

National Environmental Innovation Action Plan 国家环境创新行动计划

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Industry's Role in Green Development through Innovation

CCICED, April 17, 2009

Innovation and Environmentally Friendly Society 创新与环境友好型社会

- Enterprise Forum – April, 2008
 - Task Force Report to CCICED recommending a National Environmental Innovation Action Plan – Nov, 2008
 - Enterprise Forum – April, 2009 to seek industry's view on what will lead to success in environmental innovation
 - Innovation
 - Improvement in product and processes
 - Emerging technologies
 - Disruptive science and technology breakthroughs
- 2008年企业论坛-2009年4月
 - 工作组向国合会建议国家环境创新行动计划—2008年11月
 - 2009年企业论坛—2009年4月:从产业寻找通过环境创新的机会.
 - 创新
 - 产品的改进
 - 新兴的技术
 - 破坏性的科技突破

Outline 大纲

- The challenge and opportunity of environmental innovation
- 环境创新的挑战与机会

Technology 技术

Regulations, Standards and Enforcement

规制,标准和执行

Public Participation 公众参与

The challenge and opportunity of environmental innovation

中国环境创新的挑战与机会

- China has both the capacity and the need to become a global leader in sustainable development and innovation in environmental technology.
 - Targets on reducing intensity of emissions on a per GDP basis have been set.
 - Reduction targets of pollutants on an absolute basis must be established.
 - There is a big imbalance between regions in environmental innovation
- 中国在可持续发展和环境技术创新领域,有能力也有必要成为全球的先者.
 - 中国已经确定了未来单位GDP减放的目标
 - 但中国必须建立起环境减排的总量目标.
 - 中国的环境创新存在巨大的地区差异

