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## China's response to the challenge of climate change

Realising opportunity from crisis

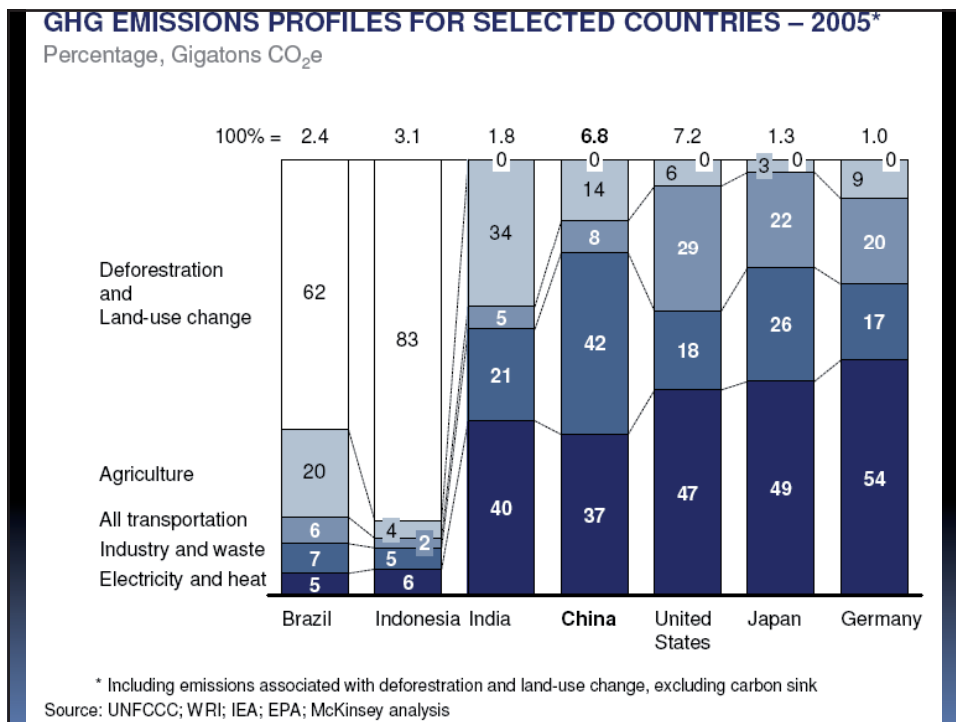
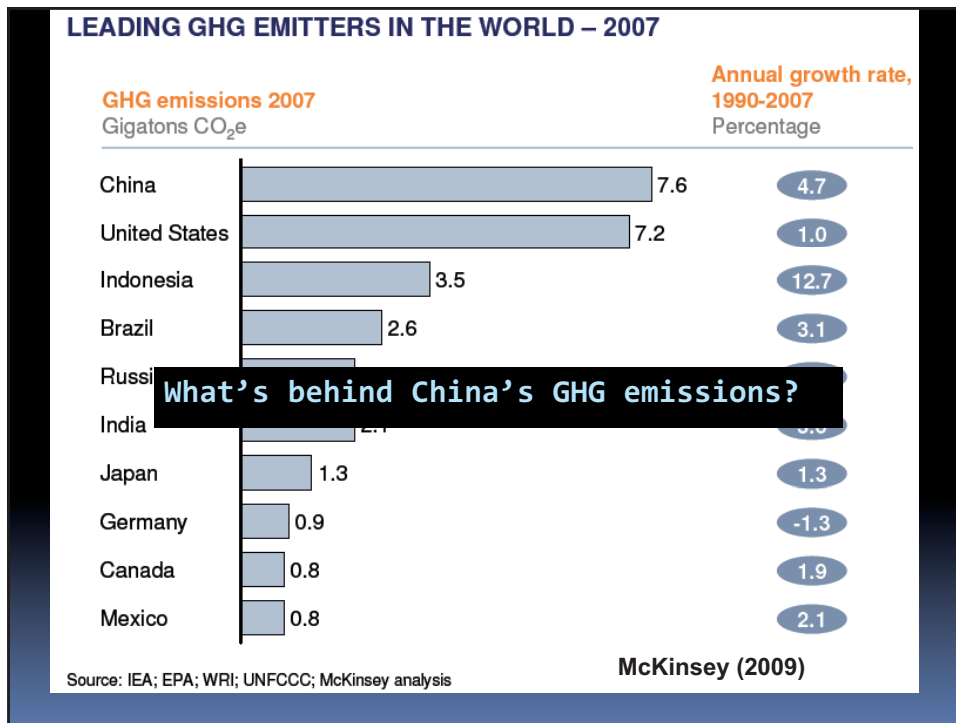
Realising opportunity from crisis

