



Green Development and China's 12th Five-year Plan

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Conference on Energy Efficiency, Climate and China's Development Strategy



Black *Cat* vs. Green *Cat*

- No matter Black Cat or White Cat, who can catch rat is good cat (Deng Xiaoping, 1962), Cat theory is the basis of China's openness reform
- Black *Cat* will be defeated in international competition, Green *Cat* is actually good cat
- Questions to be addressed
 - How to transform from black development to green development
 - How to make Black *Cat* become Green *Cat*
- Green development is not only egoism (利己), but altruism (利他)
- China's 12th five-year plan will be first green development plan
- China's modernization road (1949-2050): Red China (1949-1977), Black China (1978-2010), to Green China (2000-2050)

Agenda

- Climate change is the biggest global challenge
- China: a greenhouse gas (GHG) emission superpower
- How does China respond to global climate change
- China's first green plan: twelfth five-year plan (2011-2015)
- Conclusion

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Climate change is the biggest global challenge

- Huge challenge brought to humanity by global climate change (IPCC, 2007)
 - Ecological disaster
 - Economic disaster
 - Social calamities and unjust income distribution
 - Challenge to state security
- Whatever measures are taken, the global warming can only be exacerbated and the challenge by climate change would be even more grave during the 12th five-year plan period
- China has become one of the countries worst hit by global climate change

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Climate change is the biggest global challenge

- China is the worst victim of climate change
 - China is the biggest victim of meteorological disasters

Population of China and the world affected by climate-related disasters

Year	China (million)	World (million)	% of in World's total
1990	47.69	81.93	58.2
1995	147.50	220.04	67.0
2000	23.17	170.55	13.6
2001	39.25	98.91	39.7
2002	285.18	659.20	43.3
2003	214.78	250.77	85.6
2004	51.93	158.52	32.8
2005	83.03	153.72	54.0
2006	87.83	118.07	74.4
2007	120.04	209.96	57.2
average	116.80	210.98	52.4

Notes : a. Calculated by Oxfam based on the CRED data ; b. Calculated based on the CRED data according to Oxfam method; c. Climate-related disasters include drought, extreme temperature, natural disasters, floods, windstorms, displacement of people resulting in wet weather. d. Natural disasters covered by the statistics have to satisfy at least one of the following conditions: causing at least ten deaths, affecting at least 100 people, already declaring emergency or asking for international aid.

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Climate change is the biggest global challenge

- China is the worst victim of climate change
 - Natural disasters have caused huge losses to agricultural production
 - Natural disasters have caused huge economic losses to China
 - Poor people are the most vulnerable to climate change

Direct economic losses caused by natural disasters and their proportion in GDP

	Economic loss (billion Yuan)	Proportion in GDP of the year (%)	Proportion in added GDP of the year (%)
1990	66.6	3.6	40.6
1991 (flood)	121.5	5.6	39.6
1992	85.4	3.2	17.0
1993	99.3	2.9	12.4
1994	187.6	4.0	15.5
1998 (flood)	300.7	3.8	62.9
2003 (SARS)	148.2 a	1.1	10.9
2005	204.2	1.11	10.9
2006	252.8	1.21	10.9
2007	236.2	0.96	8.1
2008	1175.2	3.91	47.3

Note: The figures are calculated by the year's price.
Source: a. Estimated by the author based on the 1949-1995 Disaster Report compiled by the State Statistical Bureau and the Ministry of Civil Affairs", China Statistical Press, 1995, p. 403-407.
Estimates by the Asian Development Bank (ADB).

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Climate change is the biggest global challenge

- Climate poverty
 - Climate poverty is the poverty of a basic survival environment
 - Degradation of natural conditions brought about by the impact of global climate change
 - This is prevalent in areas prone to natural disasters where living and working conditions mean people are essentially being deprived of their fundamental rights to survival
 - Currently there are no clear-cut indicators for quantifying the number of victims of climate poverty, not only in China, but also worldwide. There is still no system in place to measure its scale, geographic distribution or characteristics
 - More than 70% of Chinese cities and over 50% of the population are located in areas susceptible to serious meteorological, seismic, or oceanic disasters
 - Some 74% of those living in ecologically sensitive zones are in poor counties, roughly 81% of the total population defined as living in poverty

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China: a GHG emissions superpower

