

Mitigation targets and
actions in China up to 2020

IDDRI side-event
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Outline

1. Deciphering the Chinese pledge at 2020
2. Allocation of provincial targets and local challenges
3. Rebalancing of the macro-economic development

Presentation of IDDRI Working Paper:

Guérin, E., Wang, X. 2012. [Mitigation targets and actions in China up to 2020. Progress towards the 2020 carbon intensity target, allocation of provincial targets, design of carbon market pilots, and links with broader socio economic objectives](#). Working Papers N°01/2012, IDDRI.

Current Chinese climate policy framework

Chinese Pledge at the UNFCCC

⇒ 40% to 45% carbon intensity improvement by 2020 / 2005

XIIth Five Year Plan (FYP)

⇒ Plan for greenhouse gas (GHG) Emissions reductions (January 2012)

The new Climate Law

⇒ Currently in consultation process

- **Thirteen low-carbon pilot regions** (NDRC, 2010)

5 Provinces (Guangdong, Liaoning, Hubei, Shaanxi, Yunnan) and 8 Cities (Tianjin, Chongqing, Shenzhen, Xiamen, Hangzhou, Nanchang, Guiyang, Baoding)

- **Seven pilot carbon markets** (XIIth FYP)

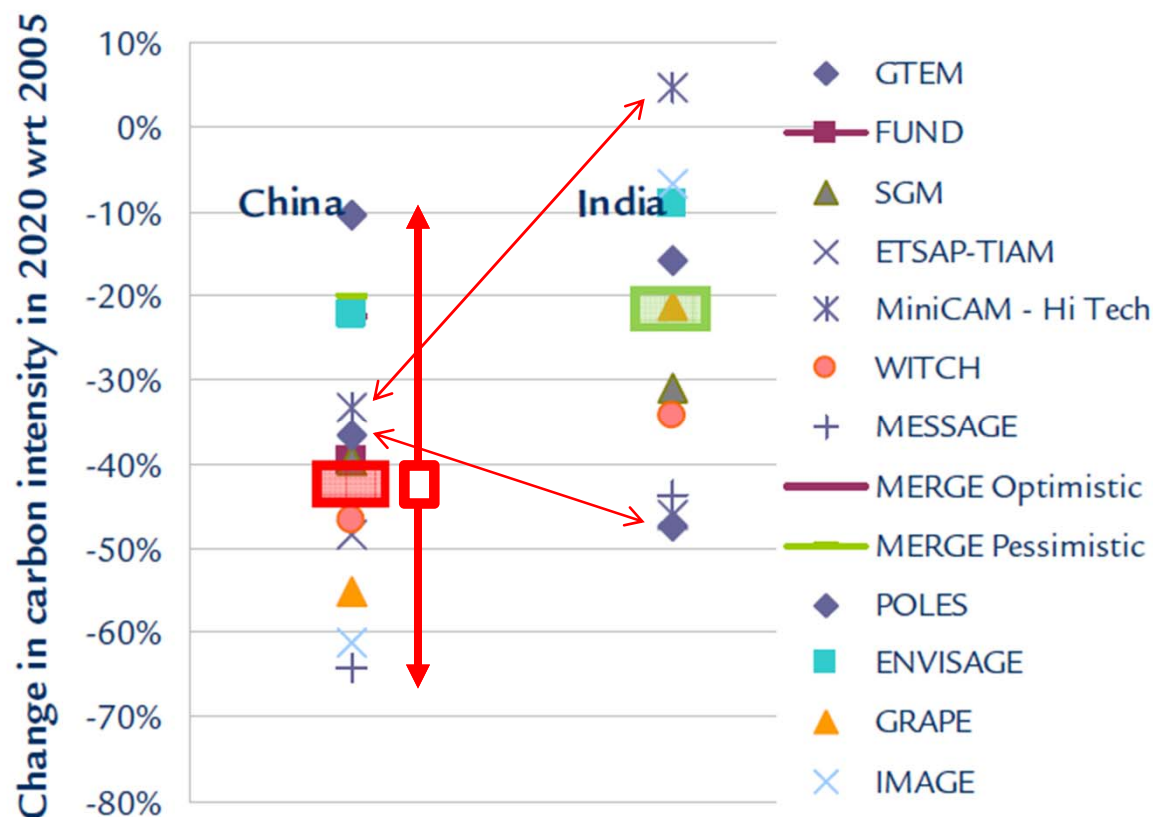
To be implemented in 2013 in 2 Provinces (Hubei, Guangdong), 4 Municipalities (Beijing, Shanghai, Tianjin, Chongqing), and 1 Local City (Shenzhen)

