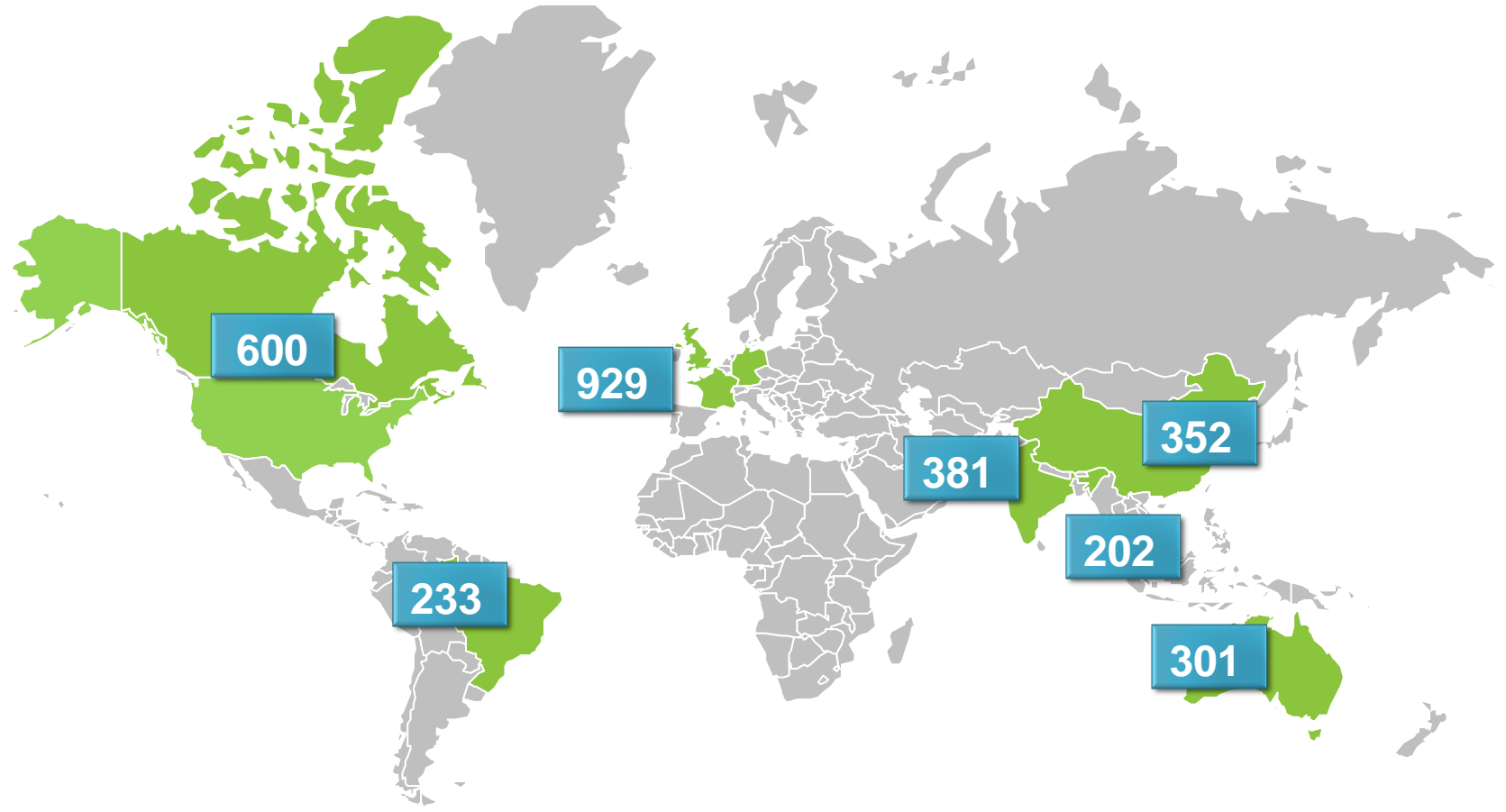
能效指标
2013 中国调查结果

ENERGY EFFICIENCY INDICATOR
2013 China Results



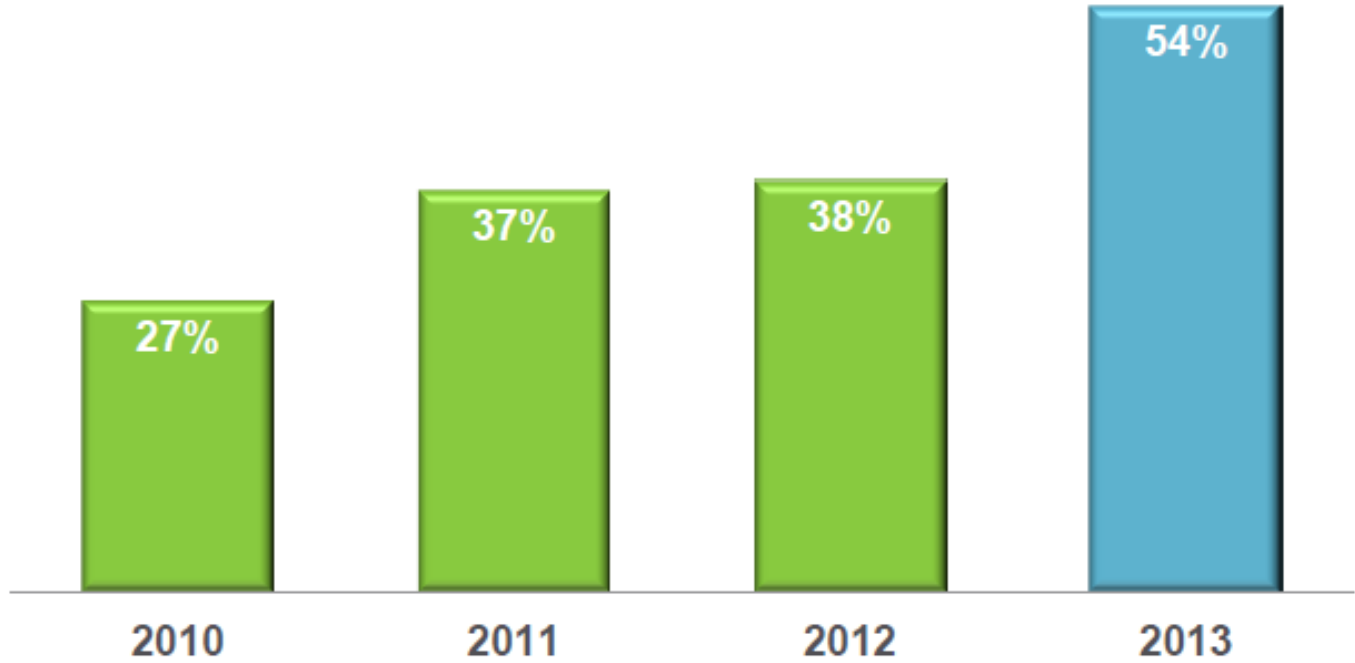
The seventh annual Energy Efficiency Indicator survey drew over 3,000 respondents from 10 countries, 352 in China

2013能效指标调查覆盖了10个国家、超过3,000名受访者，其中有352名来自中国。



In 2013, 54% of Chinese organizations say energy management is **EXTREMELY** important to their company