- The largest coal consumer
- The largest emitter of SO₂
- The largest energy consumer
- The largest CO₂ emitter
- Energy consumption added in 2000-2006 in China is expected to make up 45% of the total of the world (IEA, 2007)
- China is the world's largest *black cat* (referring to coal consumption) that has the biggest negative externality in the world

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China: a GHG emissions superpower

CO2 emissions by six major economies in the total of the world

	1960	1970	1980	1990	2005	2015	2030
China	8.98	5.65	8.08	11.29	19.16	25.34	27.32
EU	15.87	15.09	13.59	10.96	14.82	11.77	9.97
US	33.68	31.18	25.32	22.67	21.75	19.76	16.44
Japan	2.47	4.96	4.71	4.76	4.55	3.79	2.82
Russia					5.74	5.28	4.71
India	1.28	1.30	1.79	3.01	4.14	5.28	7.88
Total					70.16	71.23	69.14
EU/China	1.77	2.67	1.68	0.97	0.77	0.46	0.36
US/China	3.75	5.52	3.13	2.01	1.14	0.78	0.60

Note: a. 1992 figures.

Sources: 1960-1990 data from the World Bank, World Development Indicator 2006, CD-ROM; Taking EU as having 11 countries. 2005-2030 data from IEA, World Energy Outlook 2007, IEA: reference scenario (According to the current state, without relevant policy for controlling emissions); Taking EU as having 25 countries.

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China: a GHG emissions superpower

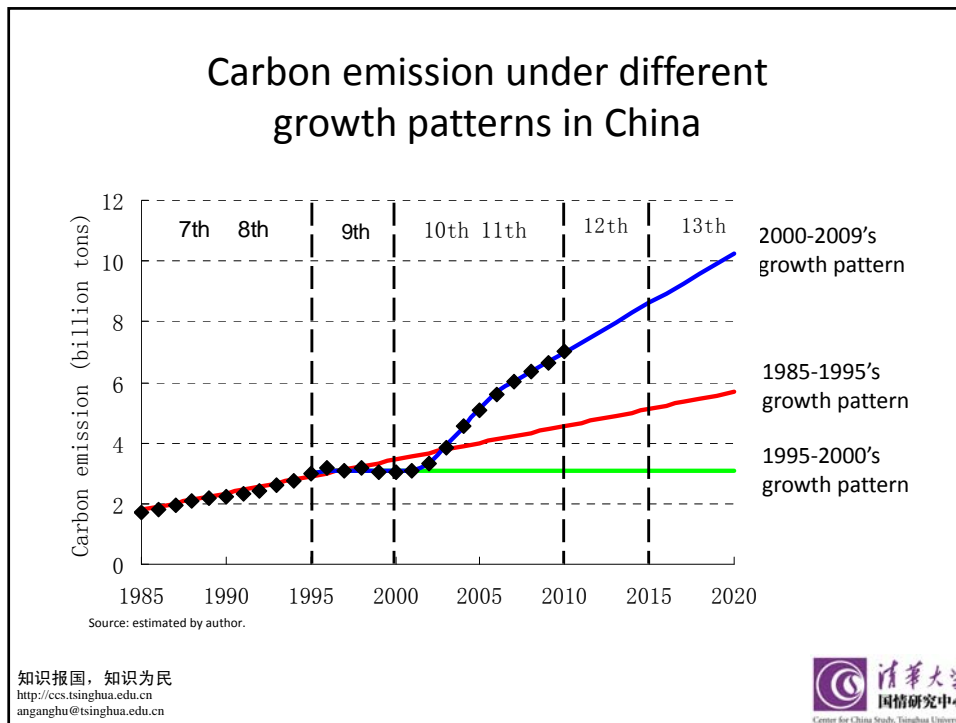
- World Top 20 CO2 Emitters (2005)

Rank	Country	Total (Mt CO ₂)	Percentage (%)	HDI
1	United States	6045.80	20.86	0.951
2	China	5007.10	17.28	0.777
3	Russian Federation	1524.10	5.26	0.802
4	India	1342.10	4.63	0.619
5	Japan	1257.20	4.34	0.953
6	Germany	808.3	2.79	0.935
7	Canada	639.0	2.20	0.961
8	United Kingdom	586.9	2.03	0.946
9	Korea	465.4	1.61	0.921
10	Italy	449.7	1.55	0.941
11	Mexico	437.8	1.51	0.829
12	South Africa	436.8	1.51	0.674
13	Iran	433.3	1.50	0.759
14	Indonesia	378	1.30	0.728
15	France	373.5	1.29	0.952
16	Brazil	331.6	1.14	0.800
17	Spain	330.3	1.14	0.949
18	Ukraine	329.8	1.14	0.788
19	Australia	326.6	1.13	0.948
20	Saudi Arabia	308.2	1.06	0.812
	Sum.	21811.50	75.26	
	World	28982.7	100.00	0.743

Source: UNDP, Human Development Report 2007/2008.

