China

Emissions targets and implications for business

China has committed to reduce its carbon intensity by 60-65% compared to 2005 levels by 2030, and increase the share of non-fossil fuels in primary energy consumption to around 20%

What is China's contribution...

1. To peak CO2 emissions by around 2030, part of the U.S.-China Joint Announcement on Climate Change of November 2014.
2. To increase the share of non-fossil fuels in primary energy consumption to around 20%, installing 104GW of **wind** capacity, 72GW of **solar** and over 60GW of **nuclear** capacity.
3. To increase the **forest** stock volume by around 4.5 billion cubic meters on the 2005 level.

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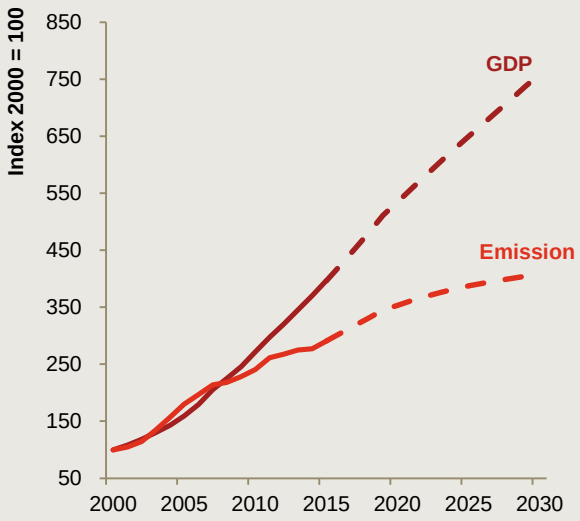
... and what are the implications for business

- At the UN Sustainable Development Summit in September 2015, China announced it will contribute **US$3 billion** for setting up a South South Cooperation fund to support developing countries to combat climate change and enhance their capacity to access the Green Climate Fund.
- The National Strategy Centre for Climate Change estimates that China will need to invest **US$6.3 trillion in the low carbon transition** including energy efficiency improvements, development of renewables, nuclear and CCS technology over the next 16 years. This equates to $400bn per year.
- The National Development and Reform Commission ruled that priority industries like coal-fired power plants, chemicals, steel, cement and oil and gas actively engage in CCS pilot projects to improve China's experience in the technology.
- China plans to implement a national carbon market in 2017 which would cover the largest volume of emissions in the world. For illustration, a modest **carbon price of US$20 per tonne in 2030 would form at least 10% of the cost structures** of energy intensive industries such as petrochemicals.
- The scale of investment to meet China's **wind and solar targets is likely to add up to around $230bn** (or 2% of one year's GDP).
- Approximately **US$130bn of investment will be needed to install the 104GW of wind capacity** by 2020 – equivalent to 35,000 3MW turbines or close to the current installed onshore wind capacity in the EU.
- We estimate **US$100bn will be required to add the 72GW of solar capacity** covering an area the size of London. Nearly 8GW of solar capacity, or roughly US$12bn of investment, was introduced in the first half of 2015.

GDP, energy and related emissions

GDP forecast: 4.6% per year
Emissions forecast: 2.4% per year



Our absolute emissions trend is based on combining the GDP forecast above with the average decarbonisation rate so far this century

GDP: Since 2000, GDP has almost quadrupled, averaging growth of 10% per year. However GDP growth has slowed recently, falling from 9.3% in 2011 to 7.4% in 2014; the lowest GDP growth rate since 1990. PwC's World in 2050 forecasts this to slow to 4.6% per year on average between now and 2030.

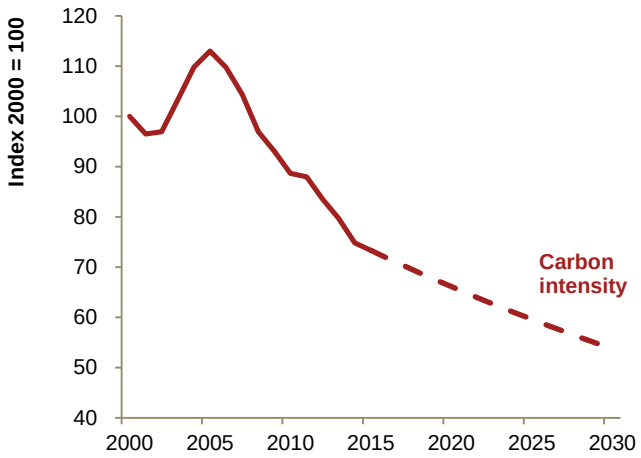
Energy: China's energy consumption has almost tripled in the last 15 years. Rapid coal increases in consumption in the early century have slowed in recent years, increasing by just 2.0% and 0.1% in 2013 and 2014 respectively. However coal still contributes 66% of total energy. The share of oil in China's energy mix has decreased from 22% in 2000 to 18% in 2014, whilst natural gas has increased from 2% in 2000 to 6% in 2014. Nuclear's contribution to the energy mix still remains negligible at just 1% in 2014.