2013年，54%的中国组织表示能源管理对其公司至关重要

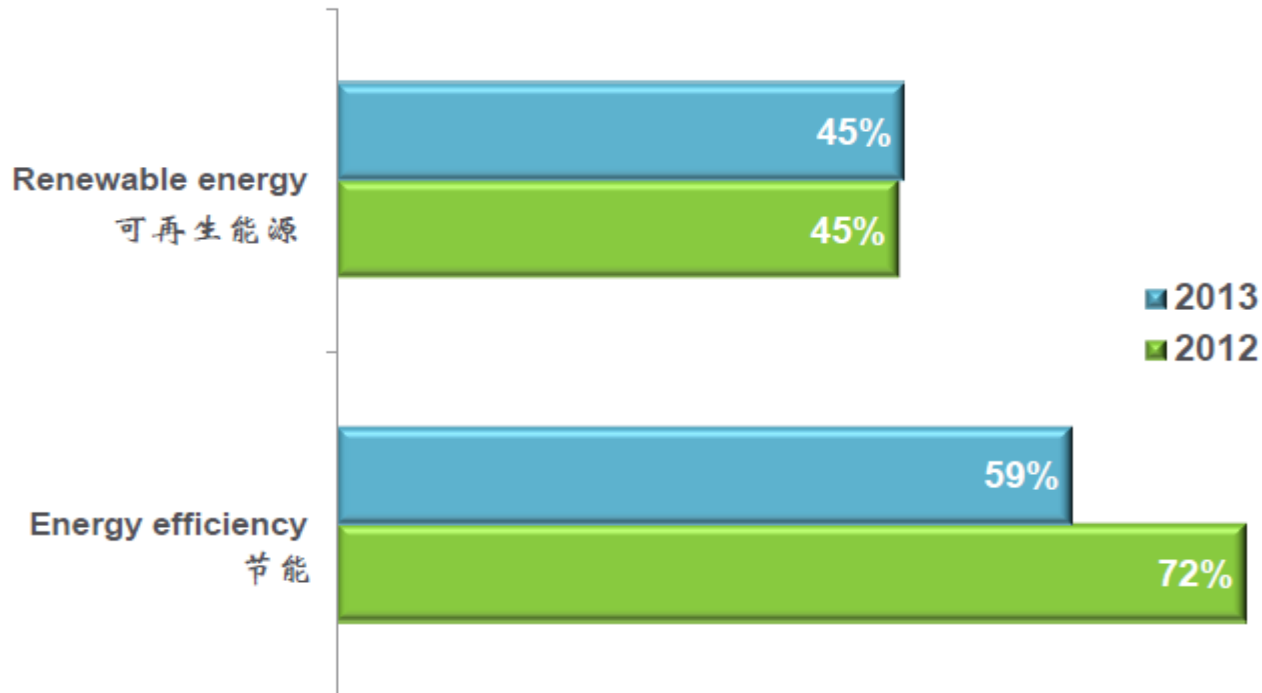


能源管理对应答者所在公司/组织的重要性排行

How important is energy management to your company/organization?

Fewer Chinese organizations invested in energy efficiency projects last year, renewable energy investment was consistent

过去一年中，中国的机构和组织，在可再生能源上的投资保持稳定，在节能项目上进行的投资有所减少



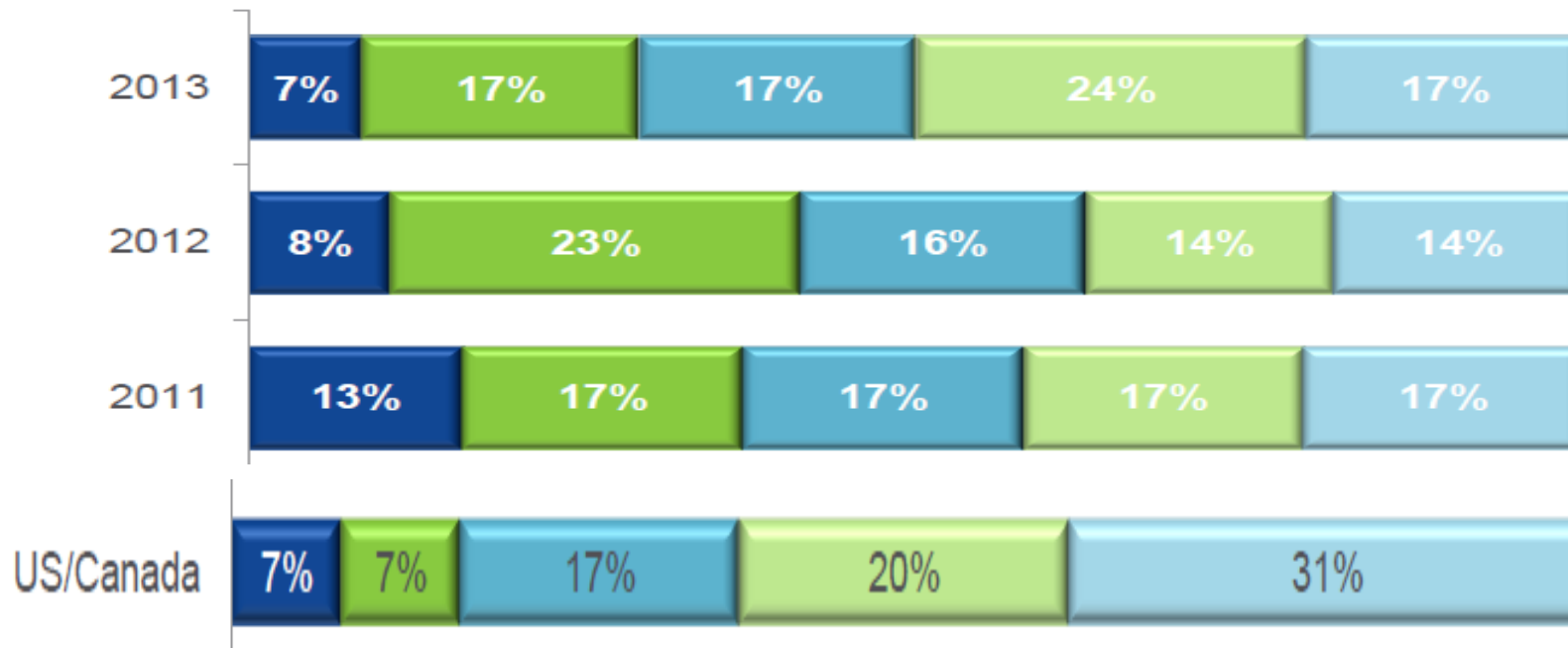
去年，在节能项目上进行过投资：

Have you invested in energy efficiency projects in the past year?

Barriers to efficiency in China shifting as market awareness rises, technical capacity grows - financial criteria emerge as top challenge

随着市场认知和技术能力的提高，中国的节能状况面临的障碍发生了变化，财务标准成为首要挑战和阻碍

受访者所在公司/组织推行节能的主要障碍及程度：



Some differences between the U.S. and China ESCO market that impact financing

US

Guaranteed Energy Savings

Third-party Financed

Longer Terms (10 – 25 years)

On-going Savings Verification

Bundled Efficiency Measures

EE, RE and DG in a single project

Standard Contracts

China

Shared Energy Savings

ESCO Financed

Shorter Terms (2-5 years)

One-time Verification

Single Technology Measures

EE, RE and DG in different projects

Non-Standard Contracts

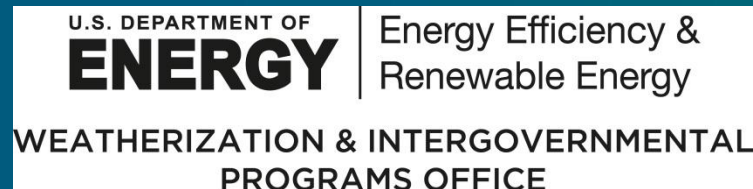


Environmental Energy Technologies Division Lawrence Berkeley National Laboratory

Current Size and Remaining Market Potential of U.S. ESCO Industry

Elizabeth Stuart, Peter H. Larsen, Charles A. Goldman
Lawrence Berkeley National Laboratory

