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Challenges for China's New Energy Development Plan (2016-2020)

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On 5 January 2017, China released its Energy Development Plan as part of its 13th Five Year Plan (FYP), which covers the 2016-2020 period.^[1] This plan reiterates existing targets, but also contains several new quantitative objectives. The Energy Development Plan sets the following targets:

- A 15% reduction in energy consumption per unit of GDP by 2020 relative to the 2015 level (already set in the 13th FYP)^[2];
- A new cap on total energy consumption of 5 billion tonnes of coal equivalent (TCE) by 2020;

- A 15% increase in the share of non-fossil fuel energy (already set in the 13th FYP), with the share of natural gas rising to 10% (as previously set at the ministry level) and that of coal falling below 58% (a new objective) by 2020.

This paper discusses some of the challenges that will be faced by the two new objectives (the energy consumption cap and the energy mix) that are established in this plan.

Should the total energy consumption target be more ambitious?

There was some debate among Chinese experts on the total energy consumption cap set in China for 2015-2016. Early figures for total energy consumption stood at around 5.1 to 5.3 billion TCE by 2020. This total was eventually reduced in the plan to 5 billion TCE. In quantitative terms, this plan seems to have set a more ambitious target than experts were suggesting. There seems to be a reasonable chance of reaching this target by 2020 based on recent trends in annual energy consumption. Total energy consumption in 2015 was 4.3 billion TCE, and if the figure of 5 billion TCE by 2020 is reached, this would equate to an average annual energy consumption growth rate of 3.06% for the period 2016-2020. Total energy consumption was 36.06 billion TCE in 2010, which gives an average annual energy consumption growth rate for the period 2011-2015 (based on the 2010 level) of 3.58%, with annual energy consumption at 7.32%, 3.90%, 3.68%, 2.13% and 0.99% for 2011, 2012, 2013, 2014 and 2015 respectively. Therefore, if the low energy consumption growth trend observed in 2014 and 2015 continues for the period 2016-2020, it should not be particularly difficult to achieve the total energy consumption cap.

The energy mix: a significant increase in natural gas

The plan sets out the targets for three energy types as proportions of the total energy consumption by 2020: 15% for non-fossil fuels, 10% for natural gas, and less than 58% for coal, leaving 17% for oil. In comparison, the 2015 data gave an energy mix comprised of coal (64%), oil (18%), natural gas (6%) and non-fossil fuels (12%). While the steady increase in non-fossil fuels is key to ensuring energy security under a green transition scenario, this plan however calls for a significant increase in natural gas consumption (the renewables target has already been set in the general Five Year Plan and is not supposed to be modified during the five-year period). One major reason for the increased gas consumption is that natural-gas-based heating can reduce local air pollution in China in comparison to coal-fired heating. Given that China has limited natural gas reserves, this will drive up Chinese demand for natural gas on the international market, increasing China's import dependency, which over the coming years may also impact on the price of natural gas on the international market.

The energy mix: a huge challenge for oil consumption

Total oil consumption was 650 million TCE in 2011 and 778 million TCE in 2015, giving a growth rate of 20% for the entire five-year period 2011-2015. If we assume that China achieves its 2020 targets of a total energy consumption cap of 5 billion TCE and a 17% share of oil in the total energy consumption (residual in the plan), then this equates to an oil consumption of 850 million TCE by 2020, corresponding to a 9% growth in oil consumption for the period 2016-2020. Compared to the 20% consumption growth rate for the period 2011-2015, this 9% growth rate for the period 2016-2020 appears difficult to achieve, as does the 17% target for oil share by 2020. The reasons are as follows: first, the domestic transport sector has been developing and will very probably continue to grow, in

particular as a result of increasing power consumption that relies heavily on logistics and transport services. This will continue to drive up demand for petrol and diesel. Second, the development of clean vehicles will be unable to generate a massive substitution effect to replace traditional fossil fuel-based vehicles in China. With the increasing demand for new vehicles as the standard of living improves, there will be an increase in the number of traditional vehicles purchased, which will also drive up petrol and diesel consumption.

Note: if the source is not specifically referenced, all data are from China's National Bureau of Statistics. [\[1\]](#) The Five Year Plan (FYP) is released in March of the first year of the FYP period after approval by the National People's Congress of China (March 2016 for the 13th FYP). Following the release of the FYP, several sectoral plans for the FYP period are released. The energy plan discussed here is one of these sectoral plans. [\[2\]](#) In general, the sectoral plans do not modify the broad targets set in the FYP, but may add new specific targets, which is the case for the energy plan presented here.
