
Coal Peaking and Decarbonization in China



Barbara Finamore

March 13, 2017

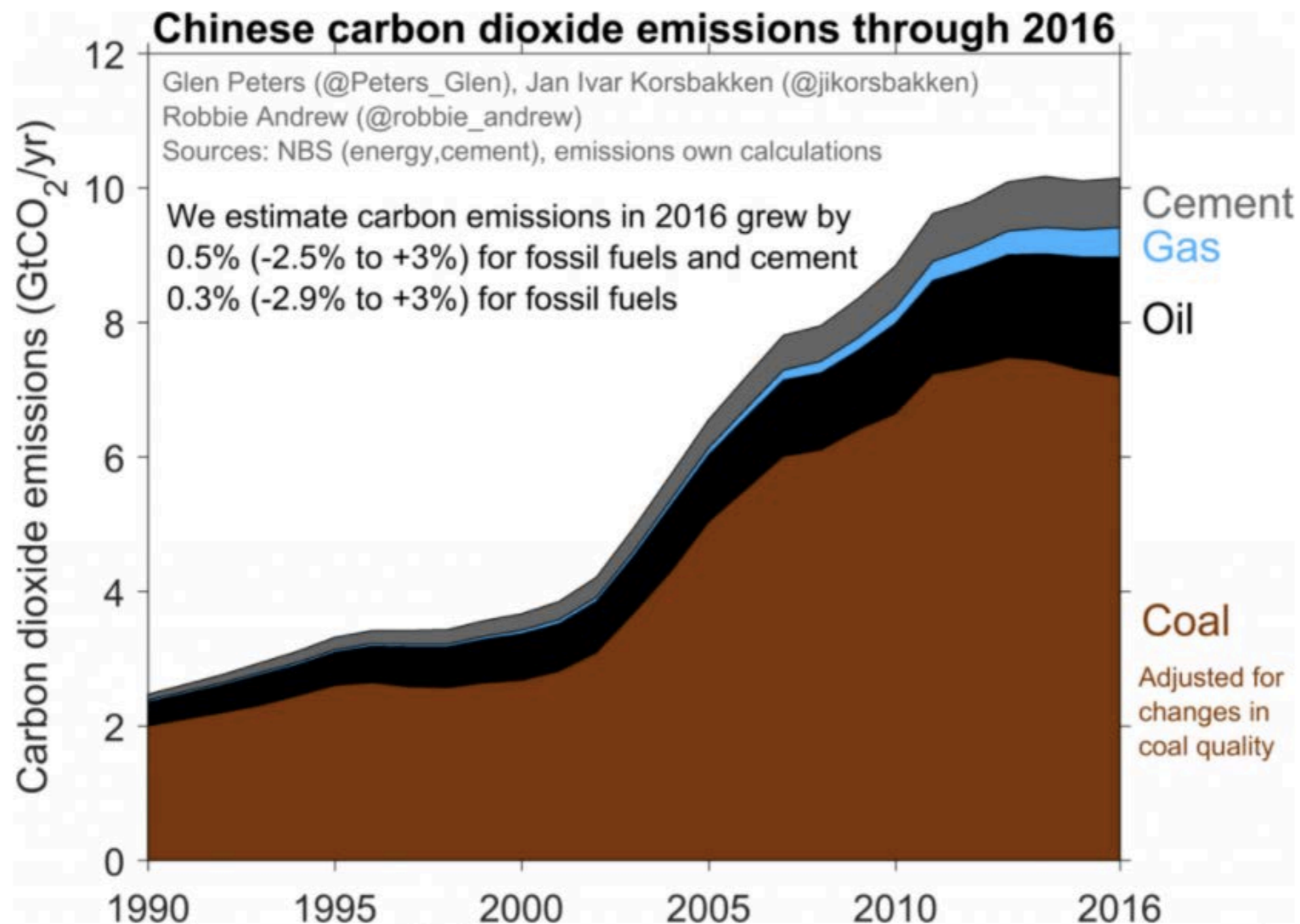
Woodrow Wilson Center China Environment Forum

Coal Cap Project Goal

Help China to establish a comprehensive, mandatory national coal consumption and production cap target in the 13th Five Year Plan energy sub-plan that:

- accelerates China's energy transition away from coal to cleaner energy
- ensures 2013 was peak coal consumption and there is a rapid reduction in coal consumption through 2020
- puts China on a CO₂ emissions pathway consistent with limiting global warming to well below 2°C and ideally 1.5°C.
- is consistent and synergistic with other environmental and climate policies to maximize co-benefits
- requires provinces and cities to develop 2020 coal cap targets and plans