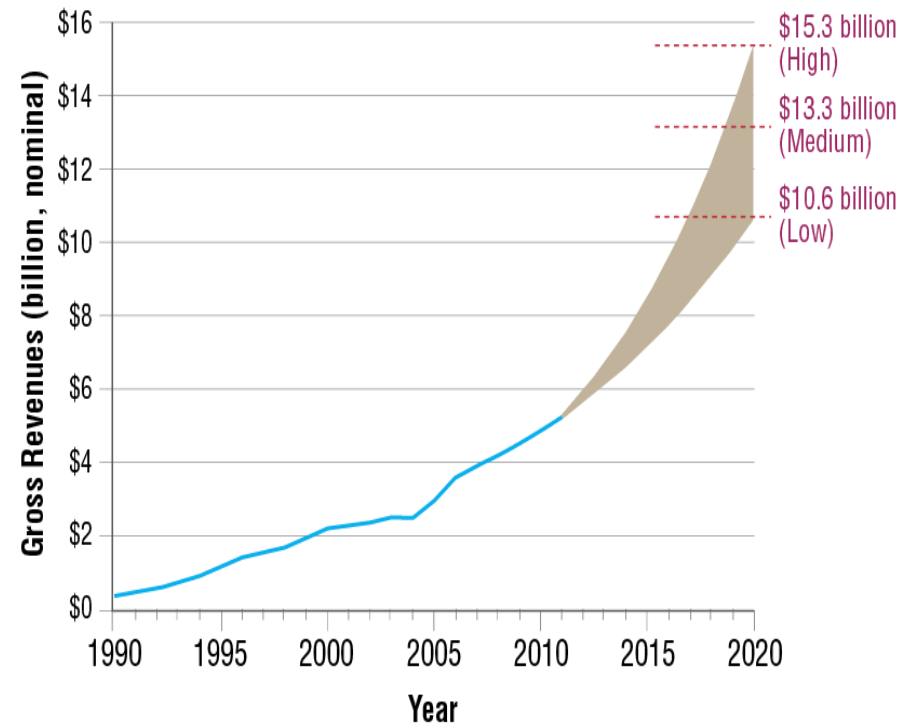
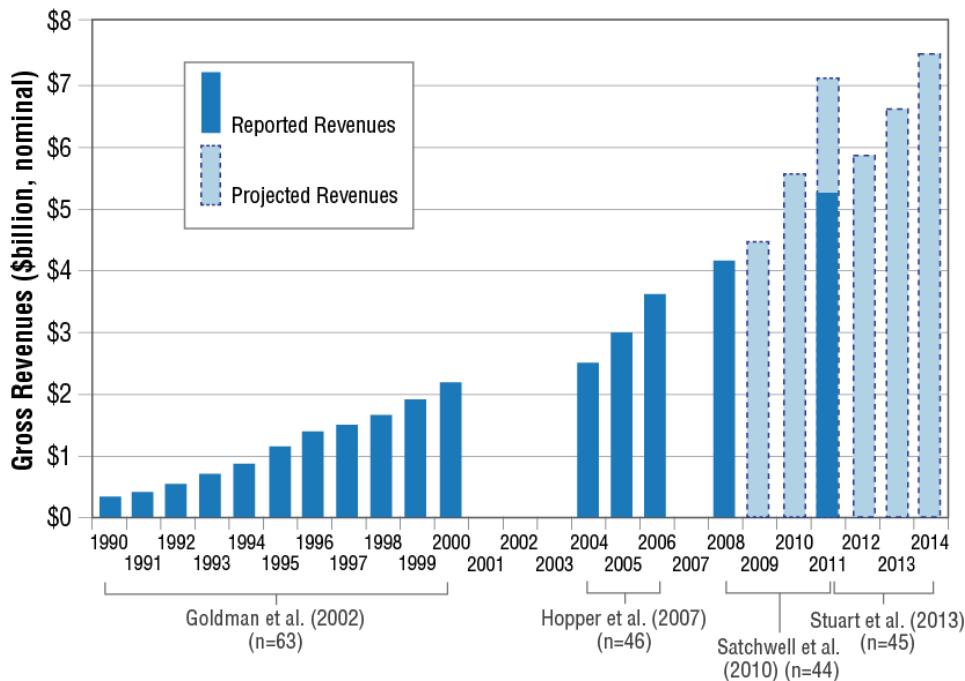
Donald Gilligan
National Association of Energy Service Companies



July 2013

INDUSTRY SIZE: CURRENT AND PROJECTED

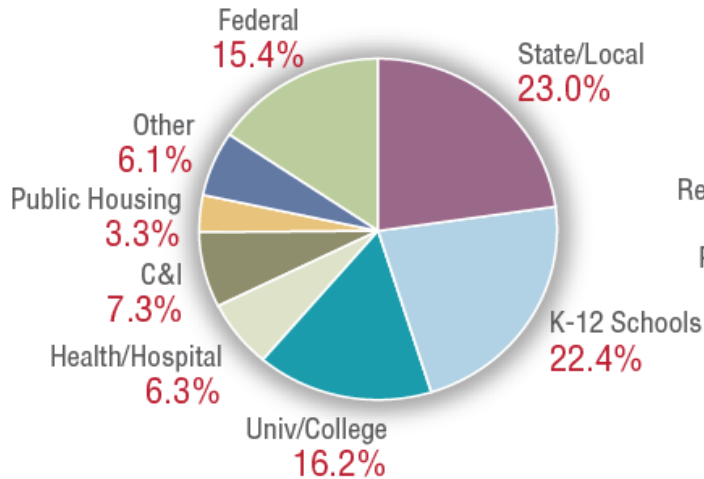
- The ESCO industry continued to grow at a steady pace--despite the onset of a major recession--reporting revenues of approximately \$5.3 billion in 2011.



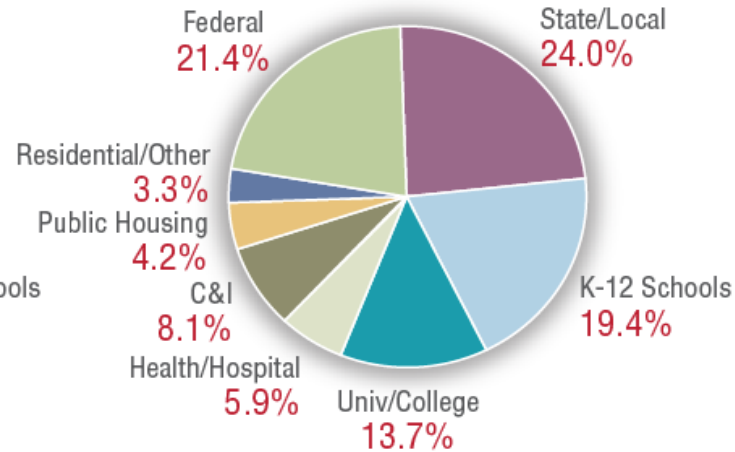
- We project that the ESCO industry will more than double in size from ~\$6 billion (2013) to \$11-\$15 billion (2020).

2008 & 2011 REVENUE SHARES

2008 Revenues (n=29)

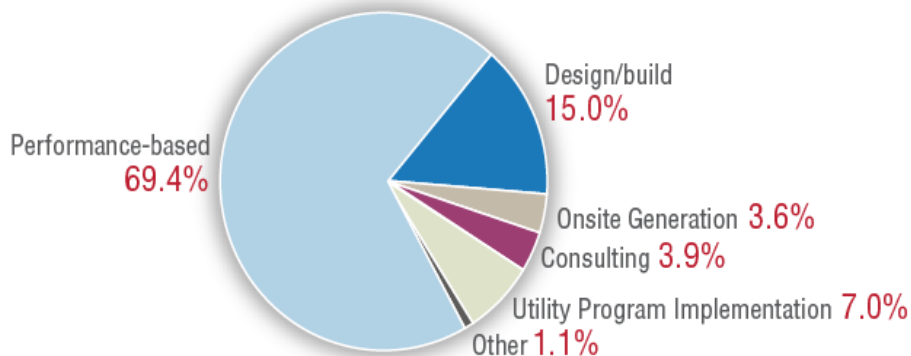


2011 Revenues (n=35)



• ~85% revenue from “MUSH”+ Federal market

2011 Revenues (n=34)

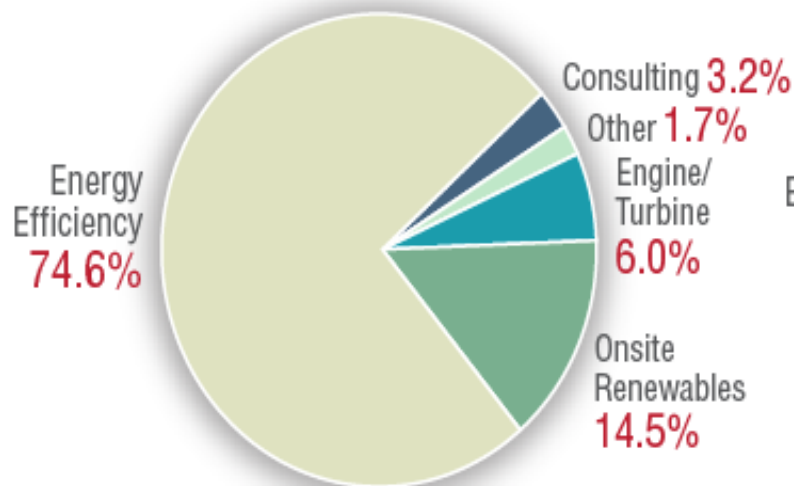


• ~70% of 2011 revenue from performance-based contracts; 15% from design/build.