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Carbon emission and growth cost under different growth patterns in China

Growth pattern	GDP growth rate (%)	Carbon emission in 2015 (billion tons)	Carbon emission in 2020 (billion tons)	Accumulated carbon emission in 1995-2020 (billion tons)	Growth cost (carbon emission in 2020/growth rate)
1985-1995	10.0	5.1 (59%)	5.7 (40%)	111.3 (71%)	5.7
1995-2000	8.6	3.1 (36%)	3.1 (22%)	80.0 (51%)	3.6
2000-2009	10.1	8.6 (100%)	10.2 (100%)	157.8 (100%)	10.1

Source: estimated by author.

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China is still a typical *Black Cat*

- National medium long term plan on energy (2004) proposed to control energy consumption within 2.4 billion TCE in 2010 and 3.0 billion tons in 2020
- *Great Leap Forward* of energy consumption: exceed 2.5 billion TCE in 2006 and 3.06 billion tons in 2009. comparing with above plan the target has been reached 12 years earlier
- This has shown very low efficiency of national energy plan and serious failure of obligated indicators
- This is significant *Black Cat*, if so, Chinese economy would be more and more black

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How does China respond to global climate change

- China is now on a crossroad: to go together with the rest of the world in emissions reduction or delink itself from the world emissions reduction; to engage in active cooperation with the world or to put up passive opposition to the rest of the world, The most crucial was adjust the two digital economic growth rate to the appropriate economic growth (around 8.5%)

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Green revolution

- Green revolution is the fourth industrial revolution in the world
- China has missed previous three industrial revolutions
- China could not miss the opportunity of forth industrial revolution
- China could lead the forth industrial revolution

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How does China respond to global climate change

- Three steps in realizing green revolution and modernization
 - The first step (2006-2020): comprehensively construct Xiao-Kang society with a scientific trajectory, implement CO2 emissions reduction and adapt to the climate change
 - The second step (2020-2030) is an important phase to reduce CO2 emissions with a large-scale. Its CO2 emissions would drop significantly by 2030, down to the 2005 level
 - The third step (2030-2050) is the phase China achieve the level of developed country : to further reduce CO2 emissions by 2050 to synchronize its step with the rest of the world, bringing the emissions level down to half that of 1990

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How does China respond to global climate change

- China's green development roadmap to 2015
 - Twelfth five-year plan (2011-2015)
 - From *accelerated development* to *scientific development* (2004)
 - From *accelerated development* to *accelerated Transition* (2010)
 - From *black development* to *green development* (2010)
 - Green development in three key fields
 - Green production
 - Green consumption
 - Green ecological environment

How does China respond to global climate change

- As climate change is the biggest factor restricting China's development and its domestic and international affairs, energy conservation and emissions reduction will be one of the core development policies for the 12th five-year development program. This is where it is so different from the previous five-year plans and also the biggest innovation
- The core of the climate change policy is to build a climate adaptation society

How does China respond to global climate change

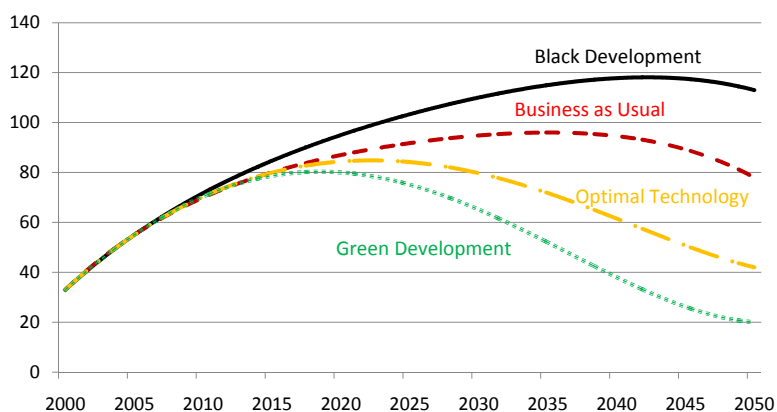
- Climate adaptation society
 - Build a resource-efficient society
 - Build an environment-friendly society
 - Develop a circulating economy
 - Develop low-carbon economy
 - Implement integrated national disaster prevention and reduction strategy

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How does China respond to global climate change

- Emission growth pattern under different scenarios



Data source: Center for China Studies (2010).

