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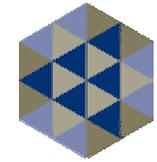
Regional Innovation and Capabilities:

ECF

Financing the Next Industrial Revolution Berlin 26 March 2007

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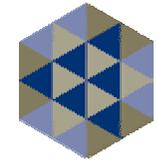


Europe post-Council strategy

Challenges and opportunities in China

Shifting investments

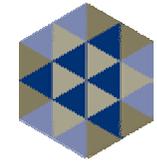
Europe Climate and Energy Security



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- Strategic Energy Review's Integrated climate and energy package is the right way to go
 - 20% by 2020 unilateral GHG emissions,
 - - 30% in cooperation with others
 - 20% energy efficiency by 2020
 - 20% by 2020 mandatory renewables target
 - Significant steps to a near zero emission power sector – carbon capture and storage
 - External energy strategy??

Overall Trends in China



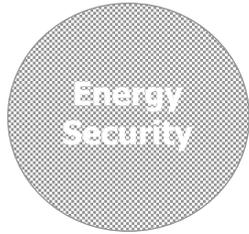
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- 22 provinces with very different circumstances
- 20 million farmers become urban residents each year – 60% of population will live in cities by 2020
- Chinese cities and towns are expected to absorb about 300 million people from rural areas in 20 years. Equivalent to entire US population
- 800 million live in poverty
- Stability is a top priority for the government
 - Efforts to slow economic growth

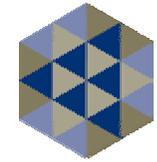
China's growth is exposed to a series of challenges:



- **To sustain economic growth** – It has been estimated that GDP growth of below 7% per year would be a destabilising factor for the Chinese economy and society.
- **To maintain social stability** –
 - China needs to address **unemployment** and inequality. Currently unemployment is estimated to be between 150 –170 million, which is around 23%.
 - **Equity** – the inequality gap between rich and poor, rural and urban citizens and west and east is causing an increase in tension within Chinese society. The collapse of the healthcare system, pension provision and social support especially in rural areas is adding to this inequality.
 - **Migration and urbanisation** - between 300 to 500 million people will migrate to the cities over the coming decade - the biggest migration wave seen in history.
- **To obtain environmental stability** – China loses at least 7% of GDP p.a. due to environmental degradation
- **To establish effective energy and natural resources management** –China's recent GDP growth is creating continuing scarcity of energy and natural resources



Energy overview



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- 2006 105,000 MW of new power generation installed=Germany's total electricity consumption
- 6 million Chinese work in 24,000 mines, 2 billion tons of coal last year and 45% of total global production
- 16 of 20 cities with worst air pollution in the world are in China
- 500,000 people/year die from the impacts
- 30% of the land suffers from acid rain
- Able to build an 800 MW power block in 18 months



China's energy demand will increase additionally when China's internal consumption rises.



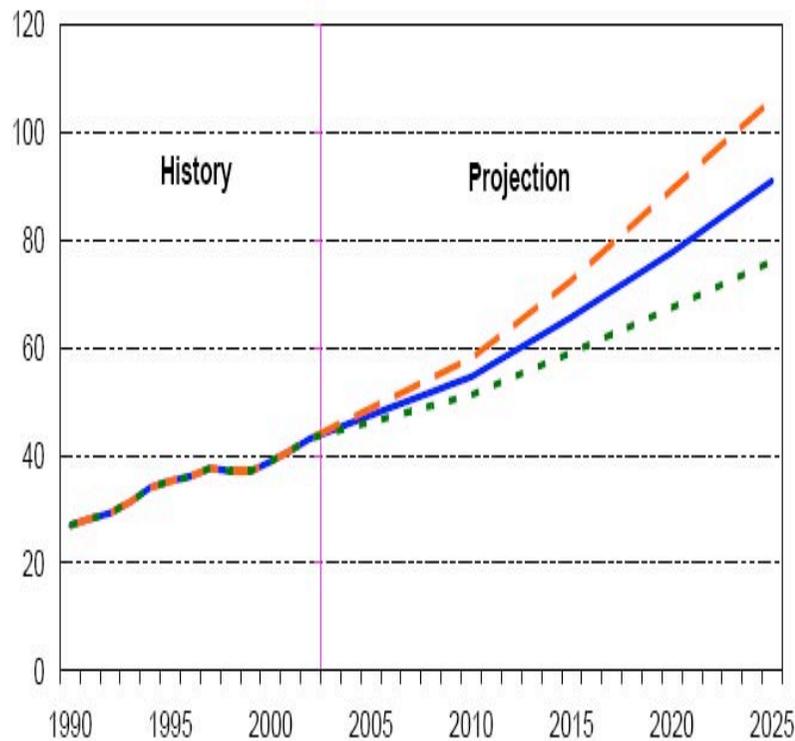
- The average Chinese person consumes only 10-15% of the energy an average US citizen uses, but with the economy developing at high speed many analysts expect this gap to be significantly reduced over the next 30 years.
- Currently, Chinese consumption of goods is well below the 65% norm of most major economies. However, it is rising rapidly, particularly in electronic product categories. China leapt into second place in the global marketplace for technology, media and telecoms in 2004 and is expected to take the lead by 2010.
- The predicted growth in the Chinese automobile market alone would result in doubled demand for fuel energy by 2025, two thirds of which will be imported.