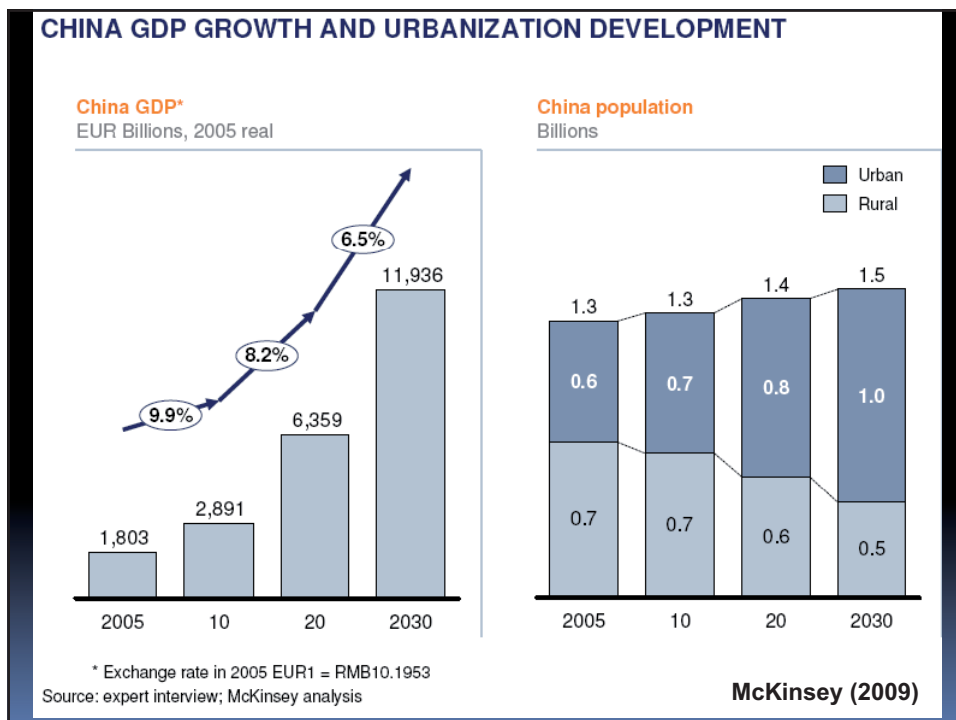
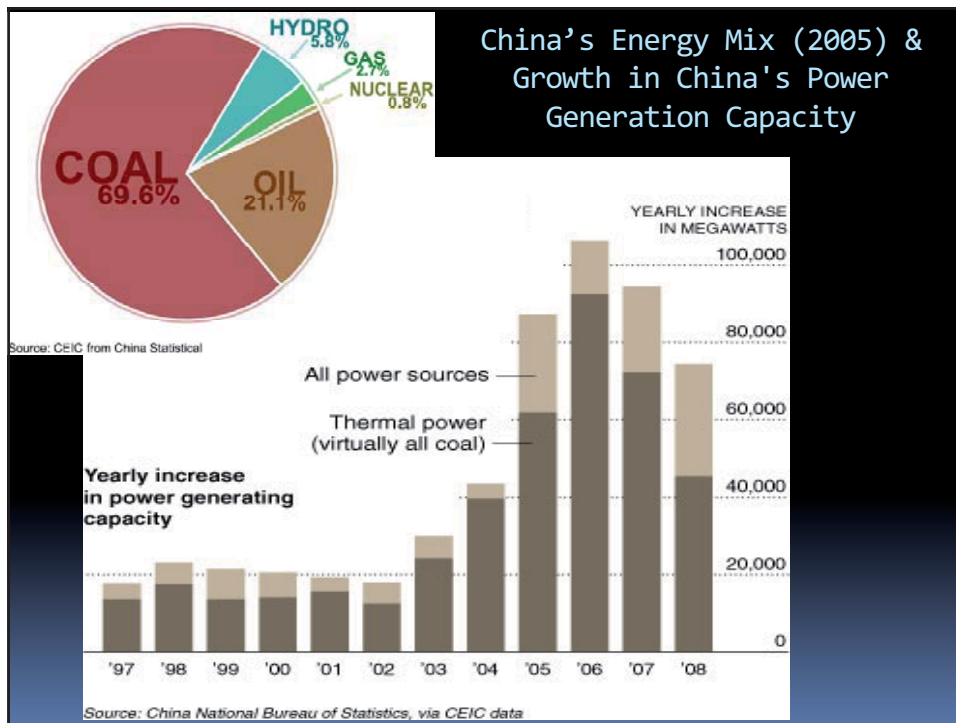
China's response to the challenge of climate change