- **Carbon tax** (new climate law)

Implementation process and coordination with ETS still not clear

Global emissions projections and the Chinese 2020 milestone

Carbon intensity reductions for India and China as predicted in the reference scenarios of the EMF22 participating models



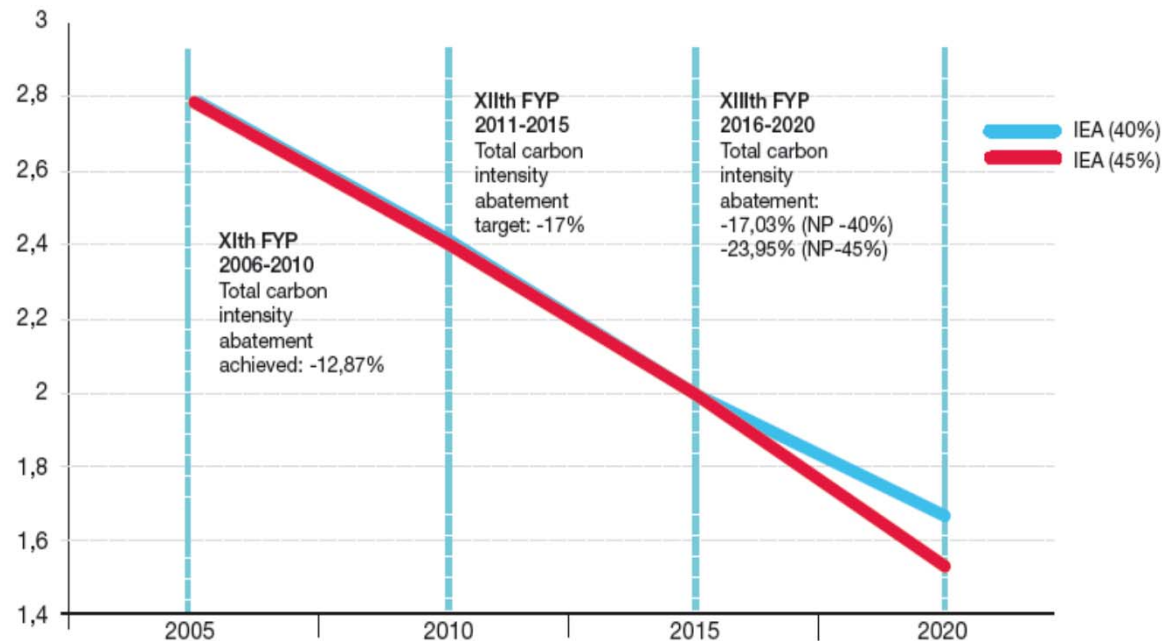
Assessment of the Chinese pledge at 2020 is difficult using global energy models...

... international comparisons bring different results of relative “efforts” (e.g. China, vs. India)

Source: Tavoni, 2010

Chinese carbon intensity challenge at 2020 and its policy framework

Reduction in carbon intensities: achieved during the XIth FYP, targeted during the XIIth FYP, required during the XIIIth FYP to reach the low end (40%) and the high end (45%) of the Chinese UNFCCC pledge



Unit: tCO₂/10kyuan (2005 price)

Source: 2005 and 2009 values are calculated based on CO₂ emissions data of IEA (2011) and Gross domestic product data of National Bureau of Statistics of China. (The 2010 value is calculated based on 2009 carbon intensity and assuming that the carbon intensity decrease of 2010 / 2009 was equal to the carbon intensity decrease of 2009/2008, given that 2010 CO₂ emission data is not available.)