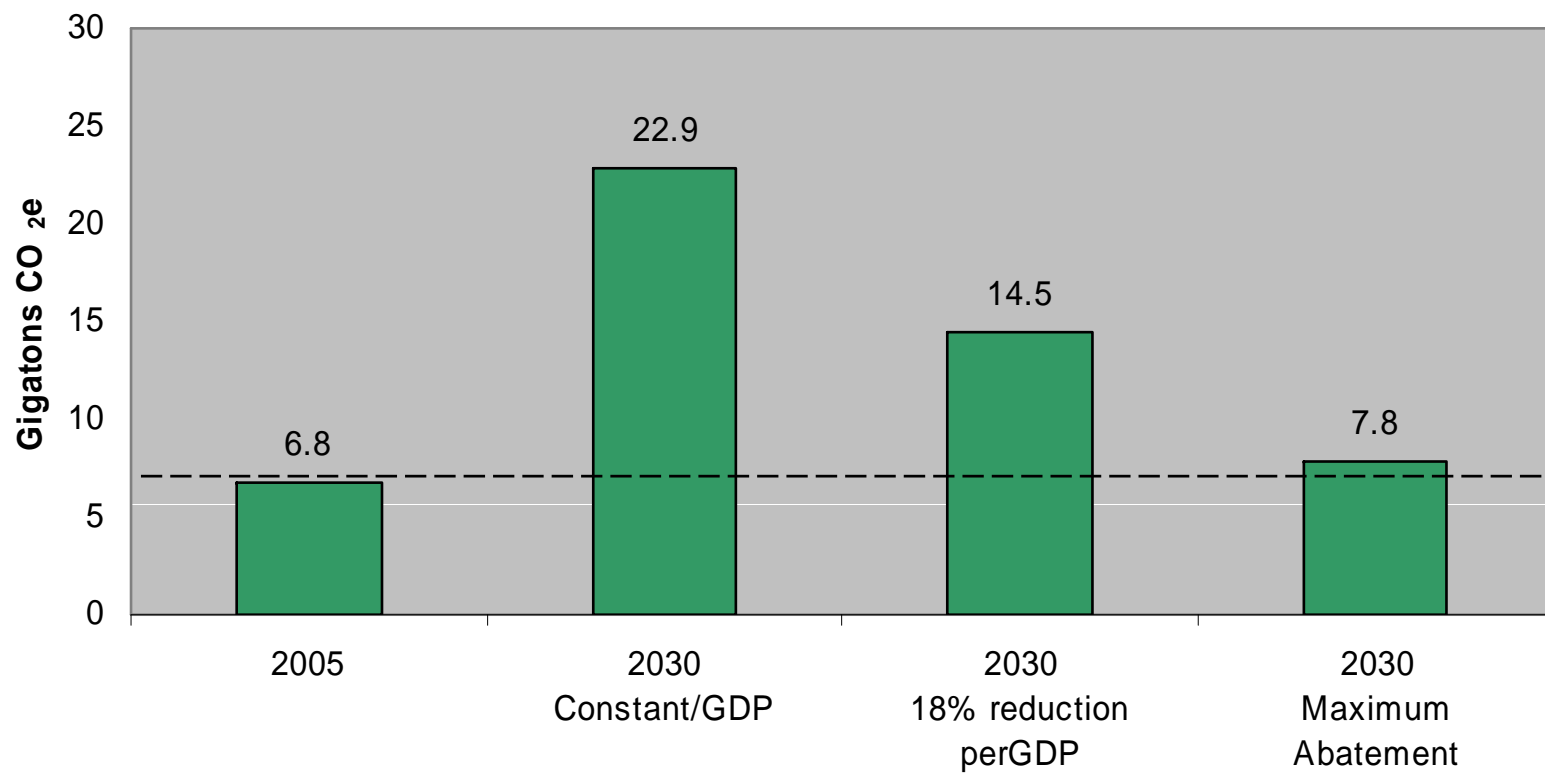
CHINA ADVANTAGE 中国优势

- Commitment by Chinese leadership
- With rapid development and GDP growth underway, China has the option to go the Clean Tech route
 - 2005 GDP 1,800 b. €
 - 2030 GDP 12,000 b.€
- Leapfrogging platform opportunities abound
- Science and technology plan being rapidly implemented, GERD/GDP to rise to 2.5 by 2020
- Network of university and municipal based research parks and spin-off companies
- Very large domestic need

- 高层的承诺
- 随意高速的经济增长,中国需要选择清洁技术的道路.
 - 2005, GDP 18000亿欧元
 - 2030年,GDP,120,000亿欧元.
- 跨越的平台机会很多
- 国家科学技术规划会得到很快的实施. GERD/GDP 在2020年达到2.5%.
- 产学研合作网络和衍生企业多
- 强大的国内市场需求

China Potential

Absolute CO₂e Emissions Using Various Scenarios



Example from McKinsey (2009) on CO₂e

麦肯锡报告关于CO₂的例子

- 2005 level as reference (6.86+)
- 2030
 - Technology frozen
 - Rises to 22.96+
- 2030
 - Technology introduction using intensity goal of 18% reduction/GDP
 - Requires significant technology introduction, innovation and R&D
 - Reduce emission to 14.56+
- 2030
 - Using maximum technology abatement
 - Requires extensive technology adoption and development of incremental and disruptive technology
 - Potential emission reduction to 7.86 on an absolute basis while maintaining GDP growth

- 以2005年为基点.(6.86+)
- 2030
 - 技术冷藏率达到22.96+
- 2030
 - 引入强度指标,降到单位GDP增长降低18%.通过创新,可以降到14.56+
- 2030 达到最大的技术消,减,利用广泛的技术,潜在的排放率降低到7.86,并保持GDP的增长.

Technologies That Must Be Implemented

必须实施的技术

1. Power

Nuclear

Wind – onshore and offshore

Solar Cells

Solar Thermal

IGCC/CCS

Biopower

Heat from waste (municipal solid waste)

CPH – combined power and heating for district use

Smart grids

Examples

- ✓ China Power Valley – the Baoding Cluster
- ✓ Green Gen and zero emission plant – world leading
- ✓ Goldwind – from experiment to global leader
- ✓ Suntech – from research bench to global leader