China's fossil energy and cement carbon emissions are peaking/plateau-ing



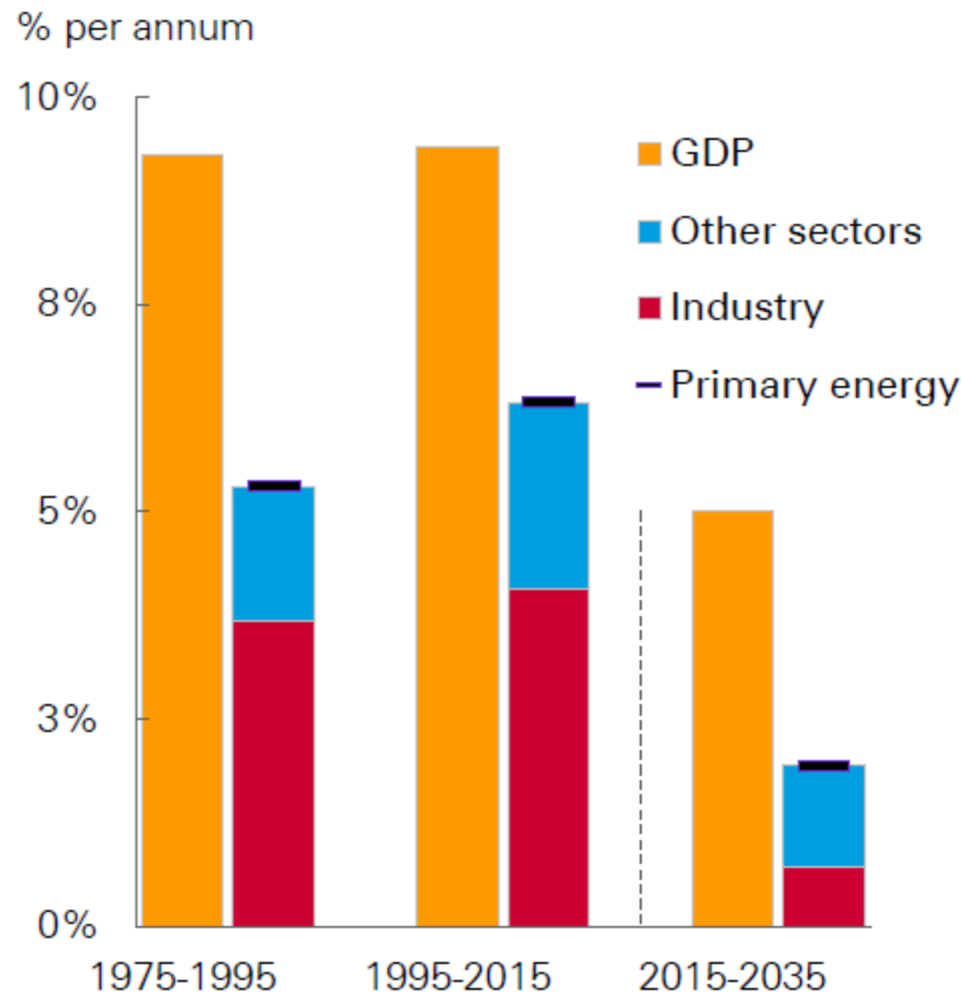
Estimated CO₂ emissions in China 1990-2016 broken down for coal (brown area), oil (black), gas (blue) and cement (grey). Source: China National Bureau of Statistics and authors' calculations.

Source: [Dr Jan Ivar Korsbakken](#) and [Dr Glen Peters](#), [CICERO](#) Center for International Climate Research, Norway. <https://www.carbonbrief.org/guest-post-closer-look-chinas-stalled-carbon-emissions>

