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**中国环境与发展国际合作委员会**  
CHINA COUNCIL FOR INTERNATIONAL COOPERATION  
ON ENVIRONMENT AND DEVELOPMENT

# China's Low Carbon Industrialization Strategy

## Final Report

China's Low Carbon Industrialization Strategy Task Force

2011 AGM  
11.15 - 17

# 1. Two new trends of industrial development in the world after the financial crisis

## 1. The resurgence of manufacturing

The manufacturing sector is perceived to be critical to long-term prosperity, growth and competitiveness while governments of developed countries seek to stimulate economic recovery. There is therefore a renewed focus on the role of governments . Many developed countries have bolstered their industrial policies and are pursuing more interventionist strategies .

US launched A Strategy for American Innovation: Driving Towards Sustainable Growth and Quality Jobs in September 2009

The EU adopted Europe 2020: A strategy for smart, sustainable and inclusive growth in June 2010

Japan announced details of its New growth strategy by 2020 in June 2010

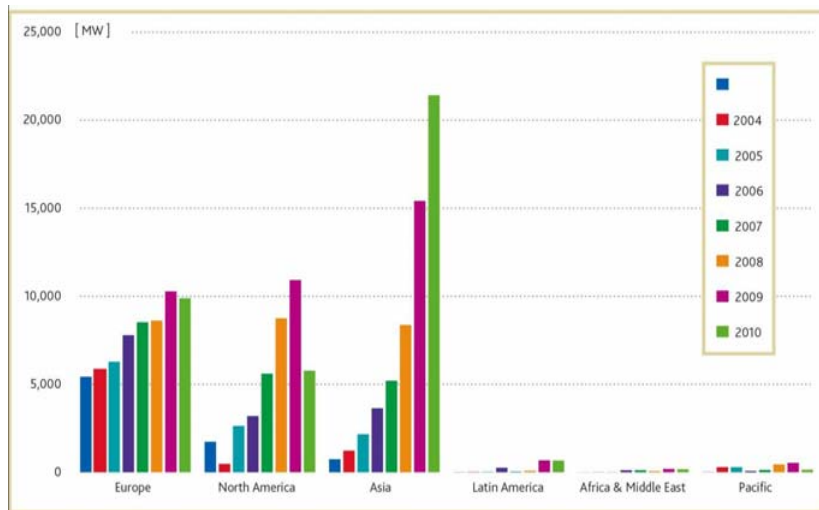
Emerging economies have maintained and accelerated support for manufacturing during the global economic downturn. Brazil's development bank BNDES financed 40% of investment in infrastructure and manufacturing in the country in 2009. South Africa launched a revised Industrial Policy Framework Action Plan in February 2010.

A study by Deloitte and the US Council on Competitiveness pointed to what it described as a 'new world order for manufacturing competitiveness' in less than a decade, along with a tectonic shift in regional manufacturing competence.

# 1. Two new trends of industrial development in the world after the financial crisis (cont.)

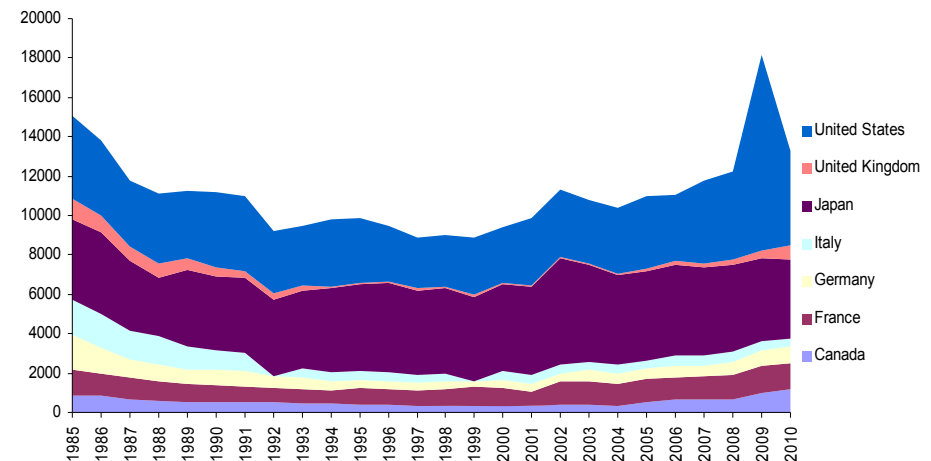
## 2. Green and low carbon transformation