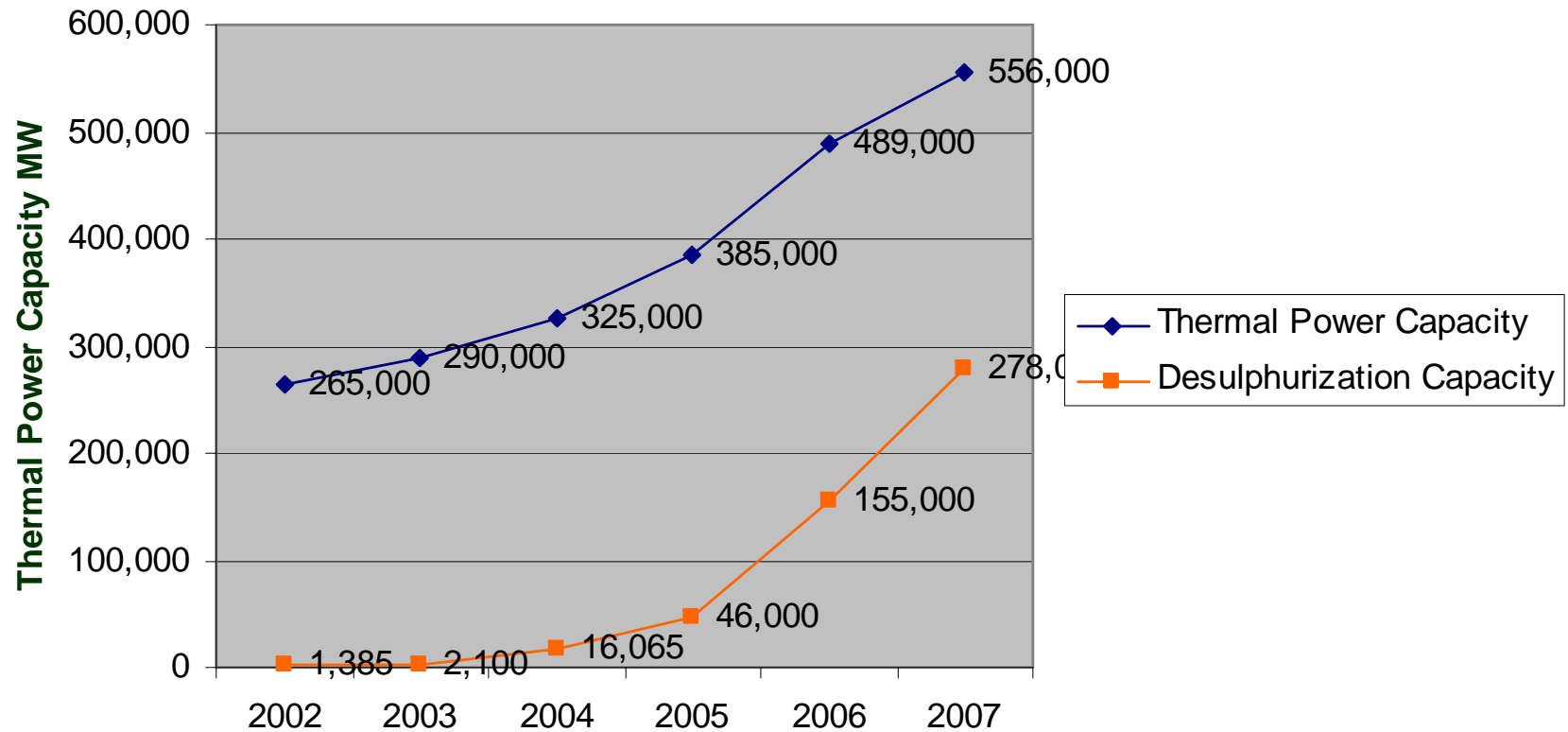
■ 电力

- 核电
- 风能
- 太阳能
- IGCC/CCS
- 生物质能
- 垃圾发电
- CPH-混合动力与热能
- 智能电网

■ 例子

- 中国电谷-保定
- 绿色基因与零排放
- 金风公司
- 尚德公司

Desulphurization in Thermal Power Plants (Gap is Rapidly Closing)



GPD roughly doubled from 2002 – 2007.

