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China: Moving towards low carbon growth?

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Recent energy and economic trends



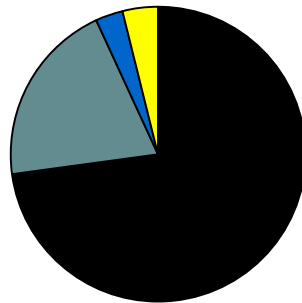
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- **China's economic growth ~10% per year since 1980s. Recently slowed to 6.8% in Q4, 2008**
- **Energy demand growth decoupled from economic growth, but has outstripped it in recent years**
- **Huge investment in energy infrastructure; oil imports rising**
- **Local, regional and international environment impacts; bad for human health and on future economic growth**
- **International calls for China to control (if not cap) carbon emissions resisted by Chinese government for time being.**
- **Government emphasis on energy saving and efficiency: mainly for security and economic reasons**

Recent trends in China

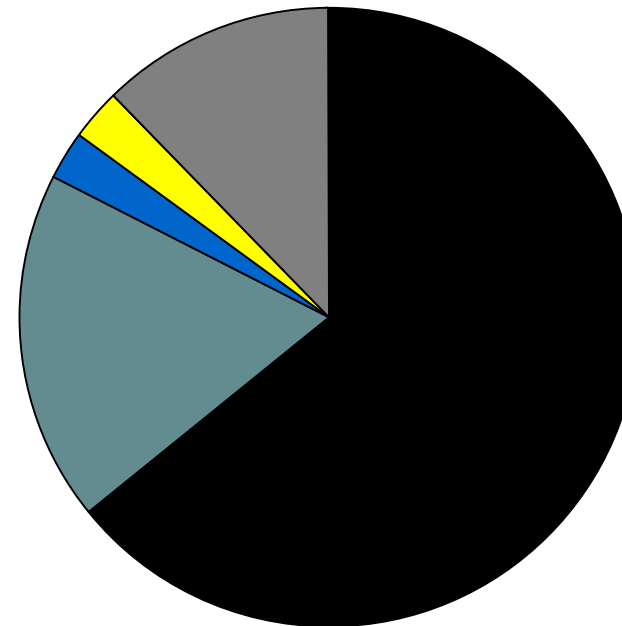
Primary energy demand

1980 (402 mtoe)



■ Coal ■ Oil ■ Gas ■ Hydro & Nuclear

2006 (1879 mtoe)