China is an important global energy consumer with increasing dependency on imported energy



Total energy consumption 1990 - 2025



- In 2003 China accounted for 12.3% of the total world energy consumption
- China is experiencing an increase in energy demand. 13 years ago China was Asia's biggest exporter of oil, it is now the second largest importer
- Oil imports increased by more than 30% in both 2003 and 2004 and China is now the second biggest oil importer after the USA

— Reference Case — High Economic Growth Case ■ Low Economic Growth Case



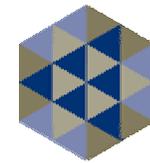
China's energy demand affects its relationship with countries, regions and the international system, and is becoming a source of international tension



- **China and Africa**
 - China is satisfying its energy demand with imports from autocratic regimes:
 - 60% of Sudan's oil is exported to China
 - 25% of Angola's oil is exported to China
 - China invests in Burma, Nigeria and other unstable states to secure its energy supply
- **China and the USA**
 - China and the USA are direct competitors in the world oil market. Their relationship is deeply influenced by China's increasing energy demand
- **China and the EU**
 - The EU and China have a common interest in Russia's gas, which once turned into competition could be exploited as political leverage
 - EU and China compete as consumers within the global oil market
- **China and the UN**
 - China's non-interference policy is linked to its energy needs
 - China's appetite for oil also affects the position it adopts within the UN Security Council – for example its stance on Iran



China's energy consumption currently satisfies Europe's consumer demands



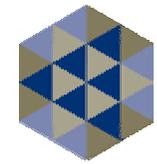
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- Industry and manufacturing account for two thirds of China's total energy consumption.
- China's economy is export driven. Around 70% of China's GDP is for export and goes to satisfy the US and the EU markets. It is our consumption which is shaping China's energy demand.
- China's export to the EU is steadily increasing



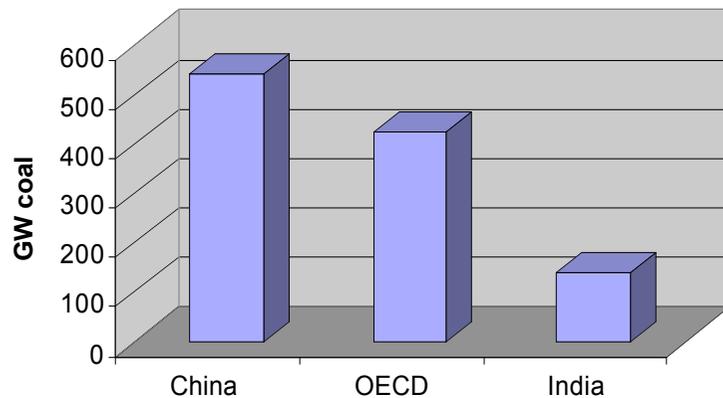


Role of coal

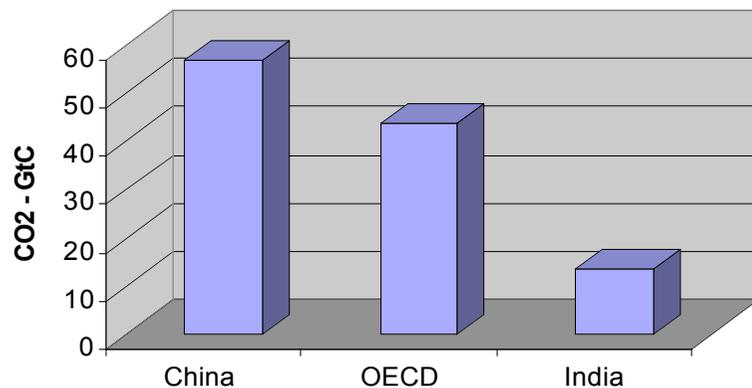


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Coal Fired Stations by 2030



Lifetime carbon lock-in



Source: IEA, WEO 2004

- In order to continue growing China needs to meet its increasing energy demand and at present sees no alternative but to use its huge coal resources