Thermal Power Capacity per GDP is approximately constant.

2. Road Transportation 道路交通

- *Advanced fuel efficiency measures in internal combustion engines*
- *Hybrid and electric vehicles*
 - *Development of battery storage technology*
 - *Cellulosic ethanol*

Examples

- ✓ Novozymes – cellulosic ethanol- search for suitable enzymes
- ✓ BYD – battery technology

- 在内燃机上的先进燃料技术
- 混合动力和电动汽车

- 例子
- 诺维信的例子
- BYD 的电池技术

Emission Intensive Industries

高强度排放的产业

- *Steel making*
- *Chemicals production*
- *Cement manufacturing*
- *Coal mining*
- *Waste Management*

Examples

- ✓ Power generation from waste
- ✓ Use of blast furnace slag in cement manufacture
- ✓ Green chemistry
- ✓ Electric Arc Furnaces
- ✓ Coal bed methane

- 钢铁
- 化工
- 水泥
- 煤碳

- 例子
- 垃圾发电
- 高炉矿渣的例子
- 绿色化学
- 电弧炉
- 煤层气

Buildings and Appliances

建筑应用

- Building codes
- Passive design
- Heating & cooling monitoring and controls
- Efficient
- LED's
- District heating

- 建筑材料
- 被动设计
- 冷热系统
- 效率
- LED
- 社区供热

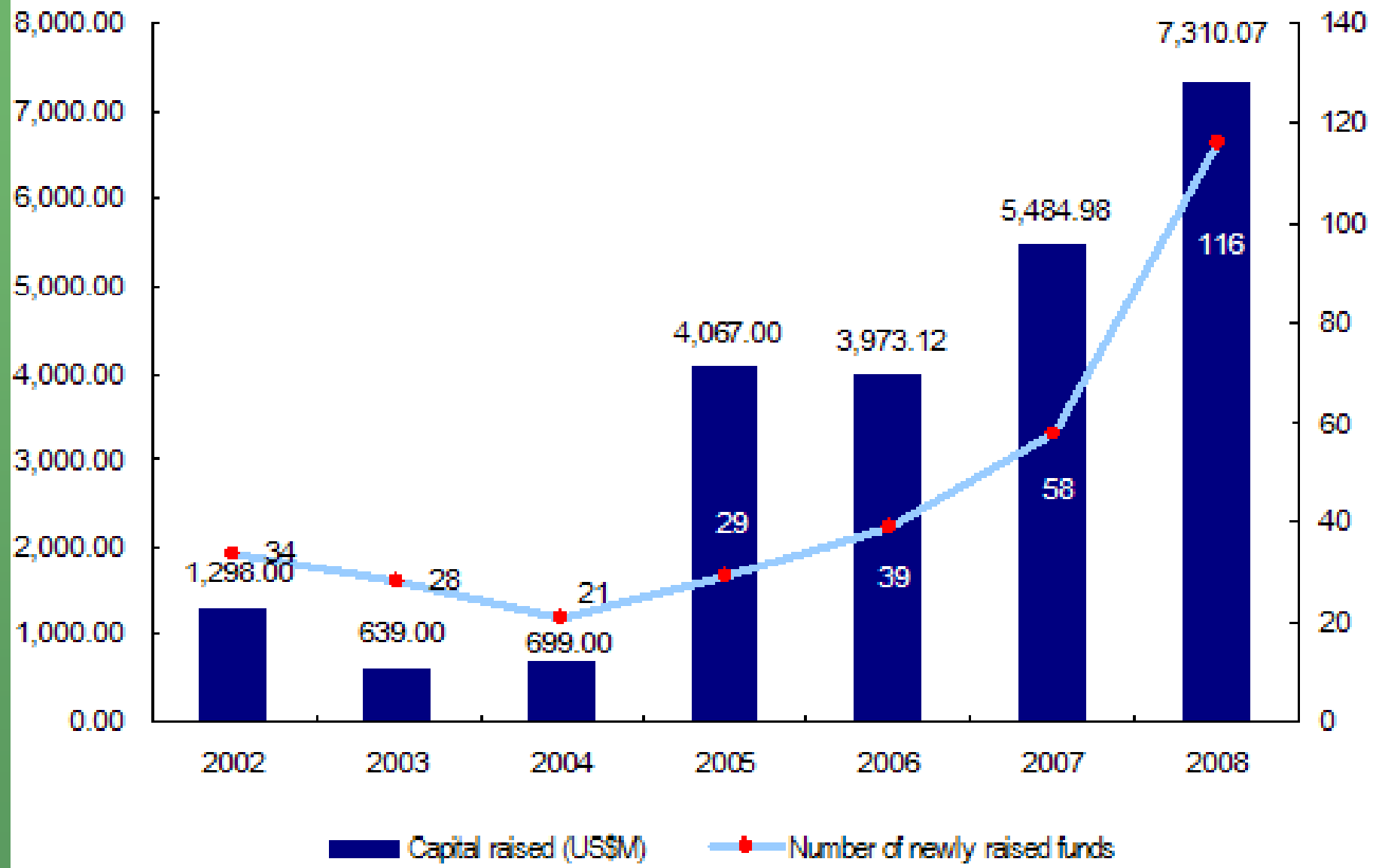
Agriculture and Forests

农业与林业

- Grassland management
- Forestation
- Livestock management
- Rehabilitation

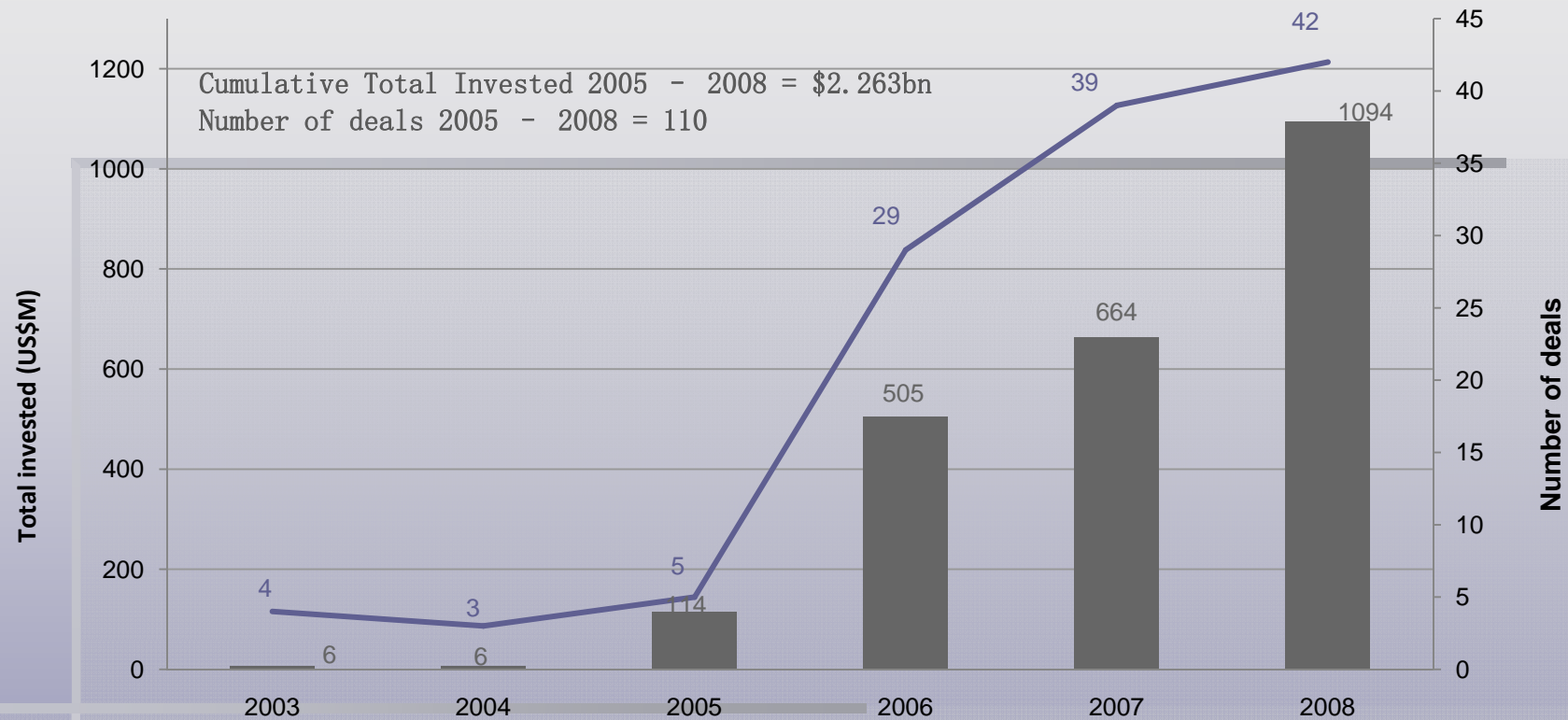
- 草地管理
- 森林化
- 动物管理
- 康复

Chart 1 Capital Raising by VC Institutions between 2002 and 2008



Data Source: Zero2IPO Research Center

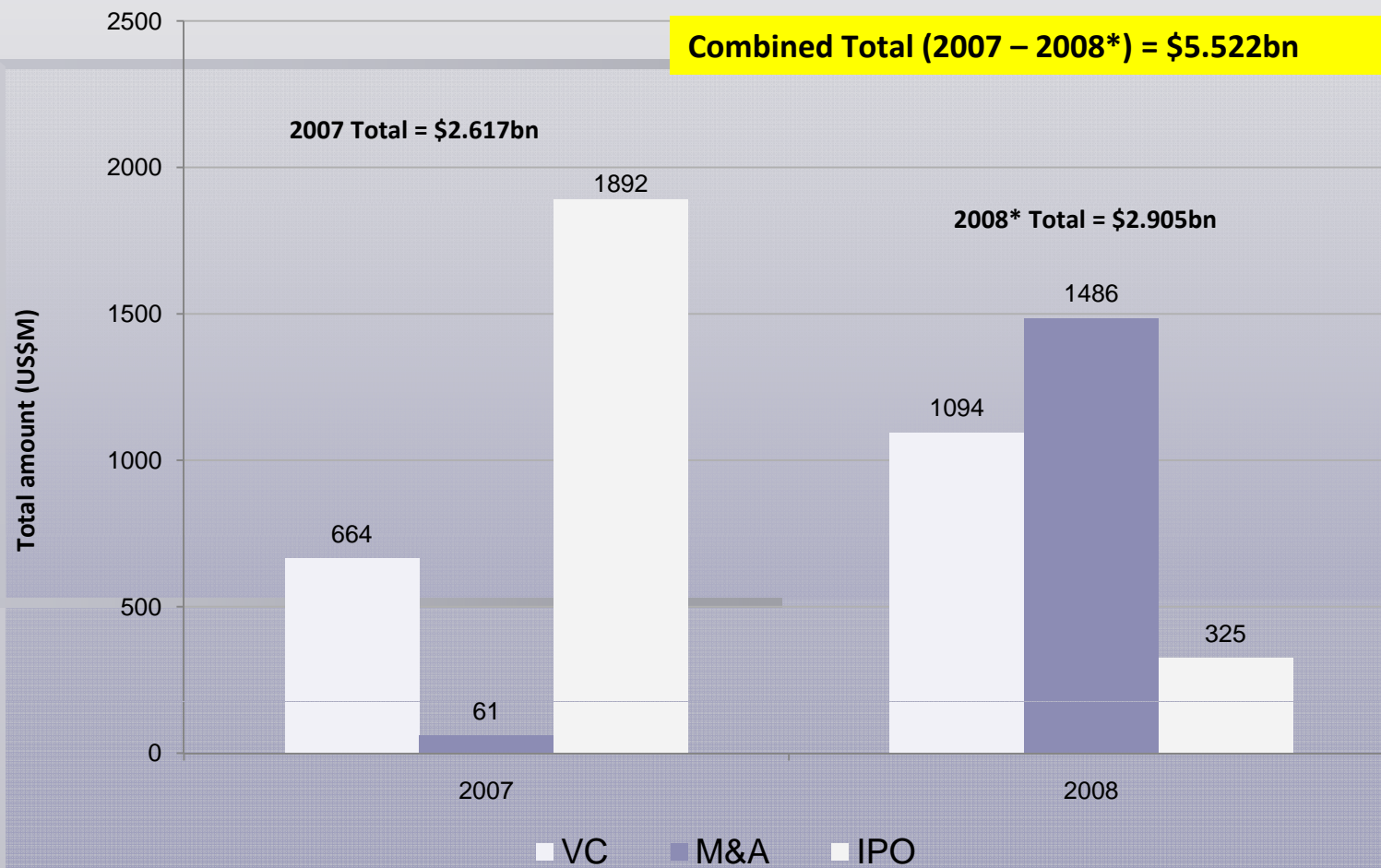
Cleantech VC Investments in China 2003-2008