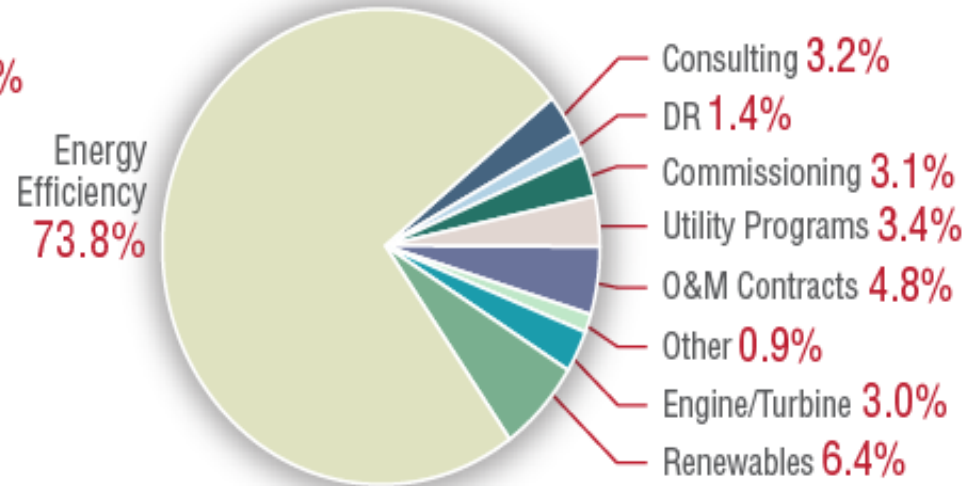
2008 & 2011 REVENUE SHARES (CONT.)

- Onsite generation and renewable energy share decreased from 2008-2011
- EE-related activity accounted for ~75% of revenue

2008 Revenues (n=29)



2011 Revenues (n=34)

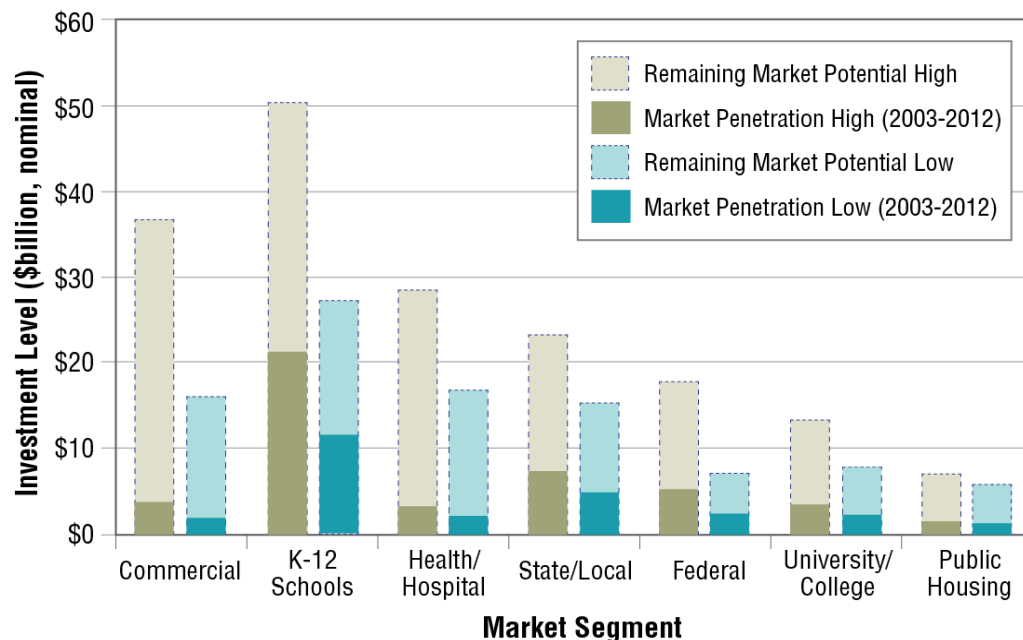


MARKET PENETRATION (2003-2012)

- Market penetration of performance contracting is highest in the K-12 schools sector and lowest in the C&I and healthcare sectors...

Market Segment	U.S. Census Region				U.S.
	Northeast	Midwest	South	West	
K-12 Schools	45%	40%	42%	30%	42%
State / Local	39%	30%	30%	45%	30%
Federal	27%	28%	25%	27%	28%
Universities/Colleges	25%	25%	23%	30%	25%
Public Housing	20%	15%	18%	18%	18%
Health/Hospitals	10%	10%	15%	15%	10%
Private Commercial	10%	6%	8%	9%	9%

REMAINING MARKET POTENTIAL



- Remaining investment potential in facilities typically addressed by this industry ranges from ~\$71 to \$133 billion.

Market Segment	Low Estimate	High Estimate
K-12 Schools	\$15.8	\$29.4
Health/Hospital	\$15.0	\$25.6
Private Commercial	\$14.4	\$33.5
State/Local	\$10.6	\$16.3
Public Housing	\$4.7	\$5.7
Universities/Colleges	\$5.7	\$9.8
Federal	\$4.9	\$12.7
Total	\$71.2	\$133.0

- Questions remain about the economic potential of these markets and the accuracy of this estimate...

FINANCING VEHICLES

- 40% of *federal projects* used 100% cash (i.e., appropriations);
- Most *K-12 schools* employed either a state/local bond issuance or a lease arrangement; and
- State or local bonds and tax-exempt municipal leases were most common in *state/local government* projects.

Market Segment	Cash	Partial Cash	Term Loan	State/Local Bond	Lease	Other	Total
Federal (n=19)	40%	7%	0%	3%	19%	31%	100%
State/Local (n=24)	15%	14%	16%	31%	23%	0%	100%
K-12 Schools (n=25)	7%	8%	18%	34%	28%	5%	100%
Univ/College (n=23)	20%	16%	22%	22%	19%	0%	100%
Health/Hospital (n=16)	33%	16%	28%	1%	21%	1%	100%
Public Housing (n=6)	17%	3%	5%	4%	58%	13%	100%
C&I (n=16)	50%	4%	23%	2%	5%	16%	100%

U.S. ESCO INDUSTRY IN A GLOBAL CONTEXT

Country	Estimated ESCO Industry Size (\$ million)	Source
China	\$4,000-\$7,000	Cahill and Bertoldi (2013)
United States	~ \$5,300	Stuart et al. (2013)
Germany	~\$3,900-\$5,200	Cahill and Bertoldi (2013)
France	~\$4,000 - \$5,000	Marino et al. (2010)
United Kingdom	~\$320	Cahill and Bertoldi (2013)
Italy	~\$600	Cahill and Bertoldi (2013)
Spain	\$390-\$500	Cahill and Bertoldi (2013)
Switzerland	~\$170-\$300	Marino et al. (2010)
Denmark	\$180-\$190	Cahill and Bertoldi (2013)
Japan	~\$374	Murakoshi (2013)
Romania	~\$50	Marino et al. (2010)

Note: Cahill and Bertoldi (2013) are preliminary results.

- U.S. ESCO industry is comparable and probably larger than French and German industry; Chinese ESCO industry is growing rapidly and may soon surpass U.S. ESCO industry size
- Definition of ESCO and revenue reporting practices vary among countries

- Industry grew steadily from 2008-2011 (\$5.3 billion)
- We anticipate that industry will double-to-triple in size by 2020 (\$10.6 to \$15.3 billion)
- Remaining market potential of ~\$71-133 billion
- Revenue share from onsite/renewable generation is decreasing
- ESCO customers use a variety of financing vehicles



Acknowledgments:

U.S. Department of Energy EERE-OWIP, Chani Vines, AnnaMaria Garcia, Terry Singer, Dave Birr, Patti Donahue, Linda Smith, Paolo Bertoldi, Caiman Cahill, Phil Coleman, Mark Zimring, Nina Lockhart, and staff at ESCOs.

Citation:

Stuart, E., P. Larsen, C. Goldman, and D. Gilligan. 2013. Current Size and Remaining Market Potential of U.S. ESCO Industry. LBNL Report 6300-E, July.