Source: Guérin and Wang, 2012

Expected carbon intensity target under the XIIIth FYP:

- **Between 17% (low end) and 24% (high end) reduction**
- Reaching the low end of Chinese pledge will require an equal effort than during the XIIth FYP (17%)

⇒ Difficult but not unattainable!

Long-term emission scenarios for China and the 2020 milestone

Scenarios are designed according to long-term development objectives and **short-term precision** is thus **unequal across scenarios**...

... but low end (respectively high end) official carbon intensity objectives at 2020 are **quite in line** with Reference (respectively Alternative) projections

	<i>References scenarios</i>			<i>Alternative scenarios</i>		
		<i>10/20 change</i>	<i>CAGR (10/20)</i>		<i>10/20 change</i>	<i>CAGR (10/20)</i>
National target		-31,0%	(-3,6%)		-36,8%	(-4,5%)
IEA, WEO, 2011	Current Policies	-34,1%	(-4,1%)	450	-42,2%	(-5,3%)
	New Policies	-37,5%	(-4,6%)			
ERI, 2009	Baseline	-41,8%	(-5,3%)	Accelerated Low Carbon	-49,5%	(-6,6%)
	Low Carbon	-47,9%	(-6,3%)			
LBNL, 2011	Continued Improvement	-39,2%	(-4,9%)	Low Carbon	-43,9%	(-5,6%)
	Continued Improvement with CCS	-39,4%	(-4,9%)			
Tyndall, 2009				Scenario 3	-22,0%	(-2,4%)
				Scenario 4	-21,1%	(-2,3%)
UNDP, 2010	Reference	-20,8%	(-2,3%)	Emissions Abatement	-36,4%	(-4,4%)
	Emissions Control	-36,4%	(-4,4%)			
Enerdata, EnerFuture, 2010	S1 – Recovery	-27,1%	(-3,1%)	S3 – Renewal	-34,7%	(-4,2%)
	S2 – Depression	-26,4%	(-3,0%)	S4 – Struggle	-32,6%	(-3,9%)