✓ increase investment in the research and development of renewable energies



**Growth in Global Wind Power By Region** □ MW □

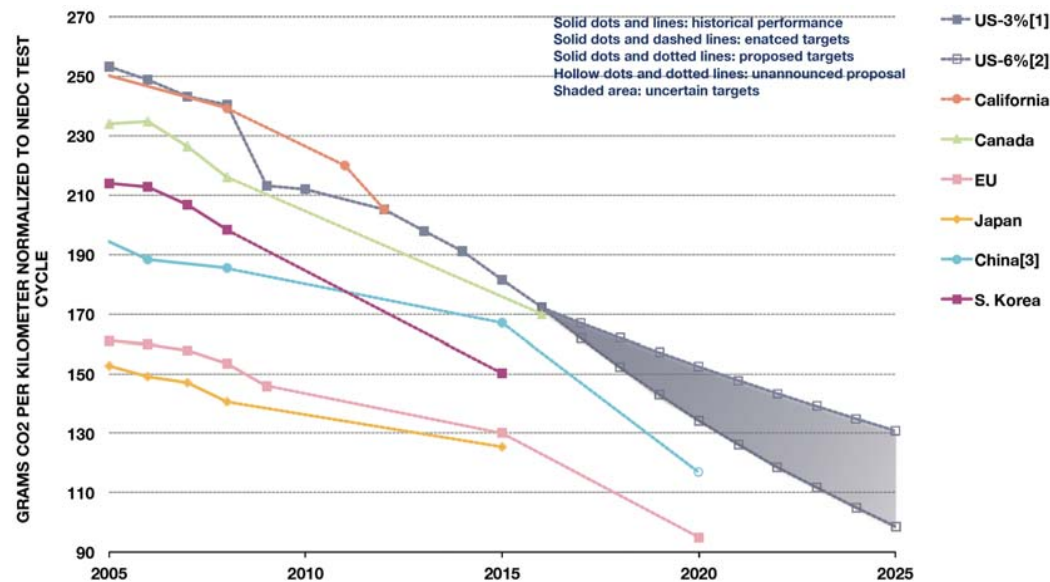
**Public R&D investment in areas related to energy in G-7 , 1985-2010 (million U.S. dollar ,2010)**



# 1. Two new trends of industrial development in the world after the financial crisis

- ✓ dramatically improve energy efficiency of industrial equipment and products

For example: In the EU, an ambitious compromise deal was agreed in December 2008. This will gradually limit CO<sub>2</sub> emissions to 120 g/km for 65% of new cars in 2012, 75% in 2013, 80% in 2014 and 100% in 2015 (2004, 161g/km). Japan is now in the process of determining a standard for passenger car fuel economy



[1] Based on 3% annual fleet GHG emissions reduction between 2017 and 2025 in the September 30th NOI.  
[2] Based on 6% annual fleet GHG emissions reduction between 2017 and 2025 in the September 30th NOI.  
[3] China's target reflects gasoline fleet scenario. If including other fuel types, the target will be lower.