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How does China respond to global climate change

Growth Pattern	Brief Description	Peak Year	Peak Emission (billion)	2000-2050 Accumulation (billion)
Black Development	Energy efficiency develops as usual	2040-2045	11.7	480.4 (1.67)
Business As Usual	National policy and strategy develops as usual	2035	9.6	414.0 (1.44)
Technological Road	Fully apply those existing and foreseeable reduction technologies	2025	8.5	342.7 (1.19)
Green Revolution		2020	8.0	287.2 (1.0)

Data source: Center for China Studies (2010).

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China's first green plan: twelfth five-year plan (2011-2015)

- Overall ideas of twelfth five-year program
 - Main guideline: scientific development
 - Main target: economic structure adjustment
 - Basic requirement: green development
 - Five-construction: economic, social, political, culture and ecological constructions (Hu Angang, 2009)

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China's first green plan: twelfth five-year plan (2011-2015)

- Six principles
 - Coordination development
 - Green development
 - Innovation Development
 - Common sharing development
 - Security development
 - Win-win and mutual benefit development

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China's first green plan: twelfth five-year plan (2011-2015)

- Main targets of twelfth five-year program
 - Macro economy is running smoothly
 - Industrial structure is upgrading
 - Sustainable development capacity is improved
 - Basic public services are covering all residents in urban and rural areas
 - Become high human development level
 - Balanced development among urban and rural, and different regions
 - Improve market mechanism
 - Achieve new progresses on political and culture development (Hu Angang, 2009)

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China's first green plan: twelfth five-year plan (2011-2015)

- Main characters of targets in twelfth five-year program
 - Both continuity and innovation: keep some old indicators, adjust some and add some new indicators
 - First priority is public service indicators, and then economic indicators
 - First priority is obligatory indicators, and then anticipative indicators
 - International comparable
 - All of them are quantitative indicators
- Focus on green development indicators
 - 14 direct indicators and 10 indirect indicators (Hu Angang, 2009)

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China's first green plan: twelfth five-year plan (2011-2015)

- More green indicators should be added into five-year plan (2011-2015)

Indicators	Contents	Targets	Status	
Direct Indicators	Energy Intensity (energy per GDP)	Lower by 20%		
	The proportion of non-fossil energy using	Up to 13-14%		
	The proportion of clean use of coal		New indicator	
	Sulfur dioxide emissions	Lower by 10%		
	Other greenhouse gases	Lower by 10%	New indicator	
	Chemical oxygen demand (COD) emissions	Lower by 10%		
	Carbon Intensity (CO ₂ per GDP)	Lower 20%	New indicator	
	Forest coverage ratio	Increase 1.5-2 points		
	Stock volume of forest trees	Increase 1 billion cubic meter	New indicator	
	The proportion of direct economic losses from natural disasters in total GDP	Decrease to level lower than 1.5%	New indicator	
	The proportion of green eco-space	Increase to higher than 57%	New indicator	
	The proportion of investment on environmental pollution in total GDP	Increase to 2% (new)	New indicator	
	Indirect indicators	The proportion of Tertiary output in total GDP	Increase 3 points	
		The proportion of employment in Tertiary sector in total employment	Increase 4 points	
The share of R&D expenditures in GDP		Increase 0.3 points		
The ratio of urbanization		Increase 3 points		

Source: Center for China Studies, Report on overall thoughts and targets of twelfth five-year plan, 2009.9.