Allocation of provincial carbon intensity targets

XIth FYP: Provinces were allocated an **energy intensity target**

XIIth FYP: Provinces received **both and energy and carbon intensity obj.**

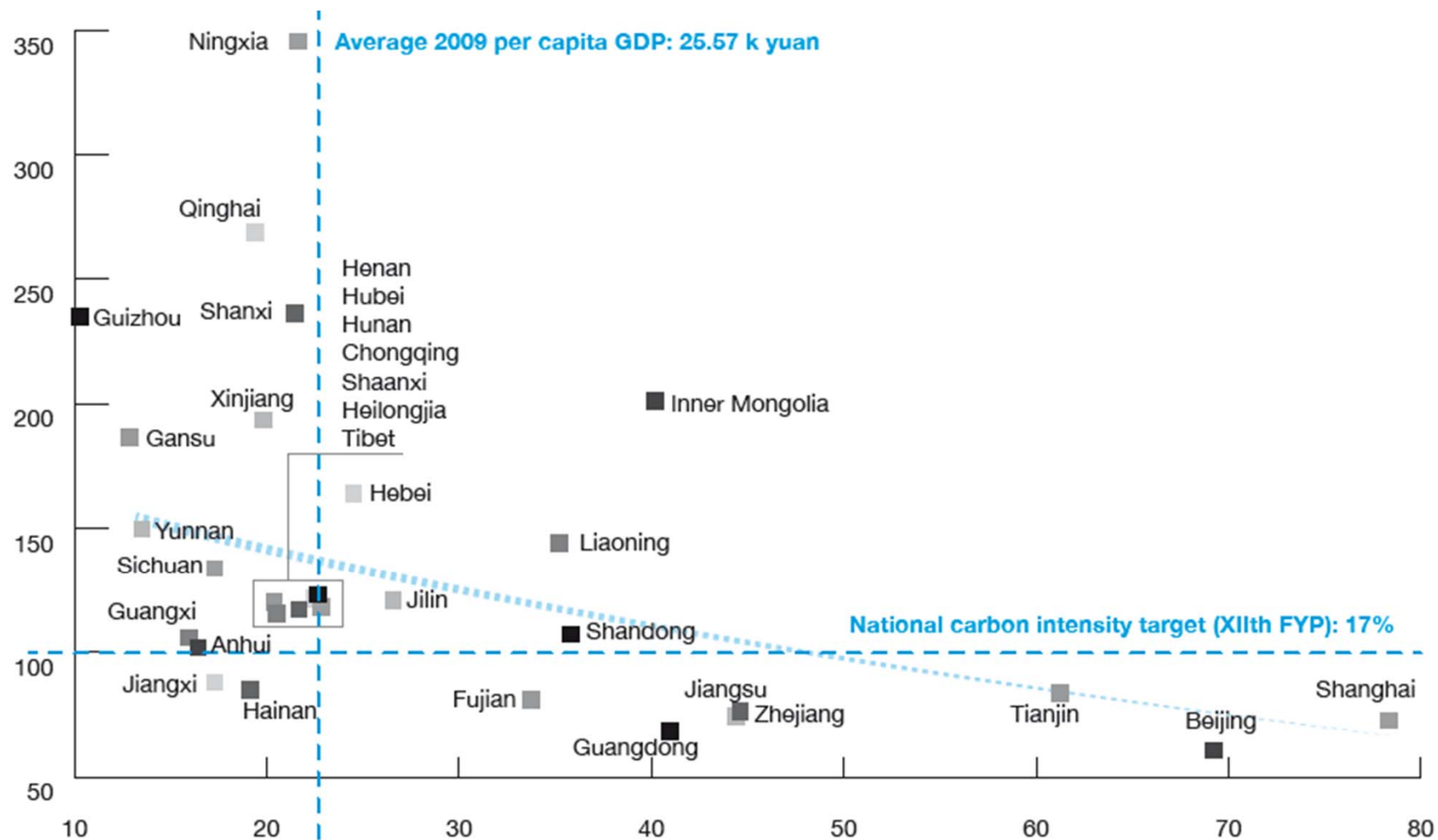
- Individual provincial carbon intensity target ranging from 19.5% (Guangdong) to 10% (Tibet, Qinghai)
- Three categories of Provinces: 9 with carbon intensity target equal to the national average, 11 a higher target and 11 a lower target

In theory, different “**burden-sharing**” principles/criteria:

- equity (measured by carbon emissions per capita)
- efficiency (measured by carbon intensity)
- ability to pay (measured by GDP per capita)