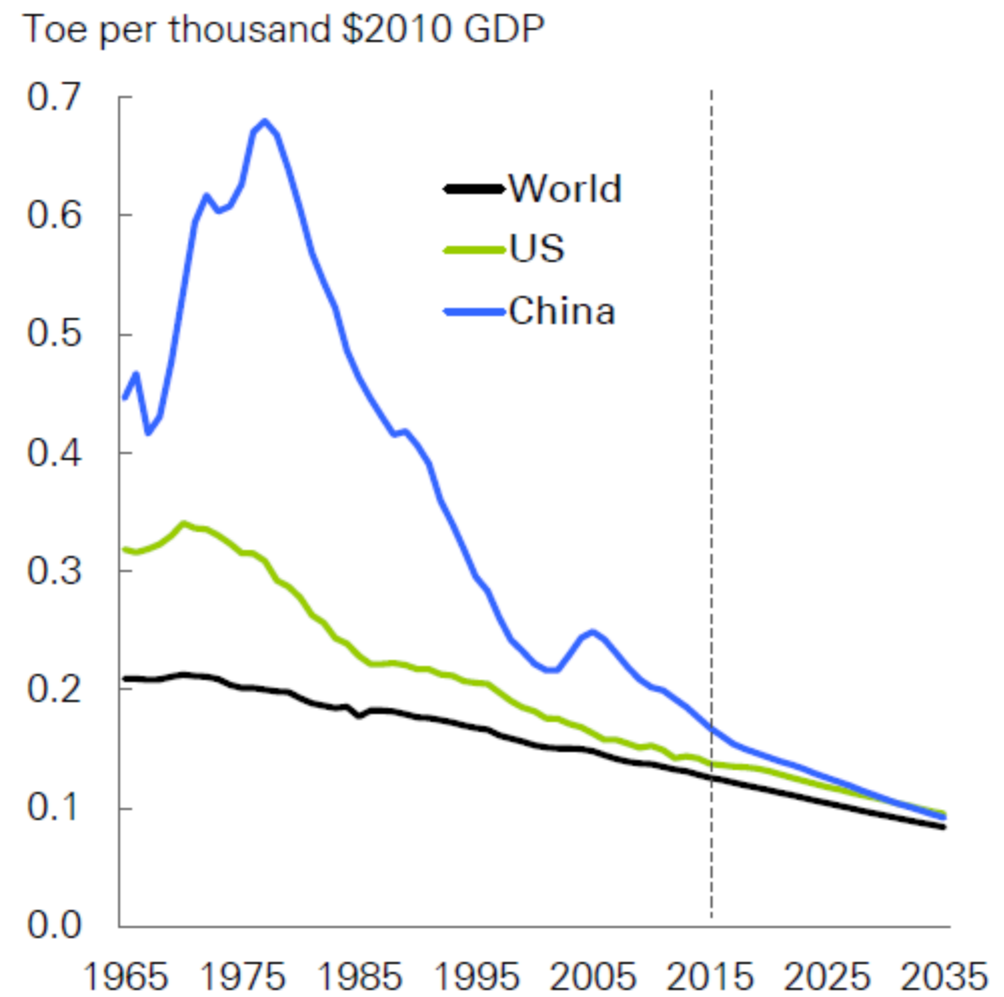


China's energy needs are changing...

