



China Greentech Initiative™

China's Emergence as a Global Greentech Market Leader

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Agenda

Introduction to the China Greentech Initiative

 China's Emergence As a Global Greentech Market Leader

 Implications For Foreign Companies

 China Greentech Sector Market Opportunities

 Question and Answer

The China Greentech Initiative combines leading organizations with strategic research to deliver value to our Partners

CGTI 2011 Partner Program –Value Proposition

Partners and Strategic Advisors

- **100+ of the world's leading** technology companies, entrepreneurs, investors, NGOs and policy advisors
- Represent a **cross section of the global community** (1/3rd China, 1/3rd North America, 1/3rd rest of world)
- Provide time, **expertise, introductions, resources,** brand and funding



On-Going
Market
Insights

Meaningful
Industry
Collaboration

Market Acceleration
and
Recognition

Strategic Research and Analysis

- **Dedicated strategic research team** of 20+ professionals
- Consolidate data from **wide range of sources** in Chinese, English and other languages
- Conduct **hundreds of focused interviews** with partners, advisors and industry experts
- Facilitate **18 in-person working sessions** (three per sector) to frame and prioritize issues, test preliminary insights and validate findings

A diverse range of world-class organizations collaborate together as part of the China Greentech Initiative platform

CGTI Partners and Advisors (as of June 2011)

Strategic Partner:



Major Partners:



General Partners:

Supporting Organizations and Advisors :



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Today's presentation summarizes insights from *The China Greentech Report 2011*

The China Greentech Report 2011



- Complements our first public deliverable *The China Greentech Report 2009* released at the World Economic Forum, the industry primer with 50,000 copies in use
- Explains China's emergence as a global greentech market leader
- Examines developments and trends across six greentech sectors
- Highlights 19 prioritized market opportunities
- Distributed electronically in China and globally at no cost to readers

The China Greentech Report 2011 covers six sectors and the segments of most interest to our Partners and Advisors

The China Greentech Report 2011 Market Map									
Sectors	Energy Supply			Resource Use			Other Markets		
	Cleaner conventional energy	Renewable energy	Electric power infrastructure	Green building	Cleaner transportation	Cleaner industry	Clean water	Waste management	Sustainable forestry and agriculture
Segments	Cleaner coal	Solar energy	Transmission	Optimized design	Cleaner road	Optimized design	Water extraction	Waste collection	Sustainable forest management
	Cleaner oil	Wind power	Distribution	Sustainable materials	Cleaner rail	Sustainable materials	Water treatment	Waste recycling	Sustainable land management
	Cleaner gas	Bioenergy	Energy storage	Energy efficiency	Cleaner air	Efficient processing	Water distribution	Energy recovery	Sustainable communities
	Nuclear power	Hydropower	Demand management	Water efficiency	Cleaner waterway		Water use	Waste treatment	Optimized crops
	Wave power	Supply flexibility					Wastewater treatment	Sustainable disposal	
	Geothermal energy								

Legend:

- Sectors covered in the Report
- Primary focus
- Secondary focus
- Limited or no focus

Source: China Greentech Initiative Analysis

Five themes illustrate the evolution of greentech markets in China and demonstrate China's emergence as a global greentech leader

China Greentech Markets – Five Themes

Astonishing Growth in China's Greentech Markets



- World leader in high-speed rail with 8,358 km operating at the end of 2010
- Nearly 2,200 wastewater plants built between 2005 and 2010

Urgent Needs Drive Greentech Growth



- Consumes nearly 10% of total daily world oil production
- Indoor and outdoor air pollution cause up to 1.3 million deaths per year

Continuing Urbanization and Growth of Eco-Cities



- 200 million urban residents in 1980, 622 million in 2010
- Urbanization rate under 50%, compared with over 80% in developed countries

Becoming a Player in International Energy and Environmental Issues



- China acquires oil assets in Nigeria, Iraq, Canada, Brazil and Argentina
- China building high-speed lines in Turkey, Venezuela, and Saudi Arabia

Seeking to Capture Domestic and Global Greentech Markets



- Six out of seven Strategic Emerging Industries (SEI) in the 12th FYP related to greentech
- Investment may reach RMB 10 trillion over next five years

China has become the largest and fastest growing greentech market in the world.