- China is currently installing new coal fired power capacity at a rate of 1GW or more every 4 days

- Coal fired power stations built in China in the next 25 years are expected to lock-in 145 GtC

- The planned additional coal-fired power stations to be built by 2012 will produce twice the amount of CO2 than envisaged by Kyoto carbon reductions for the same period



Five year plan 2005 – 2010



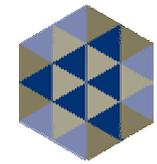
- 10 % reduction in total pollutants
- 20 % reduction in energy consumption per unit of GDP
- 30% reduction in water usage by industry
- diversifying energy resources and increase energy-efficiency till 2020 (in order to cover rising energy demand)

medium-term approach:

- hydro power plant capacity 110GW - 250GW (25% of total elect. capacity)
- nuclear power capacity: increase of 800 % (5% of total elect. capacity)



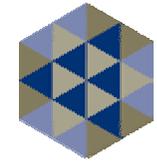
The Response



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- China's **Renewable Law** which came into force on 1 January 2006 seeks to increase the share of renewable energy in China's **energy mix** to 15% by 2020.
- New targets aim to obtain 6 GW of power from **wind energy** by 2010, and 30 GW by 2020, a boost that would leapfrog China to nearly twice the level of the installed capacity of the current world leader, Germany.
- China is the world's leader in existing installed **Solar Hot Water / Heating** capacity.
- Recently China introduced tax benefits for small cars following the EU standards.

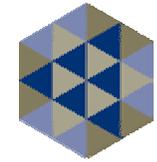
Implementation challenges



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- China did not reach annual rate 4% in 2006, only 1.23%.
- SO₂ increased about 2% in 2006.
- The Chinese government will double its effort to realize the goals above in 2010. Pressure on local governments and industry to deliver.
- Coal is top issue in China energy, coal consumption in 2006 was 2.3 billion tons.

Understanding of the government

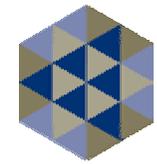


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- Different to U.S., Chinese government clearly recognizes climate change caused by man-made emissions.
- Chinese authorities seem to have a clear view on the damages by climate change
 - on the ongoing dramatically deterioration of the environment
 - the home-made causes of most of the problems
 - their failure to meet government's targets caused by their lack of implementation of appropriate measures
- China does not want to accept GHG caps but officially shows commitment to tackle the problem. People's Congress results.
- A first National Plan on Climate Change is obviously near to release
- Recent decisions are indicating a focus on internal ET and CDM rather than on fixed caps



A stable and growing China offers higher returns on Europe's investments and is critical in securing the pensions of our aging population



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- China (including Hong Kong) receives the **major part of of the FDI (Foreign Direct Investment)** made by EU companies to Far East Asia – 72% of the total inflow.
- FDI in Far East Asia are **more profitable** than FDI in other countries. Europe's FDI in Far East Asia in 2003 generated 12% of all EU revenues from FDI. China had a major role in that process.
- The **rate of return from FDI in China** is increasing: in 2003 it was 8%, while the average return on EU capital from investments in other countries in 2003 was 6%.
- It has been estimated that European wages in 30 years would be 16-40% lower if China fails to sustain its economic growth.

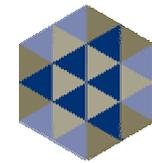


As the world's biggest market and the world's fastest growing economy Europe and China are main **trade** partners, which is beneficial for both sides



- Europe and China are currently each other's second largest **trade partners**. They are predicted to become each other's leading trade partners in the near future.
- The share of foreign-invested enterprises contributing to total Chinese exports increased from 16.75% in 1991 to 47.93% in 2000. A large percentage of the **profit realised by these exports flows back** to the major investors, including those from Europe.
- The overall trade balance in goods is negative for Europe at present, however the trade balance for **services** is positive.
- It is expected that when China's economy becomes more consumer based Europe will continue to **increase its service exports** and as two thirds of the EU economy is service based this sector offers strong possibilities for growth.