**Evolution in vehicle emissions standards (ICCT)**

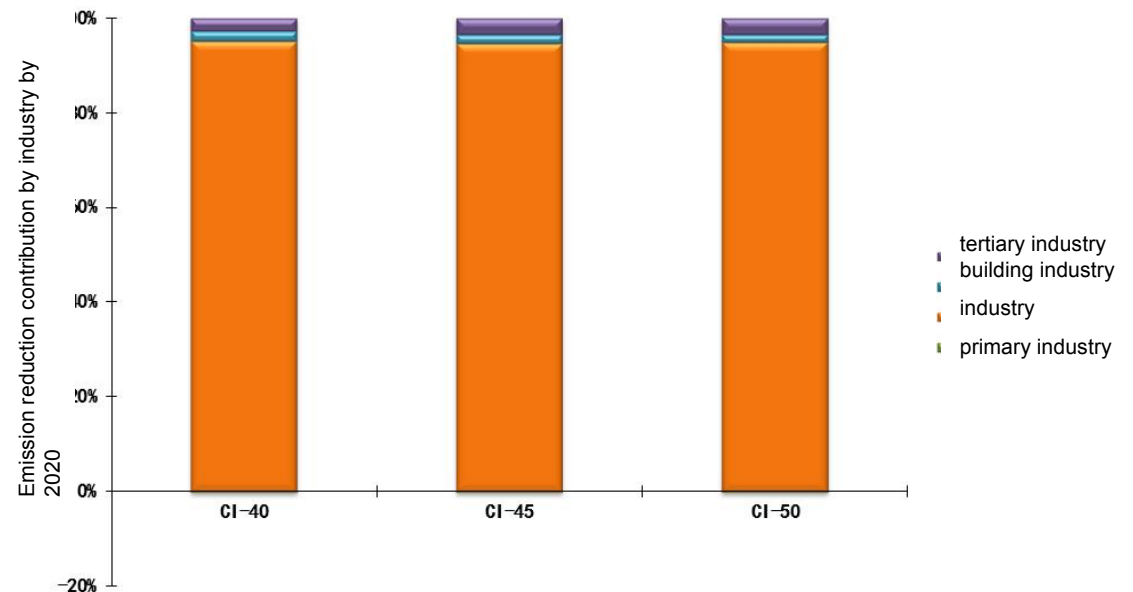


## 2. The necessities and existing foundations of China's low carbon industrialization

### 1. The necessities

- ✓ conform to trend of international development and occupy vantage point in the new round of economy transformation worldwide
- ✓ facilitate to solve resource and environment problems existing in China at present
- ✓ play a decisive and core role in China's development of low carbon economy strategy

**Contribution of emission reduction in industry to carbon emission reduction by 2020 accounts for over 90% of the total.**



Contribution of industry to 40-45% reduction targets of carbon intensity by 2020

## 2. The necessities and existing foundations of China's low carbon industrialization (cont.)

### 2. Existing foundations

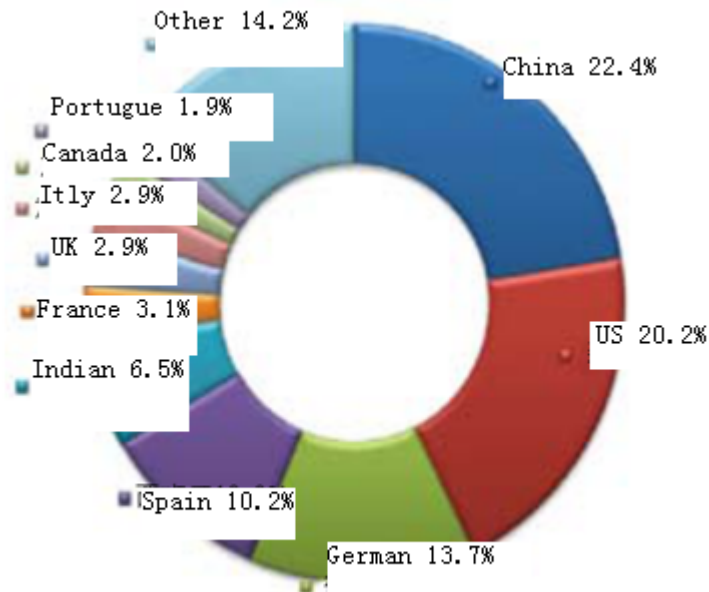
✓China is in the medium term of industrialization. China's Secondary Industry accounted for 46.9% of the total GDP in 2010, ( of which industry covered 40.2% and construction 6.7%) . In 2007, that number was 22.4% in USA; 30.1% in Japan and Germany; 29% in India and 28.0% world average .

✓Heavy chemical industry took the leading role. The proportion of heavy industry in industry was 70%. China was the world's biggest production and consumption nation of high-energy consumption products. In 2009, China's production of steel, cement, plate glass, architectural ceramics, chemical fertilizer, chemical fibers and auto took up 47%, 60%, 50%, 65%, 35%, 57% and 25% respectively.