■ Coal ■ Oil ■ Gas ■ Hydro & Nuc ■ Other

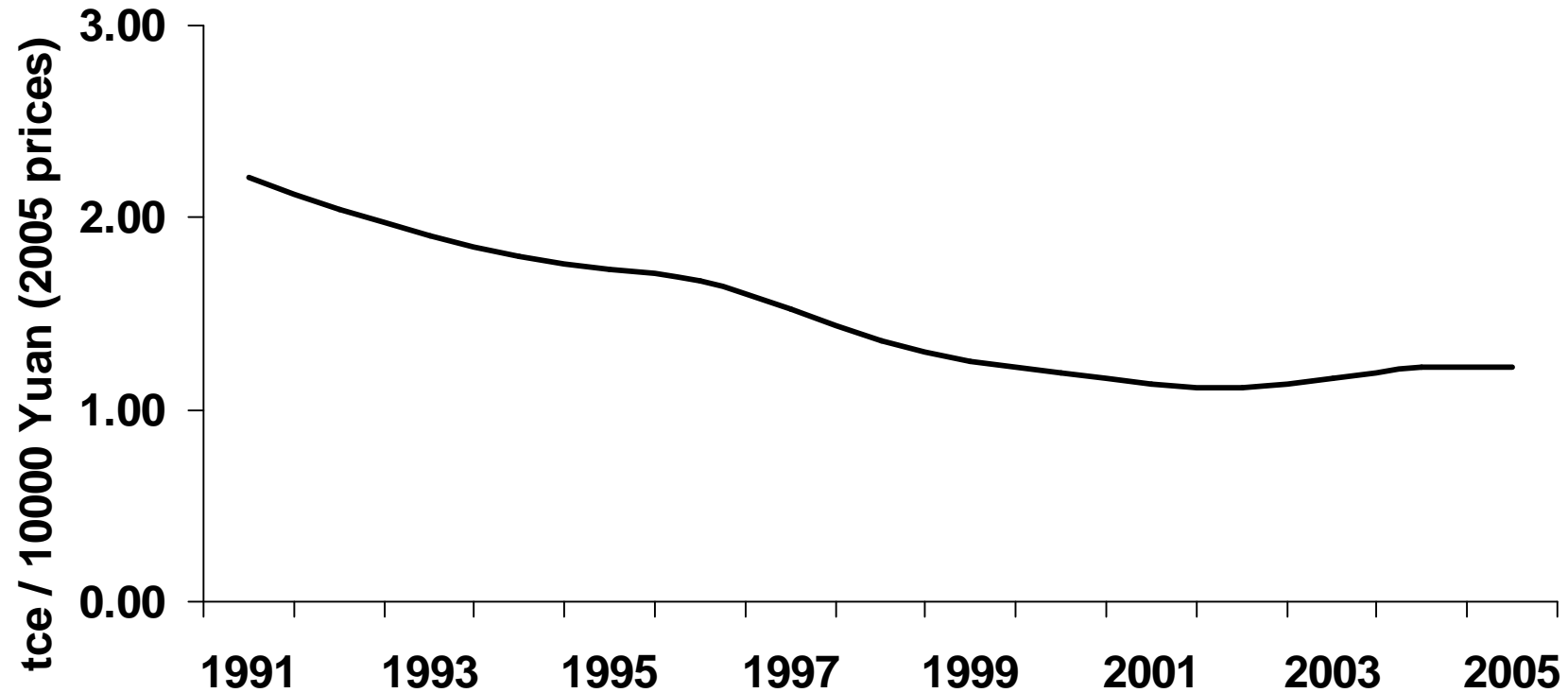
Source: LBNL / IEA