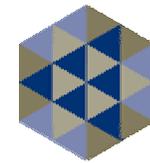
The way Europe engages with China could influence whether China becomes an opportunity or a threat



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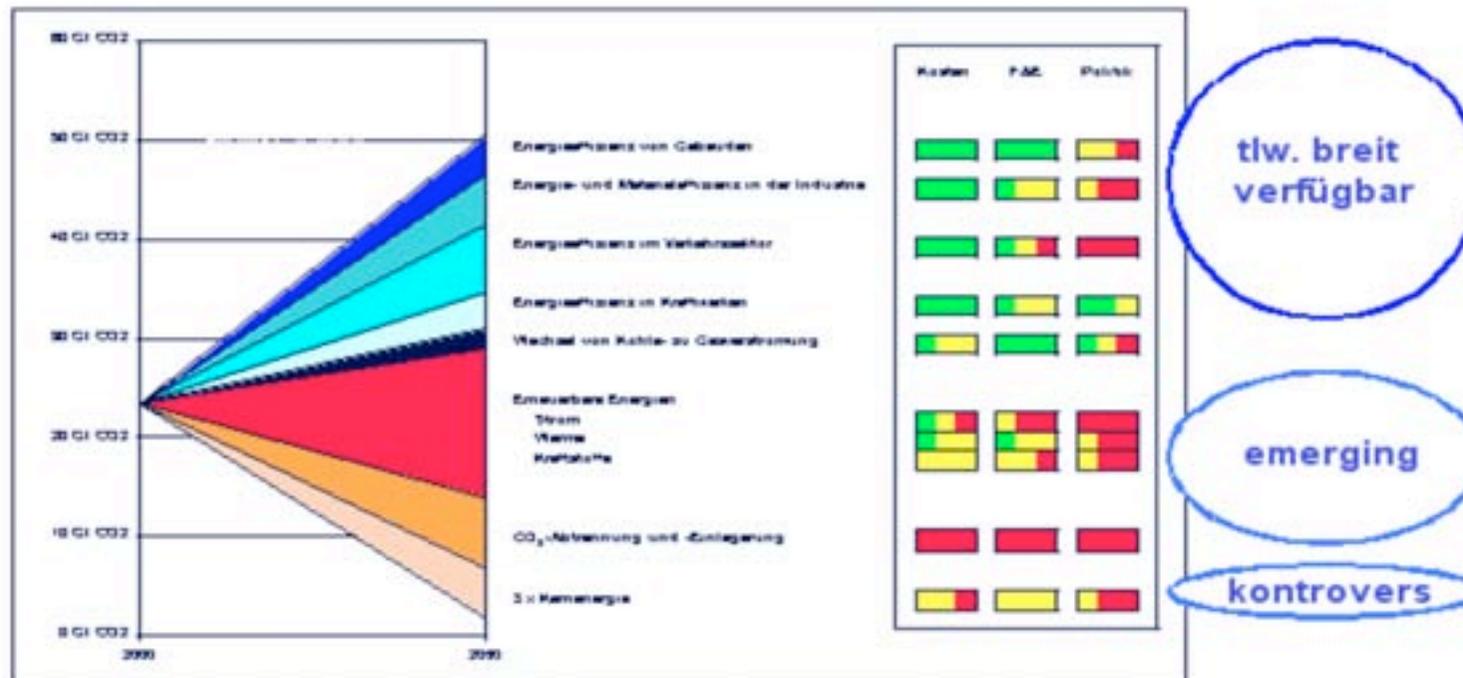
China as an opportunity	China as a threat
China supports a rules based international system in alliance with the EU and is involved in peacekeeping and non-proliferation activities	A nationalistic China causes regional and global insecurity. China continues its non-intervention policy and trading in arms destabilising unstable regions
China is integrated within the world order operating predictably and without diplomatic conflict with the US	China is in an open conflict with the US causing a threat to world security
China establishes efficient and sustainable use of energy	China pushed by its increasing energy demand compromises on foreign policy and climate security
Significant achievement in climate security based on China's cooperation	China as a major CO2 emitter diminishes all EU efforts in this regard
China maintaining fast economic growth – a guarantee of Europe's prosperity	An economically failing China reduces Europe's ability to maintain economic prosperity, and would force millions of Chinese back into poverty