- Cleantech represents 10% of total Chinese VC by number deals done, and 22% by total value
- Percentage invested in early stage financing increased from 45% in 2007 to 65% in 2008
- China's overall global share of cleantech VC investment is approximately 8%

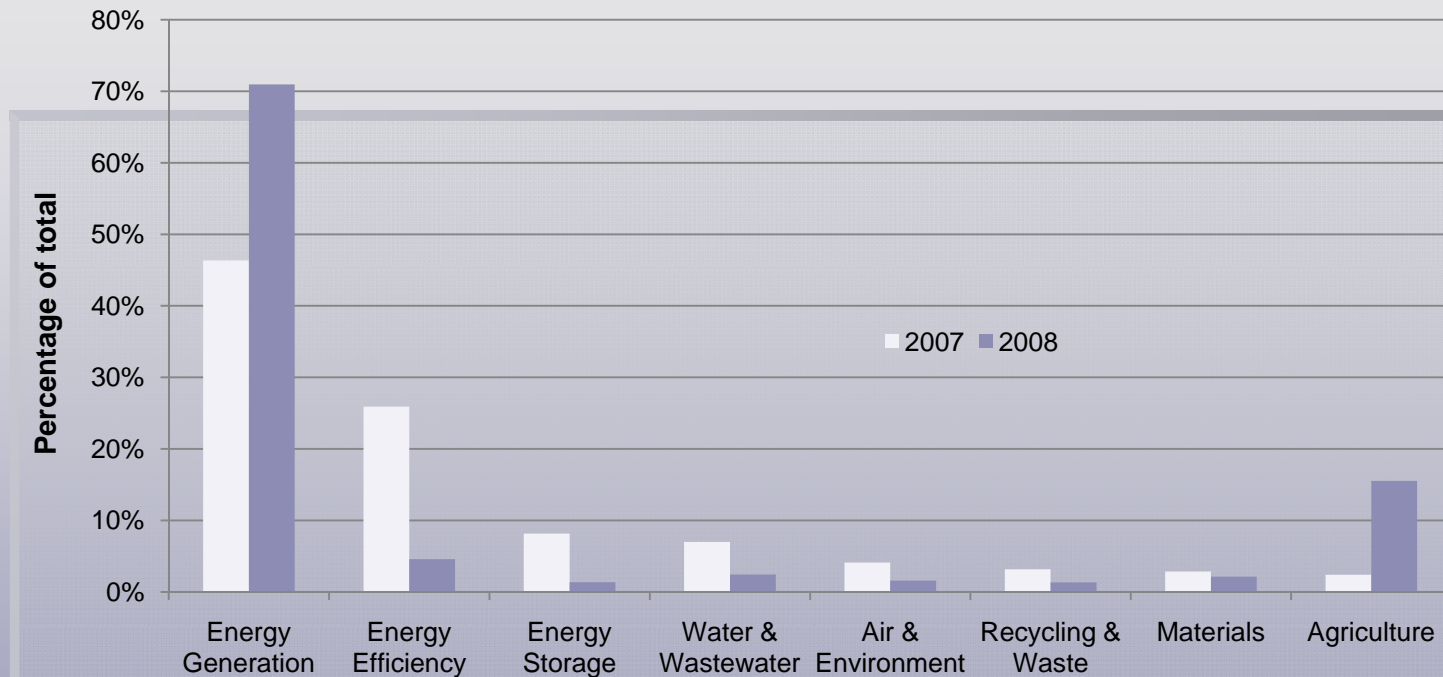
Source: Cleantech Group & China Ventures