1 China's greentech markets have grown swiftly, driven by economic expansion and policy, and show no signs of slowing

China's Greentech Markets Are Set to Lead the World



- China has become the world's wind capacity leader, with almost 45 GW installed by 2010 (19 GW were installed in 2010 alone)



- China now manufactures over 50% of global solar crystalline silicon PV modules, of which 90% are exported



- State Grid released plans that it will invest RMB 384 billion to build a national "strong and smart" grid by 2020



- 8,358 km of high-speed rail were in operation at the end of 2010, making China the world leader in terms of operating mileage



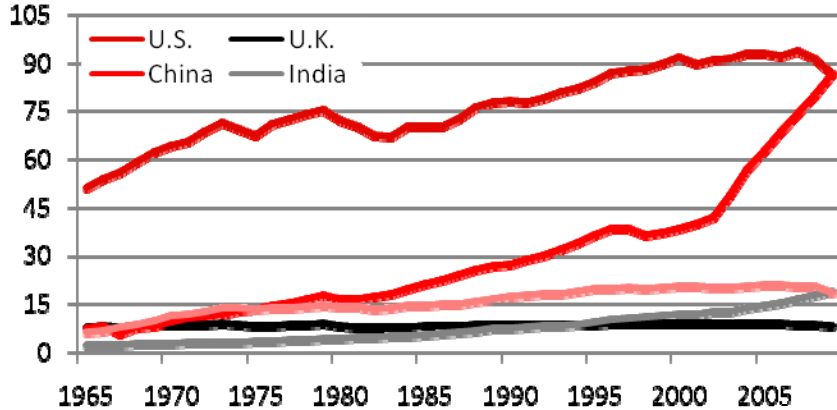
- China built nearly 2,200 wastewater plants between 2005 and 2010, and plans to build at least 2,000 more plants by 2012

***In 2010,
China
invested
\$54.4 billion
in clean
energy, more
than any
other country
in the world***

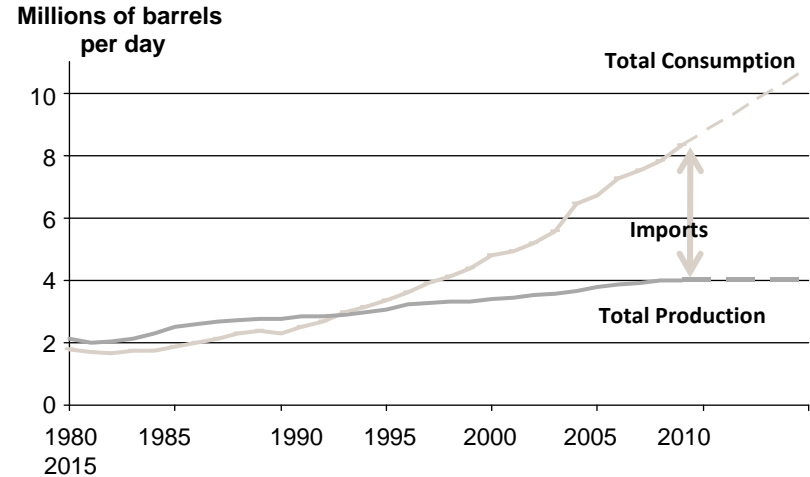
2 China's continuously increasing energy consumption and reliance on oil are pressing energy security issues