Renewable energy: China's commitment to cleaner energy is growing, with just under 10% of the energy mix now supplied by renewable energy. This has risen from just 5.4% in 2000, with investment in renewable energy reaching $89.5 billion in 2014, and $431 billion since 2005. Rapid growth in hydroelectricity means that it now provides four fifths of this 10% share. Wind, biofuels, geothermal, biomass and solar have been growing at an exponential rate, but from a very low base.

Emissions: By Sector, Power contributed 57% of emissions in 2012, Industry 27%, Transport 9% and Buildings 7%.

Carbon Intensity

Carbon intensity forecast: -2.0% per year

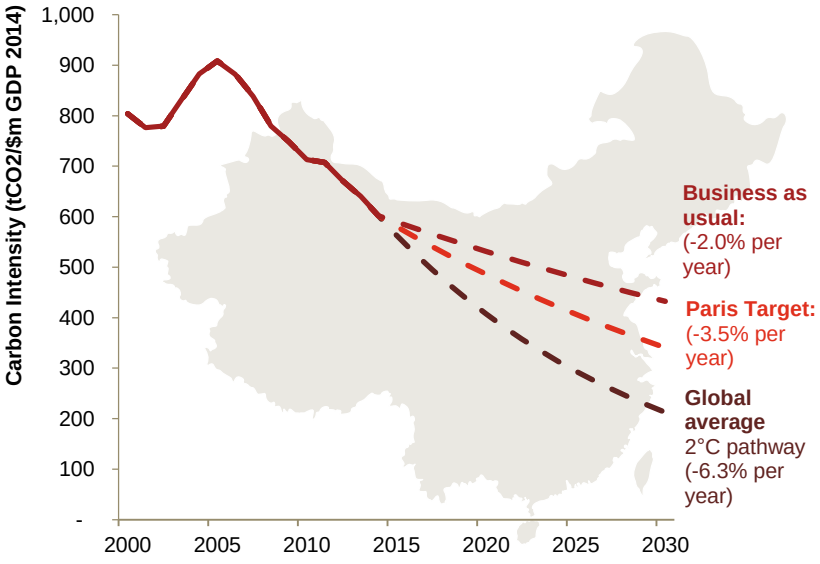


- China's decarbonisation rate has averaged 2% since the turn of the century.
- The average masks wide variations in annual rates from a 7% decarbonisation high in 2008 to carbon intensity increases of 6.7% in 2003.
- Since 2005, China has consistently decarbonised each year. Since 2011, the decarbonisation rate has risen from 1% to 6% in 2014.
- We use the 2% average decarbonisation rate so far this century for our business as usual forecast opposite and below.

How ambitious is China's 60-65% target

- Compared with its business as usual decarbonisation rate of 2.0% this century, China's target is relatively ambitious as it will require annual decarbonisation of 3.5% per year. However, against the 6.0% decarbonisation rate China achieved in 2014 the target looks like it could be achieved comfortably.
- Assuming the target is met, China's carbon intensity in 2030 will be roughly the same as the US' in 2014. Like the EU and US targets, China's falls short of the 6% annual reduction needed to limit warming to two degrees.

How ambitious is China's 60% to 65% target?



Sources:
Historic GDP: World Bank, 2014
GDP Forecasts: PwC World in 2050, 2015
Energy data: BP, Statistical Review of World Energy, 2015
Historic emissions data: International Energy Agency, 2014, World Energy Outlook and UNFCCC
Renewable Power Generation Costs in 2014, IRENA, 2015. European Wind Energy Association: Wind in power 2013 European statistics

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