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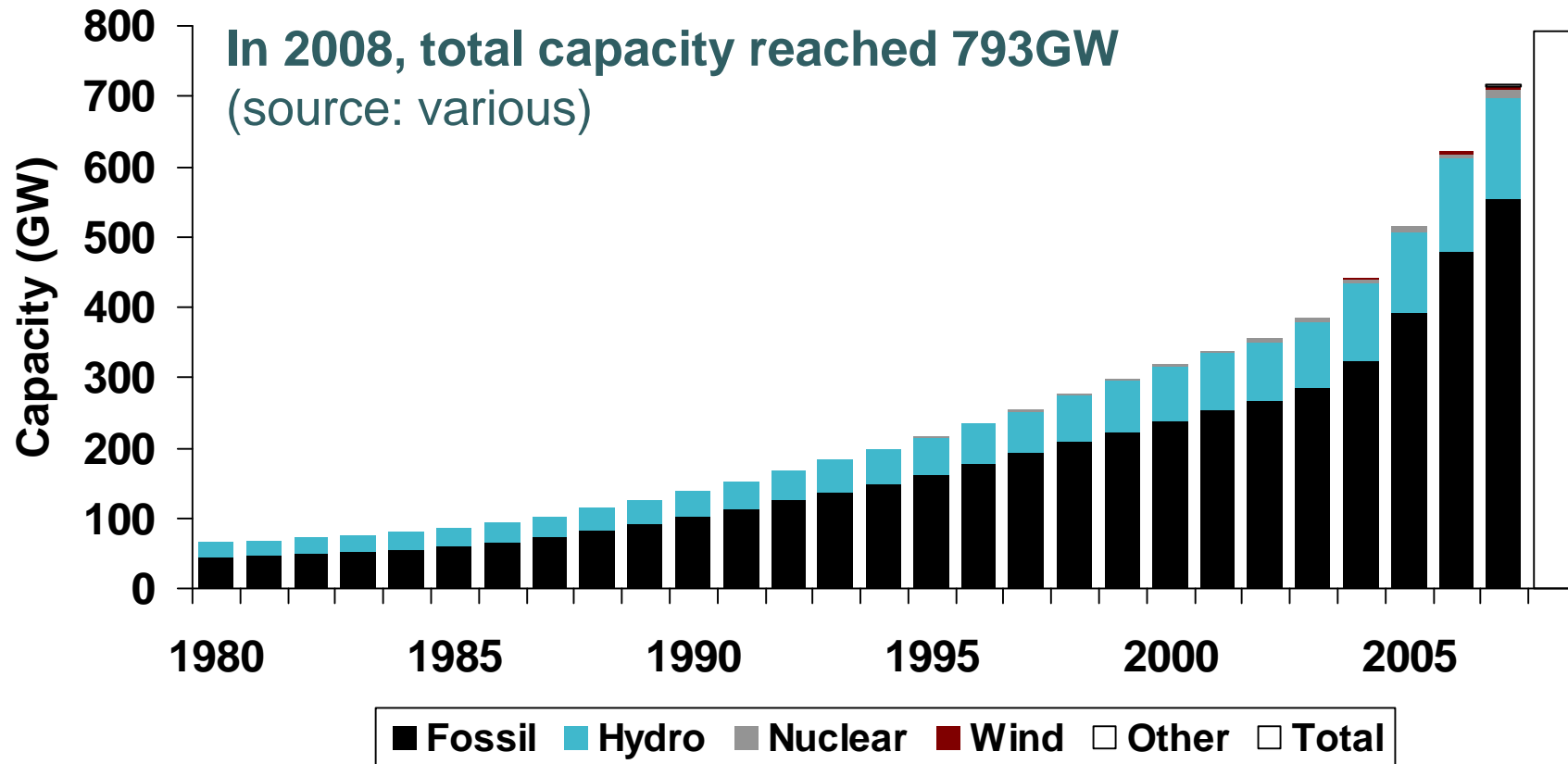
Energy intensity