Energy Security Concerns Compel Action

Total Energy Consumption of Selected Countries, quadrillion BTUs, 1965-2010



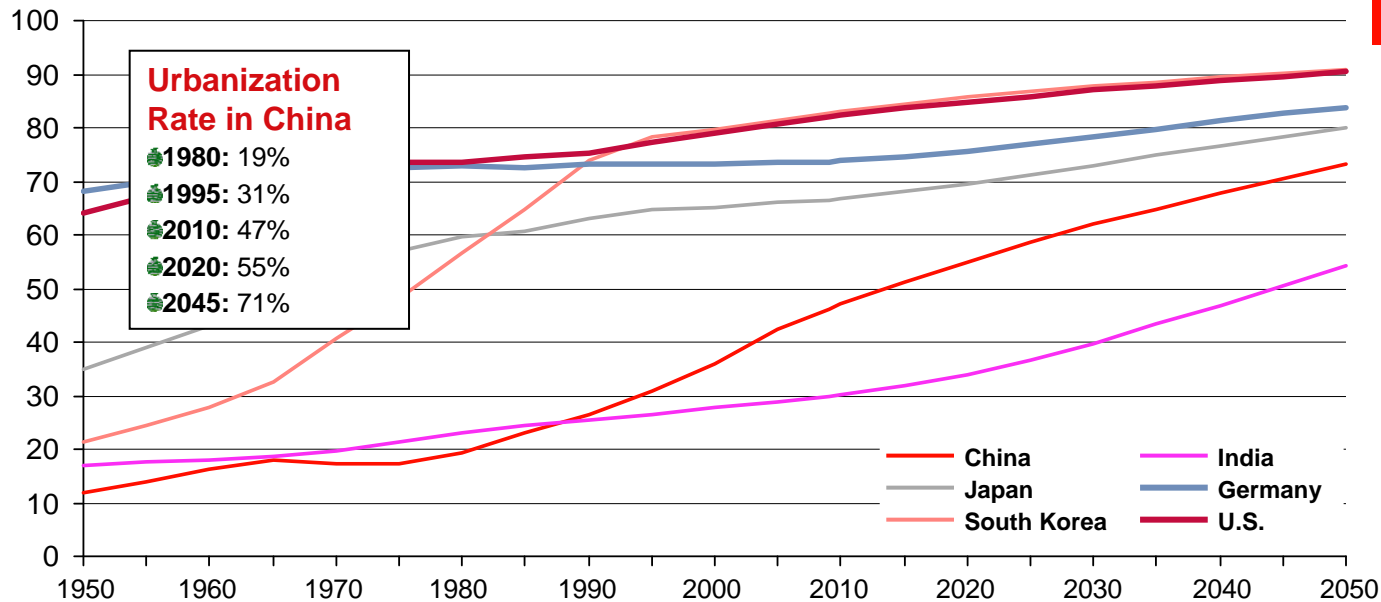
China's Growing Oil Imports, millions of barrels per day, 1980-2009, forecast to 2015



China is aggressively pursuing all avenues to diversify energy sources and reduce reliance on oil – from renewable energy to electric vehicles.

3 Urbanization in China is more than a trend—it is an immense social and ecological shift at a rate never before witnessed in human history

Urbanization Rates of Selected Countries, historical and forecast, percent, 1950-2050



In 2025

- Over 220 Chinese cities with over one million inhabitants
- Six more megacities with populations of over ten million will emerge (in addition to Beijing and Shanghai)
- Chinese cities will account for 95% of GDP (vs. 75% today)
- Urban China will account for 20% global energy consumption

Urban residents grew from 200 million in 1980 to 622 million today.