Enhancing Energy Savings Performance

Contracting in China

加强中国的 能源节约绩效合同

Dr. Robert Ichord

Deputy Assistant Secretary
for Energy Transformation
U.S. Department of State



罗伯特·艾考德（Robert Ichord）博士
美国国务院负责能源及运输事务
副助理国务卿

Background 背景

- U.S.-China Climate Change Working Group created in April 2013
美中气候变化工作小组于2013年4月成立。
- During the Strategic and Economic Dialogue Meeting in July, 2013, the U.S. and China launched five new initiatives targeting GHG emissions and air pollution
2013年美中战略与经济对话期间，双方启动了5项新倡议，旨在减少温室气体排放和空气污染。
- Both sides agreed to intensify existing efforts to improve energy efficiency, with an initial focus on buildings, including through the use of innovative financing models
双方同意加强现有改善能源效率的努力，并将建筑物设为最初关注重点，包括通过使用创新型融资模式达此目标。
- We are now beginning to discuss specific proposals for activities focusing on financing, including Energy Savings Performance Contracting (ESPC)
我们现在开始探讨以融资为中心的活动的具体建议，包括能源节约绩效合同 (ESPC)。

Overview of Proposal 建议概述

Goal: *Develop an understanding and framework for sharing information on ESPC approaches, including the potential for high-impact pilot activities.*

宗旨: *就分享ESPC方式的信息达成谅解，形成框架，包括高影响力试点项目的潜在可能性。*

- Exchange information on ESPC best practices to achieve comprehensive retrofits
就ESPC最佳实践交换信息，实现全面改造。
- Address key technical, financial, and contractual elements of ESPC program design
解决ESPC项目设计关键的技术、财务和合同等方面的问题。
- Develop policy options report and toolkit of ESPC key resources
制定有关ESPC关键资源的政策选项报告，开发工具包。
- Carry out with U.S. and Chinese industry pilot project(s) to demonstrate viability of approach
实施美中企业试点项目，以展示这种方式的可行性。

Overview of Proposal (continued) 建议概述（续）

Three phases:

三个阶段:

1. Information Gathering and Scoping

信息收集和范围

- Reach agreement on draft implementation approach
就草案实施途径达成协议
- Conduct issue analysis and develop program plan
实施问题分析，并制定项目方案

2. Stakeholder Engagement and Information Exchange

接触利益攸关方以及信息交换

- Conduct stakeholder outreach and identify community of practice
联络利益攸关方，确认实施领域
- Conduct a series of meetings and workshops focusing on key ESPC elements, including audit protocols, contract structures, financial approaches, and monitoring and verification methodologies.
就ESPC关键因素举行一系列会议和讲座，包括审计规程、合同结构、融资方式以及监督和验证方法。

3. Pilot Project Implementation

试点项目实施

- Prepare and present policy option and action recommendations report
准备和提交政策选项以及行动建议报告。
- Prepare and present toolkit of key resources and best practices
准备和提交关键资源工具包和最佳实践。
- Work with U.S. and Chinese industry to identify and implement ESPC pilot demonstration projects
与美中企业界合作，确认和实施ESPC试点示范项目。

Some Key Design Questions 若干关键设计问题

- **Target sectors:** Public, commercial, industrial?
目标领域: 公共、商业、工业?
- **ESPC type:** Guaranteed savings only, or shared savings as well?
ESPC类型: 仅限有保障的节约, 还是包括共享的节约?
- **Financing:** How to engage banks/third-party financing sources?
融资: 如何联系银行 / 第三方融资来源?
- **M&V:** How to develop or adapt standardized monitoring and verification protocols?
监督及验证: 如何制定或修订标准化监督及验证规程
- **Industry involvement:** How to best encourage and structure U.S. and Chinese industry participation in program design and implementation?
业界参与: 如何以最佳方式鼓励并组织美中业界参与项目设计和实施?

Proposed Next Steps 拟议中的后续措施

- U.S. and Chinese governments work together to identify opportunities and define scope of cooperation

美中两国政府共同确认机会，并确立合作范围。

- Goal of launching program in early 2014
2014年初启动项目的目标。

key driver to promote ESCO industry in china

China ESCO Industry Association (EMCA)
September 25, 2013, Washington D.C., USA

Contents

- 1. ESCO development in China**
- 2. Main drivers to promote ESCO industry**

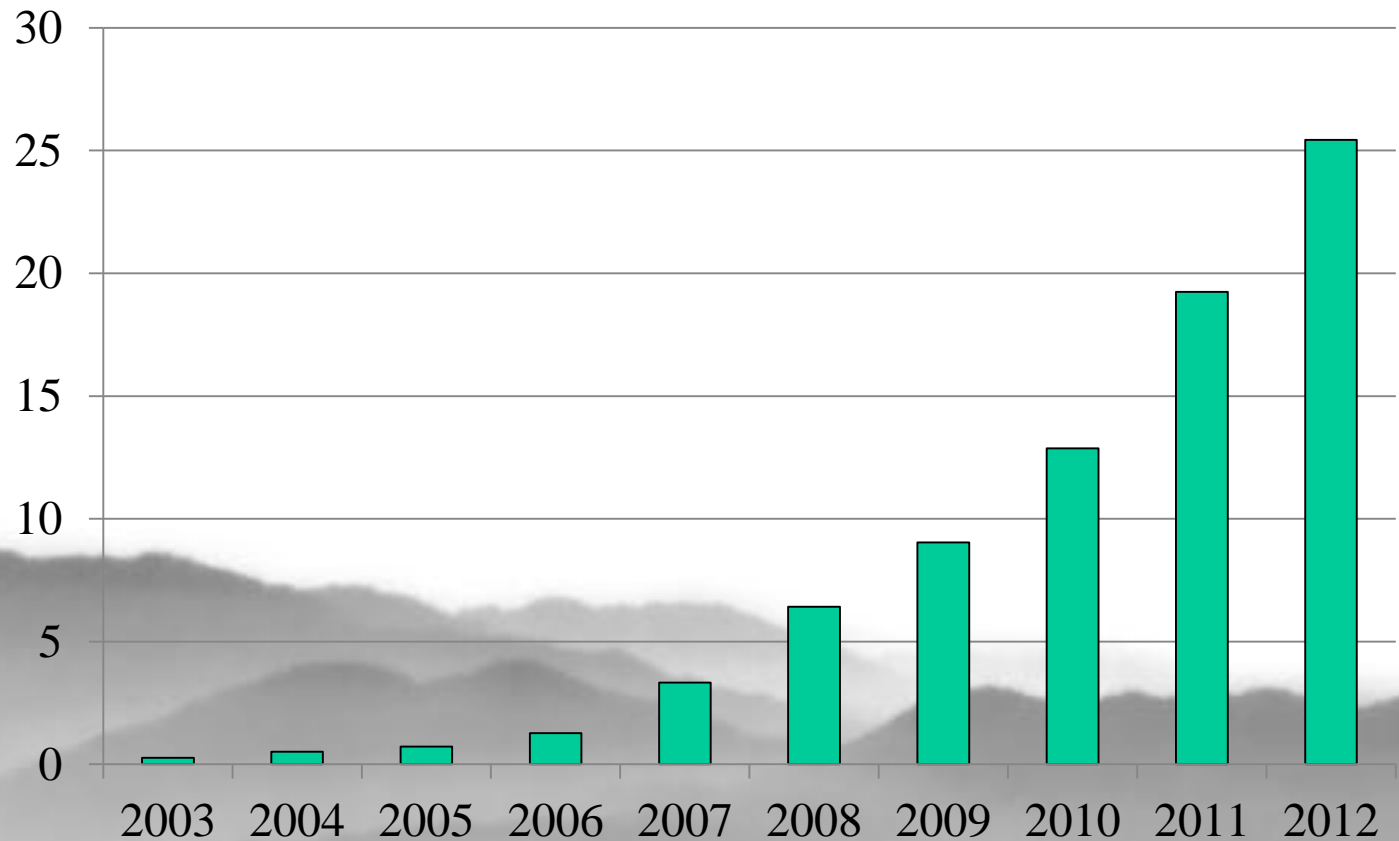
ESCO development in China

- ❁ **4175** ESCOs and **435 thousand** employees in the whole country by the end of 2012 with
- ❁ **2339** registered ESCOs in NDRC& MoF
- ❁ Annual turnover **USD25.4 billion** (25 000 000 000)(1:6.5)
- ❁ EPC investment **USD8.58billion** (8 580 000 000)(1:6.5)
- ❁ Energy saving from EPC investment **18.28 million tce**
- ❁ CO2 emission reduction **45.71million ton**