Source: Energy statistical yearbook

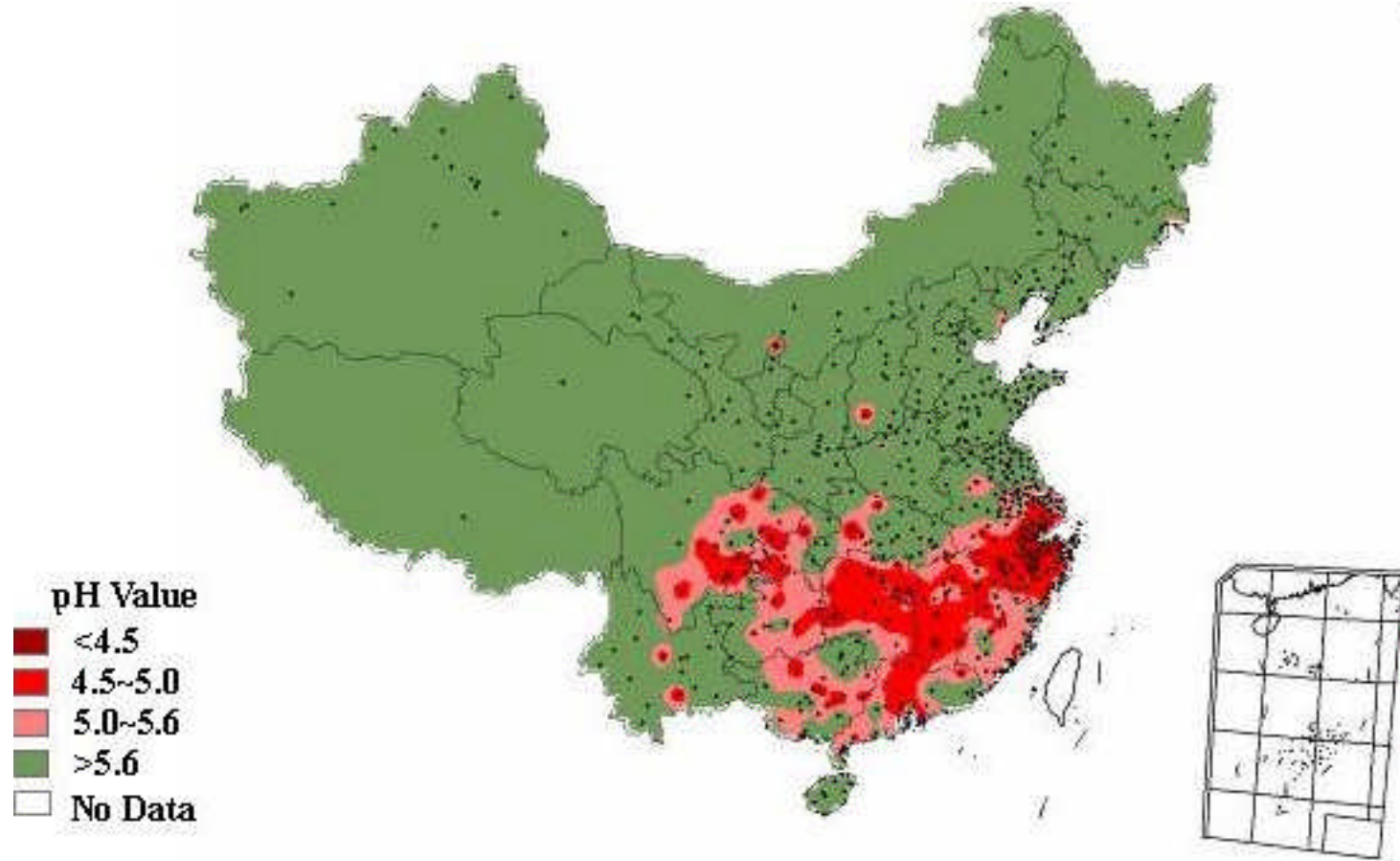
Recent trends in China

Power generation capacity



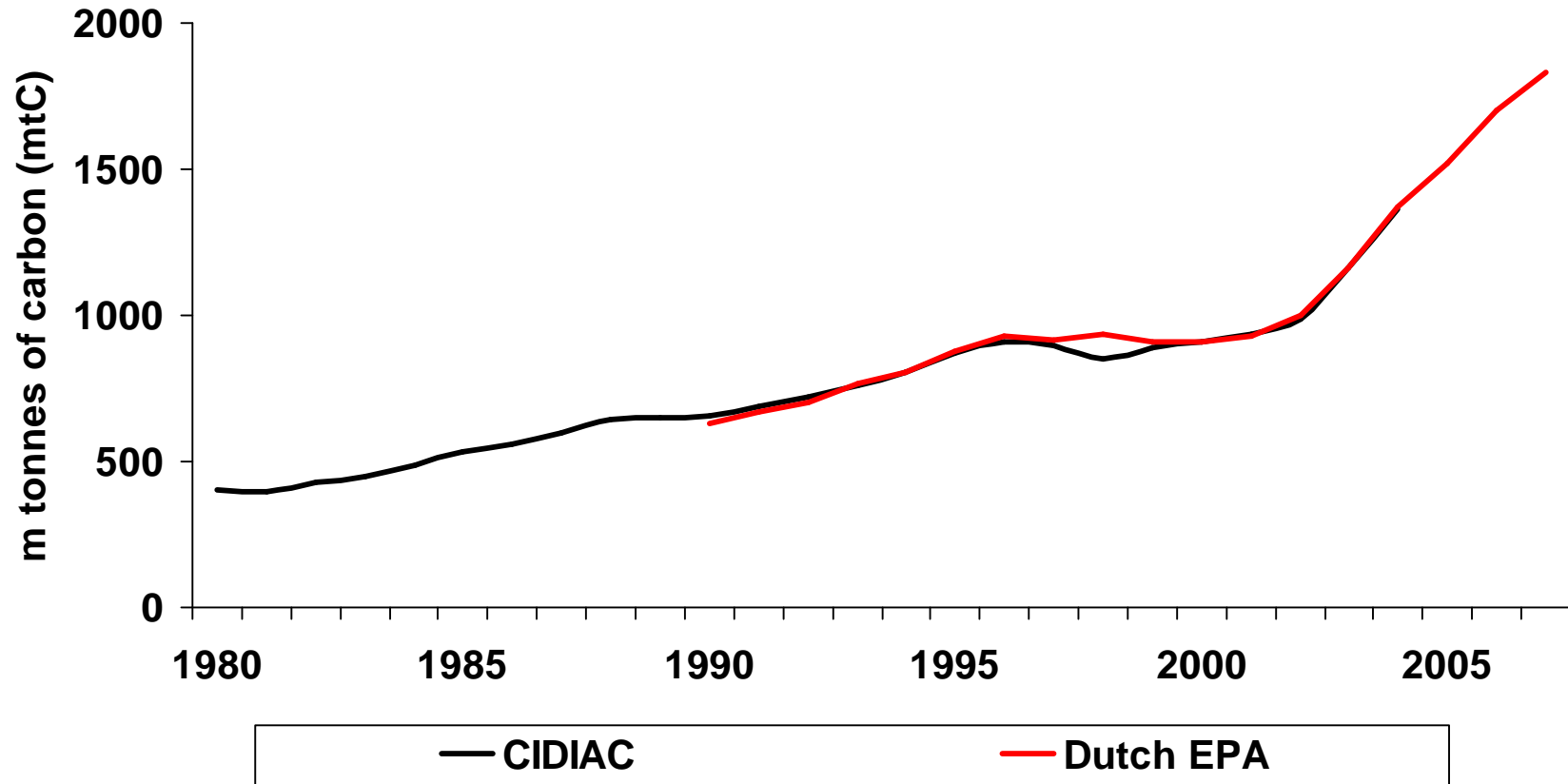
Acid Rain in China, 2006

Source: State Environmental Protection Agency



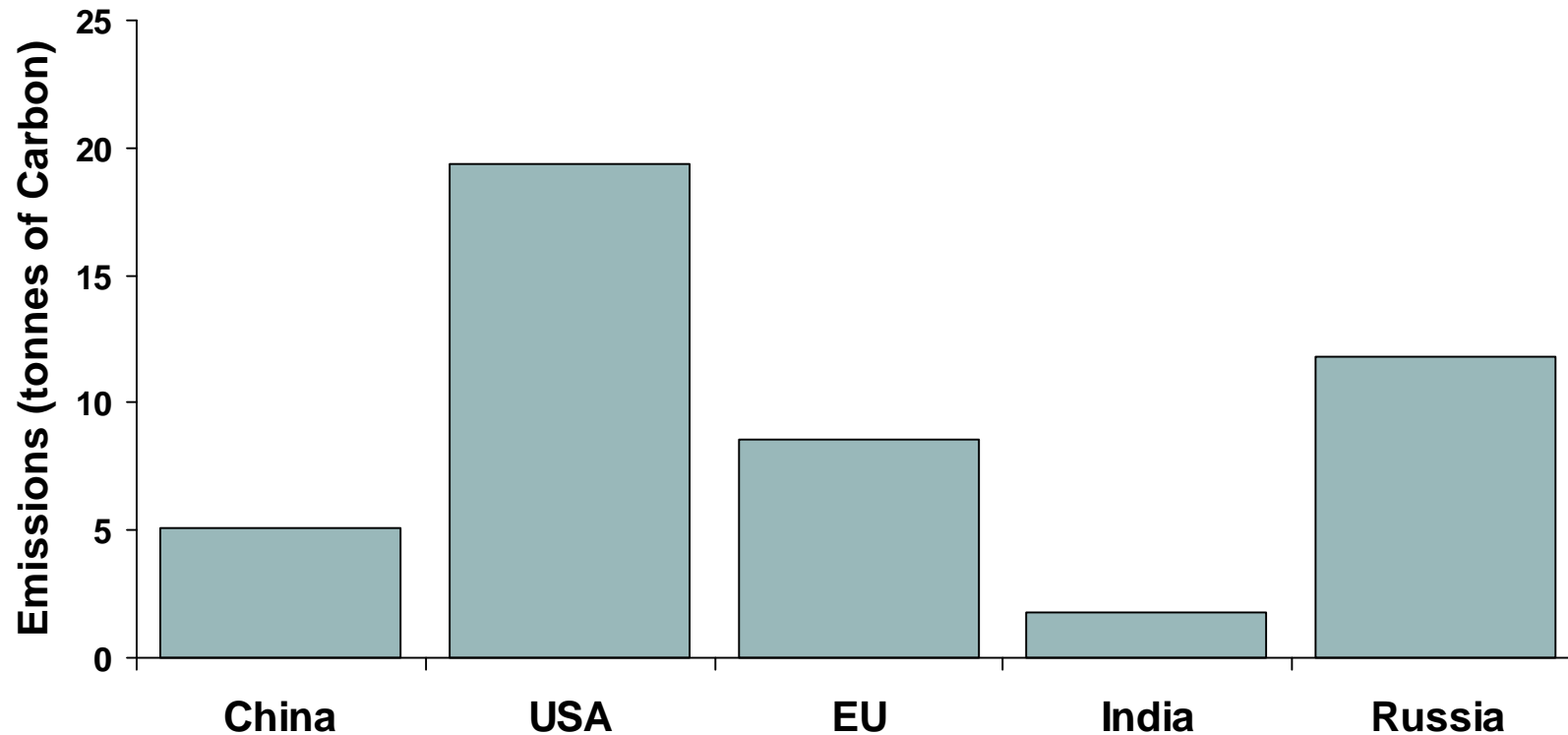
Environmental impacts

Carbon emissions



Environmental impacts

Per capita carbon emissions, 2007



Source: Dutch EPA

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Changing environmental attitudes



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‘For the purpose of attaining freedom in the world of nature, man must use natural science to understand, conquer and change nature and thus attain freedom from nature’

Mao Zedong, 1940

In 1972, China’s submission to the UN Conference on the Human Environment blamed the ‘imperialist superpowers’ and asserted rights of developing countries to develop first and address environmental challenges one by one

Source: Economy, 2004

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Changing environmental attitudes

Politics changed by domestic research



- **Recent Chinese studies project climate change impacts, e.g.**
 - Decreases in agricultural yields and increased costs of food production