✓Imbalance of China's technologic development exists in industry. Remarkable progress was made in China's industry energy-conservation during "Eleventh Five-Year Plan" period. Over 70% of the "Eleventh Five-Year Plan" energy conservation target was realized by technological energy-conservation in industry. The energy efficiency of some leading enterprises in such industries as thermal power, concrete and electrolytic aluminium has reached world advanced level. Small enterprises account for a large proportion in China's high energy-consuming industries, calculating in production. Many of the small enterprises consume energy 30%-60% more than large ones per unit of products.

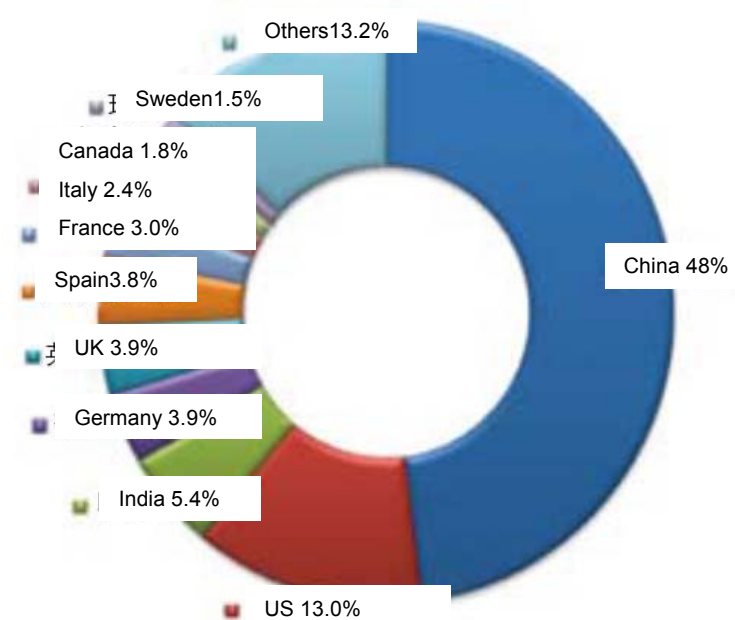
## 2. The necessities and existing foundations of China's low carbon industrialization (cont.)

✓ China leads in the industrialization and deployment of renewable energies worldwide. China's installed capacity of wind power, newly installed capacity of wind power and photovoltaic cell output rank NO.1 in the world in 2010.



资料来源: BTM Consult Aps—A part of Navigant Consulting, World Market Update 2010

composition of installed capacity of wind power worldwide in 2010



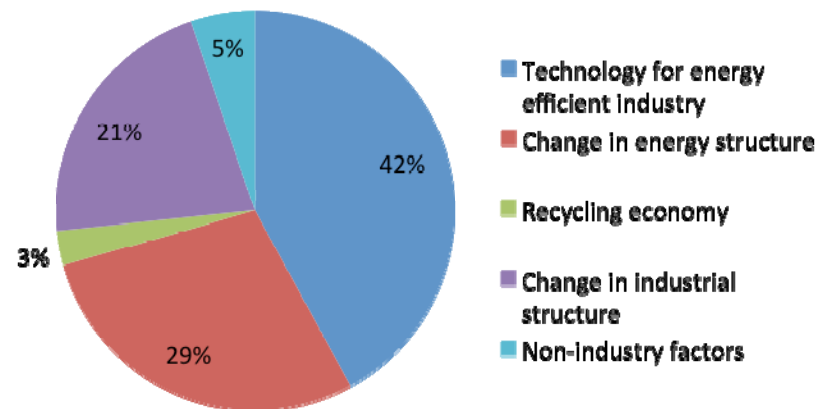
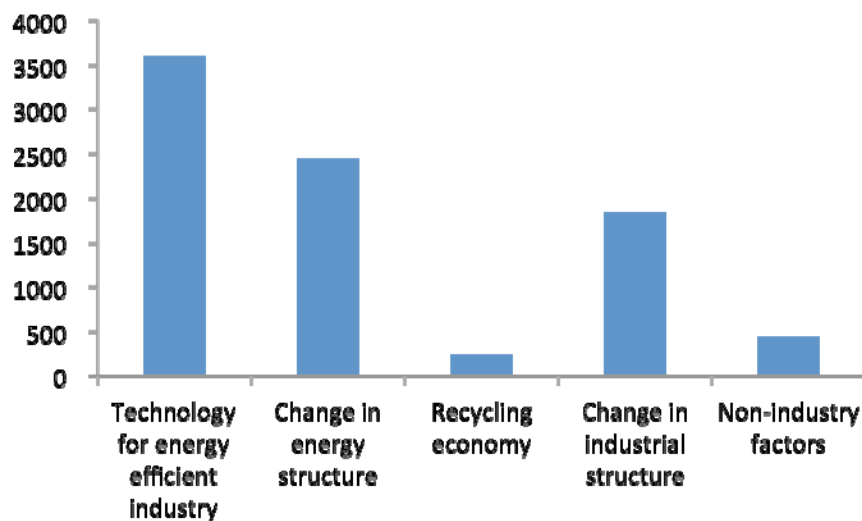
composition of newly installed capacity of wind power worldwide in 2010