China's GDP and primary energy demand growth



Energy intensity

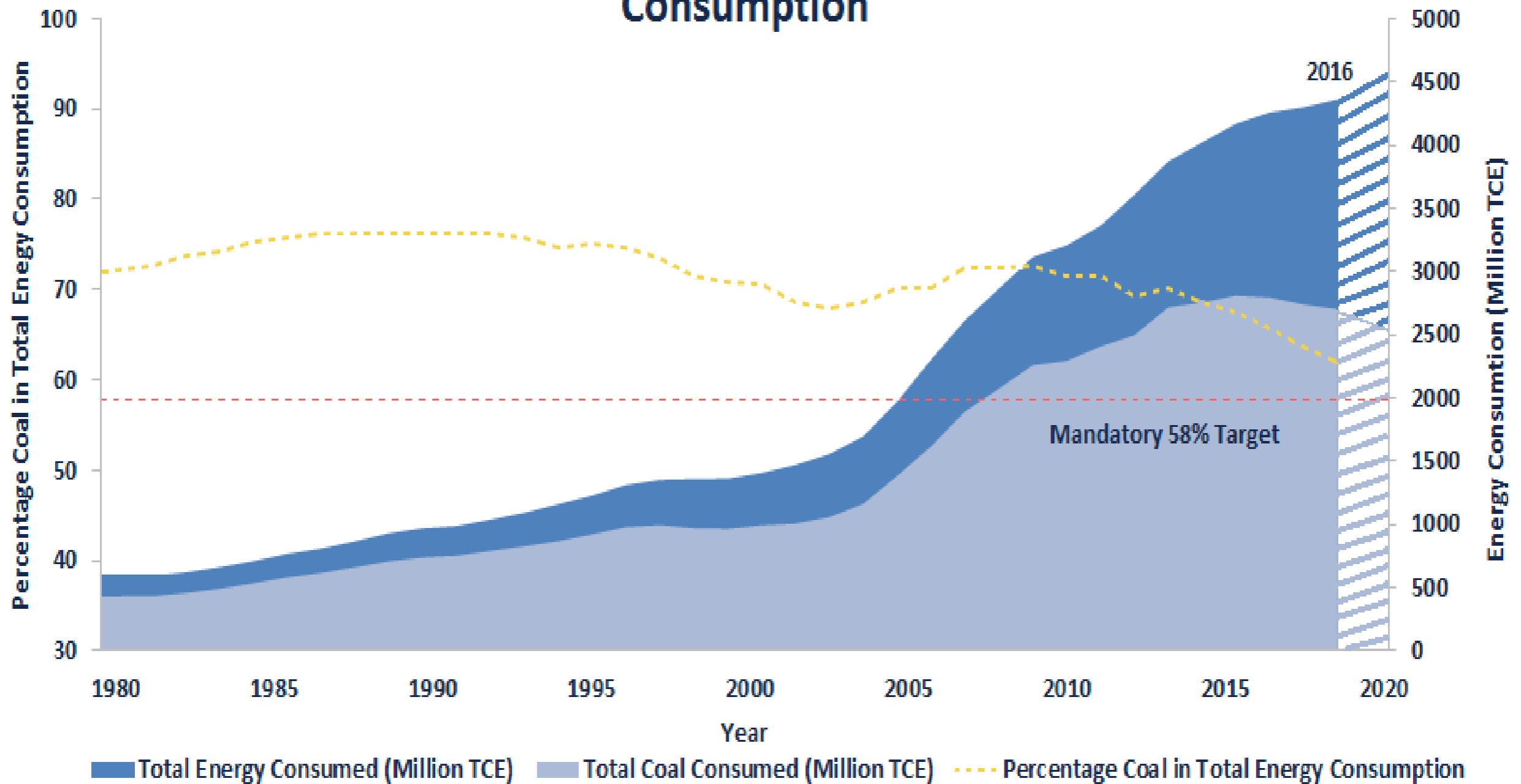


China's Coal Cap Policy Has Been Drive by Air Pollution

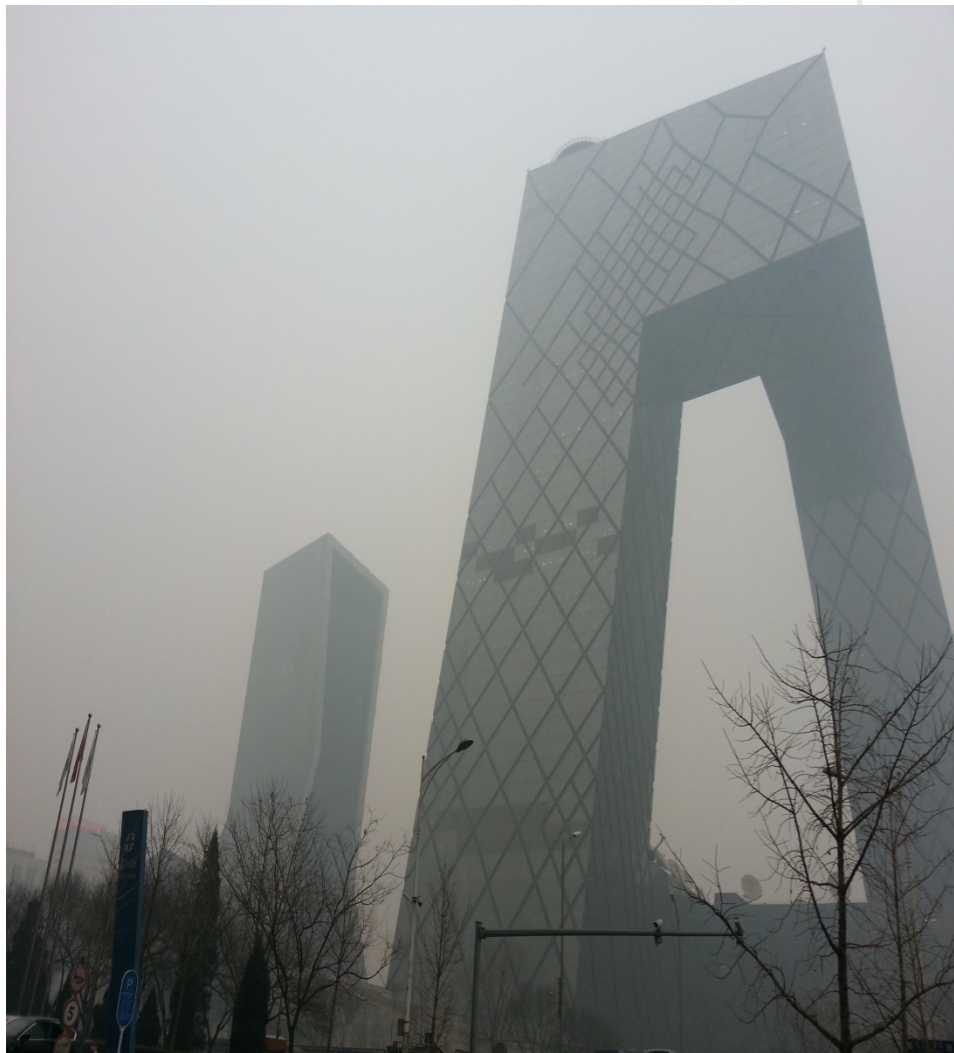
- **September 2013: Air Pollution Action Plan for 2013-17:** Sets PM 2.5 reduction targets for 3 key air pollution regions, requires key air pollution regions to decrease coal consumption, and calls for establishing “medium to long-term coal consumption cap targets.” Goal of reducing coal to 65% or below by 2017.
- **November 2014: Energy Development Strategy Action Plan for 2014-2020:** Sets national energy consumption target of 4.8 billion tce and coal consumption target of 4.2 billion tons for 2020. Reduce coal to 62% or below by 2020.
- **December 2014: Key air pollution region coal consumption reduction and replacement regulation:** Requires coal cap plans and evaluations for provinces in key regions
- **May 2015: Work plan for strengthening air pollution measures through key city coal consumption control,** targeting coal caps in 10 most polluted cities
- **August 2015, Amended Air Pollution Law:** Sets goal to gradually reduce the share of coal in primary energy consumption.
- **December 2015-February 2016:** Policies for reducing excess capacity in coal mining and iron and steel, reviewing coal power plant approvals.