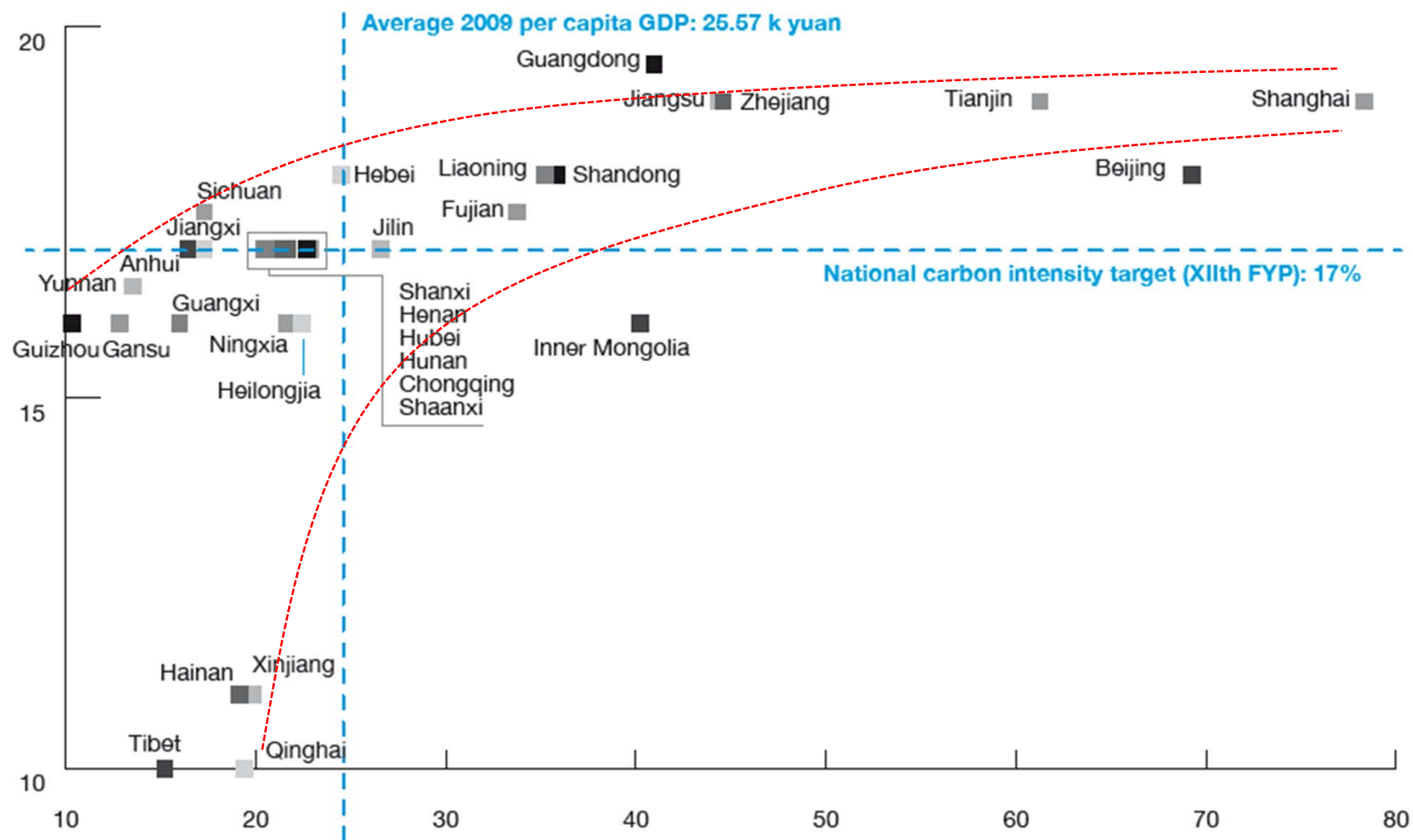
⇒ In the XIIth FYP, the **allocation of carbon intensity targets** by provinces follows predominantly the principle of **ability to pay**

Per capita GDP and energy intensity in 2009 at provincial level



Source: Guérin and Wang, 2012

Carbon intensity targets in the 12th FYP and per capita GDP in 2009 at provincial level



Source: Guérin and Wang, 2012

Local considerations for the implementation of pilot carbon markets

Provinces and municipalities selected for carbon market pilots experiments: Carbon intensity target, energy intensity, share to total and per capita GDP, average GDP and secondary sector growth rates

Provinces and municipalities	Carbon intensity target, (% 2015/2010)	Energy intensity in 2009 (tsc/Mnyuan)	Share to total GDP (% 2009)	Per capita GDP in (1000yuan, 2009)	Average GDP growth rate (% 2005-2009)	Average secondary sector growth rate (% 2005-2009)
Guangdong	19.5	68.4	10.81	40.97	12.42	13.57
Tianjin	19	83.6	2.06	61.24	15.80	17.60
Shanghai	19	72.7	4.12	78.33	11.42	8.12
Beijing	18	60.6	3.33	69.25	11.68	8.93
Chongqing	17	118.1	1.79	22.84	14.42	18.34
Hubei	17	123	3.55	22.66	13.67	16.10

Source: NBS, various years.