# 3. Tasks and paths to realize the low carbon industrialization in China

## 1. Overall tasks and paths

According to the Research Group, the total emission reduction in industry is 8.112 billion tons of CO<sub>2</sub> in order to realize the national emission reduction target by 2020. Substantial progress should be made in increasing industry energy efficiency, improving energy structure, developing circular economy and adjusting industrial structure with the contribution being 42%□29%□3%□21% respectively.



Potential in emission reduction of different paths for emission reduction

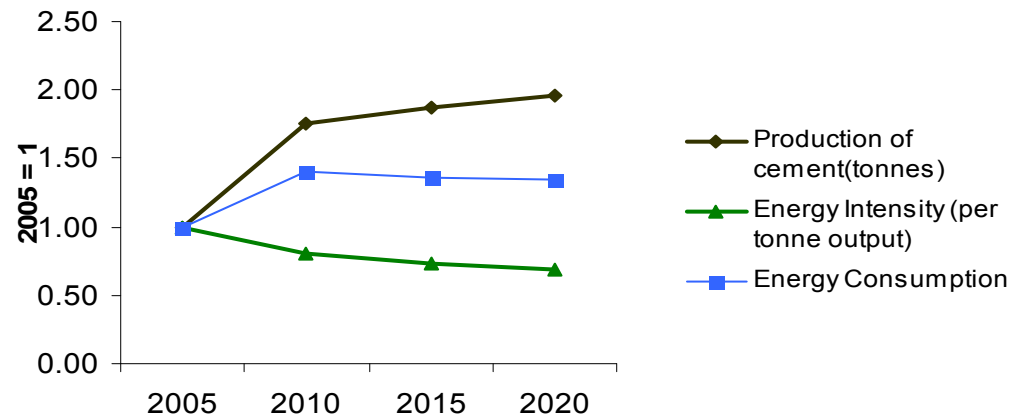
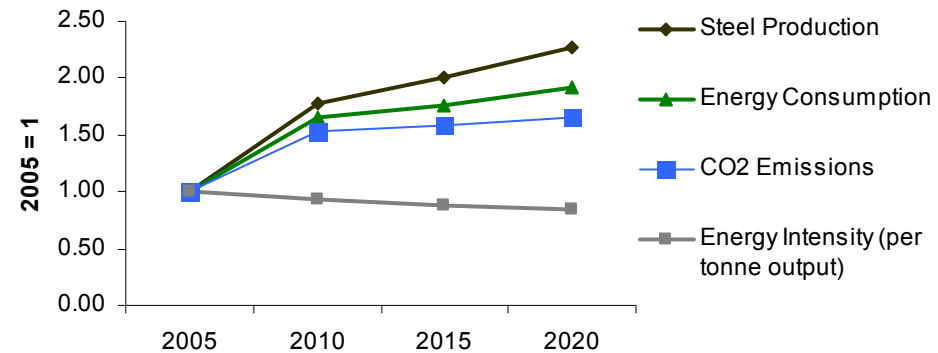
Contribution of different paths for emission reduction

To be specific, firstly, to vigorously enhance energy efficiency in traditional heavy chemical industries such as steel, non-ferrous metal, chemical industry and building materials and to reduce emission intensity; secondly, to strive to develop strategic new industries such as new energy, energy saving and environmental protection and new energy industries.