4 As China's energy demands and greentech policies have expanded, so has its role on the international stage

Becoming International Energy and Environmental Player



International Energy:

- **Sinopec acquisitions:** Addax Petroleum (US\$ 7.2 billion), Synacrude Canada (US\$4.7 billion), Bensol Brazil (\$US 7.1 billion), Occidental Petroleum Argentina (\$2.5 billion)
- **CNOOC acquisitions:** Bidas Energy (US\$ 3.1 billion), Chesapeake Energy shale oil and gas assets (US\$ 1.3 billion)
- **PetroChina:** Encana shale gas JV (\$US 5.4 billion)



Environmental Issues:

- **China surpassed the U.S. in carbon emissions in 2010**, becoming the world's largest emitter
- **2009 commitment:** 40-45% carbon intensity reduction by 2020 (based on 2005 levels)
- **2011 commitment:** 12th Five-Year Plan carbon intensity reduction of 17% by 2015 (based on 2010 levels)



5 China's 12th Five-Year Plan includes seven Strategic Emerging Industries (SEI), six which are related to greentech

Strategic Emerging Industries Related to Greentech

Energy Saving and Environment Protection	Energy saving equipment, ESCOs, recycling
New Energy	Renewable energies, nuclear, clean coal
New-Energy Vehicles	EV, PHEV, energy-efficient vehicles, advanced batteries
New Materials	LED lighting, building materials
High-end equipment manufacturing	High-speed railway equipment
Next Generation IT	Smart grid, smart metering
Biotechnology	Not applicable (bio-energy in new energy)



Investment is estimated to be as high as RMB 10 trillion over the next five years – though no plans are confirmed or in place

5% of GDP in 2010

8% of GDP by 2015

15% of GDP by 2020

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- 🌱 Implications For Foreign Companies**
- 🌱 China Greentech Sector Market Opportunities
- 🌱 Question and Answer

CGTI developed ten recommendations for foreign companies expanding into China's rapidly growing greentech markets

Ten Strategic Recommendations for Foreign Companies

Localize China Management and Decision-Making

Increase Revenues and Lower Costs

Strengthen and Diversify Relationships

Create Products and Solutions for China and Emerging Markets







- 1** Go “almost local” to speed up decision-making, lower costs, increase flexibility and attract top talent
- 2** Diversify business models to increase revenues and capture new market opportunities
- 3** Offer customized solutions to satisfy customer needs, while also reducing price competition and IP risks
- 4** Lower operations cost structure to compete more effectively in China and global markets
- 5** Partner with other foreign companies to penetrate markets and pursue area of common interest
- 6** Collaborate with government and industry to shape new market opportunities
- 7** Develop unconventional approaches to expand and strengthen government relationships
- 8** Recognize technology transfer and intellectual property risks and manage them aggressively
- 9** Invest in R&D in China to improve market access and enhance global innovation capabilities
- 10** Use China as a test bed for innovative ideas and pilot deployments

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***The China Greentech Report 2011* highlights market developments and opportunities across six greentech sectors**

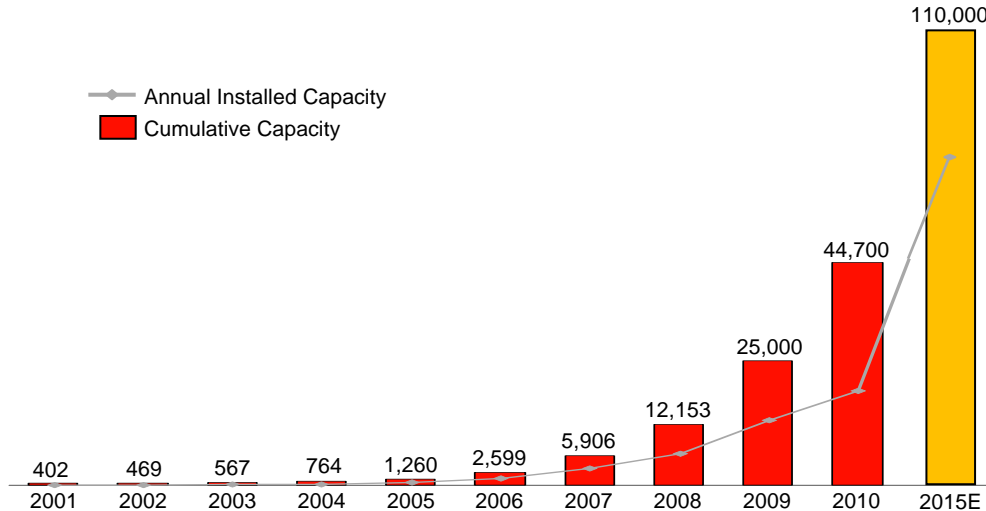
Greentech Sector Opportunities

Cleaner Conventional Energy	Renewable Energy	Electric Power Infrastructure	Green Building	Cleaner Transportation	Clean Water
					