ESCO development in China-scale

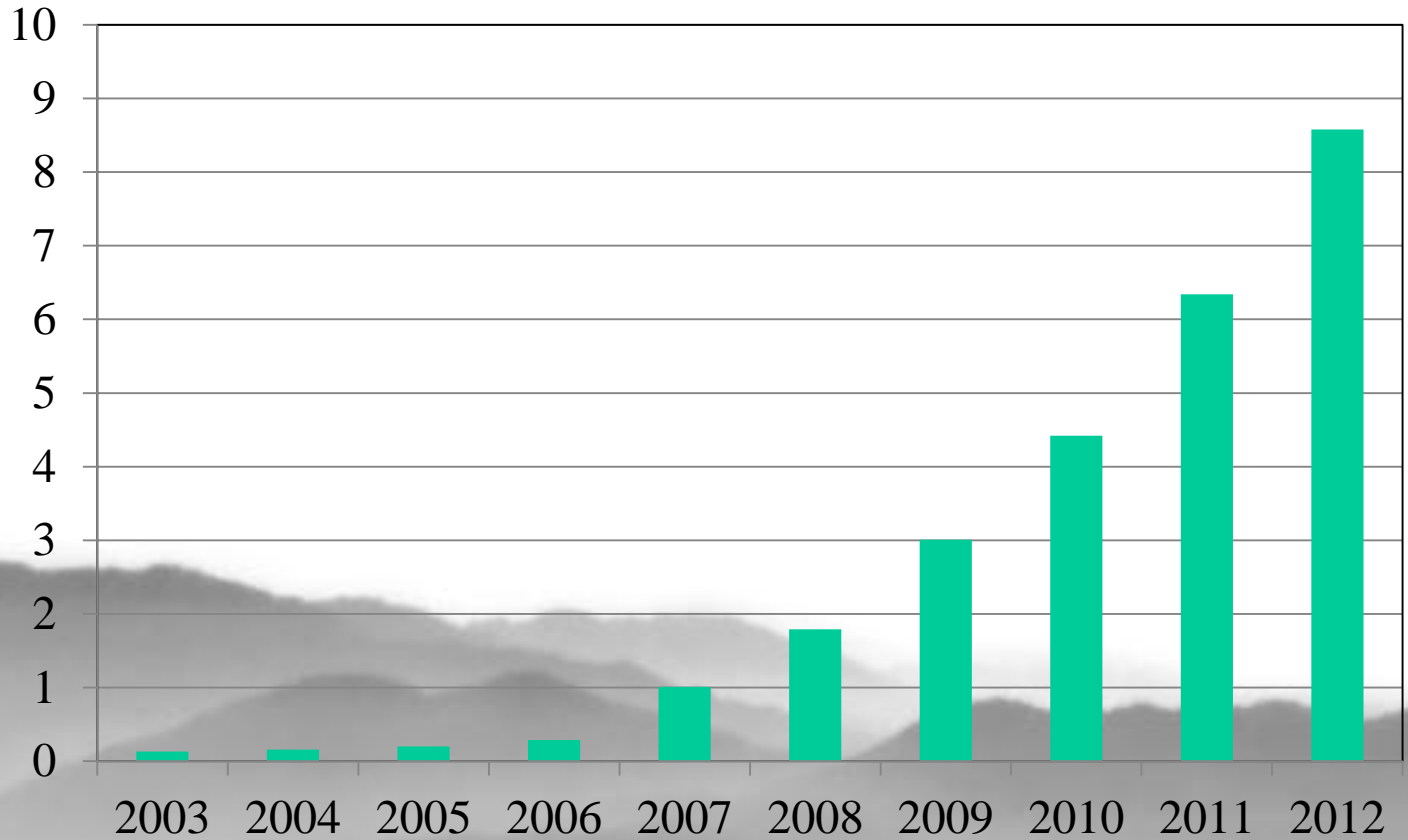
turnover(billion\$)