### 3. Tasks and paths to realize the low carbon industrialization in China (cont.)

2. It's crucial to improve energy efficiency in heavy chemical industries in the short term

According to the evaluation, if we reduce energy consumption in the heavy chemical industries by raising the technical level and strengthening management while maintaining the same energy consumption per unit of product, 3.6 billion tons of CO2 will be avoided by 2020.

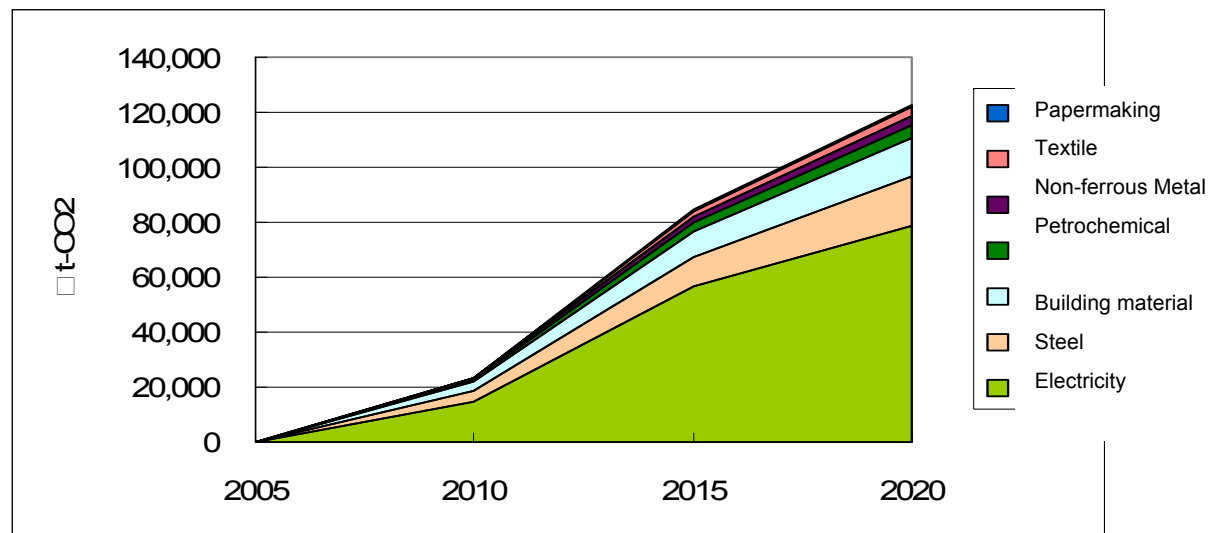


Forecast for change in steel and cement production, energy intensity, CO2 emission and energy consumption

### 3. Tasks and paths to realize the low carbon industrialization in China (cont.)

Research Group chose 79 kinds of key technologies, which involve industries including electricity (18), steel (11), building material (15), chemical industry (17), non-ferrous metal (9), textile (5), paper-making (4).