## Contrasting approaches Australia v's China

- Strong state led development  
*Acting as an engine of reform rather than an obstacle to change*
- From climate challenge to opportunity  
*Realising opportunity from crisis*
- Strategic planning & decision-making  
*Rebalancing its development path as a lean, green technological superpower*
- What are the implications for the rest of the world?





## Response of Chinese government to climate change

1. Position
2. Planning & policies
3. Administrative
4. Fiscal incentives



## 1. China's position

Acknowledge CC & serious impact for China

UNFCCC1992 Framework Convention on Climate Change

- Present & future generations
- Equity
- Common but differentiated responsibilities and respective capabilities

Therefore,

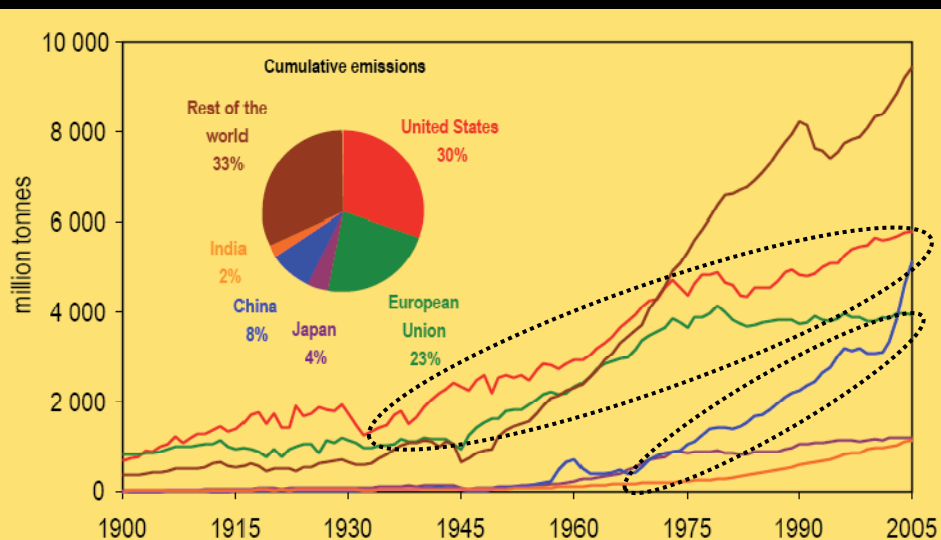
- Developed world to lead



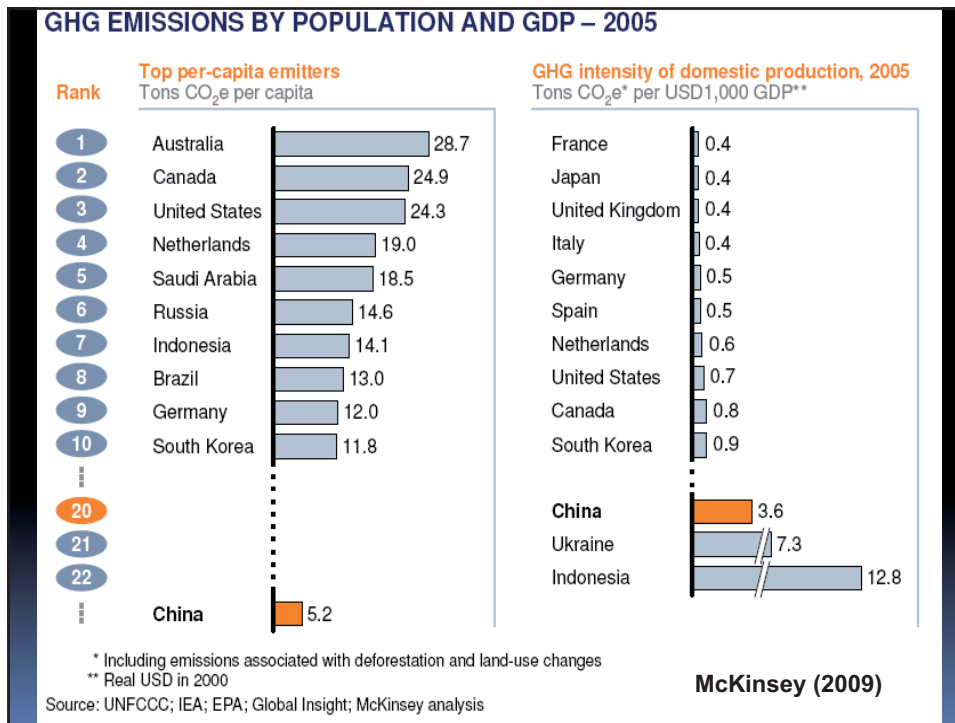
## 1. China's position cont...