China's target to reduce coal's share to 58% of total energy consumption by 2020 fundamentally changes its energy structure

China Sets Mandatory 58% Target for Share of Coal in Total Energy Consumption



Other Coal Targets

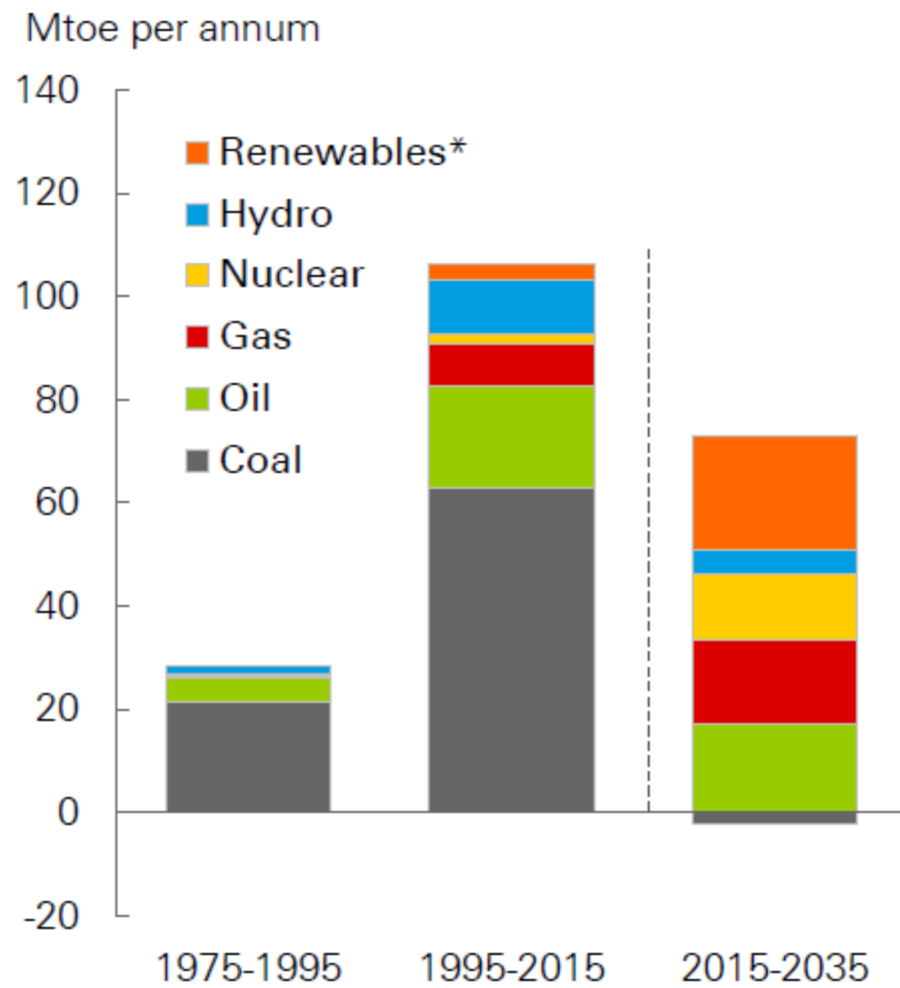


- NEA 2017 work plan: reduce coal's share of energy consumption to 60% this year
- 13th FYP total coal consumption cap target for 2020: 5.0 billion tons; likely to consume less
 - Coal Cap Project research found that a 55% share and 3.5 billion ton coal cap in 2020 would be possible with more aggressive efficiency and coal replacement policies, and would bring significant health, social and environmental savings
- Environmental Protection 13th FYP establishes specific coal consumption targets for key air pollution regions to reduce coal consumption by about 10 percent by 2020 compared to 2015; other key regions must cut by 5%



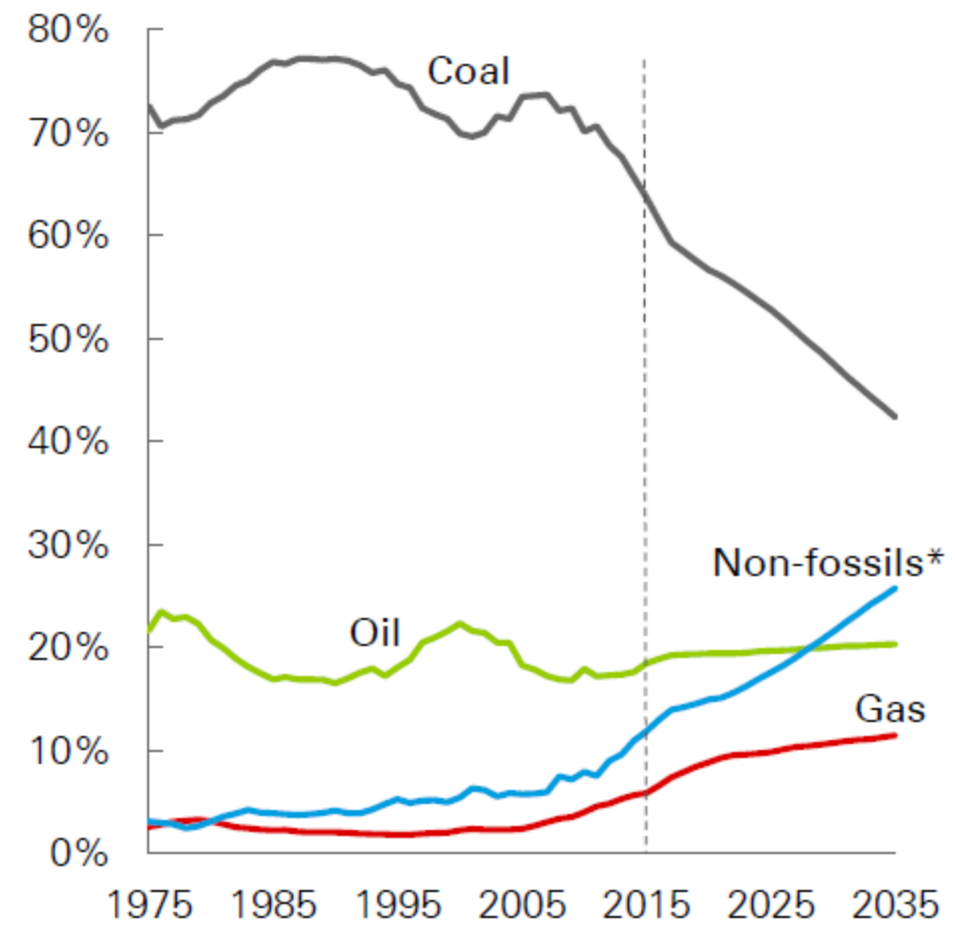
China is also shifting towards a lower-carbon energy mix...