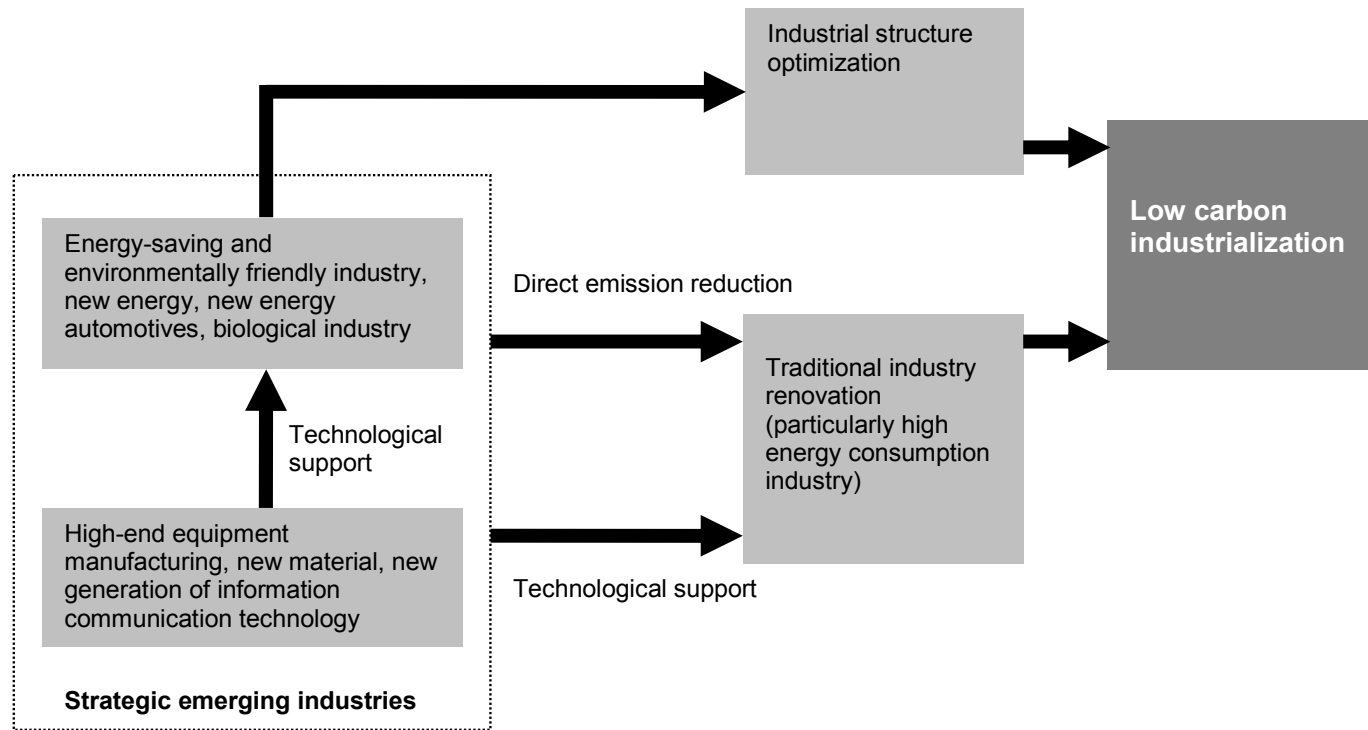
1.22 billion tons of CO<sub>2</sub> will be avoided if evaluation on the performance of their application is made.



The potentiality of the promotion and application of 79 kinds of crucial industrial energy conservation technologies in CO<sub>2</sub> emission reduction. (2006-2020)

### 3. Tasks and paths to realize the low carbon industrialization in China (cont.)

3. the development of strategic emerging industries ——catalyst for low carbon transformation



**Impact of the Development of Strategic Emerging Industries on Low-carbon Industrialization**

### 3. Tasks and paths to realize the low carbon industrialization in China (cont.)

#### Impact on Emission Reduction of Development of Strategic Emerging Industries

	Emission Reduction Effect (CO <sub>2</sub> )		Mode of Action
	2015	2020	
Energy Saving and Environmental Protection	818 million tons	1.912 billion tons	Direct Effect
New Energy	1.15 billion tons	1.771 billion tons	Direct Effect
New Energy Automotive		300 million tons	to reduce industrial emission by reducing emission from material flow and personnel flow
Biological Industry	can replace oil and serve as an industrial material		Direct Effect
Information Communication Industry	615 million tons of emission will be reduced by 2020 and the ratio of direct emission reduction to indirection emission reduction is 1:5		the ratio of direct emission reduction to indirection emission reduction is 1:5
New Material	Will have an important impact on resources saving, environmental treatment and material recycling and reutilization		Indirect Effect
High-end Manufacturing Industry			

*Note: Due to the crossover and differentiation in comparison benchmark in the above emission reduction effect, the results cannot be directly overlapped or used to compare with the results of the model analysis.*