<p>China shut down over 1,300 small-scale coal mines in the first nine months of 2010</p>	<p>Highest capacities of hydro and wind power, solar water heaters and small-scale biogas of any country</p>	<p>State Grid plans to invest RMB 3.45 trillion (US\$ 530 billion) to build a smart grid by 2020</p>	<p>Green building floor space has doubled each year since 2005 to over 7.3 million square meters in 2010</p>	<p>China's government aims to have 5 million EVs on the road by 2020</p>	<p>RMB 4 trillion (US\$ 615 billion) infrastructure investment for water supply between 2010-20</p>

China has rapidly emerged as the world's wind capacity leader; wind power capacity will continue to grow, but at a slower rate

Renewable Energy Sector – Wind

China's Wind Power Capacity Growth, MW, 2001-2015



Developments and Opportunities

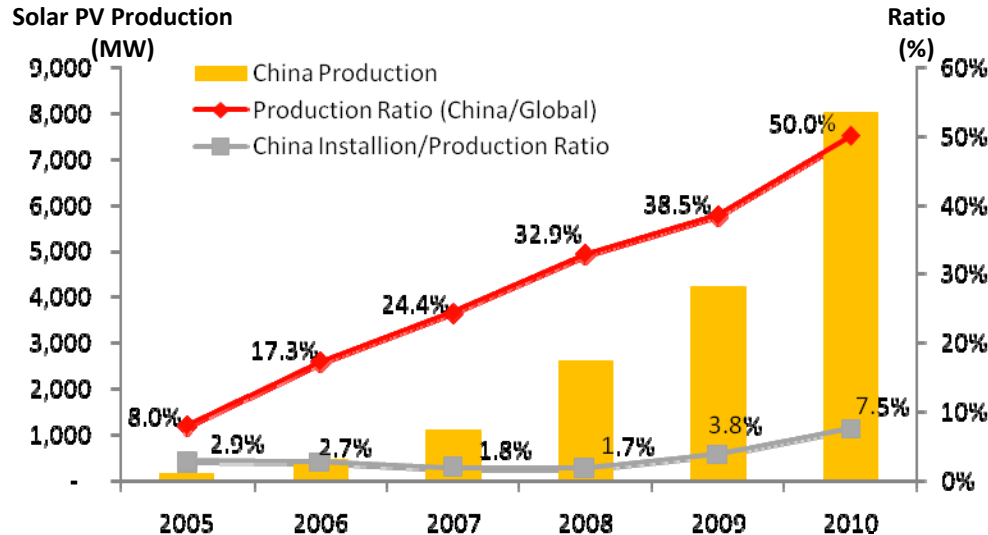
- 🌿 **Market is dominated by Chinese players**
 - SOEs developed 90% of all onshore wind power projects
 - Over 80% of wind power technology was sourced from private domestic producers
- 🌿 **China's wind market heads to sea**
 - China's offshore wind market is poised for takeoff through policy support
 - Offshore wind is more expensive and the market represents a paradox for investors
- 🌿 **Five-year market growth remains brisk**
 - Capacity will nearly triple in next five years
 - Will likely exceed 2015 target (110 GW)
 - Rapid growth of offshore wind power capacity expected

Currently, Chinese wind companies are primarily focused on the domestic market, but this will likely change in the coming three to five years.