 - Decreased run-off of rain water in northern China; increased run-off in Southern China. Adds to water imbalance that is already causing problems
 - Expected increases in storms; vulnerability of prosperous coastal zones (e.g. Shanghai) to small sea level rises
- **Climate change taken increasingly seriously at national level**
- **Government has a National Leading Group on Climate Change and has produced a climate change strategy**

Changing environmental attitudes



At the primary stage of socialism, slowing or halting economic development for environmental protection is not acceptable. But pollution is not acceptable too ...

If people have to drink polluted water while driving BMWs, that's a bitter irony of modernization ... We definitely don't want such development

Environmental Protection Minister Zhou Shengxian, Nov 2008

Economic challenges

Aligned with low carbon growth?

US

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We will ... promote the shift from the pattern of economic growth that relies mainly on investment and exports to one that relies on a balanced combination of consumption, investment and exports.

Haphazard investment and unneeded development projects in energy intensive and highly polluting industries and industries with excess production capacity will be resolutely stopped.

Wen Jiabao, March 2008

Economic challenges

Aligned with low carbon growth?



At present, the spread of global financial crisis and the obvious slowdown of the world economy have posed severe challenges to the economic development of all countries and life of their peoples. Under such circumstances, our commitment to tackling climate change must not waver and our actions must not slow down

Wen Jiabao, November 2008

Concluding points



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- Per capita carbon emissions are low in China; demand for goods from western consumers a big driver of recent growth
- Genuine desire to develop sustainably within Chinese govt
- Financial crisis makes this more difficult: worries about social stability (e.g. workers returning to countryside)
- Significant progress in low carbon technologies: fastest growth in wind power; highest adoption of solar thermal
- Energy efficiency, economic restructuring and innovation could reverse rise in emissions.
- Tyndall Centre scenarios will show how this could be achieved (publication due April 2009)

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