'Innovation Financing' in Chinese cleantech 2007 - 2008



Source: Cleantech Group & China Ventures

China VC Investment by Industry Segment 2007 – 2008



- Significant increase in percentage invested in Energy Generation (up from 46% to 71%) and Agriculture (up from 2% to 16%)
- Decreases in all other sectors, particularly Energy Efficiency (down from 26% to 5%)

Source: Cleantech Group & China Ventures

Regulations are the key to innovation

我们的出发点:规制的建立是创新的关键

- Without strong, clear, stable and uniformly enforced regulations and standards, there is no market and hence no incentive for investment in development and wide deployment of innovative environmental technologies.

- 没有一个强有力的、清晰和可执行的标准，就不会有与环境技术开发与应用相关的市场及投资。

Regulation & Standards 规制与标准

- Many new regulations and standards moving to international levels
 - Inadequate enforcement of many laws and regulations does not create market
 - Full, open third party reporting on meeting standards & regulations required
 - MEP to create national environment information system (NEIS) and related innovation
 - Transparency is a necessary condition.
- 要求许多标准和规制能够达到国际水平
 - 许多法律没有得到有效的实施
 - 要求开放、第三方的检测体系
 - 环保部要建立环境信息系统
 - 透明是必要的条件。

Public Involvement 公众参与

- Public involvement relates to the stage of development
- Community Organizations and NGO's are not active players
- Accessible Information needed
- 要与发展阶段相适应的公众参与
- 社区组织和非政府组织还不活跃
- 要有获得信息的渠道

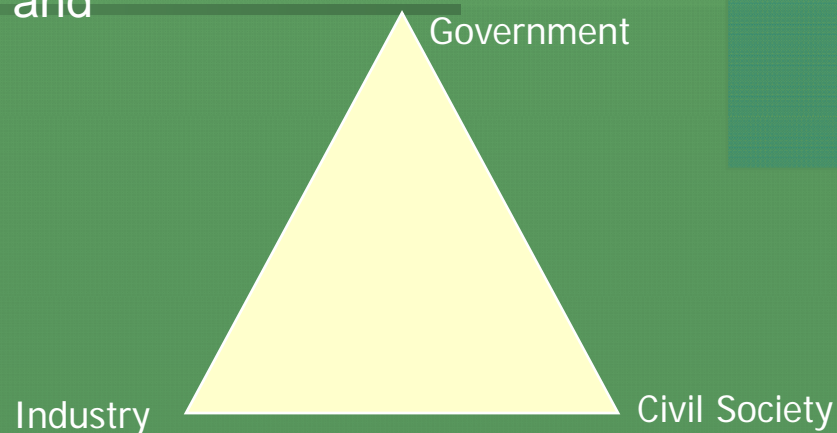
Public Participation

公众参与

- By creating public reporting and opinion channels, the public will have the opportunity to actively and directly participate in the protection of their local environment.
- The Chinese education system needs to focus more on creativity and less on textbook learning.

通过建立向公众报告和媒体的渠道，使公众可以直接地参与当地环境保护和创新的过程

完善中国的教育系统，更注重创造性的教育，减少书本知识的学习



- China has both the capacity and the need to become a global leader in sustainable development and innovation in environmental technology.
- 中国具有全球可持续发展和创新领先者的能力和必要
- I look forward to learning the views of various industries and the conditions that will stimulate

Green Development through Innovation

我期待着学习来自不同产业的观点，了解通过创新推进绿色发展的条件