## 4. Policies and measures

### 1 □ establish energy intensity reduction target in the major heavy chemical industries

the potentiality of major high energy consumption products in energy consumption reduction according to the analysis of Research Group

		product energy consumption in 2005	decrease by 2015	decrease by 2020
<b>Electricity industry</b>				
Thermal efficiency of power generation (gce/kWh)	370		13.5%	16.2%
<b>Steel industry</b>				
Crude steel kgce/t	741		12.3%	15.3%
<b>Petrochemical industry</b>				
Ethylene kgce/t	1081		11.5%	14.5%
Synthesis ammonia kgce/t	1774		12%	17%
Soda ash kgce/t	1351		20.9%	25.7%
Caustic soda kgce/t	530		20.9%	25.7%
Calcium carbide kgce/t	2095		15.5%	19.5%
<b>Building/building material industry</b>				
Cement CO2/t kgce/t	149.2		27.3%	31.3%
<b>Nonferrous metal industry</b>				
Electrolytic aluminium kwh/t	14575		6.2%	15.2%
<b>Textile industry</b>				
Chemical fiber kgce/t			18.4%	23.3%
<b>Paper-making industry</b>				
Paper and board kgce/t	525		25.7%	31.4%

## 4. Policies and measures (cont.)

### 2 Vigorously develop strategic emerging industries combined with Green and Low carbon transition

- ✓ establish, release and implement the development plans for seven strategic emerging industries as soon as possible
- ✓ set up a special fund, integrate special funds used to promote industrial development, set up a strategic emerging industries development fund, so as to support research, development, experiment and application
- ✓ speed up the commercial application of strategic emerging industries by means of tax and finance
- ✓ encourage small and middle-sized enterprises and foreign-funded enterprises to enter

### 3 accelerate low carbon technological innovation

- ✓ increase budget of low carbon research and development and raise its proportion in the total research and development inputs
- ✓ build world-class national energy lab with the overall testing ability from fundamental researches, technological development, experiments and demonstrations to detection and authentication, make it open to enterprises, universities and other research institutions, solve problems such as insufficient supply of Generic Technology in low carbon technological innovation
- ✓ establish multi-industry technological alliances and promote the innovation in industrial integration
- ✓ enhance international cooperation related to low carbon technological innovation

## FOUR Policies and measures (cont.)

### 4 □ establish and perfect laws, regulations and standard systems and strengthen the implementation

- ✓ revise energy efficiency standards for the major energy consumption products, such as building, traffic equipments, major industry energy consumption equipments, household appliances, lighting equipments; take Top Runner method into consideration
- ✓ improve Energy Rating Label and energy-saving product certification, expand the implementation scope of mandatory Energy Rating Label
- ✓ strictly execute energy efficiency standards and raise the admittance threshold of high energy consumption industries
- ✓ strengthen the monitoring on energy conservation and emission reduction, accelerate the establishment of index and evaluation systems

### 5 □ improve energy pricing mechanism and establish green financial tax systems

- ✓ accelerate price reform of energies, such as electricity, oil and natural gas
- ✓ increase financial expenditure used to support low carbon development, promote the research and development of low carbon technology, the popularity of energy-saving products and the exploiting and utilization of new energies
- ✓ accelerate green tax reform, raise the resource tax rate and make it ad valorem tax levied, impose environment tax, study and introduce carbon tax gradually; reduce tax correspondingly while introducing resource and environment tax, so as to realize revenue neutral and optimized structure

Research Group suggests that a carbon tax should be imposed from the later stage of “Twelfth Five-year Plan” gradually. In the initial implementation of a carbon tax, it can take low tax rate as a starting level, like RMB 10 / ton of CO2.

The carbon tax level suggested by Research Group according to model evaluation and specialist research is as follows:

#### Primary Design of CO2 Tax Rate

<b>Tax rate</b>	<b>2012</b>	<b>2020</b>
<b>Carbon tax (RMB per ton of CO2)</b>	<b>10</b>	<b>40</b>
<b>Raw coal carbon tax (RMB per ton)</b>	<b>19.4</b>	<b>77.6</b>
<b>Crude oil (RMB per ton)</b>	<b>30.3</b>	<b>121.2</b>
<b>Gasoline carbon tax (RMB per ton)</b>	<b>29.5</b>	<b>118</b>
<b>Diesel carbon tax (RMB per ton)</b>	<b>31.3</b>	<b>125.2</b>
<b>Natural gas carbon tax (RMB per 1000 cubic meter)</b>	<b>22</b>	<b>88</b>

THANKS!