- Developed world responsibility
  - Historical debt: emissions since industrial revolution \*
  - Exported GHGs (demand from West)
  - Poverty: low per capita GDP \*
  - Developing world's share of emissions will grow to meet social & economic **needs**
  - Developing world's actions dependent upon
    - Progress in tackling poverty
    - Level of development
    - Effort of developed economies (ie US, EU & Australia )

### Energy-Related CO<sub>2</sub> Emissions by region, 1900-2005



Source: IEA World Energy Outlook India & China (2007)



## 2. Planning and policies

- Comprehensive approach to climate change
  - National Climate Change Leading Group (2006)
  - Climate Change Strategy (2006)
  - National Program on Climate Change (2006)
  - Policies & Actions to Address Climate Change White Paper (2008)
  - Long- & Medium-Term Energy Conservation Plan
  - Circular Economy Law, Renewable Energy Law & Development Plan to 2020

## 2. Planning and policies

- Renewables & low-carbon energy
  - 10% by 2010    15% by 2020
- Energy efficiency: 20% cut per unit of GDP
- Structural economic change
  - Clean production - circular economy
  - Closure & consolidation
- Ecological restoration & reforestation
- Family planning

## 3. Administrative measures

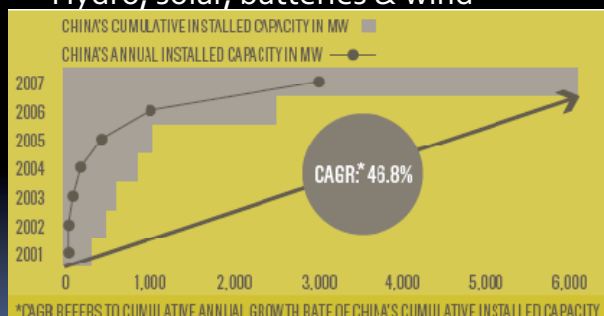
- Government procurement
- Research and development spending
- Public investment strategies
- Tightened energy efficiency mandates & targets for industry & government (at all levels including public officials)
- Resource & energy price reforms
- Standards, regulations & measures
- Top-1000 large energy users program

## 4. Fiscal incentives

- Energy efficiency rebate programs
- Progressive taxing & charges
  - Vehicle VAT & registration
    - >4lt=40% 3-4lt=20% <1.5lt=1%
- Low interest loans
  - 50% reduced rate for biogas, solar energy, small hydro and wind projects
- Feed-in tariffs & renewables fund
  - Biomass, wind & solar

## Outcomes

- Global leader in new energy economy
  - Innovation and R&D - A low-carbon revolution
  - Manufacturing
    - Hydro, solar, batteries & wind

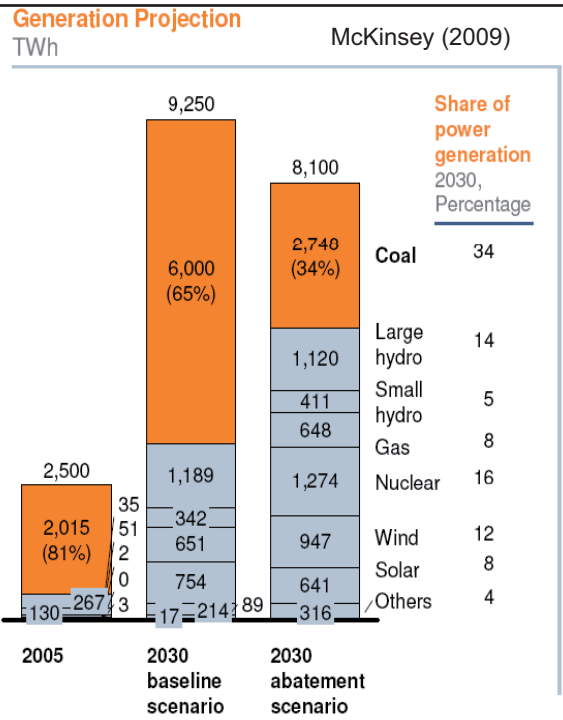


Source: The Climate Group, 2009, China's Clean Revolution II

- At current growth shall reach 100GW by 2020

## Energy

- Diversification of energy mix
- Renewables (hydro, wind & solar)
- Low carbon (gas & nuclear)
- Super critical coal
- CCS
- Pricing & market challenges



