

Combating Air Pollution in China: A Formidable Task?

Sherman Tan, PMP

02 Jan 2014

Hazardous levels

Last month, China's Ministry of Environment Protection confirmed that 13 provinces suffered its worst air pollution in 52 years. In Jan last year, Beijing was shrouded in its worst haze when "beyond" index PM2.5 readings were recorded. These were over 20 times higher than levels deemed safe by the World Health Organisation (WHO). On 26 Dec 2013, Shanghai had to warn elderly and children to stay indoors when PM2.5 was recorded at 395.7 micro-gram per cubic metre, 15 times higher than WHO's safe level. When the city's pollution index surged to 482 on 6 Dec 2013, hundreds of flights have to be cancelled due to poor visibility. According to Shanghai's environmental bureau, 26% of the PM2.5 level came from industrial activities, 26% from transportation and 7.3% from power generation.

The air pollution generated by major urban cities such as Beijing, Guangzhou and Shanghai have spread to inland cities covering Jiangsu, Zhejiang, Anhui and even coastal cities in Shandong. On 22 Dec 2013, the PM2.5 level in Shenyang in northeast China's Liaoning province exceeded the maximum reading of 500 micrograms per cubic meter and the municipal authorities had to issue air quality yellow alert.

Neighbouring countries are also not spared. According to the new research quoted by the [New York Times on 29 Dec 2013](#), fine-particle pollutants from China have been found in other countries. The reported indicated as high as 40% to 60% of pollution found in Japan cities has their origins from China. It is estimated that China's emissions also contribute to ozone layer depletion in the neighboring countries. Recognizing these threats, China, Japan and South Korea agreed on 15 Dec 2013 to jointly combat air pollution and to boost sustainable development for greater ecological improvements.

Curbing coal consumption

Currently, about 20% of the global greenhouse gas emissions are due to coal, making it one of the largest sources of man-induced climate change. In 2012, China alone consumed 3.8 billion tonnes of coal while the rest of the world took up 4.3 billion tonnes. According to the [International Energy Agency](#), coal consumption will continue to grow despite China's ambitious plans to cut reliance on coal and increase other sources of energy supplies.

Announced on 12 Sep 2013 as part of the overall anti-pollution plan (http://www.gov.cn/zwqk/2013-09/12/content_2486773.htm), China planned to cut total consumption of coal to below 65% of primary energy use by 2017, down from 66.8% in 2012. The plan also called for three main economic areas: Beijing-Tianjin-Hebei, Yangtze River Delta and Pearl River Delta, to decline their coal consumption by 2017. Combined with other regions; notably Hebei province, the planned cut in coal consumption by 2017 amount to 83 million tonnes from 2012 level. In addition, ban will be imposed on new coal-fired power plants covering China's most important coal importing regions; the Pearl River Delta and Yangtze River Delta that are responsible for over 50% of the country's thermal coal imports.

Multi-prong approaches

Besides the planned reduction in coal consumption, the Chinese government also intends to increase usage of non-fossil energy up from 11.4% in 2012 to 13% by 2017. To support this plan, several targets have been set. Firstly, it would add 150 billion cubic meters of natural gas trunk pipeline transmission capacity by end-2015 covering the

current coal-dependent areas; namely Beijing-Tianjin-Hebei region and the Yangtze and Pearl River Deltas. Another area is to raise its installed nuclear capacity to 50 Gigawatts (GW) by 2017, up from the current 12.5 GW.

Another area the Chinese government is working on involved scaling down and cleaning up the under-regulated industries like the manufacturing of cement, iron, steel and batteries. For instance, in 2012, China produced 2.21 tonnes of cement which is equivalent to 56% of the global total output. According to the Ministry of Environmental Protection (www.mep.gov.cn), this sector alone is accountable for 15-20% of China's total particular matter (PM) emissions which is a major cause of the hazardous smog. Cement manufacturing also put into the atmosphere 8-10% of nitrogen oxide and 3-4% of sulphur dioxide which are components responsible for acid rain. According to a notice issue by the MEP on 27 Dec 2013, Beijing aims to close up to 370 million tons of outdated cement manufacturing capacity by 2015. Guidelines in the notice will also require cement producers to install advanced anti-pollution technologies to control nitrogen dioxide emissions.

From yesterday, Tianjin joined Beijing and Shanghai in controlling vehicle growth through a combination of bidding and lottery system of car license plates. The move is targeted at controlling the number of vehicles on the road to curb traffic congestion and air pollution.

Improved air quality by 2017?

The multi-prong approaches undertaken through the control of coal consumptions, industrial and vehicular emissions and increased usage of clean energy alternatives are to support the key goals of the 12 Sep 2013 anti-pollution plan to improve air quality as follows:

- 1) Reduce PM 2.5 levels from between 15% to 25% of 2012 levels by 2017 in the following regions:
 - a) Beijing-Tianjin-Hebei region: 25% reduction
 - b) Yangtze River Delta (Shanghai, Jiangsu & Zhejiang): 20% reduction
 - c) Pearl River Delta (Guangdong): 15% reduction
- 2) Reduce PM 10 levels in all 286 prefecture-level cities by at least 10% from 2012 levels by 2017

While the planned actions are remarkable, can these initiatives be sustained?

The most important part in this equation is the use of coal. Coal for power generation is the cheapest amongst other energy sources and China's growth of over 7% per annum cannot be further reduced to support its enlarging economy and population's demands for growth. Can China reduce the use of coal without crippling its economic growth? While there are various international discussions on this topic, there is also increased concern from countries that are dependent on export of coal to China. In 2007, thermal coal export to China was only 3% of total coal export in Australia but this ballooned to 18% in 2012. A report "[Stranded Down Under](#)" released on 16 Dec 2013 discussed the impact on Australia arising from the planned scale down of coal consumption in China.

In less than a month's time, the Chinese will be celebrating their Lunar New Year but depending on the smog condition and air pollution indexes across the countries, revelers in China could well be disappointed as authorities might ban the use of fireworks during the festive period. The real disappointment would however, be the Chinese authorities losing their impetus in their announced efforts to achieve the 2017 targets.

The writer is the Principal Consultant & Director at Innovar Pte Ltd (www.innovar.com.sg). He can be contacted at office@innovar.com.sg.