2016-IP31: Chinese CO_2 Emissions have peaked?

A recent article in the journal Nature Lord Nicholas Stern and researchers from Tsinghua University of China have looked at China's recent economic growth and have concluded that China has decoupled its economic growth from its coal consumption[1]. They key reasons for this are: a structural shift away from heavy industry and policies on air pollution control which have caused coal consumption to peak.

There has been much speculation on the likely timescale that China's coal consumption would peak, with many projections suggesting this would occur between 2020 and 2040. For example, in November 2014 at U.S.-China Joint Announcement on Climate Change and Clean Energy Cooperation President Xi Jinping of China announced targets to peak CO_2 emissions around 2030, with the intention to try to peak early[2].

This new research by Lord Stern et al however suggests that the inflection point has already been reached and despite China remaining dependent on coal for energy production for the foreseeable future, they postulate that China has now entered a period of post coal growth. In transitioning to Post coal growth, China is following the same pathway as other more affluent countries, like the USA, have done before them

It is noted that China is experiencing an economic slow-down and growth has slowed significantly. In particular growth in the construction and manufacturing industry fell 8% between 2011 and 2015. These two industry sectors accounted for around 80% of Chinese coal consumption during the same period. In parallel with this decline is the growth of the service industry in China which uses about a quarter of the energy of its competitors. The shift they argue is in part due to rising labour costs in China, causing an attendant loss in competitive advantage and low value manufacturing switching to less affluent Developing Countries.

The second driver they argue are strengthened policies on air pollution and clean energy. Lowering coal use has been a critical component of measures to reduce emissions of pollutants like, SOx, NOx and particulates. China has placed limits on coal consumption in 10 Eastern provinces, 4 of which were the main manufacturing centres in the county. Added to this there has been significant growth in wind, solar, nuclear and hydropower power production in China in the last 8 years.

They then go on to consider if this is a short term blip or a long term trend and are confident it is a long term trend based on three factors. First, the trend in manufacturing and construction is consistent with developments observed in other economies that expanded rapidly and then slowed. They feel there is a growing consensus that Chinas growth rates in the future will decline to 5% or less by 2030. Second they feel that air pollution polices and development of clean energy are long term developments, and are set into future economic plans. Thirdly China is making big strides in technology innovation. They cite the example of China's renewable industry which has gone from non-existent to being a world leader in 10 years.

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1 http://www.nature.com/articles/ngeo2777.epdf?referrer_access_token=JUCB4ZRRy4Ca404TIRHKBNRgN0jAjWel9jnR3ZoTv0O58OiObXINYoVkEbVK_EX5-rYKZC-RcZ09FwnekNIyz2g0LZd95-IYFIdIsz9b91QC4NcAZ9AhmekUGmSrsXTyd8TsZwwG1ItZhdDPXm-8wGBv4vRzJZX8v-jHzuwRaYwu-5X6JJub3mJ6xQoE_bKiFtGHb8MT9jek0R8m0bEOk_c0GHm_E9Cqip-aj5ya7yB2_Aq8kdvBSUKAZyw-RLpmXf_ks4To1Xu0sNPokqduQCXvFyFT18Uqgfcsq18TENg%253D

2 http://www.whitehouse.gov/the-press-office/2014/11/11/fact-sheet-us-china-joint-announcement-climate-change-and-clean-energy-c

They conclude by suggesting that Chinas peak in coal consumption has important implications for the rest of the world. Since China is the world's largest emitter of CO_2 a reduction in emissions from China will affect global emissions and ensure that the new target of below 2C might be attainable.

This news is reinforced by BP's Statistical review for 2016 that indicated that in 2015, China's CO_2 emissions reduced by 11.6 Mt, 0.1%, this the first decline since 1998[3]. The IEA in March 2016 reported that global energy-related CO_2 emissions stayed flat in 2015 for the second year in a row and thus we have seen two straight years of greenhouse gas emissions decoupling from economic growth. The two largest emitters, China and the United States, both registered a decline in energy-related CO_2 in 2015. In their analysis, China's emissions declined by 1.5%, as coal use dropped for the second year in a row. They attributed this to similar reasons as those proposed by Stern et al above. First, the economic restructuring towards less energy-intensive industries and the government's efforts to decarbonise electricity generation pushed coal use down. In 2015, coal generated less than 70% of Chinese electricity, ten percentage points less than four years ago (in 2011). Over the same period low-carbon sources jumped from 19% to 28%, with hydro and wind accounting for most of the increase.

Summary

There seems to be growing evidence that China's CO_2 emissions may have peaked around 2014/15 which is earlier than previously suggested. Coupled with the fact that the USA's CO_2 emissions are also decreasing this means that the world's two largest greenhouse gas emitters are now showing downward trends. The main contributors to these reductions are reductions in coal use and increases in the renewable energy generation. This does not infer a complete phase out of coal in China or the USA. In China coal will certainly remain the major energy producing fuel for many years to come. It is expected that the rate of growth of renewable energy production will reduce/peak in the next ten years. The next option to reduce CO_2 emissions significantly from fossil fuel use then becomes CCS.

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[3] IEAGHG Information Paper: 2016-IP25; CO2 emissions in 2015 – 65th BP Statistical Review, http://www.ieaghg.org/docs/General_Docs/Publications/Information_Papers/2016-IP25.pdf