## Outcomes

- Innovation - A low-carbon revolution
  - Closure of old & inefficient power generators 2006-June 2009 = 54GW
  - Low-carbon energy technology
    - Smart Grid & UHV transmission lines
    - CCGT (Combined Cycle Gas Turbines) - gas
    - IGCC (Integrated Gasification Combined Cycle) - coal
    - Super critical coal (high efficiency)
    - Nuclear IIIb & IV generation 2009=9GW
    - CCS

## In the pipeline



- 12<sup>th</sup> Five year Plan (2011-2015) to include: Low-carbon economy & extension of energy efficiency program
- More aggressive energy targets
  - "New Energy Program" (US\$200-400 b) over 10 years
    - Wind 30Gw → 120 Gw
    - Solar 3Gw → 10 Gw
    - Hydro to 300GW
    - Nuclear (9Gw → 70Gw)
    - Smart grid & meters
- Carbon intensity reduction of 40-45% by 2020
- Emissions cap and trade system (2011?)
- Peak (2030) and decline GHG emissions scenario

## What's driving China's response? - *strategic planning*

- Climate change as a vehicle for rebalancing
- Energy security
- Sustainable economic development
  - Growth market in low-carbon economy
- Competitive advantages
  - Manufacturing base (exports) of energy efficient goods
- Social stability - employment
- Environmental protection
- 'Low-carbon economy' concept...

## A low-carbon economy

### Transition to a low-carbon economy

- Decoupling economic growth from carbon growth (energy intensity)
- Structure of the economy
- Innovation through investment in S&T+ R&D
- Leap frog approach to development
- Experience of Japan, South Korea & UK
- Diversification of economy & energy

## Considerations

'In theory we have solved the problems. Now the challenge is to enforce them'  
Pan Yue Deputy Minister, Environmental Protection

- Mode of development: quality v's quantity
- Plan to market (Role of incentives & mechanisms)
- Governance & implementation issues
  - Local industry, government & officials, central-local
- Industry - still too much of the 'old economy'
- Carbon tax & trading market
- Global considerations

## Additional challenges

- Broader considerations critical
  - Integrated & sustainable planning
  - Realistic implementation (monitoring & adaptability)
  - Carbon tax & global agreements
- Timing is critical... **Lock-in effects**
  - Power generation
  - Urban planning
  - Transport
  - Buildings
  - Industry
- Speed of technological penetration
  - Investment in R&D
- Climate implications  
Cost of inaction:  
5 years delay = 1/3 of 2030 abatement potential (2.4 Gt of CO<sub>2</sub>e)

## Concluding argument

- In the short-term, China will retain its 'dirty economy': capital intensive, industry-led growth strategy
- China's stimulus and 11th FYP set the foundations for the rebalancing of its economy
- The global recession has sped up the rebalancing of its economy & accelerated China's economic ascendancy
  - Adopting aggressive "**low-carbon economy**" strategy will provide significant environmental and economic advantages
- China's growth will be stronger than anticipated to 2030
- A 2030 GHG peak & decline scenario = global agreement

## Implications for Australia

1. Responsibility v's shame
  2. Leadership & decision-making v's laggard
  3. Implications of bad decisions & policies
  4. Competition & innovation v's dirty economy
  5. What about carbon leakage?  
Mass production of new energy & energy efficient goods, such as solar cells, wind turbines, motor vehicles, power generators, fuel cells & household appliances, such as air conditioners
- Perhaps, we can just be content with...
- Demand for resources
  - Supply of skills & talents
  - Opportunity for foreign investment

**THANKS!**

Any questions?



## Further reading

- CAS (2009) *China Sustainable Development Strategy Report 2009—China's Approach Towards a Low Carbon Future*, Chinese Academy of Sciences (CAS) Sustainable Development Strategy Research Group, Science Press, Beijing (in Chinese)
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