Source: Guérin and Wang, 2012

The 2 provinces and 4 municipalities can be grouped in three different categories:

- **Beijing and Shanghai:** *Low energy intensity and Low industrial growth*
(Structural factors play positively in the achievement of carbon intensity targets)
- **Guangdong and Tianjin:** *Low energy intensity and High industrial growth*
- **Hubei and Chongqing:** *High energy intensity and High industrial growth*
(Structural factors play negatively, provinces only relying on the technological factors)

Rebalancing the macro-economic drivers for growth: structural objectives of the XIIth FYP

Rebalancing the economy is the **bottom line** to achieve China transition toward low-carbon development

Two of the XIIth FYP objectives are **related to emissions reductions**

1. Conserving energy (reinforcing the energy policy of the XIth FYP)
2. Protecting the local and global environment (incl. climate policy)

The other **four** objectives are **linked to macro-economic drivers**:

3. Encourage domestic consumption
4. Reduce socio-economic inequalities
5. Develop the service sector
6. Shift to higher value added in the industrial sector

⇒ Reflect a good comprehension of what is needed to set the country on a sustainable low-carbon development path

⇒ What are the chances for these four objectives to be met?

Short-term structural adjustments of the Chinese economy

Service sector development objectives
(share of services in total GDP):

- XIth FYP: from 40% in 2005 to 43,5% in 2010 (missed by 0,5% only)
- XIIth FYP: +4% points to 47% in 2015

Industrial sector development objectives
(share of services in total GDP):

- XIIth Ind. FYP: Continued industrialization (manuf. + energy) with +2% points from 40% in 2010 to 42% in 2015

⇒ Will certainly make it complicated for China to reach its pledge

Annual growth rates of GDP, exports and investment in fixed capital: 2005-2010

Growth rates(2005 price)	GDP	Exports	Investement in fixed capital
2006/2005	12.7	27.2	23.9
2007/2006	14.2	26	24.8
2008/2007	9.6	17.2	25.9
2009/2008	9.2	-16	30
2010/2009	10.3	31.3	23.8
Average annual growth rate (2005 – 2010)	11.2	15.7	25.7

Source: National Bureau of Statistics of China, various years.

Source: Guérin and Wang, 2012

Planned shift to higher value added in the industrial sector

Four key industries in the XIth FYP (but no targets set) :

- Next generation of information technology
- Biotechnology
- High end equipment manufacturing
- New materials

Three Strategic Emerging Industries (SEI) in the XIIth FYP (all related to emissions reductions):

- Clean energy technology (High efficiency, energy savings etc.)
- Alternative energy (Nuclear, renewable power, smart-grids)
- Clean energy vehicles (Electric, hybrid, fuel cell cars)

From 5% of GDP for the SEI in 2010 to **8% in 2015 and 15% in 2020**

Package of incentives to support the development of these SEI:

⇒ Great chance that the new target will be reached...

Conclusion: filling the « policy gap »

The progressive **shift from command and control to economic instruments**, such as carbon markets, goes in the right direction

⇒ But carbon markets alone will not enable China to shift towards green economy and meet its climate objectives

The climate performance of China will be intimately linked to the **achievement of the overall objectives of the XIIth FYP**

⇒ In particular to the macroeconomic rebalancing of the Chinese economy, which is not easy to perform and not completed yet!

Structural factors play differently among provinces for carbon intensity decrease

⇒ The design of carbon market pilots, but also the implementation of policies complementary to the carbon market, will have to reflect these differences

Strengthening of the Chinese carbon MRV system of key importance

⇒ *Domestic level*: design, implementation and assessment of climate-related policies

⇒ *Internationally*: context of the International Consultation and Analysis (ICA) process

Learning Platform on Climate Policies

www.learning-platform.org

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