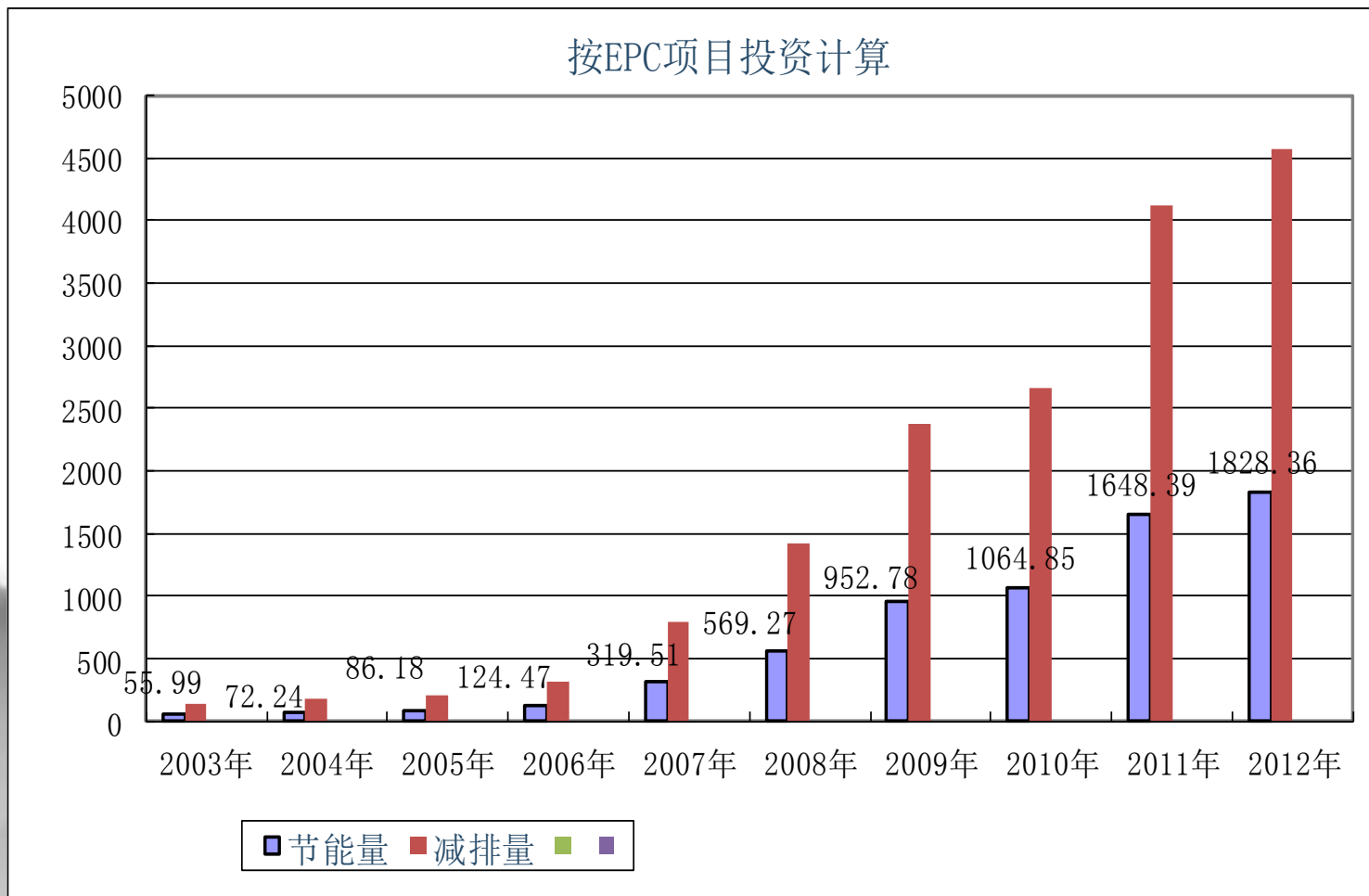
ESCO development in China-scale



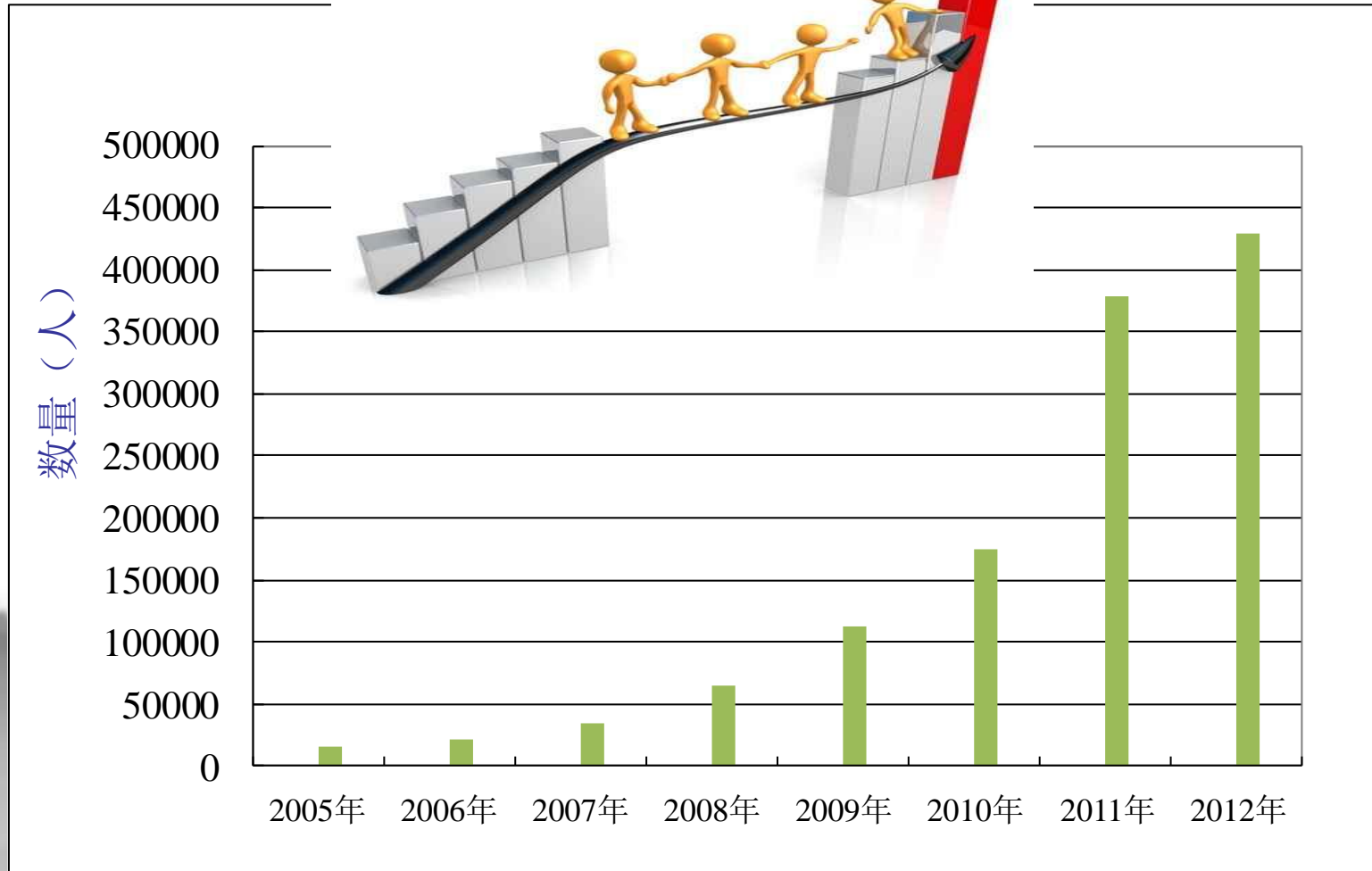
EPC investment (billion\$)



ESCO development in China-energy saving and emission reduction



ESCO development in China-employee



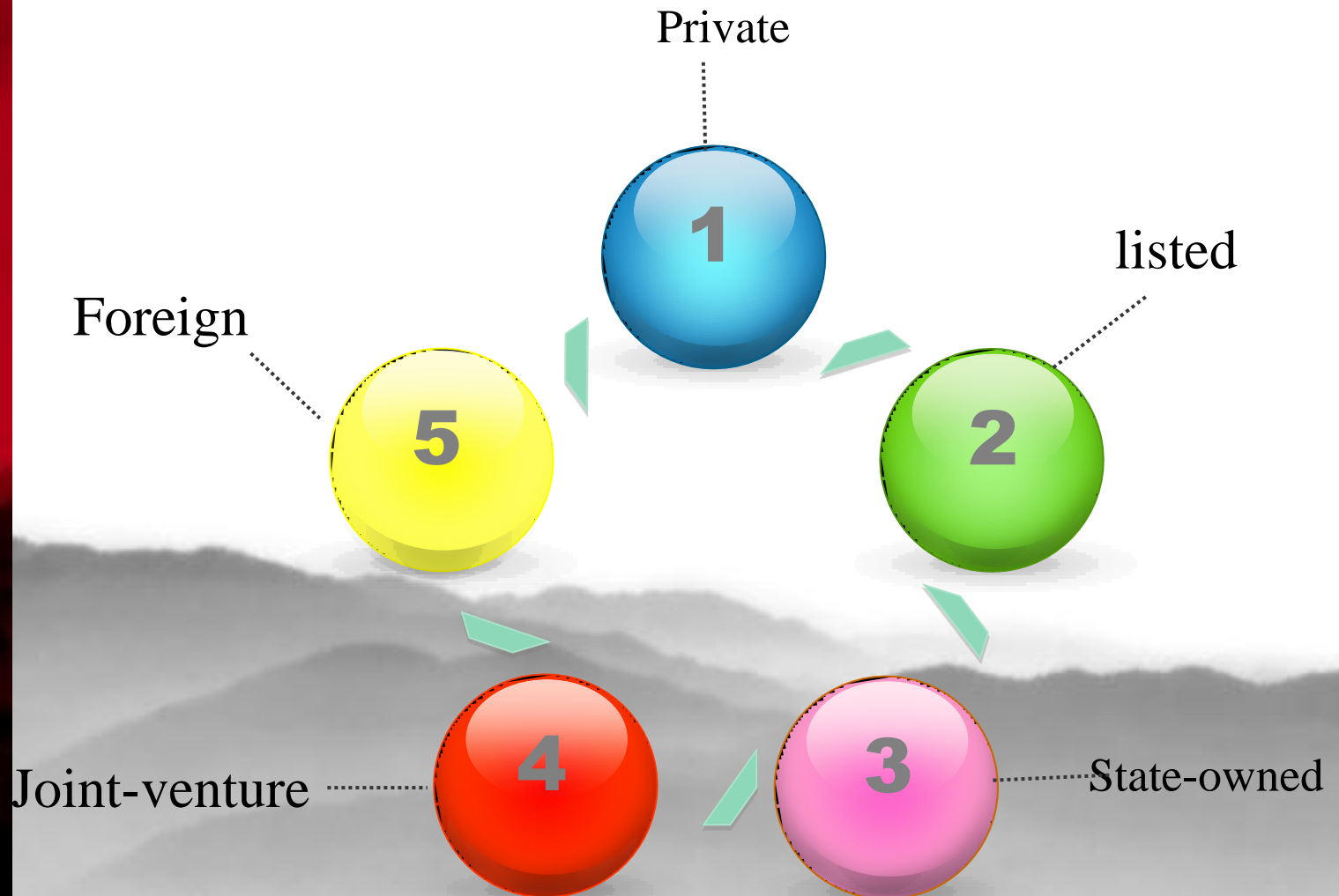
Numbers of employees

ESCO development in China-composition

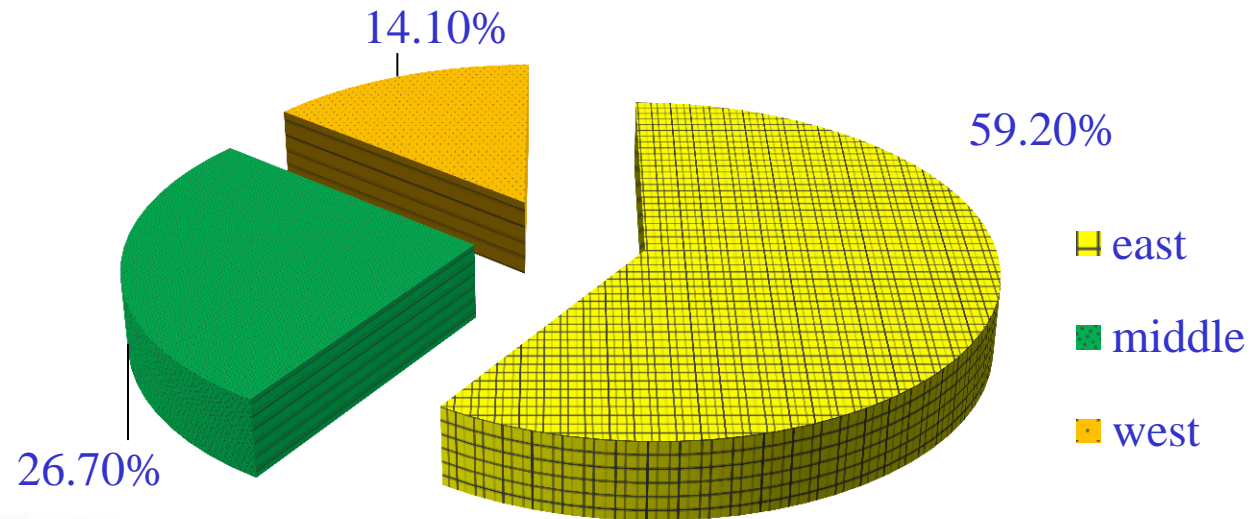
- 90% Small-medium private enterprises → state-owned enterprises and multi-international enterprises
- Special ESCOs funded by large energy consumer enterprises
- Listed companies involvement with capital advantages
- Market-oriented ESCOs with Chinese features-Guanxi