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China's first green plan: twelfth five-year plan (2011-2015)

- Overall strategy to deal with global climate change
 - Embrace green revolution
 - Perform green development
 - Promote green cooperation
 - Make green contributions
- Emphasis in twelfth five-year plan
 - Encourage green investment
 - Implement green production
 - Advocate green consumption
 - Promote green growth

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Green Production, Green Industry, Green Consumption, Green Trade and Green Standard

- Green production
 - Speed up the economic restructuring
 - Increase proportion of Tertiary industry in total national output (GDP)
 - Lower the ratio of industries with high energy-consumption and high-emissions
 - Foster emerging industries of strategic importance (new sources, new materials, energy conservation, environmental protection, biomedicine, information networks, and high-end manufacturing industries) (Premier Wen Jiabao, 2010/03/05)
 - Improve the structure of energy consumption
 - Increase the proportion of non-fossil energy use and the develop clean coal
 - Upgrade the old production system by new green technology
 - Promote the construction the “Smart Grid”
 - Speed up the process of “Land Greening” and increase the Forest carbon sinks (2004-2008, 0.578 billion ton/year)

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Green Production, Green Industry, Green Consumption, Green Trade and Green Standard

Year	Forest Coverage (%)	Forest Areas (trillion square meters)	Forest reserves (billion cubic meters)	Total volume of living timber (billion cubic meters)	Accumulated carbon dioxide absorption (billion tons)
The 3rd National Census (1984-1988)	12.98	1.25	9.14	10.57	16.73
The 4th National Census (1989-1993)	13.92	1.33	10.6	11.95	19.53
The 5th National Census (1994-1999)	16.55	1.59	11.2	12.49	20.62
The 6th National Census (1999-2003)	18.21	1.75	12.45	13.62	22.79
The 7th National Census (2004-2008)	20.36	1.95	13.72	14.91	25.11
2015	22		14.2		25.9
2020	23		14.7		26.9

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Green Production, Green Industry, Green Consumption, Green Trade and Green Standard

- Green Consumption
 - Develop government green purchases
 - Build green government system
 - Promote green business
 - Encourage enterprises to introduce the green concept in marketing
 - Speed up the development of green logistics system

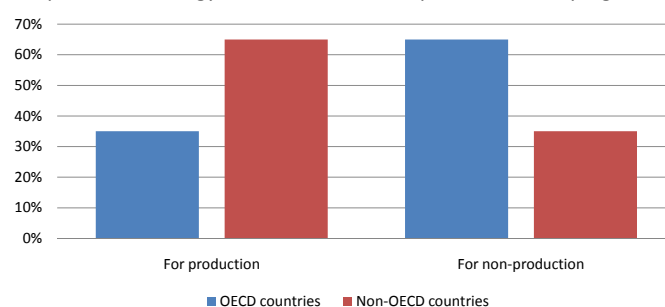
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Green Production, Green Industry, Green Consumption, Green Trade and Green Standard

- Encourage green life attitudes
 - Avoid the high energy consumption model of western countries

Comparison of energy use between developed and developing countries



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Green Production, Green Industry, Green Consumption, Green Trade and Green Standard

- Green working and life styles
 - Guide people to use green and public transportations
 - Purchase green energy-saving products
 - Advocate moderate energy consumption and eco-friendly life

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Green Production, Green Industry, Green Consumption, Green Trade and Green Standard

- Development of green long-distance transportation
 - China's total railway would increase from 79700km in 2008 to 90000km in 2010 (ranking No.2 in the world), and to 110000km in 2012
 - The high speed railway will expand from 2319km in 2009 to 13000km by 2012, ranking No.1 in the world

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Green Production, Green Industry, Green Consumption, Green Trade and Green Standard

- Green buildings
 - China has been the world's largest construction market
 - In 2009, China's commercial housing construction areas have reached to 937 million square meters, and residential sale areas reached to 853 million square meters (three times higher than the United States)
 - To avoid the sunk cost, China has to speed up the buildings' green restructuring (energy-saving)
 - Improving and strictly implementing energy and environmental standards

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Green Production, Green Industry, Green Consumption, Green Trade and Green Standard

- Green standards of ecological environment
 - Improve the green ecological space
 - Increase the forest areas, natural grasslands, wetlands, water areas
 - Implement more rigorous environmental standards to prevent pollution
 - Protect water resources, reduce water consumption per unit of GDP

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Conclusion

- China, as a country with the largest population, the biggest economy and the largest number of invention patents, will, by peaceful and green development and international and green cooperation, make major contributions to the world in tackling climate change
- China's contribution to global climate change is biggest public good to the world

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Conclusion

- China's response to global climate change
 - Initiate green revolution
 - Achieve green development
 - Promote green cooperation
 - Make green contribution
- Publication in Chinese



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Thank you!