Technology cooperation

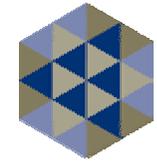


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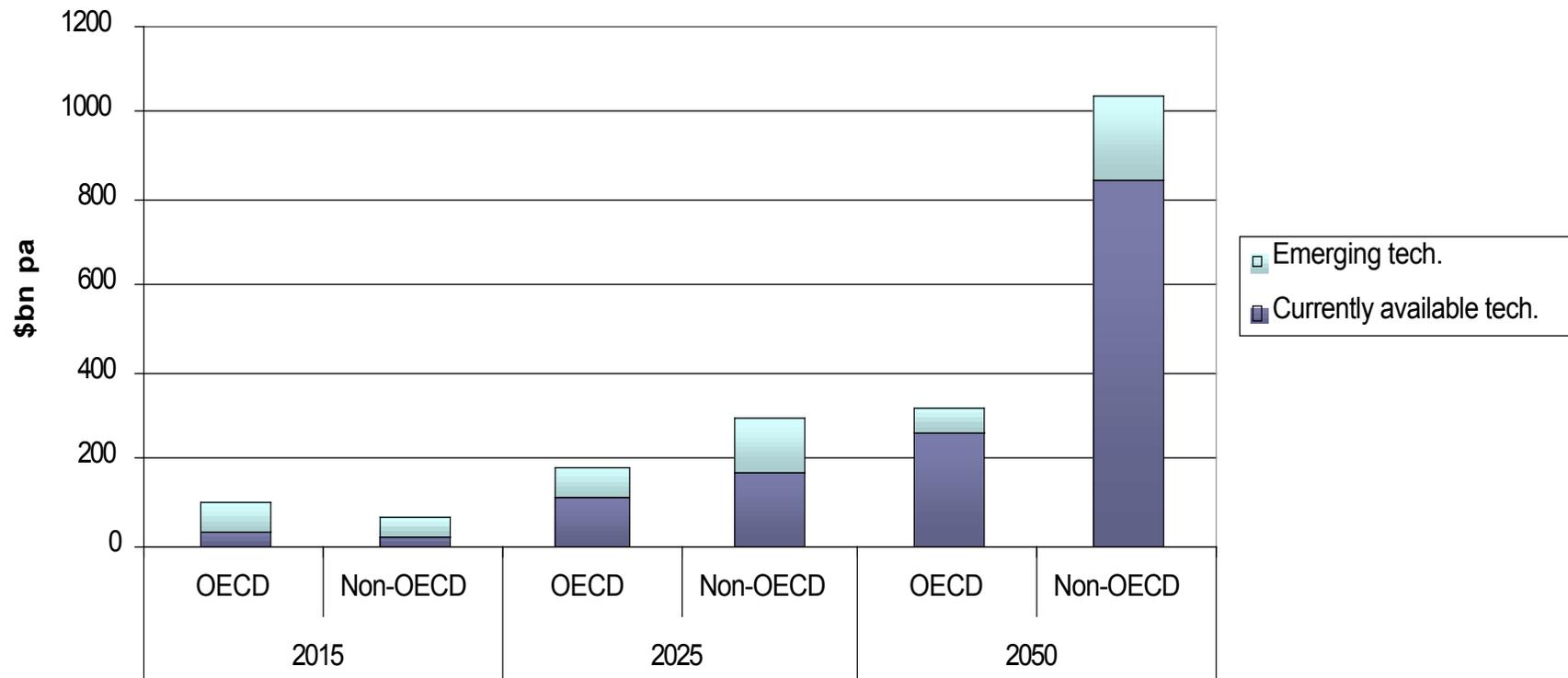
Mehr als eine Option notwendig
Auswahl von Optionen möglich



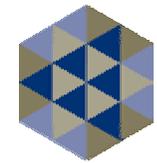
Technology investments



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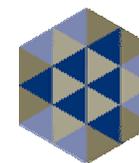


Scale of investments



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Non-OECD \$bill/year 50% OECD support	2015	2025	2050
Currently available (carbon price)	12	87	433
Emerging component (beyond carbon price)	23	61	87
Total	35	147	520



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Thank you!

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