ESCO development in China-composition



ESCO development in China-distribution



National policies

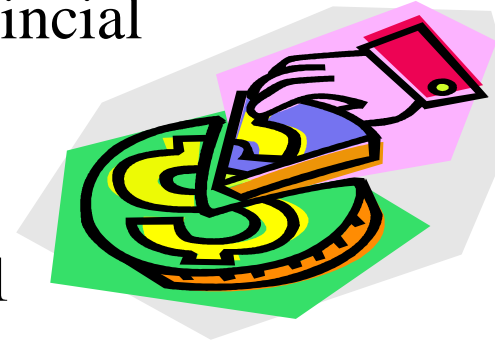
- ❁ No. 25 notification from state, 2nd April, 2010
- ❁ No. 240 notification from MoF, 9th June, 2010
- ❁ No. 60 notification from NDRC, 30th June, 2010
- ❁ No. 110 notification from Tax Bureau, 30th Dec. 2010

National supportive policies

1**Direct financial award****2****Preference tax policy****3****Improved account rules****4****Improve financial policy**

A: financial award

- ❁ Financial support : national + local financial reward
 - ⌘ RMB240 per tce saving from central government
 - ⌘ RMB60 + per tec saving from provincial government
 - ⌘ 2 billion RMB each year from 2011
- ❁ Registered ESCOs are qualified to apply financial reward with completed EPC projects



B: Tax- reduction & exemption

- ❁ Operational tax: exemption
- ❁ Industrial income tax: 0 for the first 3 years with profit and 50% for the next year
- ❁ VAT: exemption when fixed assets are transferred to customer
- ❁ 500 ESCOs enjoyed 1 billion RMB tax exemption

C: financial investment

- ❁ China Banking Regulatory Commission (CBRC) : green credit guidelines
- ❁ Creative new products designed for EPC projects and ESCOs:
 - ❁ Pudong Development Bank: factoring business for the future income of ESCOs from energy savings
 - ❁ Beijing Bank: green-path for ESCOs with guaranteed savings



ESCO development-innovation

- ❁ 1st “pure ESCO” get listed in the stock market in Shenzhen, China
 - ❁ 28th June, 2012: the bell rang for the 1st “pure” ESCO with all their EPC
- ❁ 1st ESCO get private debt in Shenzhen
 - ❁ 8th June, 2012, Shenzhen Coolstar received 50k private debt as a small company



ESCO development-innovation

EMCA



According to the EMCA annual statics, 112 invention patents and 223 new practical patents from ESCOs

Key drivers for China ESCO

---“pull and push”

- ❁ National strategy
- ❁ Supportive policies
- ❁ Market potential
- ❁ Customer demand
- ❁ ESCO industry sustainable development

12th five-year plan

- ❁ Plan for energy conservation
 - ⌘ EPC promotion and ESCO development as a national key EE program
 - ⌘ National target to reduce energy

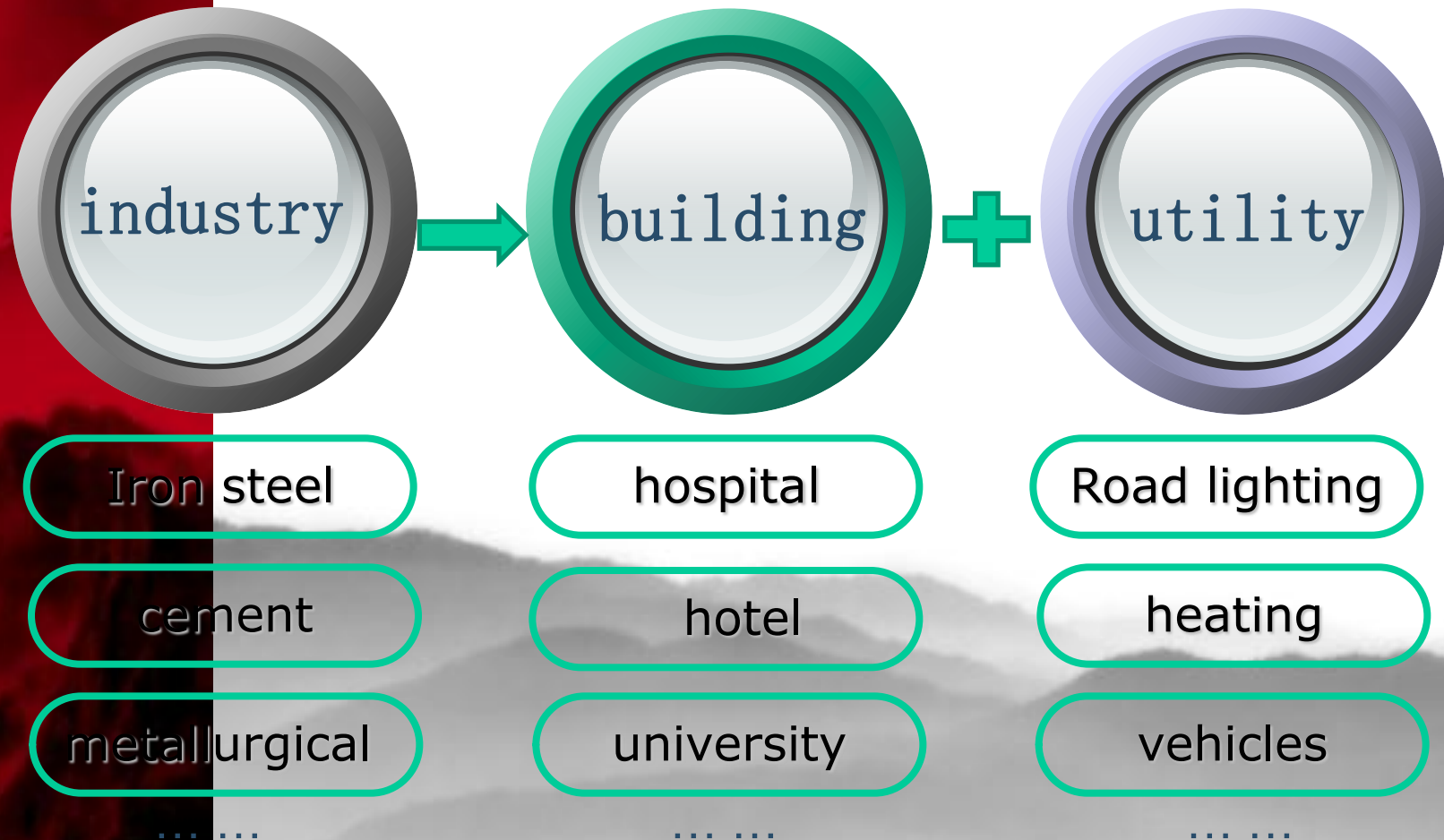
Supportive policies

- ❁ More financial award from central and provincial government
- ❁ Tax policy will cover more ESCOs with detailed implementing guidelines
- ❁ Overcome the barriers for ESCO business in public buildings especially government facilities
- ❁ Green credit guideline with detailed requirement for banks

Market potentials

- ❁ 10thousands enterprises program create market for ESCOs
- ❁ Industrialization and urbanization will have more demand for ESCO industry
- ❁ ESCO service will transfer from heavy industry to buildings gradually

Market transfer



Customer demand

- ❁ State-owned enterprises – practice social responsibility and keep key competitive advantages in the slowed economic growth
- ❁ Private enterprise – reduce cost and energy consumption to avoid close-down
- ❁ Public buildings-municipal regulation

Thank you

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