Primary energy demand growth by fuel



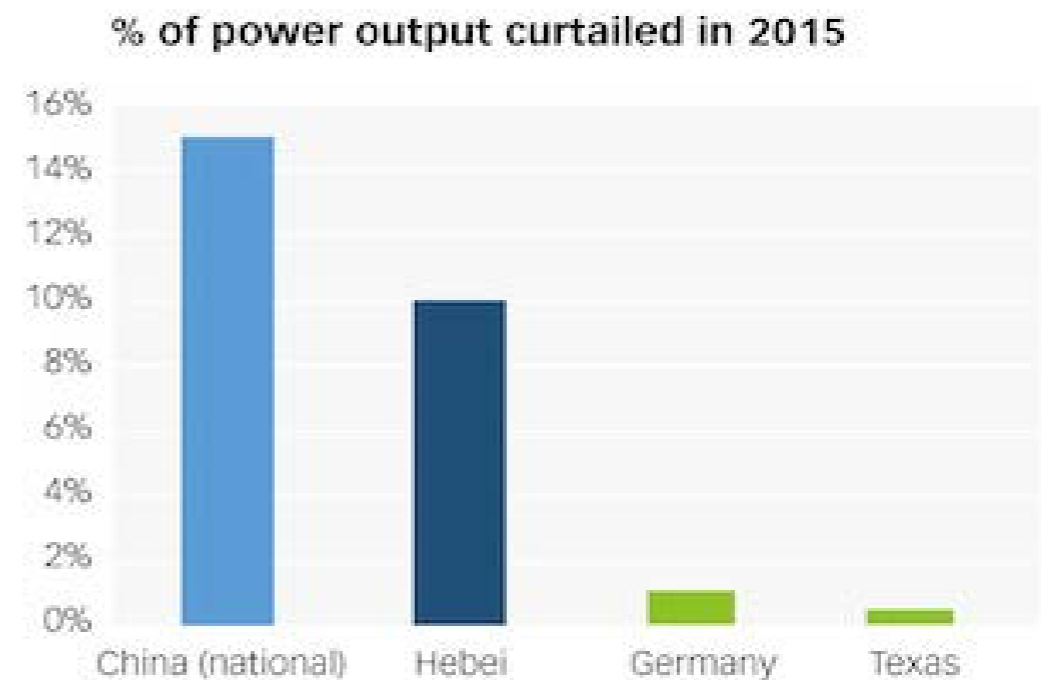
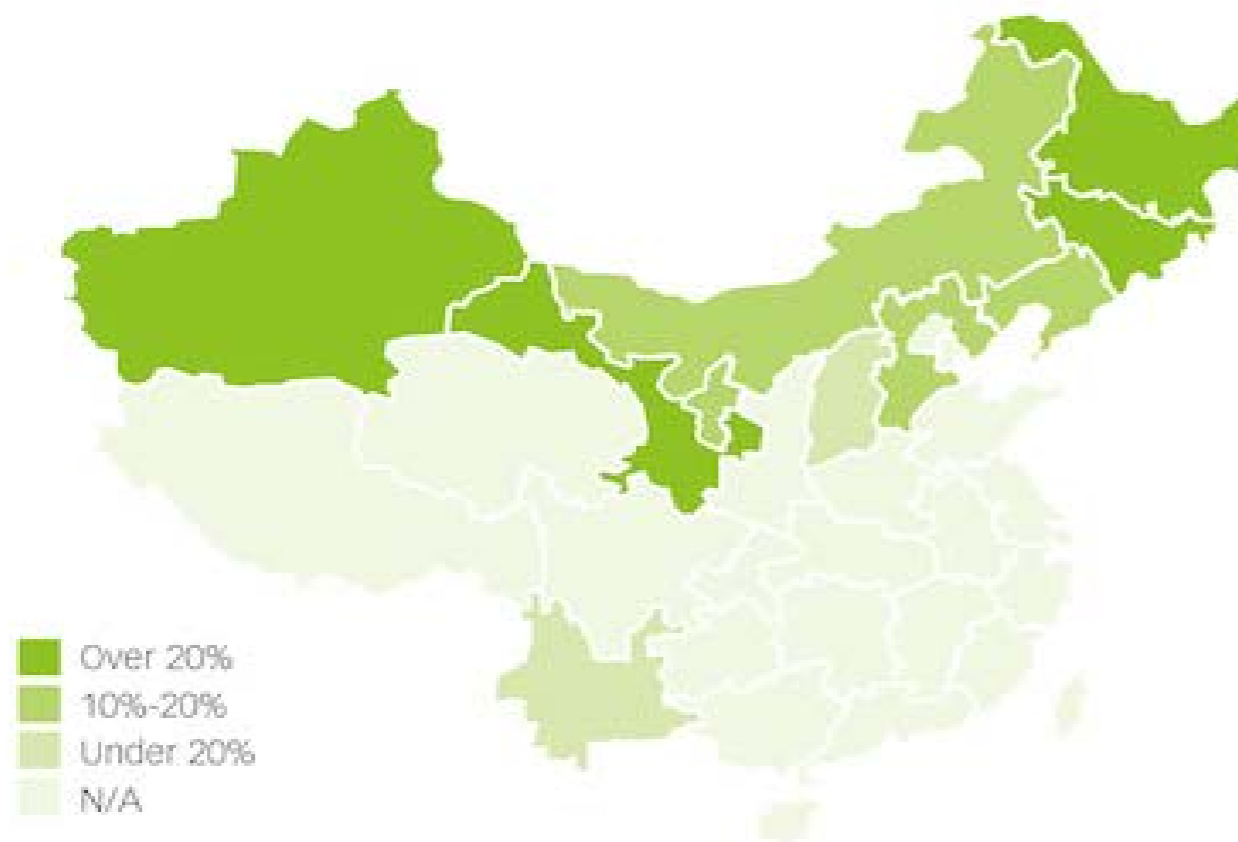
*Including biofuels