Solar will experience rapid growth in the coming years due to government support, lower costs and expanding markets

Renewable Energy Sector – Solar

China's Solar Power Capacity Growth, MW, 2001-2010



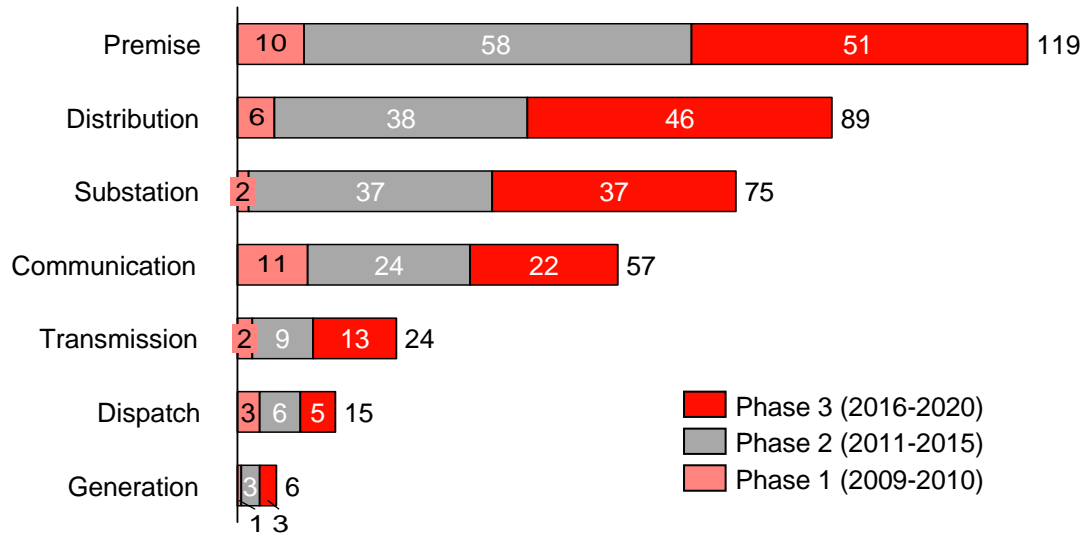
Developments and Opportunities

- 🌱 **Leading PV manufacturers globally**
 - More than 50% of 2010 global PV panel production was based in China
 - Five of top ten global solar PV cell and panel producers are Chinese
 - Continued cost reductions, Japan nuclear crisis, and emerging US demand will benefit Chinese PV manufacturers
- 🌱 **Domestic solar market expansion**
 - Plans to boost solar power capacity 50-fold by 2020 to nearly 50 GW
 - Initiated subsidy programs (*Golden Sun* and *Solar Roofs*) along with two major concession rounds

State Grid plans to invest RMB 384 billion for a “strong and smart grid” ensures China’s market will be one of the world’s largest

Electric Power Infrastructure – Smart Grid Investment

State Grid’s Smart Grid Investment, billions RMB, 2009-2020
(RMB 384 billion total)



Developments and Opportunities

China’s grid challenges

- China’s electricity demand soared 110% from 2000-09
- Over 80% of coal and hydro resources in remote regions
- Connectivity of wind and solar power to the grid