Shares of primary energy



Key Issue: High Levels of RE Curtailment

CHINA WIND CURTAILMENT RATES IN INTERNATIONAL COMPARISON



Curtailment affects most regions with high wind capacity in China; in 2015 curtailment reached 15% at the national level.

Source: NEA, 2016

Source: Paulson Institute

Key Issue: Coal Overcapacity in Power Sector Still Climbing

- Coal consumption in China's power sector, which consumes almost half of China's coal, has been falling since 2013
- Despite this, China's Energy Development 13th FYP promises to continue to grow coal-fired power capacity from 920 GW in 2015 to 1100 GW in 2020
- Since announcing that goal, China has canceled 120 GW of coal power plants planned or currently under construction. Premier Li Keqiang recently announced another 50 GW cut in coal capacity.
- These are just necessary cuts to make sure China does not exceed already bloated 1100 GW goal.
- Average operating hours for existing coal plants has already dropped to 47.5% in 2016, and are expected to fall further, thus running the risk of stranded coal assets.
- A joint Oxford University and NCEPU study estimated that stranded coal-fired assets could be as much as 4.1-9.5% of China's 2015 GDP.

Key Question: Coal Chemicals Industry

- Modern coal chemicals industry remains small but looks to expand exponentially
- If all planned projects are approved, coal consumption from this sector could jump from 128 million standard tons to 477 million by 2020

Coal Cap Project recommendations:

- China needs to strengthen and clarify its policy and regulatory oversight of this industry
- Development of “modern” coal chemical industry should be restricted to “demonstration projects,” with no new approvals of other projects until demonstration projects can prove that CO₂ and emissions and other pollutants can be controlled.
- Water availability should dictate the extent to which this industry should develop.
- Demonstration projects need to strictly follow environmental standards with their waste disposal and resource utilization.
- Specific standards and caps should be set for coal chemical industry.