Smart grid opportunities

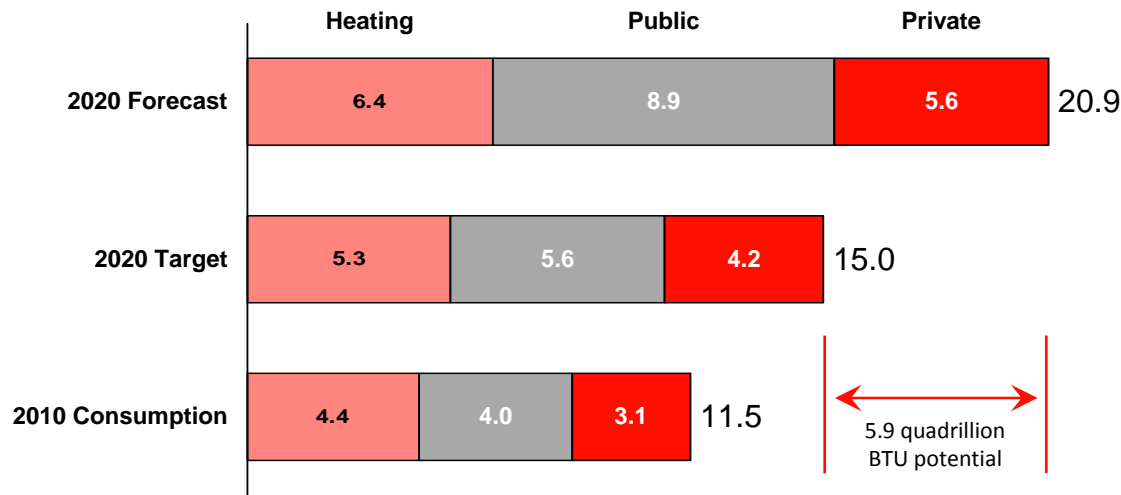
- Smart Grid plan could abate 1.65 billion mtce per year, equivalent to Russia’s total 2009 emissions
- Improved line loss, dispatch management and connectivity of wind energy sources

Distribution and consumption are relatively attractive for foreign solution providers.

China has set aggressive targets for energy consumption for district heating, public buildings and private buildings

Green Building Sector Opportunities

China's Building Energy Consumption Forecast and Target, quadrillion BTUs, 2010 and 2020



Opportunities

Green Building opportunities

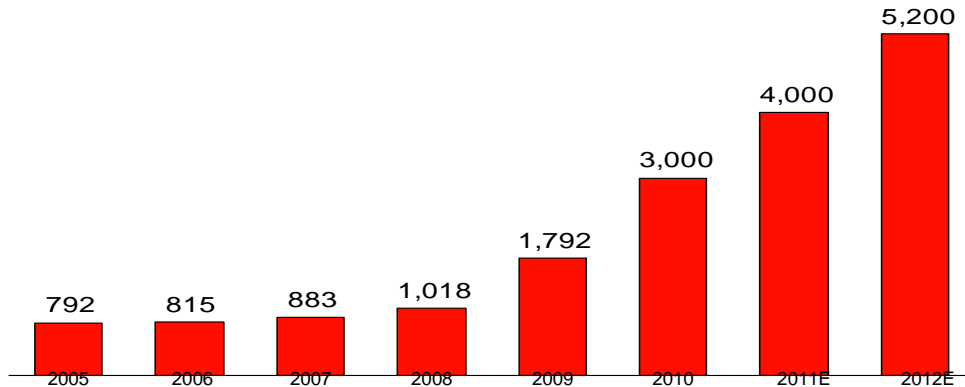
- LEED and 3-Star green building development
- Building energy efficiency retrofits – especially public buildings, hotels, supermarkets and malls
- Participation in government-mandated district heating and government building initiatives
- ESCO business model expansion
- Green building material supply chain improvements

Green Building is arguably the most open, market-driven sector of all six greentech sectors covered by the China Greentech Initiative.

China has made substantial progress on clean water, but many issues remain

Clean Water Sector Major Market Developments and Trends

China's Municipal Wastewater Treatment Plants
number of plants, 2005-2012



Developments and Opportunities

- 🌱 **Serious drought and pollution**
 - Droughts in Southwest and other regions highlights acute water supply problems and related economic risks
 - 12th FYP focused on controlling phosphorous, nitrogen, heavy metals and ammonia nitrogen pollution
- 🌱 **Opportunities in water supply, wastewater treatment, greywater and point of use products**

About 2,000 new municipal wastewater plants will be built during the next three years, primarily in smaller, lower-tier cities.

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Question & Answer

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