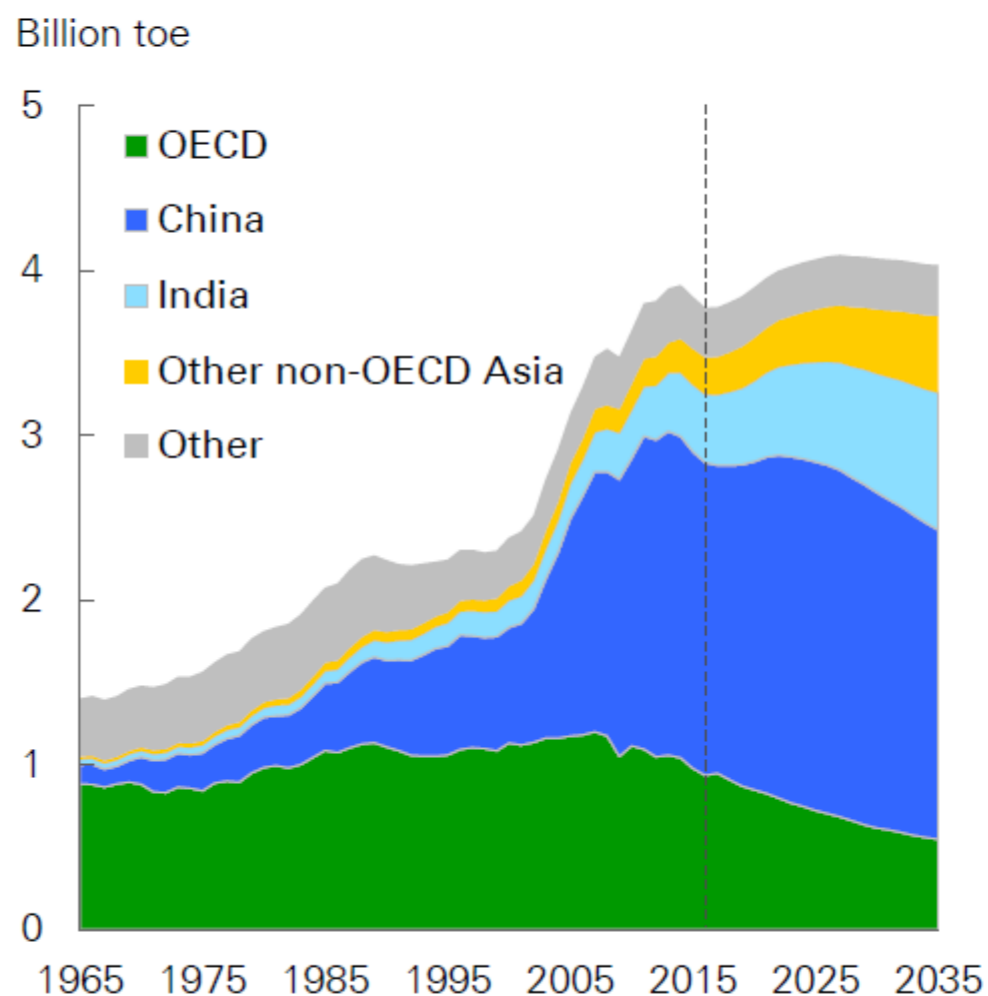
China's Decarbonization: Will Coal Peak or Plateau?

Base case: Coal

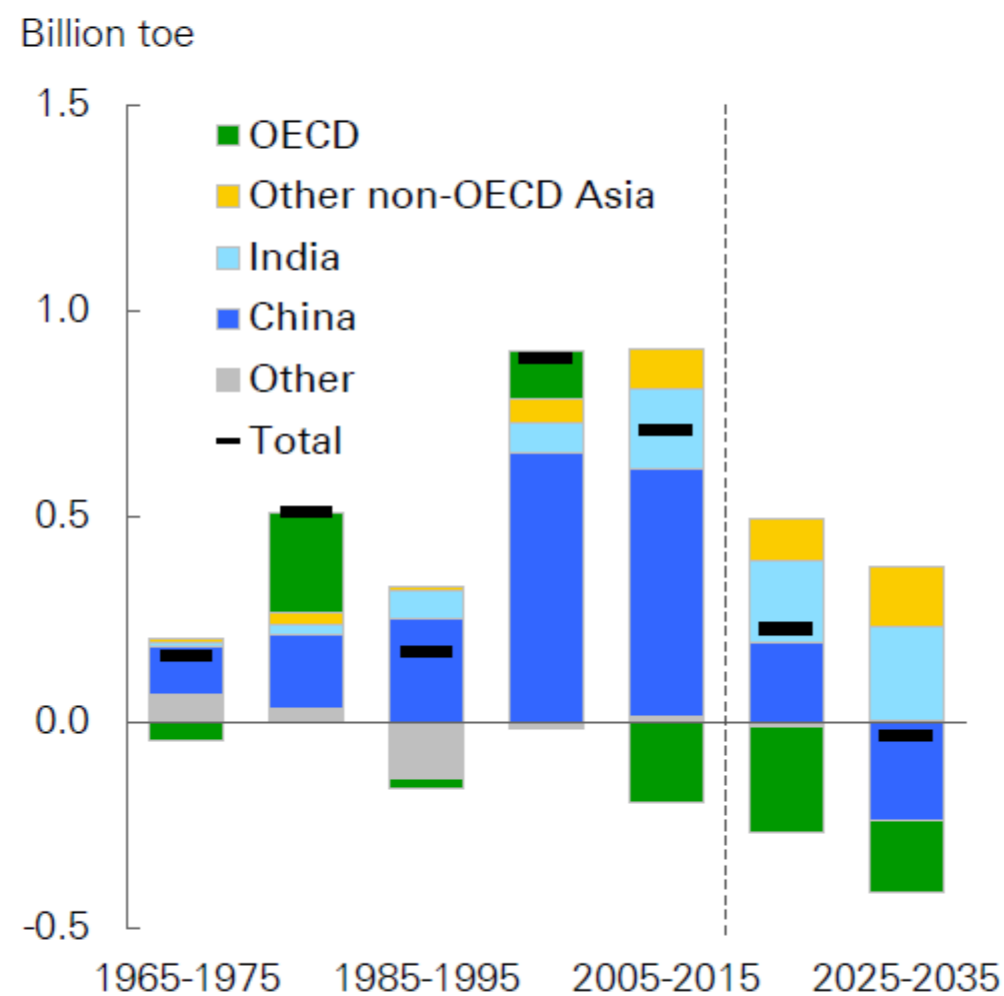
Growth in global coal demand slows sharply...



Coal consumption by region



Ten-year increments by region



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